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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

# ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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*The economic situation and policies of Luxembourg were reviewed by the Committee on 2 May 2006. 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 18 May 2006.*

*The Secretariat's draft report was prepared for the Committee by David Carey, Ekkehard Ernst and Stefaan Ide, under the supervision of Patrick Lenain.*

*The previous Survey of Luxembourg was issued in September 2003.*



## BASIC STATISTICS OF LUXEMBOURG

### THE LAND

Area (km <sup>2</sup> )	2 586	Major city (thousand inhabitants, 2005):	
Cultivated land, grassland and pastures		Luxembourg	76
And forests (2003)	87%		

### THE PEOPLE

Population(thousands, 2005)	455	Civilian employment (thousands, 2004)	302
Number of inhabitants per km <sup>2</sup> (2003)	174	Agriculture	4
Net natural increase (2004)	1 874	Industry and construction	64
Net migration	1 584	Financial services, services to business	84

### PRODUCTION

Gross domestic product, current prices, (2005)		Origin of GDP in per cent:	
Euro million	29 324	Agriculture	1
Gross national income per head,		Industry and construction	19
current prices, 2004 (US\$ PPP).	54 579	Financial services, services to business	43
Gross fixed investment, current prices in % of			
GDP, (2005)	20		
Per head	1 303		

### THE GOVERNMENT

In % of GDP, 2005		Composition of Parliament (No. of seats)	
General government consumption	17	Christian social	24
General government current revenues	41	Worker socialist	14
General government gross debt	6	Democrats	10
		ADR	5
		Déi Gréng	7

Last elections: 2004

### THE CURRENCY

Monetary unit: euro		Currency unit per USD, average of daily figures	
		Year 2005	0.80
		April 2006	0.81

## Executive summary

The Luxembourg economy has regained its footing after the sharp slowdown at the start of the decade and is now growing at around its trend rate of 4-4½ per cent. The financial-services sector, which accounts for nearly one-third of economic activity, has benefited from the return of confidence in capital markets. Nonetheless, there are signs that the conditions for long-term economic growth are becoming less favourable. Output growth has not returned to the extraordinarily fast rates of the 1980s and 1990s, the dynamism of real incomes has declined, productivity growth has slowed, the fiscal situation has deteriorated and inflation has remained higher than in the main trading partners. This Survey analyses these challenges and outlines measures to prepare for changing times.

**A worrying sign of strain is the deterioration of the fiscal position, caused by the rapid growth in public expenditure.** The authorities have rightly announced that they will bring the budget back to balance by the end of the current legislature, i.e., in 2009 at the latest. To achieve this goal, it will be important to rein in the growth of public salaries and social benefits. This should start in earnest in the 2007 budget.

**Another source of concern is the weakening of the pension system, which appears unsustainable under present rules.** This results from the maturing of the system as well as the forthcoming increase in average effective replacement rates. The government should undertake reforms to put the pension system back on a sustainable path. These include indexing the age of retirement to life expectancy, reducing incentives for early retirement and pre-funding future pension promises by accumulating a large, actively-managed pension reserve.

**Despite strong employment growth, unemployment is rising.** Employers prefer to recruit cross-border workers, who accept lower salaries than residents. To reverse these trends, labour market institutions that drive up reservation wages should be reformed, in particular high unemployment replacement incomes. In addition, activation measures are to be reinforced and a review of the public employment service (ADEM) has been commissioned with a view to restructuring it to match job-seekers and job vacancies more effectively.

**Enhanced human capital development would strengthen productivity growth and improve lower-skilled residents' employment prospects.** There is considerable scope to improve education achievement and attainment, which are below the OECD average, especially for children of immigrants and low socio-economic backgrounds. While much has been done to help these children cope with Luxembourg's trilingual education system, more could still be done. There are other reforms that would improve education outcomes, notably reducing selection at early ages and avoiding widespread recourse to grade repetition.

**Strengthening product market competition would also help to lift productivity growth.** Institutions to enforce competition were recently established, but they do not seem to have a sufficiently broad mandate to impose significant changes. Anti-competitive practices in professional services need to be tackled. In retail trade, barriers to entry should be eased and shop opening hours liberalised so as to reap the benefits of a potentially fast expanding sector.

## Assessment and recommendations

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### *Economic growth is around the trend rate, but is unlikely to return to its earlier brisk pace*

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The economy has regained its footing after the disruptive events at the start of the century, and is currently undergoing a sustained recovery. Output growth rose to around 4% in both 2004 and 2005, which is near the trend rate, and the short-term outlook is one of continued dynamic growth in 2006. The financial services sector (which represents around 30% of value-added) has recovered from the bursting of the stock market bubble, with investors regaining confidence in equity markets. The sector has also escaped unscathed from the introduction of a withholding tax on interest income, which does not appear to have deterred non-resident customers. Employment gains have been correspondingly robust (about 3% annually in the past two years) especially in financial institutions, but also in associated activities such as business services.

Nonetheless, there are signs that long-term economic conditions are becoming less favourable. Real GDP growth has not returned to its previous brisk pace, the dynamism of real incomes has abated, trend productivity has decelerated, the fiscal situation is under strain and inflation has remained higher than in the main trading partners, with adverse consequences for competitiveness. The very high growth of the 1980s-90s was underpinned by specialisation in fast growing, high value added sectors, notably financial services. Financial market liberalisation in OECD countries and other factors came together to support expansion in the global financial services industry and Luxembourg offered regulatory and tax advantages that enabled its financial sector to grow particularly quickly. As the transition draws to a close, trend growth may slow further, bringing it closer to the European average. In view of these prospects, it would be prudent for the government, to prepare the economy for changing times, notably by investing in the human capital development of children, including those from immigrant and lower socio-economic backgrounds.

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### *The authorities rightly aim at curbing public expenditure*

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An obvious sign of strain in the economy is the deterioration of public finances from comfortable budget surpluses during most of the 1990s to a deficit of 1.9% of GDP in 2005. This deterioration is largely of a structural nature, as shown by the failure of the deficit to fall during the current upswing. If it continued, this fiscal trend would risk undermining macroeconomic stability and low taxation of labour incomes, which has been so important in the past, notably in attracting foreign investors and workers. The authorities are

committed to bringing the structural budget close to balance by 2009, which would imply an improvement of 0.5% of GDP on average every year until the end of the current legislature. To this end, the government and social partners have signed a tripartite agreement that aims to curb the growth of public expenditure, including by deferring (without catch-up) the indexation of salaries and benefits and reducing public investment programmes. Curbing spending growth is essential, in particular that of social benefits, which are the largest category of public expenditure and were boosted by the introduction of new entitlements (such as *cong  parental*) and the widening of existing ones (such as the *Rentend sch* pension reform). Most benefits have very high replacement rates by international comparison. *Therefore, future budgets should avoid introducing new entitlements or expanding existing ones, and should temporarily suspend the adjustment of benefits to real wages.*

Among social entitlements, health care spending has been the most dynamic. Spending per capita has risen faster during 1997-2003 in Luxembourg than in any other OECD country (when converted at purchasing power parity). Pressure has emerged in the budget of the *Union des Caisses de Maladie* and contributions had to be hiked. This fast pace of growth is mainly explained by a fast expanding cross-border labour force covered by national social security institutions, by the introduction of a long-term care scheme (*assurance d pendance*) and by the decision of the authorities to build new hospitals, which have provided expanded choice to patients but also permanently increased spending. *As an alternative to establishing additional in-patient institutions so as to cover the full range of medical treatments, the authorities should foster cooperation with healthcare suppliers in regions of neighbouring countries; this would help to reduce the duplication of hospital services.* As well, the number of doctors has risen rapidly, as have their fees, now that they are indexed to the economy's nominal wage rates. While controlling outpatient care expenditure is a problem across the OECD, *the authorities should consider introducing a gatekeeper system, entrusting general practitioners with the decision to refer to specialists; this may help to reduce future growth in ambulatory-care spending.*

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#### *Human resource management should be modernised in the public sector*

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Another reason behind the strong growth in public expenditure is the momentum of the government wage bill. The civil service is not oversized by international comparison, but individual wages are high and have strong dynamism partly reflecting automatic seniority-based increases. So as to slow this dynamism, the government has decided to freeze public sector pay scales in 2007 and 2008. Existing rules on the mobility of employees across government agencies are rigid, making it difficult to respond to the changing nature of demand for public services. *Hence, the management of the public service should be made more flexible, so as to facilitate the reallocation of human resources as well as to introduce elements of an incentive-based performance evaluation system.*

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#### *The budgeting framework needs to be brought in line with best practices*

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There are other budget management practices that could be made more efficient. First, the government continues to submit to Parliament a budget that is essentially limited to the revenues and spending of the central government during the next year; it thus fails to

assess the medium-term trends of the budget and to present the financial interactions with the social security system, which are very intricate in the case of Luxembourg, in a fully transparent way. *The government should submit to Parliament a budget that assesses the medium-term trends of the general government and encompasses the social security system.* Second, the government continues to request authorisations for line-by-line credits, thus stressing the requested financial means rather than the ultimate policy objectives. *The budgetary framework should adopt an outcome-based approach, which focuses on final objectives and provides a fungible sum of money to budget managers, with responsibility to achieve these objectives.* Third, public investment projects are carried out by 29 “special funds” responsible for a large variety of tasks. A strength of these funds is that they can carry forward unused resources to the next year, thus avoiding end-of-year spending splurges. On the other hand, they lead to rigidity in budgetary execution because resources cannot be reallocated, if so needed. *The number of “special funds” should be reduced so as to foster fungibility of resources.*

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*In the absence of reform, the pension system will incur large liabilities after 2030*

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Although the social security pension scheme appears to be in good financial shape for the time being, it is projected to mature progressively and incur large liabilities after 2030, when the ratio of contributors to beneficiaries will become much less favourable. Moreover, many current beneficiaries who now have incomplete contribution records – notably women, cross-border workers and migrants – will acquire rights to fuller pensions. As well, longer life expectancy means that pensions will be paid for a longer period than at present, thus increasing future spending. If nothing is done, liabilities could accumulate and reach between 49% and 151% of GDP by 2050, depending on the future rate of growth of real GDP. The financial position of the social security system will initially deteriorate at a gradual pace, providing breathing space for reform which, if implemented rapidly, could re-establish the long-term viability of the system without causing disruptive adjustments.

The bunching of pension promises after 2030 calls for pre-funding of future payments. In this regard, *pension replacement rates should be reduced so as to lower expenditure and accumulate financial assets equivalent to between 70% and 100% of GDP by 2030 (depending on future growth), from the present level of 24% of GDP.* Such a reduction in replacement rates would not unduly harm the welfare of pensioners as statutory pension replacement rates are very high at present – indeed they are among the highest in the OECD. Even though pre-funding would help to cope with the maturing of the system and the bunching of payments, it would not put it back on a sustainable footing. For this purpose, workers should be encouraged to devote a substantial part of their increased longevity to productive activities, rather than entirely to leisure. *To this end, reforms should include: indexing the legal early-retirement and pension ages to life expectancy; tightening access to pre-retirement schemes; reducing the eligibility to imputed pension rights for non-contributory periods; and putting the existing financial inducement to later retirement on an actuarially-neutral basis.*

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### Labour market reforms should aim at increasing resident labour utilisation

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Despite employment growing at a strong pace, unemployment has risen since the start of the decade. The increase in unemployment partly results from an administrative reform that shifted the disabled and partially disabled job-seekers to the unemployment insurance scheme. However, there has also been an increase in the number of regular residents unemployed. The fact that a growing proportion of residents fail to find a job seems to result from their having high reservation wages, reflecting the high levels of replacement incomes. During the first year of unemployment, benefits are as high as 90% of prior earnings on a net basis for the average worker. Although this runs out after 12 months, the minimum guaranteed income (RMG) then keeps the replacement rate at close to 80% for someone who had average earnings and has a dependent spouse. *The authorities should therefore consider lowering existing unemployment replacement rates, after an initial period of three months of unemployment.* The fact that the RMG is conditioned on the level of the spouse's income may also create significant inactivity traps for dependent partners. *The rate at which the RMG declines when the dependent partner finds a job should be made more gradual, so as to strengthen work incentives.*

The rise of unemployment makes it all the more important for the public employment service (ADEM) to ensure a better match between job seekers and jobs. Activation measures undertaken by ADEM have become inadequate, in particular because the agency is no longer adequately funded and equipped to deal with the large number of job-seekers. The recent tripartite agreement reinforces activation measures. In addition, the authorities have commissioned a special OECD Review of ADEM to help guide reforms to improve the effectiveness of the system.

The existing panoply of pre-retirement schemes has helped to depress the employment rate of older workers to one of the lowest levels in the OECD. These schemes were created in the past to respond to special events (notably the sharp decline of steel production), but no longer appear justified. *This is notably the case of the "préretraite d'ajustement", which should be phased out.* Workers can obtain an early-retirement pension at age 60 provided that they contributed to the pension system during at least 40 years, including imputed credits for non-contributory periods, such as periods of tertiary education or child rearing. Such imputed credits are not only high by international comparison, but are likely to contribute to an inefficient lengthening of periods of tertiary education and to excessive labour-market withdrawal of women after childbirth. *The authorities should reconsider the arrangements for imputing non-contributory periods to pension rights, so as to strengthen work incentives.*

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### Education reforms are needed to upgrade skills

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Weak education outcomes will become a rising hurdle for the government strategy to build a knowledge-based economy unless reforms are instituted. Student achievement is below the OECD average, according to the 2003 PISA study, with the gap in achievement between immigrant students, most of whom come from EU-member countries in which Romance languages are spoken, and native students being above average. Partly reflecting this,

attainment is also below the OECD average. Correcting these weak outcomes does not necessarily mean spending more, but it certainly implies spending more effectively.

A factor that makes learning especially challenging for children from immigrant and/or lower socio-economic backgrounds is that Luxembourg has a trilingual education system (*Lëtzebuergesch*, German and French are used as languages of instruction). The ability to speak fluently each of the three official languages is considered an objective because it fosters social unity in a country that could otherwise divide into two distinct linguistic communities (German- and French-speaking). Trilingual education is also considered essential to integrate the children of immigrant families, who otherwise may stay at the margin of society.

The authorities have worked hard to overcome learning difficulties in a trilingual education system. Pre-school has been extended to 3-year olds on a voluntary basis, so that children of immigrant origin have more time to learn *Lëtzebuergesch* before joining primary school. Supplementary courses in German are also offered at the primary-school level to improve the German-language competence of immigrant children. There are special classes for immigrant children who did not start their education in Luxembourg in which German and/or French are taught intensively with a view to enabling them to join regular education as soon as possible. New empirical evidence based on the PISA tests suggests that Luxembourg has had considerable success in meeting this challenge: the adverse impact of immigrant status on PISA test scores is around the OECD average. Less support and flexibility is available, however, at the level of vocational courses, which are predominantly taught in German, although this is the track that many immigrant children find themselves in after having done poorly at primary school, resulting in a high rate of dropouts. *The authorities should thus continue to exercise flexibility and seek innovative solutions in the implementation of the trilingual system, notably by encouraging the participation of immigrant children in supplementary German-language classes, as well as by increasing the proportion of courses in the vocational track of secondary education that are taught in French.*

Another specific feature of the Luxembourg education system is that it is very stratified. Children are sorted into a large number of parallel tracks at an early stage, with little opportunity to get into a higher track at a later stage. There are three main tracks, with academic and vocational programmes separately provided; the academic (*enseignement secondaire*, representing about 30% of students) and technical vocational (*Régime technique*, representing about 25% of students) tracks lead to qualifications that have the same legal standing in the labour market and for access to university studies. Students are also sorted within tracks according to performance. International evidence suggests that the impact of socio-economic background on student performance is large in countries with more differentiated systems. This implies that education may not be able to offer children from low socio-economic background and/or immigrant origin a chance to do better than their parents.

So as to enhance permeability between the different tracks and increase social diversity, the government decided ten years ago that all new secondary schools would offer all three tracks (general academic, technical vocational and ordinary vocational) in lower secondary education. However, already established secondary schools have refused to do so. *All secondary schools should be compelled to offer all three education tracks in the first years.* In a further move to increase permeability, the authorities are considering introducing a module corresponding to the first two years of secondary school during which the general



and technical vocational programmes would develop in parallel. This would facilitate entry into the more prestigious general programme for some children who were oriented to the technical programme from the beginning of secondary school. The authorities are also considering offering exams that would enable students having gained a certificate at the end of ordinary vocational secondary education (*Régime professionnel*) to do extra exams and gain access to tertiary education. *Overall, there should be a greater degree of permeability between tracks so as to give students selected for vocational programmes a second chance. The authorities should also reflect on whether it makes sense to continue to direct such a large proportion (45 per cent) of students into the vocational tracks (Régime de technicien and Régime professionnel) that mostly lead to particular occupations or trades given that a good general education may be more appropriate for the jobs available in Luxembourg.*

Luxembourg has a high rate of grade repetition, which is recognised as bad educational practice since it does not improve performance, is expensive and tends to increase the impact of socio-economic background on performance. The authorities aim to reduce this practice and have, to this end, recently introduced remedial measures for all children falling behind. Grade failure has also been reduced by allowing some averaging of results across subjects – previously children were required to pass in every subject or repeat them all – and should fall further with new, less restrictive rules for averaging results across subjects. The authorities are considering reorganising the six-year primary education programmes into three two-year modules with defined competences to be achieved at the end of each module. The curricula in these modules would be pared back, leaving an extra margin of 30% of course time for getting to the required level. Children not meeting the required standards in the first or second modules would at most be required to repeat one year while failure in the third cycle would result in children going into the vocational education track (*régime préparatoire*) that leads to apprenticeship training during the upper secondary years. *The authorities should continue implementing the reforms being considered to reduce grade repetition, notably the reorganisation of primary education into three two-year modules with defined competences to be achieved.*

Approximately one quarter of teachers are not certified, having failed to pass the final exams or to successfully complete the training period. This is a cause for concern because empirical evidence suggests that uncertified teachers have an adverse impact on achievement. *The government should enhance access to second-chance opportunities through continuing education to enable more uncertified teachers to certify.* With almost all teachers being natives of Luxembourg, mostly from middle-class households, there is much room for misunderstanding between teachers and students from immigrant households, resulting in poor communication and undermining the effectiveness of teaching. *Teachers should be given more training to overcome cultural differences that could otherwise stand in the way of effective learning. Moreover, greater efforts should be made to overcome these differences directly by recruiting more students from immigrant backgrounds into the profession.* This would also provide such students with positive role models.

#### *Competition should be enhanced, especially in professional services and retail trade*

Being a small economy with open borders and small travelling distances to neighbouring countries, Luxembourg already enjoys many of the gains coming with competitive pressures on product markets. Nevertheless, regulatory barriers to product market

competition remain, the removal of which would have a beneficial effect on productivity growth. The authorities have taken an important step in this direction by bringing the competition policy framework into line with that prescribed by the articles of the European Union Treaty. They created a Competition Council and a Competition Inspectorate. *These institutions should expedite the reviews they have been mandated to do, outsourcing if necessary.* The field of competences of the Council is restricted by law to sanctioning the abuse of dominance and restrictive agreements. *It should be widened to include competition advocacy and the examination of laws and regulations issued by legislative and administrative bodies.*

Important regulatory barriers to competition remain in professional services provided by lawyers, notaries, architects and accountants. In these professions, the economic rationale for regulation is to alleviate significant market failures, notably information asymmetry. However, it has been found that professional services are often subject to pervasive regulation that hinders competition, thereby reducing incentives to lower prices, increase quality and offer innovative services. The OECD summary indicator on regulation of professional services ranks Luxembourg as the third strictest in a cross-country comparison. This suggests that consumers are deprived of many of the benefits associated with strong competitive pressure among providers of professional services. In particular, the access of new entrants is restrained by very strict licensing and education requirements, with negative consequences for competition. *The authorities should consider ways to ease the stance of policies regulating professional services, notably by opening access to the market to new entrants, as well as by curbing excessively strict conduct regulation.*

The retail trade sector has been an important driver of productivity growth and employment in many countries over the past decade. Where competitive pressures have been at work, the sector has found ways to benefit from progress in new information technology, logistics and managerial techniques. In Luxembourg, these developments have been hampered by the introduction in 1997 of a moratorium on authorisations for large new retail outlets, which was extended to 2005. The moratorium was allowed to lapse at the beginning of this year, but government authorisation is still subject to a test of whether a new outlet is likely to induce an economic imbalance. Furthermore, granting planning permission for large retail outlets may suffer from the fact that municipalities have to draw up zoning plans and that these are subject to pressure from incumbents; in fact, zoning policies are in general very tight for all economic activities, notably road and telecommunications infrastructure and office buildings. New retail outlets have therefore been established in neighbouring countries, causing some inconvenience for consumers and depriving the economy of employment gains as well as tax revenues. Entry of large retail outlets is also discouraged by stricter regulations on shop opening hours than in neighbouring countries. *Thus, zoning policies should be reviewed to determine whether they unnecessarily hinder economic development; shop opening hours should be liberalised, for example by aligning them with those in France.*



## Chapter 1

# Insuring against lower economic growth in the long term

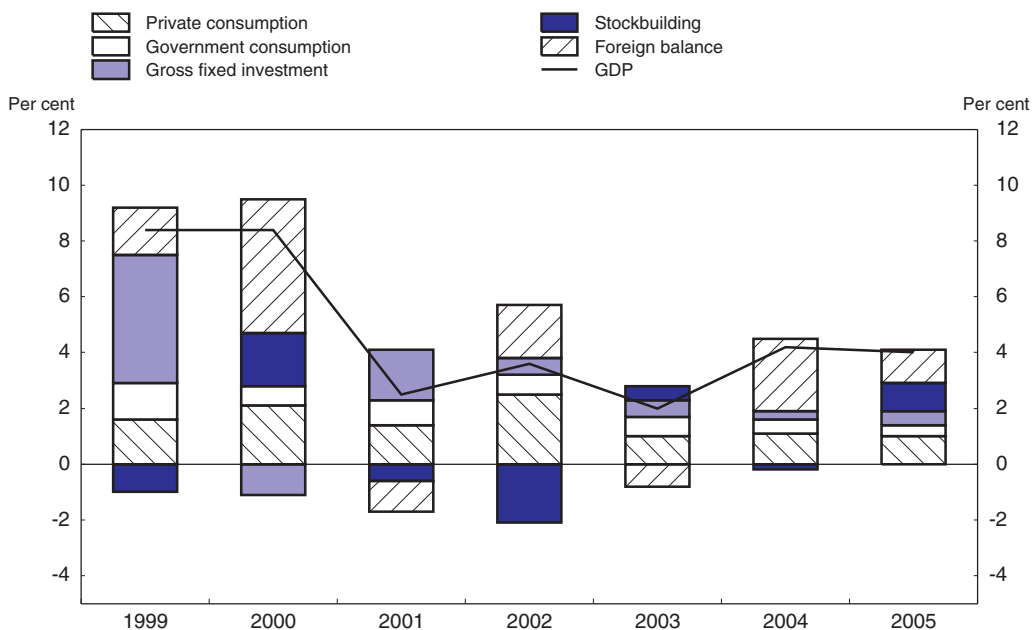
*Economic growth in Luxembourg has picked up to around the trend rate in the past two years, following weak activity in the wake of the bursting of the global equity market bubble. While the estimated trend growth rate remains high by international comparison, it has nevertheless slowed considerably from the 1980s-90s, reflecting lower contributions from financial services. In the long term, such contributions may weaken further as adjustment to factors such as financial market liberalisation and regulatory and tax advantages that have underpinned rapid development of Luxembourg's financial sector draws to a close, pulling trend growth closer to the European average. In a related development, output growth has become increasingly labour intensive. Labour productivity growth has fallen and, with cross-border workers taking most new jobs, unemployment has risen strongly and growth in GNI now substantially trails that in GDP. In view of these developments, a number of challenges emerge: adjusting public finances to persistently lower growth, notably the PAYG pension system; enhancing the employment prospects of resident workers; improving education achievement and attainment to compete in the labour market; and increasing product market competition to boost productivity growth.*

## The macroeconomic context

### **Economic growth has picked up to around the trend rate**

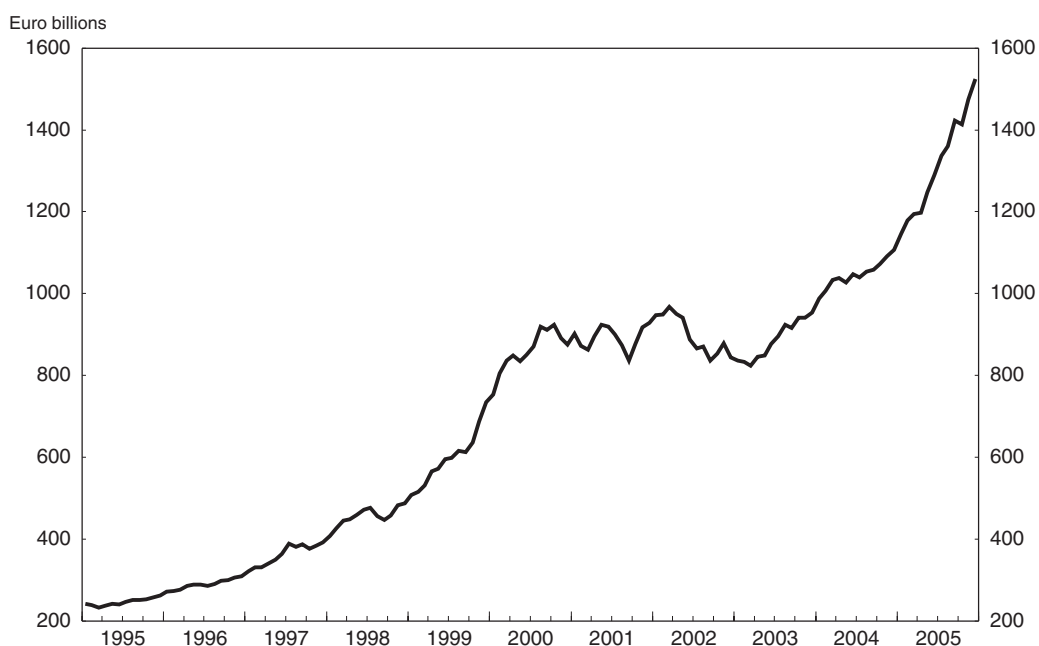
After three years of relatively slow economic growth, the pace of activity has picked up, reaching 4.3% in 2004 and an estimated 4.0% in 2005. Although lower than growth rates observed at the end of the 1990s, economic growth remains well above the euro area average. External demand for financial services has strengthened on the back of the recovery in global equity markets since 2003, underpinning a large increase in the net exports' contribution to growth (Figure 1.1). Net mutual fund assets increased by 60% in the two years to December 2005, with around 40% of this increase attributable to the rise in financial markets (Figure 1.2). While bank commissions have risen by 26% over this period, growth in overall bank revenue has been weaker (9%) owing to lower growth in other sources of income, notably interest rate margins (Table 1.1). The EU Savings Directive, which introduced withholding taxes on interest income accruing to non-resident EU residents from July 2005, does not seem to have affected financial sector revenue, although it may have encouraged a switching of investments into equity funds.

Figure 1.1. **Contributions to real GDP growth<sup>1</sup>**



1. 1999-2005 data are based on revised national accounts.

Source: OECD Economic Outlook No. 79, OECD calculations.

Figure 1.2. **Net assets of mutual funds domiciled in Luxembourg**

Source: Commission de Surveillance du Secteur Financier.

Table 1.1. **Aggregate profit and loss account for the banking sector**

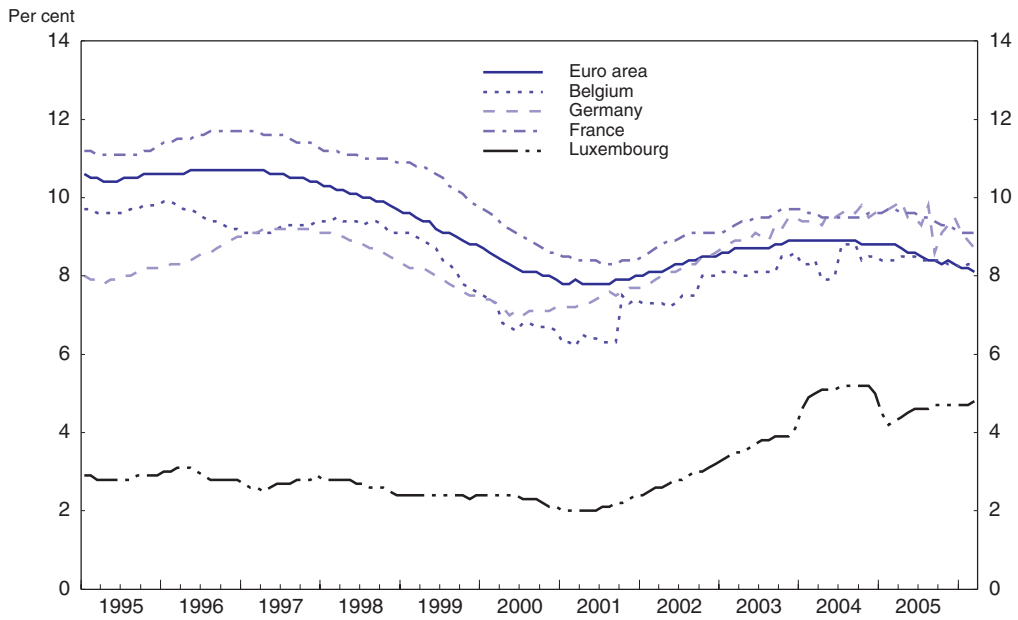
In millions of euros

	2001	2002	2003	2004	2005
1. Bank income	7 939	8 061	7 590	7 450	8 269
Interest margin	4 382	4 141	4 080	3 913	3 914
Income from commissions	2 792	2 615	2 533	2 771	3 203
Other net income	765	1 305	978	766	1 152
2. Compensation of employees	1 758	1 809	1 752	1 798	1 941
3. Operating costs	1 865	1 681	1 632	1 663	1 736
4. Profits before provisions (= 1-2-3)	4 316	4 571	4 206	3 989	4 592
5. Net provisions	536	1 166	638	345	240
6. Taxes	920	685	694	778	804
7. Net profits (= 4-5-6)	2 860	2 720	2 874	2 866	3 548

Source: Commission de Surveillance du Secteur Financier, Luxembourg.

Reflecting this upswing, domestic employment growth has picked up to 3.6% in the year to March 2006. These gains are almost exclusively attributable to hiring in the financial sector and in associated activities such as business services and real estate. Meanwhile employment in industry continues to decline. The inflow of cross-border workers remains high, accounting for almost 70% of new jobs created, and bringing their employment share to around 38%. Although the unemployment rate is still low compared with rates in neighbouring countries and regions, the number of job seekers has been on the rise continuously since the economic downturn in 2001 (Figure 1.3). Part of this rise was due to administrative reasons as partially and fully disabled persons have been reclassified as being part of the labour force. Nevertheless, even abstracting from these administrative effects, the increase in unemployment was still substantial, reflecting, as discussed in Chapter 3, skill mismatches and high reservation wages.

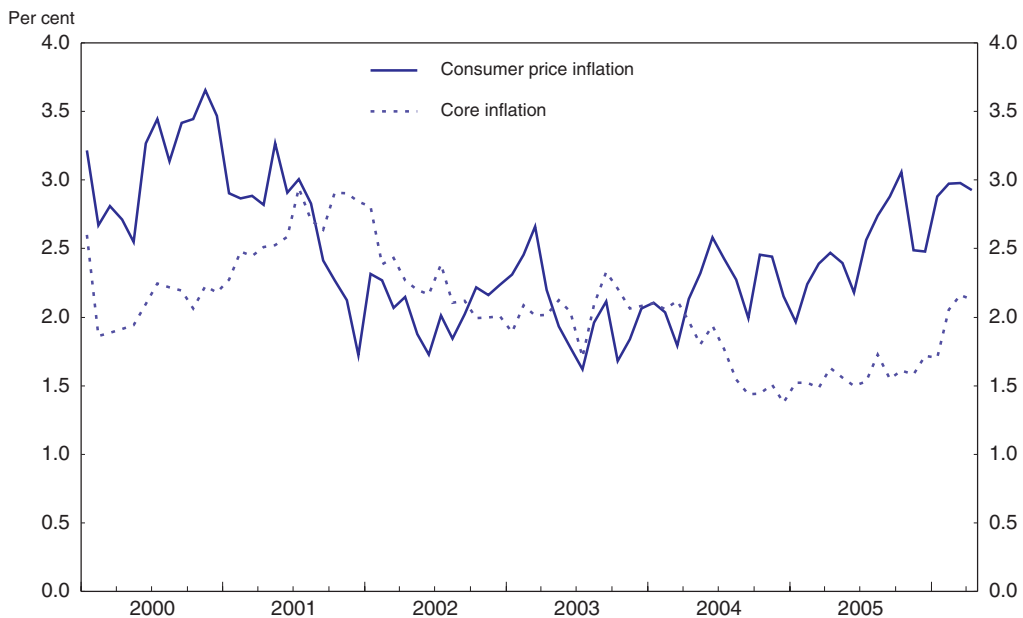
**Figure 1.3. Unemployment rate**  
In per cent of the labour force



Source: Eurostat, New Cronos.

Inflation accelerated in the course of 2005, mostly as a result of the surge in oil prices, with the annual rate of increase in the national CPI<sup>1</sup> reaching 2.9% in April 2006 (Figure 1.4). While core inflation remained subdued in 2004 and 2005, it has been trending upward since the

**Figure 1.4. Inflation developments**  
Year-on-year percentage changes



Source: OECD, Main Economic Indicators.



beginning of 2005 and reached 2.1% in April 2006. The average wage increase during the first nine months of 2005 was 3.6% compared with the same period last year. Wage indexation contributed strongly – 2.5% – as did continued high real wage growth in the public sector and the financial and business services sectors. In the manufacturing sector, real wage increases remained subdued, contributing to ongoing low increases in unit labour costs in this sector.

With conditions improving in the financial sector, the current account surplus surged from 6.4% of GDP in 2003 to 10.5% in 2004. Despite a further large increase (amounting to 5% of estimated GDP) in the balance on financial services, the current account surplus has since declined somewhat, to 9.8% of estimated GDP in 2005. The rise in the surplus on financial services has been offset by a similar increase in the deficit on net factor payments to the rest of the world. This reflects both rising salary payments to cross-border workers and falling net investment income. The deficit on merchandise trade also increased somewhat as goods exports were weighed down by weak demand from EU-countries and rising energy prices lifted import values.

### **A sustained recovery with inflation pressures appearing**

Economic growth is projected to continue at a stable rate near trend over 2006-2007 reflecting a continuous impulse from exports and private consumption (Table 1.2). The stimulus from public spending is assumed to diminish as the authorities are committed to gradually bringing the budget close to balance. Non-residents will continue to be the main beneficiaries of the projected job creation in the private sector while unemployment should exceed 5% on an annual average basis, reflecting skill mismatches

Table 1.2. **Short-term projections**

	2003	2004	2005	2006	2007
Percentage changes					
<b>Demand and output (volume)</b>					
Private consumption	2.4	2.6	2.3	2.8	2.3
Government consumption	4.5	3.0	2.6	3.4	3.1
Gross fixed capital formation	2.3	1.5	2.2	4.2	3.1
Final domestic demand	2.9	2.4	2.3	3.3	2.6
Change in stock building	0.5	-0.2	1.0	0.0	0.0
Total domestic demand	3.6	2.1	3.7	3.3	2.6
Exports of goods and services	3.7	10.2	8.9	9.3	8.1
Imports goods and services	4.9	9.8	9.4	9.4	7.7
Change in net exports	-0.8	2.6	1.2	2.0	2.6
GDP at market prices	2.0	4.3	4.0	4.5	4.5
<b>Inflation</b>					
GDP deflator	4.8	1.1	4.2	4.1	1.9
Private consumption deflator	2.2	2.4	2.8	3.0	2.0
%					
<b>Others</b>					
General government balance (% of GDP)	0.2	-1.1	-1.9	-1.7	-1.2
Unemployment rate	3.7	4.2	4.7	5.1	5.2
Current account balance (% of GDP)	6.4	10.5	9.3	10.4	9.7
Short-term interest rates	2.3	2.1	2.2	2.7	3.4
Long-term interest rates	4.1	4.0	3.4	3.9	4.2

Source: : OECD Economic Outlook, No. 79.

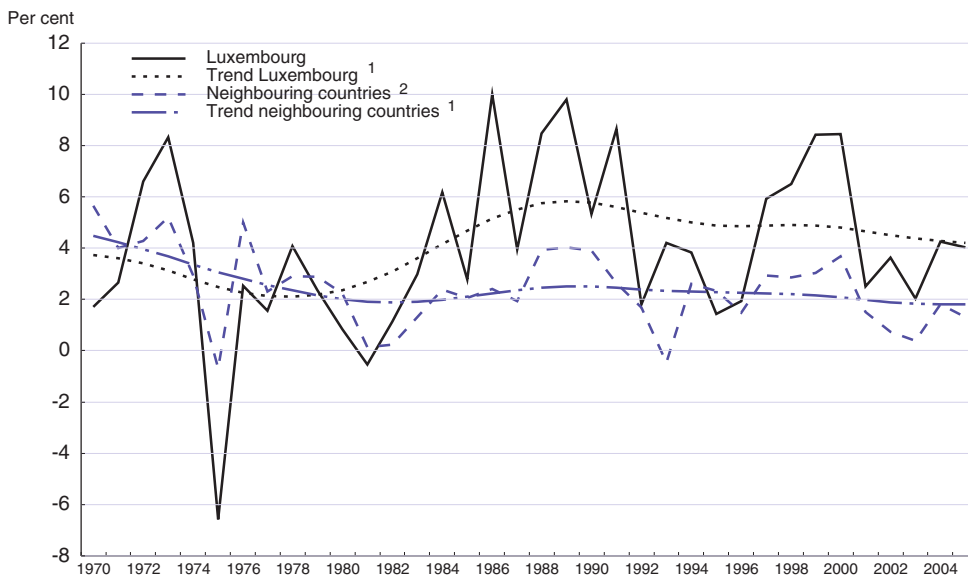
and high reservation wages. As noted, core inflation has been trending up in 2005, and is set to continue to do so, as higher energy prices via the indexation mechanism and strong employment gains result in strong wage growth. Headline inflation will ease towards the end of the projection period as the contribution of increases in energy prices dissipates.

## Trend economic growth is slowing from the very high rates in the 1980-1990s

**Developments in the financial- and communications sectors have underpinned high economic growth, albeit slowing in recent years<sup>2</sup>**

Economic growth was slightly lower in Luxembourg than in neighbouring countries until the late 1970s and on a similar declining trend (Figure 1.5). Since then, growth has been much higher in Luxembourg than in these countries: it averaged 5.2% over 1985-2005. It turned up sharply during the 1980s, reaching a peak trend rate of around 6% per year in the late 1980s-early 1990s, before gradually declining to 4-4½ per cent during the early 2000s.

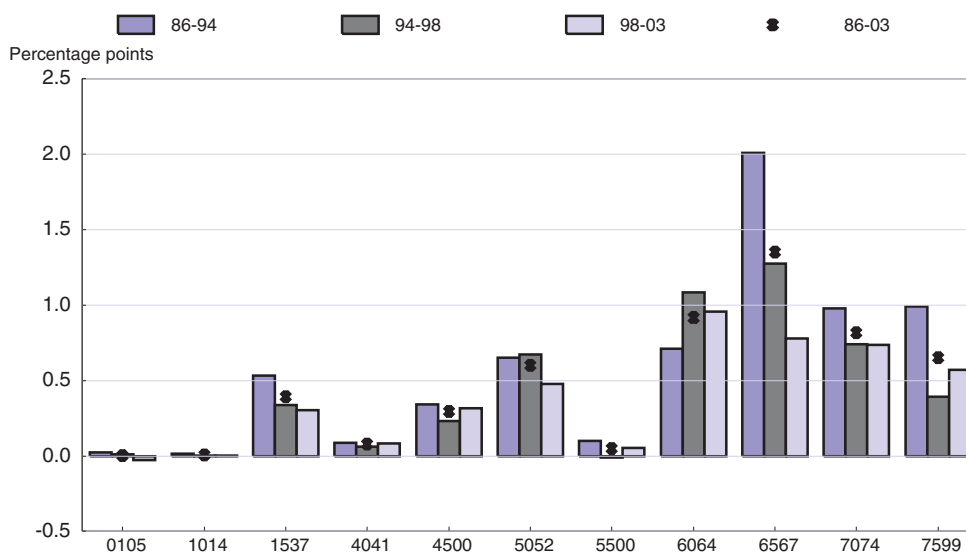
Figure 1.5. **Trend real GDP growth in Luxembourg and in neighbouring countries**



1. Trend real GDP growth has been calculated by applying a Hodrick-Prescott filter with an adjustment parameter of 100 to annual GDP series extended beyond 2005 using the OECD Economic Outlook 79 projection for 2006-2012.
2. Average (not weighted) of Germany, France, the Netherlands and Belgium.

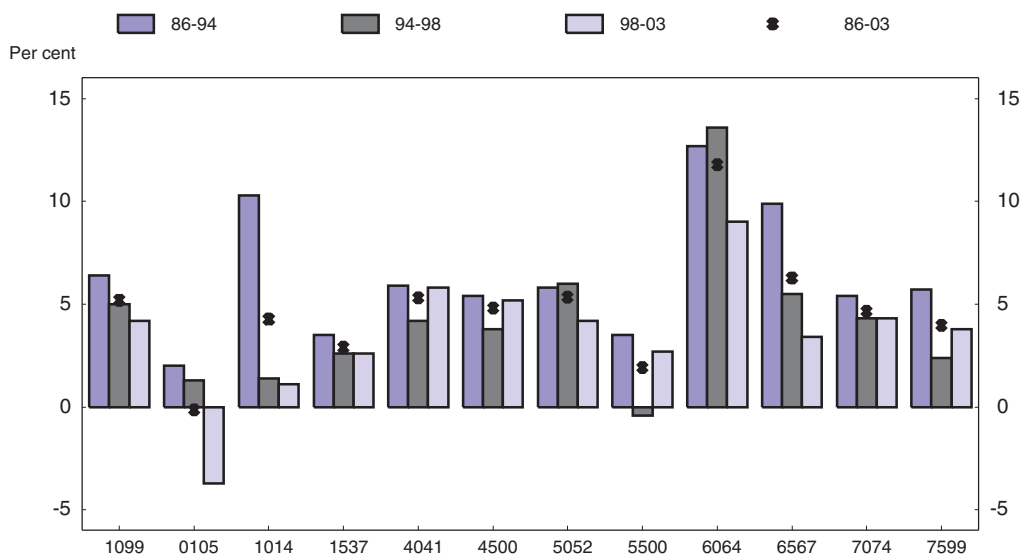
Source: OECD Economic Outlook, No. 79.

High economic growth in Luxembourg has been underpinned by the financial sector (NACE 6567) and to a lesser extent by the transport, storage and communications sector (NACE 6064). It grew at an annual average real rate of 6.9% over 1986-2003<sup>3</sup> and contributed on average 1.4 percentage points to annual growth of the whole economy over this period (Figures 1.6 and 1.7). Financial sector growth in Luxembourg was particularly high (9.9%) over 1986-94, when the sector contributed 2.0 percentage points to average annual real economic growth, but has since fallen to 3.4% in 1998-2003,<sup>4</sup> cutting the sector's contribution to overall economic growth to only 0.8 percentage point per year. The sector's contribution to nominal growth over 1986-2003 was even higher than that to real growth, reflecting a substantial increase in the relative price of financial services.

Figure 1.6. Contributions of different sectors to real annual growth in value added<sup>1</sup>

1. 0105: Agriculture, hunting and forestry, 1014: Mining and quarrying, 1537: Total manufacturing, 4041: Electricity, gas and water, 4500: Construction, 5052: Wholesale and retail trade, 5500: Hotels and restaurants, 6064: Transport, storage and communication, 6567: Financial intermediation, 7074: Real estate, renting and business activities, 7599: Community social and personal services.

Source: OECD, STAN Database.

Figure 1.7. Annual growth in real value added by sector<sup>1</sup>

1. 1099: Total, 0105: Agriculture, hunting and forestry, 1014: Mining and quarrying, 1537: Total manufacturing, 4041: Electricity, gas and water, 4500: Construction, 5052: Wholesale and retail trade, 5500: Hotels and restaurants, 6064: Transport, storage and communication, 6567: Financial intermediation, 7074: Real estate, renting and business activities, 7599: Community social and personal.

Source: OECD, STAN Database.

Initially, development in Luxembourg's financial sector was built on private banking. Strict bank secrecy laws, a solid reputation for protecting property rights, sound government policies, rising taxation of capital in neighbouring countries and financial liberalisation all provided a favourable backdrop for the development of this activity. Subsequently, mutual fund administration emerged as a major activity, also supported by many of these factors. This activity received an enormous boost in 1988, when Luxembourg became the first EU member State to transpose the first EU Directive concerning Undertakings for Collective Investments in Transferable Securities (UCITS) into national law (Box 1.1). Rapid growth in mutual fund administration underpins the high growth recorded in the financial sector up until the mid-1990s. The sharp decline in growth in the financial sector in recent years reflects the severity of the downturn following the boom in 1999-2000.

#### Box 1.1. Luxembourg's mutual fund industry

Luxembourg's mutual fund industry has blossomed since the transposition of the EU Directive concerning Undertakings for Collective Investments in Transferable Securities (UCITS) into national law in 1988. Net fund assets have risen from € 247.1 billion in December 1994 to € 1 525.2 billion in December 2005 (see Figure 1.2), making Luxembourg's mutual fund sector the second largest in the world (after that in the US) (Association of the Luxembourg Funds Industry, ALFI, [www.alfi.lu/en\\_index.hcsp](http://www.alfi.lu/en_index.hcsp)). Luxembourg-based funds represent 22% of the European investment fund market and 77% of all funds in Europe sold in at least two countries other than their country of domicile, far ahead of any other country (the next highest is Ireland, with 14% of such cross-border funds) (*ibid*). Like Ireland, Luxembourg provides administrative services for these funds; they are normally managed by teams in major financial centres, such as London.

The transport, storage and communications sector (NACE 6064) has also contributed substantially to economic growth in Luxembourg in recent decades. This sector grew at an annual average rate of 11.8% over 1986-2003 and contributed on average 0.9 percentage point to annual growth of the whole economy. In contrast to the financial sector, this sector's contribution to growth has steadily increased and slightly exceeded that of the financial sector in 1998-2003. High growth in this sector has been driven by the exploitation of Luxembourg's parking rights for satellites and the development of the logistics industry. Luxembourg has many features that make it attractive for the logistics industry, including substantial traffic rights and infrastructure for air cargo, low road fuel taxes for trucking, and low taxes on labour income. Other sectors to have made large contributions to economic growth over 1986-2003 are: real estate, renting and business activities (NACE 7074); community, social and personal services (NACE 7599), which mainly comprises services produced by the government, such as public administration and education; and wholesale and retail trade (NACE 5052).

Almost two thirds of the difference in growth over 1986-2003 between Luxembourg and neighbouring countries is attributable to the financial-intermediation - and transport, storage and communications sectors (Table 1.3). Other sectors that made substantially greater contributions to growth than in neighbouring countries were: wholesale and retail trade; community, social and personal services; and construction. These sectors undoubtedly benefited from the high growth in demand engendered by the financial-intermediation- and transport, storage and communications sectors in Luxembourg. Strong labour demand has led to high immigration and growth in cross-border workers, increasing

Table 1.3. **Contributions to real average growth in value added by sector in Luxembourg and neighbouring countries<sup>1</sup>**

Percentage points, 1986-2003, annual averages

	Luxembourg	Belgium	France	Netherlands	Neighbour-country average <sup>2</sup>
6567 Financial intermediation	1.4	0.2	0.0	0.2	0.1
7074 Real estate, renting and business activities	0.9	0.2	0.3	0.3	0.3
6064 Transport, storage and communication	0.9	0.8	0.6	0.7	0.7
7599 Community, social and personal services	0.7	0.4	0.5	0.4	0.4
5052 Wholesale and retail trade	0.6	0.1	0.2	0.4	0.2
1537 Total manufacturing	0.4	0.4	0.4	0.3	0.4
4500 Construction	0.3	0.1	0.0	0.0	0.0
4041 Electricity, gas and water supply	0.1	0.1	0.1	0.0	0.1
5500 Hotels and restaurants	0.1	0.0	0.0	0.0	0.0
1014 Mining and quarrying	0.0	0.0	..	0.0	0.0
0105 Agriculture, hunting, forestry and fishing	0.0	0.0	0.0	0.1	0.0
0199 Total	5.4	2.1	2.0	2.5	2.2

1. Germany is excluded because National Accounts data by sector are not available prior to reunification in 1991.

2. Not weighted.

Source: OECD, STAN Database; Secretariat calculations.

demand for the services of all three of these sectors. Another factor that contributed to the higher contribution to growth from the distribution sector in Luxembourg than in neighbouring countries is that relative taxation of road fuels, tobacco and alcohol became increasingly attractive in Luxembourg over this period, encouraging cross-border shopping; for example, 70% of road-fuel sales in Luxembourg are to non-residents. The remaining sectors of the economy appear to have had weak linkages to the dynamic parts of the economy: these sectors made similar contributions to growth in Luxembourg and in each of the three neighbouring countries. For the most part, these sectors are either export-oriented and/or subject to strong competition from imports (NACE 1537, 5500, 1014 and 0105).

### ***It would be imprudent to count on these sectors underpinning high economic growth indefinitely***

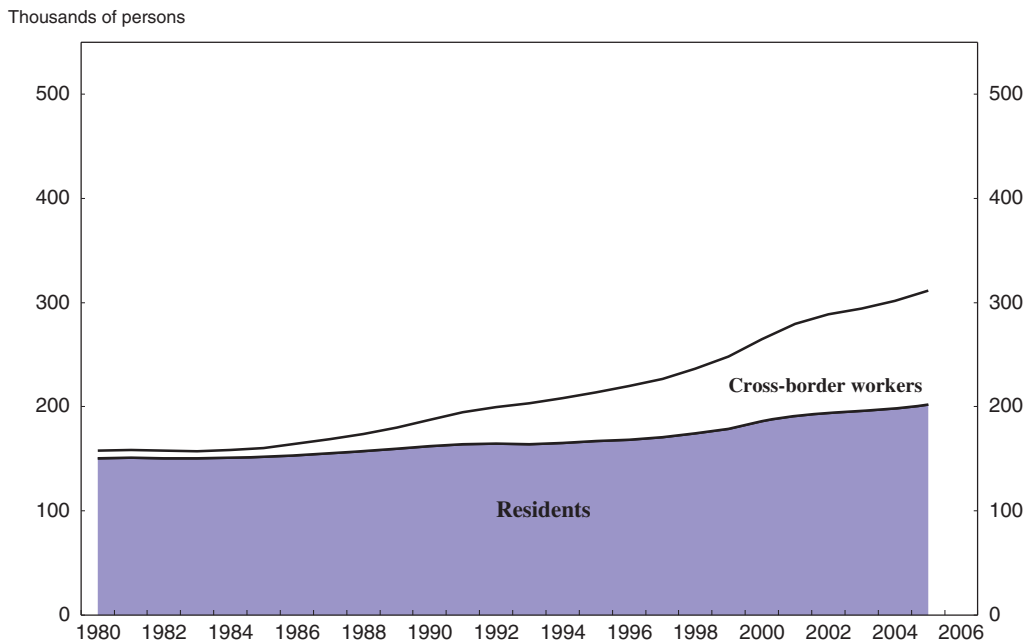
As noted above, a series of factors came together from the early 1980s that made possible very high growth in the financial intermediation and transport and communications sectors. Judging by growth of the overall economy, these sectors had not demonstrated spectacular growth before then (data by sector are not available before 1985). High growth since the early 1980s can be considered as a transition to a state in which the potential gains from expanding these sectors faster than the rest of the global economy have been fully exploited. When this state is reached, these sectors will represent a considerably larger share of the Luxembourg economy but will grow more or less in line with the rest of the economy. There is much uncertainty about how far the Luxembourg economy is through this process and hence when this tailing off in these sectors might occur. While these sectors could continue to deliver superior growth for many years to come, marginal costs will eventually rise and/or marginal revenues fall to a point that will choke off further rapid growth. For example, it could be necessary at some point to lower mutual-fund administration fees to attract an even larger share of European cross-border business, especially if competitors (such as Ireland) enter into a price war. Similarly, landing slots for air-freight traffic will eventually become scarcer, choking off high growth. These considerations suggest that it would be prudent to count on economic growth in Luxembourg eventually converging to European growth rates.<sup>5</sup>

## Economic growth has become increasingly labour intensive

### **Employment growth has risen to very high rates, sustained by inflows of cross-border workers**

Employment growth has increased from an average annual rate of 3.0% over 1986-94 to 4.5% over 1998-2003. Such high growth in labour inputs far exceeds the capacity of the resident population to supply them. Most employment growth reflects employment of cross-border workers (Figure 1.8). Cross-border employment as a share of domestic employment has risen from 7% in 1986 to 33% in 2003; it was 38% by 2005. Even though the growth rate in cross-border employment has slowed, it was still very high (9.5% per year) over 1998-2003.

Figure 1.8. **Employment of residents and cross-border workers**



Source: OECD, Analytical Database.

### **Labour productivity growth has fallen<sup>6</sup>**

With employment growth rising and output growth falling, labour productivity (LP) growth has slowed sharply. During the early stages of the lift off in economic growth, LP growth per worker was very high (3.2% per year over 1986-1994, based on national accounts data before the revisions of 30 March 2006), partly reflecting the shifting of resources to sectors with higher productivity levels, notably financial intermediation, and real estate, renting and business activities (Tables 1.4 and 1.5); the shift-share methodology is described in Annex 1.A1. The contribution of resource shift was 1.4 percentage points per year, compared with only 0.3 percentage point per year in the other OECD countries with available data over this period. This difference accounts for most of Luxembourg's superior LP growth performance over this period. Since then, LP growth in Luxembourg has fallen to zero per cent over 1998-2003 (based on national accounts data before the revisions of 30 March 2006), mainly reflecting a collapse in the contribution of within-sector LP growth; the contribution of resource shift fell to 0.7 percentage point per year, which is still far higher than in other OECD countries.

Table 1.4. **Shift-share analysis of labour productivity growth per person**<sup>1</sup>

	1986-2003	1986-1994	1994-1998	1998-2003
Decomposition (percentage points)				
<b>Luxembourg</b>				
Within sector effect	1.0	2.0	0.8	-0.4
Shift effect	1.1	1.4	0.8	0.7
Interaction effect	-0.1	-0.1	-0.1	-0.1
Total	1.9	3.2	1.7	0.0
Decomposition (percentage points)				
<b>Other countries<sup>2</sup></b>				
Within sector effect	1.4	1.5	1.4	1.1
Shift effect	0.2	0.4	0.2	0.0
Interaction effect	0.0	0.0	0.0	0.0
Total	1.6	1.8	1.6	1.1

1. See Annex 1.A1 for methodology. Columns may not add up owing to rounding errors.

2. Other countries are: Spain, Portugal, Italy, Finland, France (1986-2002), Japan, Austria (1986-2001), Australia, USA, Belgium, Netherlands, Denmark and the United Kingdom. Country data are not weighted.

Source: OECD STAN Database.

Table 1.5. **Sector details of shift-share analysis of labour productivity growth in Luxembourg**

	1986-2003	1986-1994	1994-1998	1998-2003
Within sector effect				
Agriculture, hunting, forestry and fishing	0.0	0.1	0.0	0.0
Mining and quarrying	0.0	0.0	0.0	0.0
Total manufacturing	0.5	0.8	0.3	0.3
Electricity, gas and water supply	0.1	0.1	0.1	0.1
Construction	0.1	0.0	0.1	0.1
Wholesale and retail trade	0.3	0.4	0.4	0.2
Restaurants and hotels	0.0	0.0	-0.1	0.0
Transport and storage and communication	0.5	0.5	0.7	0.3
Financial intermediation	0.2	0.6	0.3	-0.5
Real estate, renting and business activities	-0.8	-0.8	-0.9	-0.8
Community social and personal services	0.1	0.4	-0.1	-0.1
Shift and interaction effect <sup>1</sup>				
Agriculture, hunting, forestry and fishing	-0.1	-0.1	0.0	-0.1
Mining and quarrying	0.0	0.0	0.0	0.0
Total manufacturing	-0.6	-0.7	-0.4	-0.5
Electricity, gas and water supply	0.0	0.0	0.0	0.0
Construction	0.0	0.2	-0.1	-0.1
Wholesale and retail trade	-0.1	-0.1	-0.1	-0.2
Restaurants and hotels	0.0	0.0	0.0	0.0
Transport and storage and communication	0.1	0.0	0.1	0.2
Financial intermediation	0.5	0.8	0.2	0.3
Real estate, renting and business activities	1.1	1.2	1.1	0.8
Community social and personal services	0.0	0.0	0.0	0.0

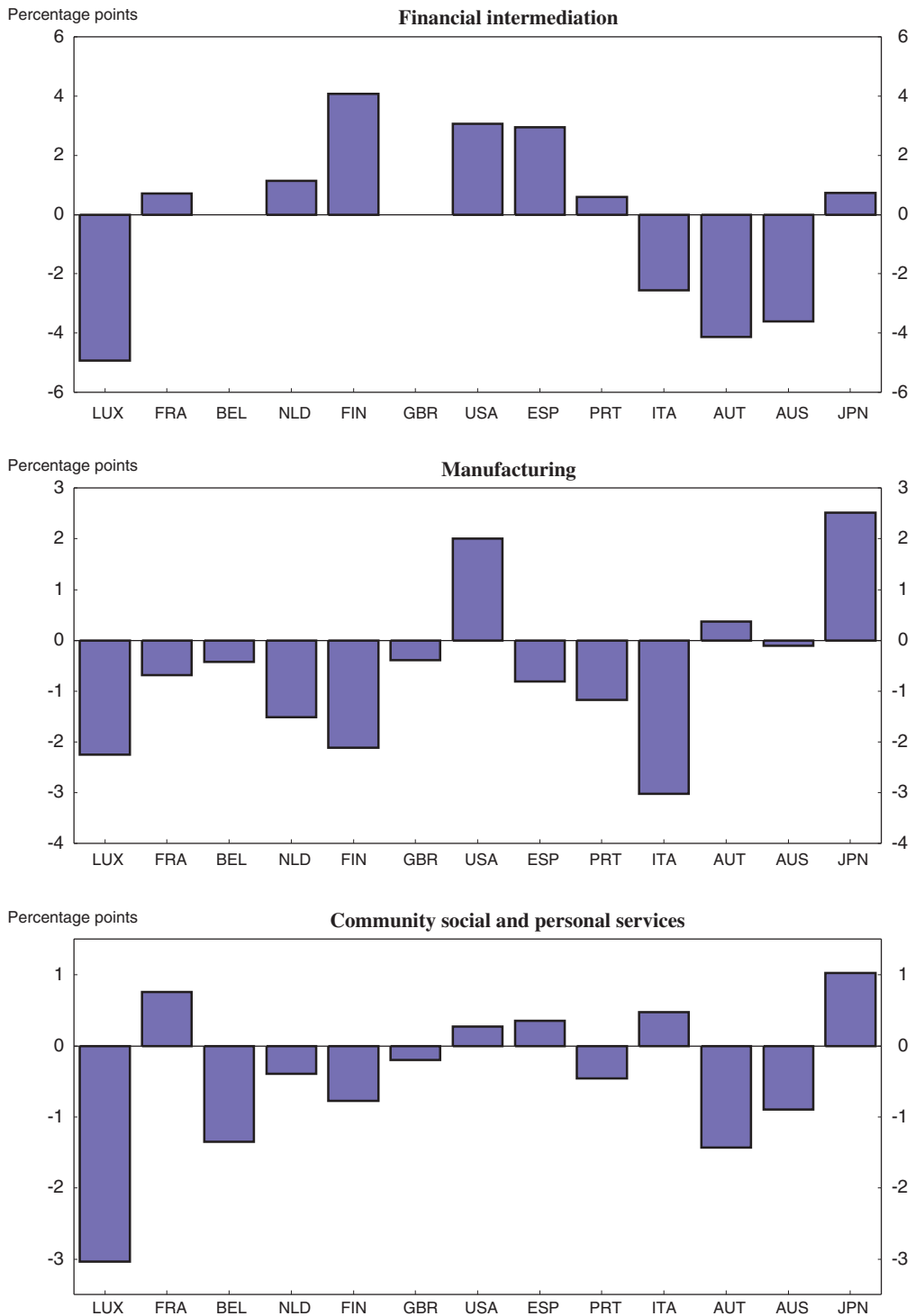
1. The contributions from the interaction effect were very small and are not reported separately. Only for real estate, renting and business activities the interaction effect was -0.1 over the period 1986-2003 and the sub-periods 1994-98 and 1998-2003.

Source: OECD STAN Database.



**Figure 1.9. Difference in labour productivity growth between 1998-2003 and 1986-1994**

In sectors where contributions declined in Luxembourg<sup>1</sup>



1. 1986-2002 for France, 1987-2003 for the Netherlands, 1986-2001 for Australia.

Source: OECD, STAN database.

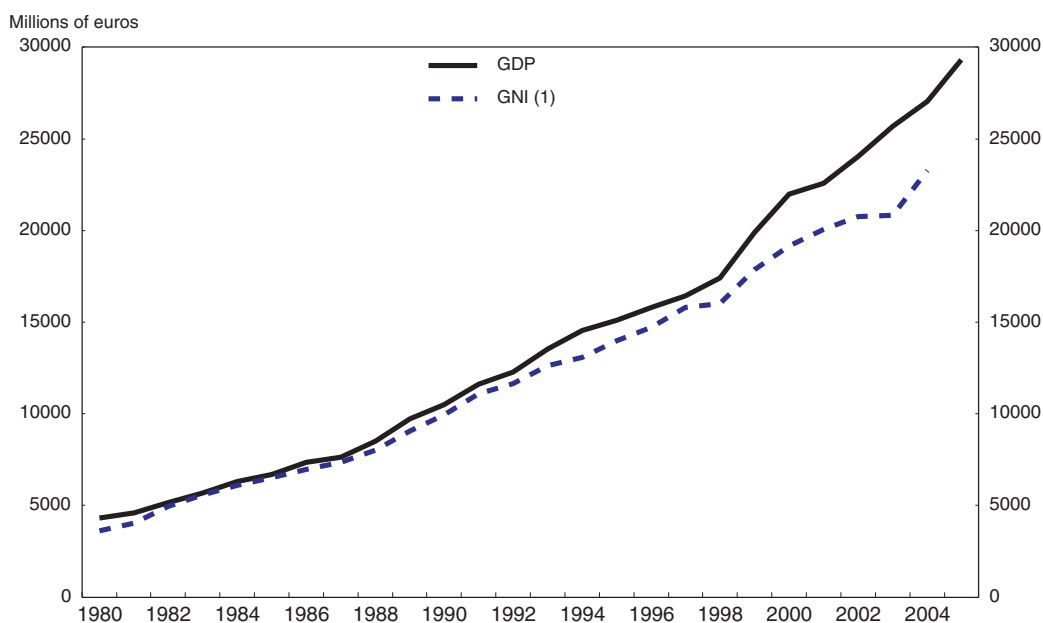
Contributions of within-sector LP growth in Luxembourg over 1998-2003 were extremely low by international comparison. Based on the revised national accounts, LP growth per person declined somewhat less than shown by the old national accounts, which were used in the foregoing analysis, but was the same over the entire period (1986-2003).<sup>7</sup>

Much of the decline in contributions of within sector LP growth is attributable to the financial intermediation, manufacturing, and community and personal services sectors (see Table 1.5). The decline in LP growth per person in each of these sectors was particularly large by international comparison, especially in financial intermediation (Figure 1.9). The fall in LP growth in the financial sector was most marked, pointing to an inadequate adjustment of staffing levels to the severe downturn in activity in the early 2000s. However, 2003 saw employment contract in financial services, leading to a substantial recovery of labour productivity growth (based on the revised national accounts) in 2004 (5.2% in financial services and 6.9% in financial intermediation).

### **GNI has grown much more slowly than GDP in recent years**

The counterpart of a shift to more labour-intensive economic growth with non-residents supplying most of the extra labour inputs is that GNI<sup>8</sup> has been growing considerably more slowly than GDP (Figure 1.10). Whereas GNI growth was 0.7 percentage point lower than GDP growth over 1986-94, this gap grew to 2.6 percentage points over 1998-2003. Real growth in GNI per capita has slowed from 3.8% per year over 1986-1994 to only 1.2 % over 1998-2003, the same as in Germany and the Netherlands but lower than in France and Belgium (Table 1.6). Hence, despite much more economic growth in Luxembourg than in neighbouring countries during 1998-2003, real incomes of Luxembourg residents actually grew more slowly than in those countries on average. Nevertheless, GNI per capita at PPP exchange rates remains by far the highest in the OECD (see Box 1.2).

Figure 1.10. **The evolution of GNI and GDP**



1. See footnote 5 for the definition of Gross National Income.

Source: OECD, Analytical Database.

Table 1.6. **Growth in real GNI per capita in Luxembourg and in neighbouring countries<sup>1</sup>**  
% per year

	1986-1994	1994-1998	1998-2004
<b>Luxembourg</b>	<b>3.8</b>	<b>3.2</b>	<b>1.2</b>
Germany	..	1.4	1.2
France	1.7	1.9	1.7
Belgium	2.4	1.9	1.6
Netherlands	2.0	2.5	1.2

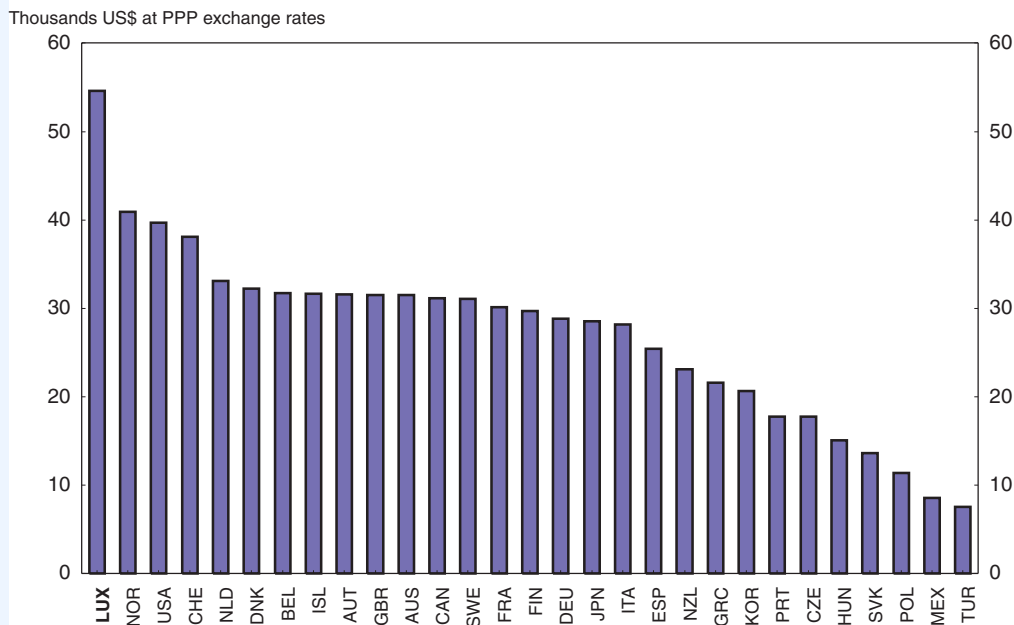
1. GNI has been deflated by the GDP deflator.

Source: OECD Economic Outlook, No. 79.

### Box 1.2. Gross national income per capita at PPP exchange rates

Gross national income (GNI) per capita (at PPP exchange rates) in Luxembourg is by far the highest among OECD countries (Figure 1.11). It was about one third higher in 2004 than in the US and Norway, the next highest ranking countries, and approximately twice the average for the EU. GNI per capita is a better measure of income levels in a country than GDP per capita because net factor payments to the rest of the world are taken into account. Hence, GNI includes incomes earned abroad accruing to a country's residents but excludes incomes earned domestically but accruing to non-residents. In most countries, there is not a large difference between GNI and GDP. However, GNI in Luxembourg is about 14% lower than GDP, reflecting large net factor payments made to the rest of the world. Net labour income payments exceed total net factor income payments, Luxembourg residents earning slightly more capital income abroad than do non-residents in Luxembourg.

Figure 1.11. **Gross national income per capita, 2004<sup>1</sup>**



1. 2003 for Japan and Poland.

Source: OECD Annual National Accounts, OECD Labour Force Statistics 2005.

### ***Luxembourg nationals are concentrated in the public sector, leaving private-sector employment to foreigners***

Cross-border workers and immigrants have in recent years accounted for almost all growth in private sector employment and now account for about 80% of such employment (Fontagné, 2004).<sup>9</sup> Luxembourg nationals prefer to work in the public sector where salaries are high and *Lëtzebuergesch* language requirements severely curtail competition from foreigners. Some 80% of public sector employees are Luxembourg nationals. In total, more than 40% of Luxembourg-national employees work for the public sector.

## **The economy has become highly specialised, increasing volatility**

### ***Industrial concentration has risen to high levels***

Industrial concentration in Luxembourg has increased strongly over the past two decades, and is now considerably higher than in any other OECD country (Figure 1.12). This ranking reflects the enormous share of the financial sector in business sector value added in Luxembourg: no other OECD country has such a large leading sector.

### ***Volatility of output growth is high by international comparison***

While such specialisation underpins the high level of incomes in Luxembourg, the downside is that the economy is more subject to fluctuations than are larger, more diversified economies. Output growth volatility was the sixth highest among OECD countries over 1986-2004 (Table 1.7). Most of the countries that experienced higher volatility had to contend with special crises over this period. Although output volatility declined in Luxembourg between the business cycles of the 1980-1990s and of the 1990-2000s, it was nevertheless second highest among OECD countries over the most recent business cycle.

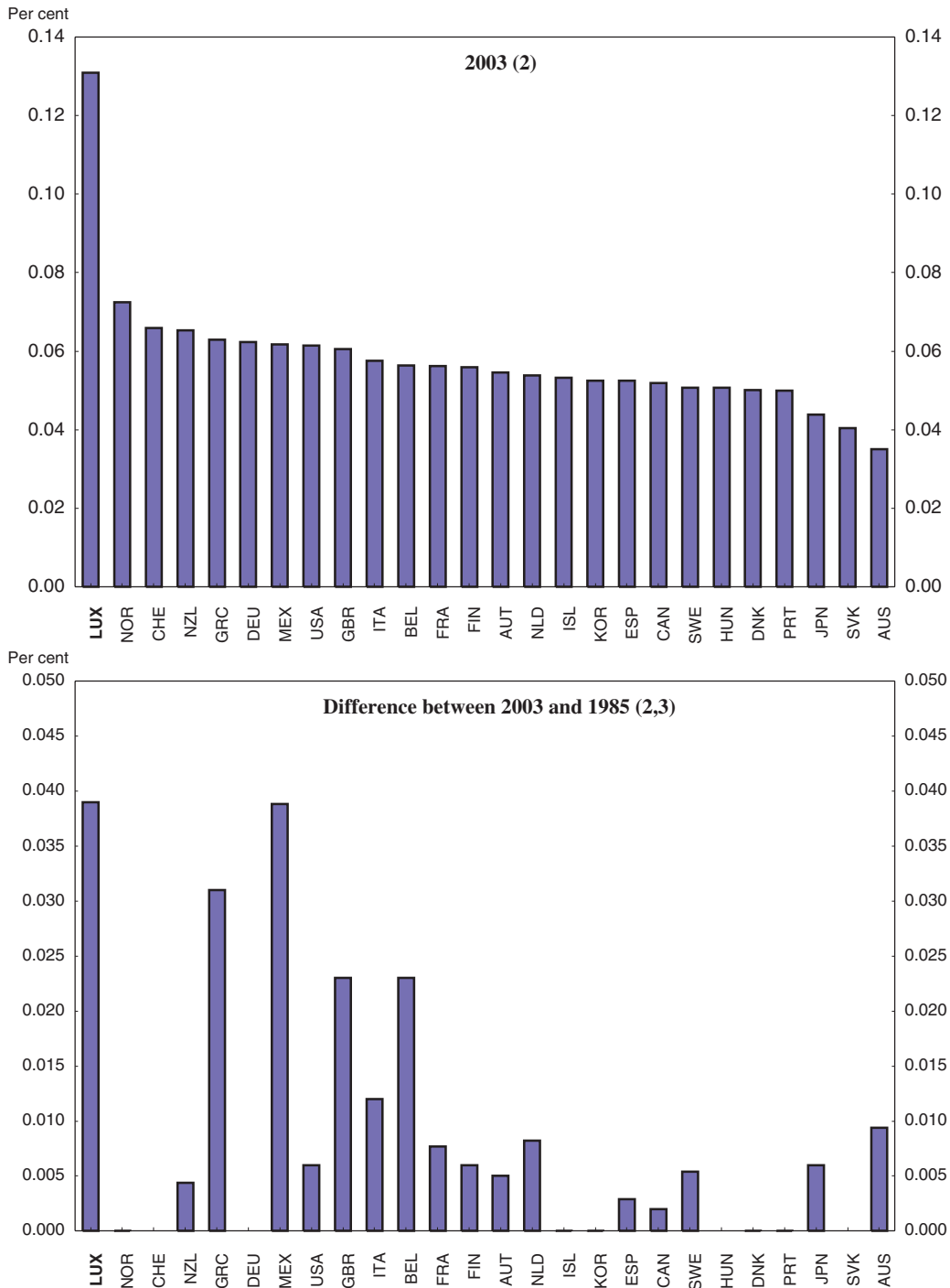
## **Economic policy challenges**

As noted, the economy is recovering after a prolonged downturn and is projected to return to trend by 2007. Although employment growth has remained robust, unemployment has risen to record levels by Luxembourg standards as cross-border workers continue to take most new jobs. Public finances deteriorated sharply during the downturn and the government is now formulating consolidation measures.

From a longer-term perspective, Luxembourg's economic performance is enviable. Economic growth averaged 5¼ per cent over the past two decades, propelling national income per capita to the top of the OECD league. This success has been built on specialisation in fast growing, high value added sectors, notably financial services. A number of factors, including financial market liberalisation came together to support expansion in the global financial services industry and Luxembourg offered various regulatory and tax advantages that enabled its financial sector to grow particularly quickly. Such growth in both the global and Luxembourg financial sectors represents a transition, albeit long, as the effects of these favourable shocks feed through. Trend growth has already slowed to 4-4½ per cent and may well slow further in the long term.

Output growth in Luxembourg has become increasingly labour intensive, with cross-border workers supplying most of the labour. Labour productivity growth per person has fallen substantially in recent years reflecting unfavourable developments in certain key sectors, notably financial services. With a rising proportion of incomes earned in

Figure 1.12. **Herfindhal index of NACE business sector concentration**<sup>1</sup>



1. The Herfindhal index is calculated as the sum of the squared shares of NACE business sectors. The NACE sectors used are: 0105;1014;1516;1719;2000;2122;2325;2600;2728;2933;3435;3637;4041;4500;5052;5500;6064;6567;7000;7174.  
 2. 2001 for Australia, Canada and New Zealand, 2002 for Switzerland, Iceland and Poland.  
 3. No entry means that 1985 data were not available for that country.

Source: OECD STAN Database.

Table 1.7. **Volatility of output growth**<sup>1</sup>  
As measured by standard deviation

	1986-2004	1980s-1990s	1990s-2000s
Australia	1.5	2.3 (84-92)	..
Austria	1.0	1.1 (85-93)	1.0 (94-2003)
Belgium	1.3	1.4 (84-93)	1.1 (94-2003)
Canada	1.8	2.4 (83-93)	1.3 (93-2004)
Denmark	1.5	1.4 (82-93)	1.5 (94-2003)
Finland	3.3	4.2 (85-93)	1.5 (94-2003)
France	1.2	1.3 (86-96)	1.1 (97-2003)
Greece	2.0	1.8 (88-96)	..
Iceland	3.0	3.4 (84-92)	2.2 (93-2002)
Ireland	2.8	1.9 (87-94)	2.2 (95-2004)
Italy	1.3	1.5 (85-93)	1.1 (94-2004)
Japan	2.0	2.3 (85-99)	1.5 (2000-2002)
Korea	3.9	4.1 (83-98)	..
<b>Luxembourg</b>	<b>2.6</b>	<b>2.9</b> <b>(86-96)</b>	<b>2.4</b> <b>(97-2003)</b>
Mexico	3.2	..	2.5 (96-2003)
Netherlands	1.4	1.1 (83-94)	1.6 (95-2004)
New Zealand	2.0	2.7 (84-92)	1.3 (93-2004)
Norway	1.4	2.1 (84-90)	1.3 (91-2003)
Portugal	2.4	2.9 (85-94)	1.9 (95-2004)
Spain	1.5	1.6 (82-96)	0.8 (97-2004)
Sweden	1.8	2.1 (84-93)	1.2 (94-2003)
Switzerland	1.5	1.7 (84-96)	1.3 (97-2003)
United Kingdom	1.5	1.9 (82-92)	0.7 (93-2003)
United States	1.2	1.6 (83-95)	1.3 (96-2004)
Average <sup>2</sup>	2.0	2.2	1.5

1. Cycles are measured from the year after a trough (when the negative output gap is greatest), until the next trough. For the last cycle there are no data if there was no clear trough.

2. Not weighted

Source: OECD Economic Outlook, No. 79.

Luxembourg accruing to cross-border workers, growth in GNI per capita has fallen sharply and has been trailing that in neighbouring countries on average in recent years.

While growing specialisation in high value added sectors, notably financial services, has been the key to achieving such high per capita incomes, it may have contributed to making the Luxembourg economy one of the most volatile in the OECD. With such specialisation expected to increase for some time to come, this being the basis of higher projected growth than in other European countries in the medium term, the economy may become still more volatile. High and rising volatility together with declining trend growth increase the risk of adverse economic shocks interacting with Luxembourg's generous unemployment benefit/assistance system and poorly performing public employment service to increase structural unemployment. The rise in unemployment in recent years may be a foretaste of what is to come if these institutional arrangements are not reformed.

The remainder of this chapter briefly describes the main policy challenges that emerge in the light of these economic trends.

### ***Assuring the sustainability of public finances (Chapter 2)***

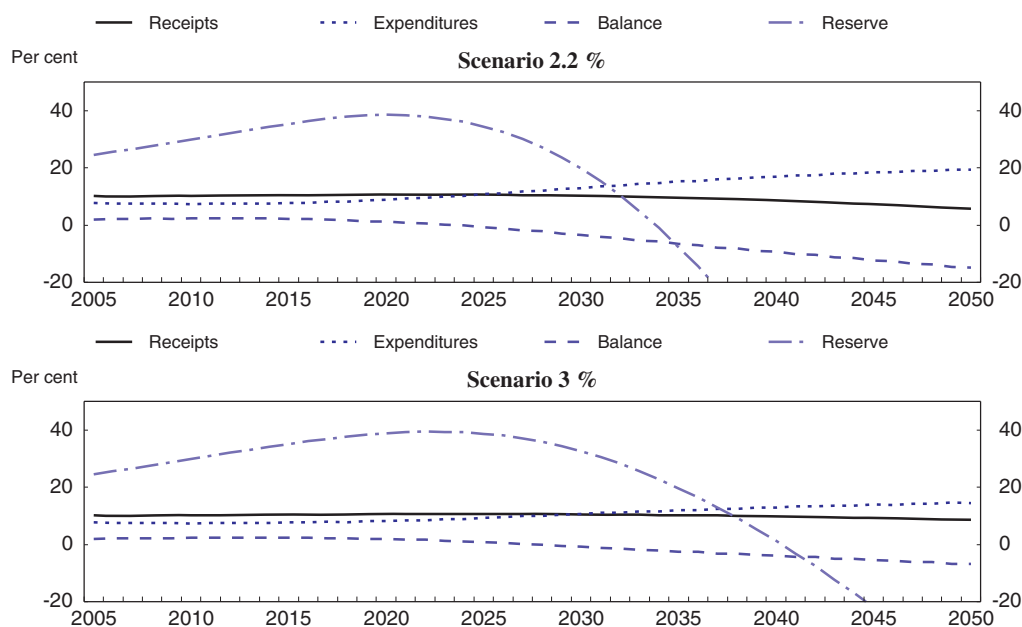
Public finances deteriorated markedly during the downturn, with the budget balance falling from a surplus of 5.9% of GDP in 2000 to a deficit of 1.9% in 2005. This deterioration reflects ongoing high growth in public expenditure in the face of more subdued revenue growth, which nevertheless remains in phase with the economic cycle. The government now faces the challenge of getting the budget back to balance in the next few years whilst at the same time preserving low taxation of labour income, which adds to Luxembourg's attractiveness as a production location. To this end, the government has announced consolidation measures that are mainly on the expenditure side of the budget (Luxembourg Government, 2006). They are expected to return the budget near to balance by the end of the current legislature, i.e., by 2009, at the latest.

Assuring the sustainability of Luxembourg's PAYG pension system poses a far greater challenge. This pension system was set up in the mid-1980s and is still maturing. The scheme currently has a favourable ratio of contributors to beneficiaries. Moreover, many current beneficiaries have incomplete contribution records, holding down replacement rates. With high employment growth in recent decades, the scheme's future liabilities are building up quickly. Moreover, average replacement rates are set to rise as future retirees have more complete contribution records. If economic growth were to ease to around 3% indefinitely with employment growth of 1.3%, the pension system would fall into deficit in 2028 and net assets would fall from 24% of GDP currently to minus 49% of GDP by 2050 (Figure 1.13). If growth were to fall to 2.2% with employment growth of 0.5%, which corresponds to an assumption that growth in cross-border employment falls to the same rate as that for the resident population, the pension system would fall into deficit sooner and net debts would reach 151% of GDP by 2050. The potential for the financial position of the pension system to deteriorate is far greater in Luxembourg than in most other OECD countries mainly because there is more scope for employment growth to slow. Increasing contribution rates as required by current rules to maintain pension reserves at 1.5 times annual current spending would entail an increase from 24% presently to 36.75% by 2048 under the 3% growth scenario and to 48.75% under the 2.2% growth scenario. Such increases in taxes, which would need to be followed by further increases, would make Luxembourg a less attractive production location, potentially aggravating the problem. Addressing these risks to the pension system is likely to entail reducing replacement rates, which are the highest in the OECD, making access to early retirement pension less favourable, and accumulating reserves that are better managed to meet future deficits.



Figure 1.13. **Evolution of the financial balance and net assets of the pension system, 2005-2050**

In per cent of GDP



Source: IGSS (2006).

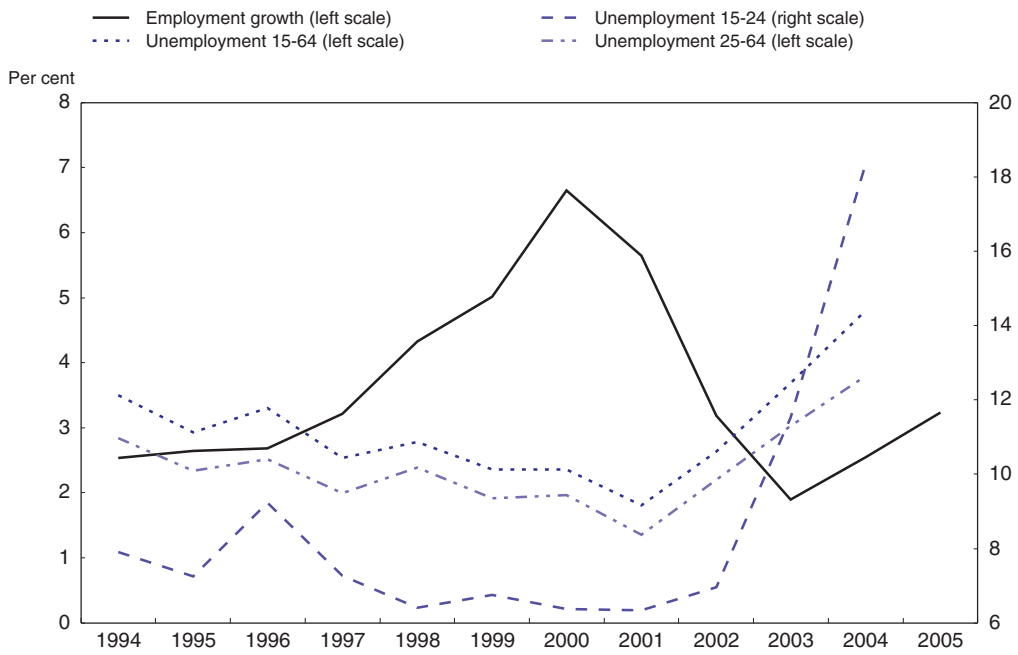
### Improving the employment prospects of resident workers (Chapter 3)

Luxembourg continues to have a large pool of working-age (15-64) residents not in employment, despite high employment growth; most new jobs are taken by cross-border workers. Unemployment has risen considerably in recent years, especially for the younger age group (Figure 1.14). The employment rate for older workers (55-64) is one of the lowest in the OECD while that for prime-age women (25-54) leaves room for further improvement (Figure 1.15). Improving employment prospects of resident workers would help to lift growth in GNI per capita back towards the average rate in neighbouring countries.

Reducing unemployment is likely to call for declines in Luxembourg's generous unemployment benefit/assistance replacement rates and better performance of the public employment service in matching jobseekers and vacancies. Such reforms are all the more important going forward to reduce the risk of large adverse economic shocks interacting with labour-market institutions to create lasting increases in unemployment.

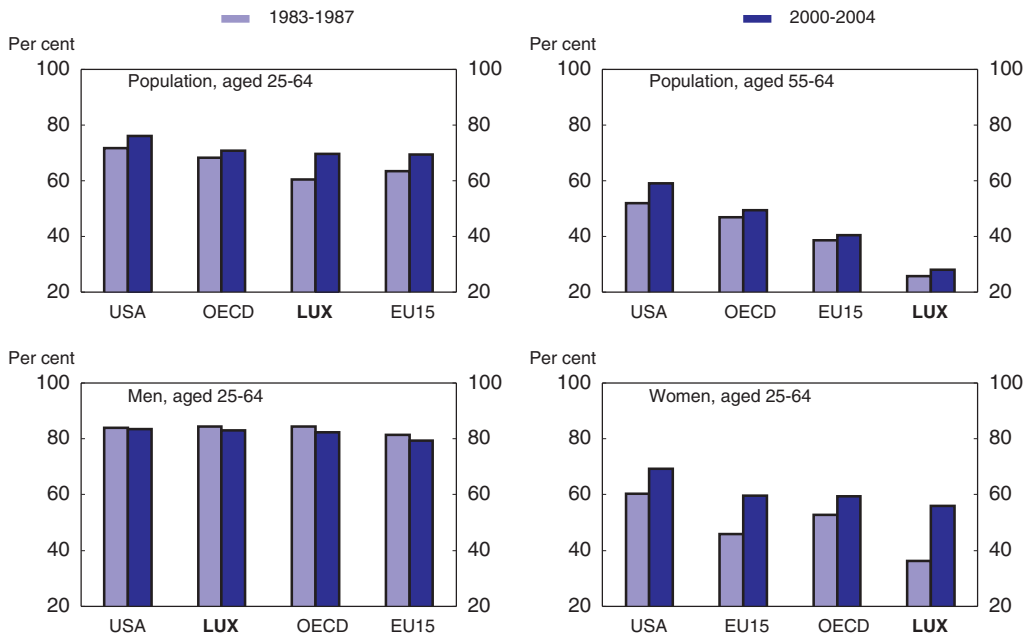
As noted above, reducing access to early retirement would improve the sustainability of the pension system. It would also increase Luxembourg's low employment rate for older workers. Phasing out publicly subsidised pre-retirement schemes would also help in this regard as would enhanced vocational training for workers approaching the older age group. Incentives for female labour force participation could be strengthened by limiting access to imputed contributions to the pension scheme for child rearing and by enhancing the supply and affordability of child care. Easing strict EPL would improve employment prospects for women and young workers, especially if average growth slows, as such a slowing would make EPL regulations more of a constraint to adjusting employment to desired levels in a downturn: widespread layoffs would be required in a lower growth environment, not just reductions in the rate of (positive) employment growth.

Figure 1.14. **Employment growth and unemployment rates**



Source: OECD, *Labour Force Statistics and Analytical Database*.

Figure 1.15. **Employment rates**<sup>1</sup>



1. Total employment as a percentage of the corresponding population.

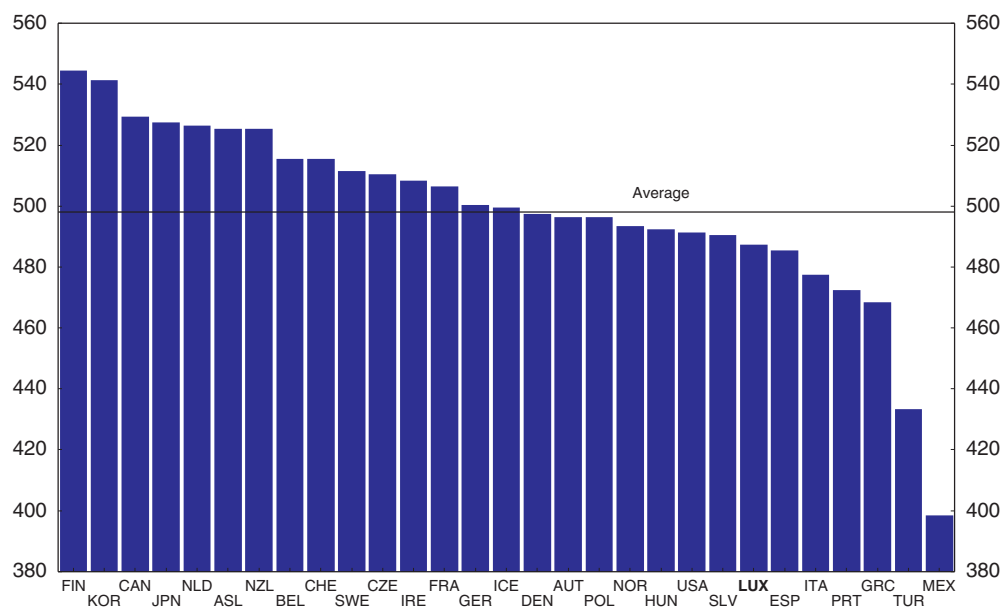
Source: OECD, *Employment Outlook Database*.

## Improving education achievement and attainment to compete in the labour market (Chapter 4)

Improvements in human capital development would help to lift productivity growth from the low rates to which it has fallen. With higher levels of education achievement and attainment, residents would also be better equipped to compete with cross-border workers and immigrants for jobs in the private sector. This is likely to become more important if trend growth continues to slow, as this would necessitate slower growth in public sector employment, obliging more residents to compete for jobs in the private sector than would otherwise have been the case. Better education outcomes for weaker students would also enhance their employment prospects.

Education achievement in Luxembourg is below the OECD average according to the 2003 PISA study (Figure 1.16). Immigrants scored well below native students. While the impact of immigrant status on results was around the OECD average, this shortfall of performance is a larger problem in Luxembourg than in other countries because immigrants make up such a large proportion (one third) of students. Attainment is also below average. Improving education outcomes is likely to entail going further in helping immigrant students to cope with the challenge of learning in a trilingual education system, reducing the scope of selection in the system, enhancing permeability between tracks, and expanding second-chance arrangements for unqualified school leavers. Completing the reform underway basing school programmes on key competences will also help to improve outcomes.

Figure 1.16. **Average of student performance in mathematics, reading, science, and problem solving**  
In the 2003 OECD PISA study

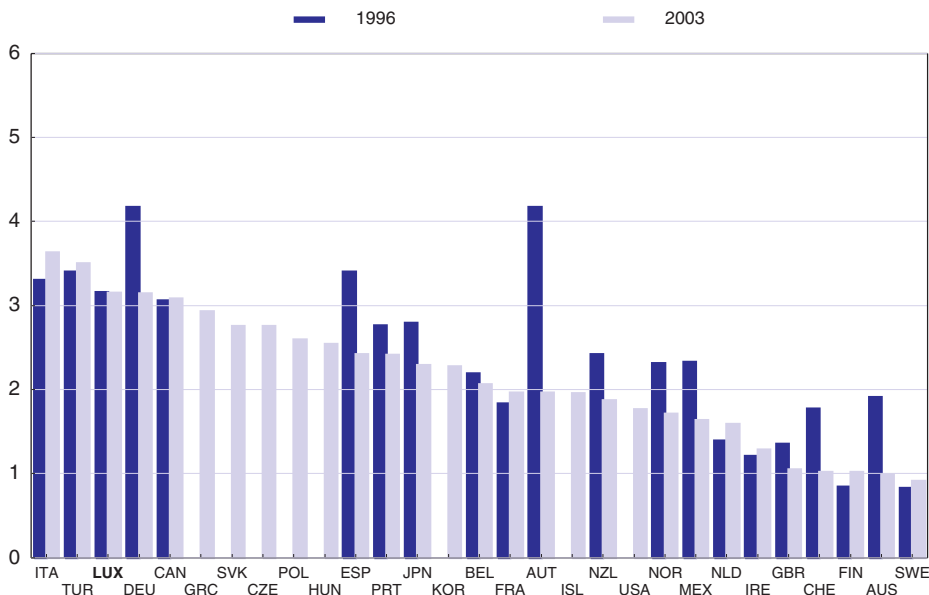


Source: OECD, PISA 2003.

### Increasing product market competition to boost productivity (Chapter 5)

Increasing product market competition would help to lift productivity growth, which has fallen in recent years. Luxembourg's new competition authorities, which have been set up in line with EU requirements, should help to combat anti-competitive practices. However, they may need more resources if they are to carry out their mandate effectively and to take actions to promote product market competition. Removing barriers to competition in professional services, which are subject to more anti-competitive regulation than in most other OECD countries, would strengthen product market competition (Figure 1.17). The ending of the moratorium on the establishment of large retail outlets should lead to renewed entry of large stores, strengthening competition in the retail sector. An easing of zoning regulations to facilitate the entry of such stores as well as more liberal shop opening hours would also help. Based on international experience, especially from the US, ICT has created the potential for the retail sector to make a large contribution to productivity growth.

Figure 1.17. **Summary indicator of regulation of professional services**<sup>1</sup>



1. Sorted by 2003 values. The scale of indicators is 0-6 from least to more restrictive. The professional services covered are: architects, engineers, accounting, legal.

Source: Conway, P. and Nicoletti, G. (2006), "Product market regulation in the non-manufacturing sectors of OECD countries: measurement and highlights", *OECD Economics Department Working Papers*. Forthcoming.

### Notes

1. The national CPI is generally considered to be a more reliable indicator of inflation than the harmonised index of consumer prices (HICP) because significant fuel purchases by non residents distort the weight of energy prices in the latter.
2. The analysis of sectoral developments in this section and the remainder of the chapter is based on the current version (April 2006) of the OECD STAN database, which has not yet been updated to reflect recent revisions to national accounts data in European countries. These revisions entail the allocation of Financial Intermediation Services Indirectly Measured (FISIM) to both intermediate consumption and final uses instead of just to intermediate consumption, as previously occurred. As a result of these revisions, FISIM now affects both the level of GDP and its growth. The hypothetical effects of such a revision in the National Accounts were analysed in the last OECD

*Economic Survey of Luxembourg* (OECD, 2003, Box 1). For more information on this revision of Luxembourg's national accounts, see STATEC (2006, statnews No. 18/2006).

3. National accounts data by sector are available in the OECD STAN database for 1985-2003. 1986 has been used as the first year for growth calculations because the output gap (-1% of trend real GDP) is estimated to have been the same as in 2003, with the result that actual and trend growth rates coincide. The output gap is the difference between real GDP and trend as a percentage of trend real GDP. Trend real GDP has been calculated by applying a Hodrick-Prescott filter with an adjustment parameter of 100 to the annual real GDP series in *OECD Economic Outlook 78*, which includes projections for 2005-2012. Data in this series, as in the OECD STAN database, pre-date the latest revision of Luxembourg's national accounts, which allocates Financial Intermediation Services Indirectly Measured (FISIM) to both intermediate and final uses, that was published on 30 March 2006.
4. The output gap is also estimated to have been -1% of trend GDP in 1994 and in 1998 based on the OECD Economic Outlook No. 78 database.
5. It is sometimes argued that even if growth in Luxembourg's financial sector slows to the global average, Luxembourg will continue to experience higher growth than other European countries because financial services grow faster than the rest of the global economy and Luxembourg's economy is specialised in these services. However, financial services will not grow faster than the global economy indefinitely – at some point well before there is no other activity in the global economy, it will no longer be profitable to expand financial services faster than the rest of the global economy. For the time being, financial services are growing faster than the rest of the global economy (they rose in OECD countries from 5½ per cent of GDP on average in 1985 to 7½ per cent in 2003) as the opportunities created by financial market liberalisation and ICT work their way through.
6. The labour productivity estimates reported in this section do not take into account the recent revision of Luxembourg's national accounts unless otherwise stated.
7. Based on the revised national accounts, trend labour productivity (LP) growth per person employed is estimated to have fallen from 2.5% per year over 1986-94 to 0.8% per year over 1998-03 and to have been 1.7% per year over 1986-03. Trend LP has been calculated by applying a Hodrick-Prescott filter with an adjustment parameter of 100 to the annual LP series in *OECD Economic Outlook 79*, including projections for 2006-2012.
8. Gross National Income (GNI) is equal to GDP less taxes (less subsidies) on production and imports, compensation of employees and property income payable to the rest of the world plus the corresponding items receivable from the rest of the world. Thus, GNI, at market prices is the sum of gross primary incomes receivable by resident institutional units/sectors. It is commonly denominated GNP. In contrast to GDP, GNI is not a concept of value added, but a concept of income. (<http://unstats.un.org>).
9. The remainder of this paragraph is also based Fontagné (2004).

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## ANNEX 1.A1

*Shift-share analysis of labour productivity growth*

The productivity-decomposition analysis used in Chapter 1 is based on the shift-share analysis described in EC (2003), which decomposes aggregate changes in labour productivity into an intra-industry, a shift and an interaction effect. The “intra-industry effect” measures productivity growth within each sector. The “shift effect” measures the effect on total economy productivity of the displacements of resources between industries of varying productivity levels. Finally, the interaction effect accounts for labour re-allocation effects between industries with varying productivity growth rates. The methodology was applied using the OECD STAN database.

For each individual industry  $i$  labour productivity is defined as output ( $Y$ ) divided by labour input ( $L$ ):

$$LP_{it} = \frac{Y_{it}}{L_{it}}$$

$$LP_t = \frac{Y_t}{L_t} = \sum_i Y_{it} / \sum_i L_{it}$$

When expressed in nominal terms, labour productivity can be written as a weighted sum of the intra-industry productivity values:

$$LP_t = \sum_i LP_{it} \frac{L_{it}}{L_t}$$

This gives, in difference terms:

$$\Delta LP = \sum_i \Delta(LP_i) \frac{L_{i,t-1}}{L_{t-1}} + \sum_i LP_{i,t-1} \Delta\left(\frac{L_i}{L}\right) + \sum_i \Delta(LP_i) \Delta\left(\frac{L_i}{L}\right)$$

Dividing by  $LP_{t-1}$  to get the growth (percentage change) and rearranging the terms:

$$\frac{\Delta LP}{LP_{t-1}} = \sum_i \frac{\Delta LP_i}{LP_{i,t-1}} \frac{Y_{i,t-1}}{Y_{t-1}} + \sum_i \frac{LP_{i,t-1}}{LP_{t-1}} \left(\frac{L_{it}}{L_t} - \frac{L_{i,t-1}}{L_{t-1}}\right) + \sum_i \frac{1}{LP_{t-1}} (\Delta LP_i) \Delta\left(\frac{L_i}{L}\right)$$

- The first component is the intra-industry effect, i.e., the sum of industry productivity growth rates, weighted by the initial (nominal) output shares.
- The second component is the shift effect, i.e., the sum of changes in input shares, weighted by the relative productivity level (i.e., the ratio of industry productivity to average productivity). This effect could also be written and decomposed as the sum of industry labour input growth rates, weighted by initial output shares, minus total labour input growth.

- The sign of the residual (interaction) component is usually negative (in the economy there is a majority of industries where the productivity change and the labour input change have opposite signs). It may, however, be positive when beneficial restructuring of the economy occurs (in this case, most of the industries enjoying productivity growth are at the same time attracting more resources).

The decomposition described above would strictly hold only in the case of (discrete) percentage changes. The logarithmic approximation (used throughout the study) entails an error of magnitude often comparable to the interaction effect. We have, however, defined the intra-industry effect and the shift effect analogously to the discrete case. A corresponding decomposition for the continuous time assumption can be found in Nordhaus (2002), who has also shown that when “old-fashioned” price index methods are used (i.e., not the Törnqvist method), one should add to the decomposition an additional term accounting for the drift in prices.

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## ANNEX 1.A2

*Progress in structural reform*

This annex reviews actions taken to follow up structural policy recommendations made in the 2003 OECD *Economic Survey of Luxembourg* and, where indicated, still outstanding from earlier *Surveys*. Recommendations made in this *Survey* are shown in the boxes at the end of each chapter.

Past recommendations	Actions taken and current assessment
<b>A. Labour market</b>	
<b><i>Reform early retirement and disability pensions</i></b>	
Closely monitor the effect of the 2002 law on disability. Reduce the generous replacement rates of the invalidity pension and the waiting allowance and make access tougher.	There have been no changes in replacement rates or access conditions for disability benefit since the 2002 law. The waiting allowance is also unchanged. Waiting allowance replacement rates should be progressively reduced.
Complement the disability pension reform by a reduction in early retirement pension on an actuarial basis. Reduce the ease with which imputed years of contributions can be obtained.	No action taken. Such reforms remain vital for reducing incentives to retire early.
Terminate public subsidies for the pre-retirement pension (for workers laid off in restructuring industries).	The participation of enterprises in the costs of <i>préretraite d'ajustement</i> are to be increased from 0-50% to 30-75% but should be increased further.
<b><i>Reform unemployment and related benefit schemes and enhance active labour market policies</i></b>	
Reduce the withdrawal rate of benefits for additional earnings under the general assistance scheme (RMG), including housing assistance.	RMG has been limited to one measure per household, which effectively reduces the withdrawal rate, while still being above the minimum wage for a two-person household.
Encourage people on the RMG to come back to work progressively by working part time.	No action taken.
Reduce the need for active labour market policies by relying on stronger financial incentives for the unemployed, <i>i.e.</i> , by reducing the very generous replacement rate.	There has been no change in the very generous unemployment benefit (UB) replacement rates. UB replacement rates should be progressively reduced after 3 months of benefit receipt to sharpen job-search incentives. The performance of the public employment service in matching job seekers with vacancies needs to be improved.
<b><i>Increase employment flexibility</i></b>	
Remove the remaining rigidities that dissuade employers from offering part-time jobs.	No action taken.
Relax regulations on temporary employment.	No action taken.
Ease employment protection regulation. Simplify procedures for terminating employment contracts in SMEs.	No action taken. EPL remains very strict, notably for temporary contracts. EPL should be made more neutral between regular and temporary contracts by allowing a longer total duration of fixed-term contracts and more renewals. Thresholds and additional notice periods for collective dismissals should be reduced.



Past recommendations	Actions taken and current assessment
<b>Increase wage and labour cost flexibility</b>	
Improve flexibility in wage bargaining by allowing for lower wages for older workers. Modify wage indexation to exclude energy from the index.	No action taken concerning wage flexibility for older workers. Making EPL less dependent on seniority and reducing financial incentives for early retirement would encourage the social partners to negotiate lower wage premiums for older workers, increasing their attractiveness to employers. Indexation adjustments to wages and social benefits are to be deferred (without catch-up) in 2006-2008. Nevertheless, it remains important to make a structural adjustment to indexation arrangements to exclude energy from the price index used for wage indexation so as to avoid that energy price shocks move real wage rates away from equilibrium levels.
Examine the approach to reducing labour costs for low-skilled workers while maintaining socially acceptable levels of disposable income. If an earned-income credit system were to be introduced, it should replace the existing patchwork of in-work benefits. The most suitable instrument may be a reduction in employers' social security contributions for low-income workers.	No action taken. Taxes on low labour incomes are already lower in Luxembourg than in neighbouring countries. The case for in-work benefits in Luxembourg is weaker than in other countries because many of the people activated by such a policy would not have been costing Luxembourg's social security/assistance system anything as they would be residents of neighbouring countries.
Raise the female employment ratio by shifting the relevant unit for income tax from the household to the individual. Envisage providing more childcare facilities and reviewing the very generous imputation arrangements for education and childcare in the pension system.	In fact, the average tax rate on the second earner's income is not much higher than if the second earner had been taxed separately. In 2005 a new law to create childcare and after-school facilities (" <i>maison relais</i> ") was enacted. The adequacy of supply of such facilities should be monitored. Imputation arrangements for (education and) child rearing still need to be made less generous to encourage women to remain in the labour force longer (including during their child-raising years).
<b>Education</b>	
Consider supplementing the multi-lingual approach to education by the possibility of choosing between a German and a French stream with the instruction language not chosen being taught intensively as a foreign language and <i>Lëtzebuergesch</i> also being learnt.	The authorities have created the possibility in vocational education for students to be instructed in French or German without having to achieve a high level of competence in the other language. More such courses should be available in French.
Make reasons for success and failure more transparent and raise overall performance by: <ul style="list-style-type: none"> <li>• defining and enforcing quality and efficiency standards;</li> <li>• leaving more autonomy to schools in how to achieve these standards and how to allocate budgets;</li> <li>• allowing for more competition from private schools; and</li> <li>• support transmission of internationally-identified best teaching and management practices.</li> </ul>	<ul style="list-style-type: none"> <li>• Quality standards are assessed through standardised national exams at various grades. However, teacher performance is not externally assessed.</li> <li>• A new law gives secondary schools more financial autonomy by granting them an overall budget to cover their running costs excluding teacher salaries, which are paid directly by the government, and a teaching-hours credit to organise classes and other school activities. The law also gives pedagogical autonomy, which is presently limited to 10% of courses. More such autonomy can be obtained by participating in pilot projects.</li> <li>• The government recently increased subsidies for private schools.</li> <li>• The authorities follow closely developments in educational practices with a view to transmitting best practices. Teacher participation in continuing education is high.</li> </ul>
Enable the future "University of Luxembourg" to provide high-quality tertiary education to compete with the universities in the neighbouring regions through international recruitment and internal and external evaluation. Integrate existing tertiary institutions and focus on Luxembourg's strengths. Improve the quality of secondary education. Maintain the grant system for studying abroad.	The University of Luxembourg is a post-graduate research university with a focus on subjects where potential spillover benefits to the Luxembourg economy are greatest. The teacher training tertiary institution is being integrated into the university. Numerous reforms have been made or are planned to improve the quality of secondary education, as discussed in chapter 4. The grant system has been maintained.
Focus financial incentives for continuing education and training on groups that are not covered by private sector initiatives, e.g., unemployed and older workers. A pre-requisite for supporting the latter is a significant increase in the effective retirement age.	No action has been taken and participation of older workers remains much lower than for younger workers.
Continue to build an effective system of continuing education and training on the foundations that have been established.	The authorities are working to improve the coherence of continuing education programmes.

Past recommendations	Actions taken and current assessment
<b>B. Product markets and the knowledge-based economy</b>	
Raise rate of transposition of Single Market rules to achieve the target (98.5%). The Competition Council should be established and adequately resourced so as to facilitate the effective enforcement of EC competition rules. The new regime on state aid should be put in place quickly. Fixed and monitored prices should be abolished. Set up a single legislative framework for public procurement.	The rate of transposition of Single Market rules has decreased to 95.6%, partly owing to the additional government workload associated with holding the EU presidency during the first half of 2005. The Competition Council and Inspectorate have been established by a new Competition law but appear to be under-resourced. The field of competences of the Competition Council and Inspectorate should be broadened beyond abuse of dominance and restrictive agreements so that they can take a more pro-active role in promoting competition.
Implement reforms to increase the availability of residential building sites, including <i>i</i> ) an increase in land taxes to discourage speculation and finance infrastructure development, <i>ii</i> ) allowing rentals for sitting tenants to be adjusted to market rates to encourage investment in accommodation and <i>iii</i> ) zoning changes to allow more dense residential development.	A special tax is to be introduced to discourage excessive speculative holdings of building sites. Municipalities are to be encouraged to authorise the construction of more housing through capital subsidies for population increases. No action has been taken on adjusting rentals of sitting tenants to market rates.
Introduce road pricing to ease congestion and as a guide to the value of expanding capacity, notably on the motorways used by cross-border workers.	No action taken.
Remove obstacles to competition amongst broadband-internet operators by imposing a reduction in access charges and by insisting that Luxembourg P&T withdraw completely from the supply of cable internet services.	A reduction in access price charges has been observed but levels remain high compared to neighbouring countries. Luxembourg P&T still holds a stake in cable internet services.
<b>C. Public sector</b>	
Make greater use of cost-benefit analysis or of cost-effectiveness analysis in decisions on expenditures	No action taken.
Take public sector management reforms that increase managerial independence and accountability further.	No new public sector-wide policy rules but ministries have a certain degree of freedom to implement such rules.
Make greater use of contracting out where enforceable contracts can be written relatively easily.	Public-Private-Partnerships have increased e.g. in the field of research activities (Luxinnovation).
Privatise enterprises where public ownership is no longer necessary for regulating monopoly power, notably the incumbent telecommunications operator.	There have been no privatisations. Government retains: a majority stake in the Rail company; 31% stake in the gas company; 33% stake in the major electricity company; and 100% in the incumbent telecommunications operator.
Make rapid progress in developing e-government through the stages of interaction and electronic declarations. Present a seamless online service and make complementary organisational changes.	An extensive " <i>plan directeur</i> " for e-government has been drawn up but has not yet been fully implemented. E-government has not yet entered an interactive phase.
Reduce the administrative burden by subjecting new legislation to administrative burden impact assessments and by assigning firms and individuals identification numbers to centralise information in one public sector databank.	A National Committee for Administrative Simplification for enterprises was created but the agreed priorities have not been implemented.
<b>D. Reduce costs of moral hazard in health care</b>	
Support the proposal for GPs (general practitioners) to centralise their patients' medical files.	No action taken.
Consider changing remuneration of medical practitioners to reduce the fee-for-service component.	No action taken.
Discuss the issues of authorisation and reimbursement separately.	No action taken.
Make reimbursement contingent on medical efficacy as proven by international scientific studies or in current practice.	No action taken.
Develop the information and accounting system of the hospitals so that Diagnostic Related Groups (DRGs) can be introduced.	No action taken.
Precede decisions affecting the health insurer financial equilibrium ( <i>e.g.</i> , medical fees, reimbursement rules) by a cost analysis provided by the health insurer.	No action taken.
Bring capital-intensive medical applications in line with demand and centralise whenever the saving in average cost and improvement of service quality outweighs the loss of proximity for patients in rural areas.	No action taken. On the contrary, some new, highly equipped hospitals have been built.

Past recommendations	Actions taken and current assessment
<b>E. Sustainable development</b>	
Reduce the average state pension replacement rate to one that is consistent with long-term balance. Index the official retirement age to rising life expectancy.	No action taken.
Recast climate change policy to achieve the Kyoto target at less cost to the economy by using instruments to the point where marginal abatement costs are equal: introduce an across-the-board carbon tax and participate in European and international emission trading schemes. Place greater emphasis on using flexible mechanisms to promote abatement in (non-OECD) foreign countries.	Expensive programmes for energy produced from renewable sources and co-generation are still in place. Luxembourg participates in the European emission trading schemes for enterprises. Flexible mechanisms, like Clean Development Mechanism and Joint Implementation are being or will be used.
Continue to improve the efficiency of development aid by targeting priority countries and areas and better monitor effectiveness. Continue to support reform of the Common Agricultural Policy.	



## Chapter 2

# Public finances: adjusting to lower growth

*After having been a model of fiscal rectitude until 2001, Luxembourg has since then joined the group of countries experiencing budgetary difficulties. With expenditure growth remaining brisk, in spite of decelerating growth entailing a slowdown in revenue growth, the fiscal balance has rapidly deteriorated and the general government deficit has reached 1.9% of GDP in 2005, raising concerns with policymakers. The authorities are rightly determined to bring the budgetary position close to balance before the end of the current legislature, i.e., by 2009 at the latest. This will require dealing with the fast-growing trend of public spending, notably the strong momentum of social benefits and public salaries.*

*The public pension scheme for persons working in the private sector at present looks to be in good shape: the contributions of the growing number of cross-border workers finance a relatively slow increase in this number of retirees. In the long term, however, pension arrangements will endure a likely decline in employment gains, a rising number of pensioners and an increased longevity of retirees. Thankfully, these effects will be felt later than in other OECD countries, but this should not be interpreted as giving room for complacency. The earlier that measures are introduced to respond to this challenge, the smoother the adjustment will be.*

## Overview

The budgetary position has deteriorated sharply since the start of the decade. After the large surpluses generated in 2000-01 (around 6% of GDP in each year), the budgetary balance has constantly declined, with the deficit reaching 1.9% of GDP in 2005, more than expected under the authorities' 2004 update of the Stability and Growth programme. If it were to persist, this weakening of public finances could jeopardise the underlying virtues of Luxembourg's economic system, in particular its sound macroeconomic environment and its low level of taxes, which have been key to the strong growth in employment and living standards. The government rightly aims at re-establishing a balanced budget before the end of the current legislature, *i.e.*, by 2009, at the latest. Rebalancing the budget will require more than partial measures, as the underlying momentum of expenditure remains very dynamic, especially for social expenditure and public investment.

Comprehensive reforms will also be needed to address the challenge of ballooning pension promises, which are unlikely to be met in the absence of policy changes. Although the pension system presently appears to be in good financial shape, and should remain in surplus for a longer period than in most other OECD countries, the system will start to generate large deficits around 2030 and net financial liabilities are projected to become unbearable by 2050. The pension system relies on an implicit agreement of inter-generational solidarity; this arrangement is currently well accepted, but may fall apart if future generations have to bear the growing burden of supporting the older population.

This chapter addresses these short-term and long-term challenges consecutively. The first part provides a brief overview of the structure of public finances and then discusses what could be done to rein in the growth of public spending and reform the budgetary framework. The second part reviews the structure of the pension system, summarises the upcoming difficulties and presents some possible solutions.

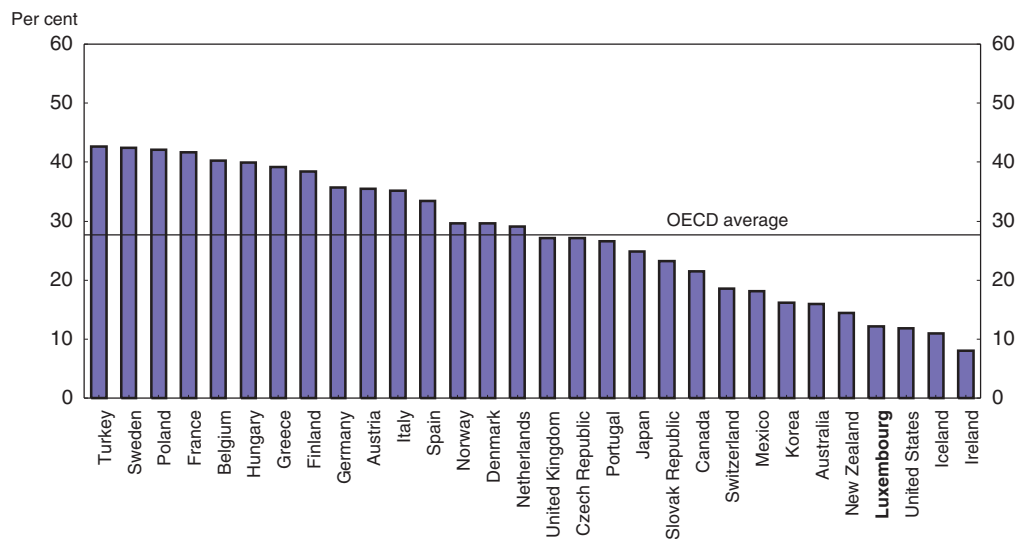
## The short-term challenge: curbing expenditure growth

### **The structure of public finances**

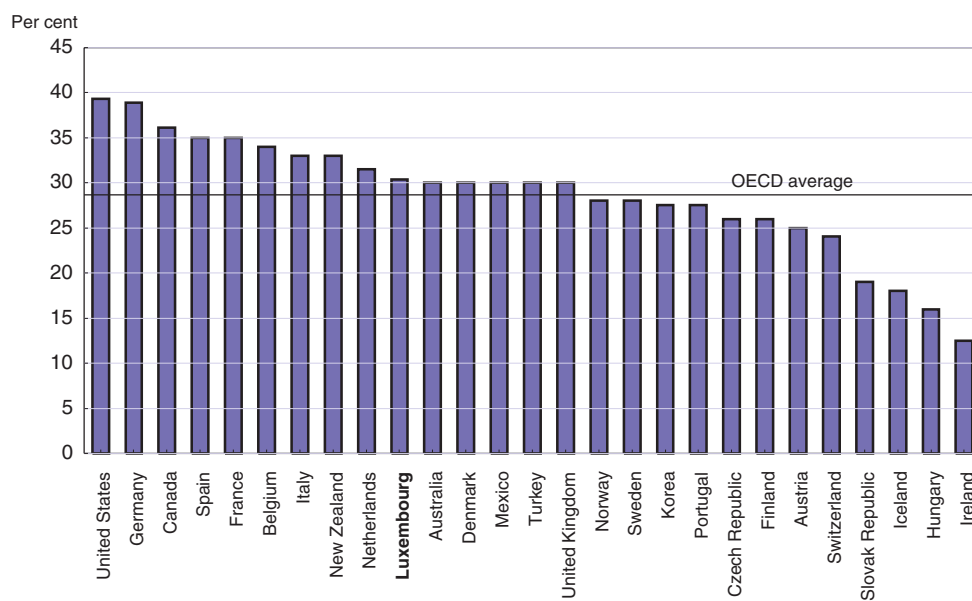
Despite recent difficulties, Luxembourg's public finances retain many enviable features. On the revenue side of the general government budget, tax rates are generally lower than in other OECD countries. The total of income tax and social security contributions paid on labour income (12.2% of labour costs for a married average one-earner couple with two children) is well below the OECD average (27.7%) and particularly advantageous compared to the tax wedges prevailing in the three neighbouring countries (Figure 2.1). This reflects the low levels of both personal income tax rates and social security contributions. The corporate income tax is also relatively low by international standards, although not among the lowest in the OECD (Figure 2.2): companies pay a tax to the central government representing 22% of earnings (*impôt sur le revenu des collectivités* or IRC), a 4% (to be raised to 5% from 1 January, 2006) "solidarity" levy on the IRC that helps to finance measures to reduce unemployment and a tax to local governments of 6.5-10% of

Figure 2.1. **Taxation of wage income, 2005**

Income tax and social security contributions as a percent of gross labour costs,  
for average one-earner couple with two children



Source: *Taxing Wages 2004-2005*.

Figure 2.2. **Total statutory corporate income tax rate, 2005<sup>1</sup>**

1. The Luxembourg rate applies to a company resident in Luxembourg City, where the local authority tax rate is 7.5% – see the OECD Tax Database for more details on the breakdown of the total corporate income tax rate in Luxembourg and other countries.

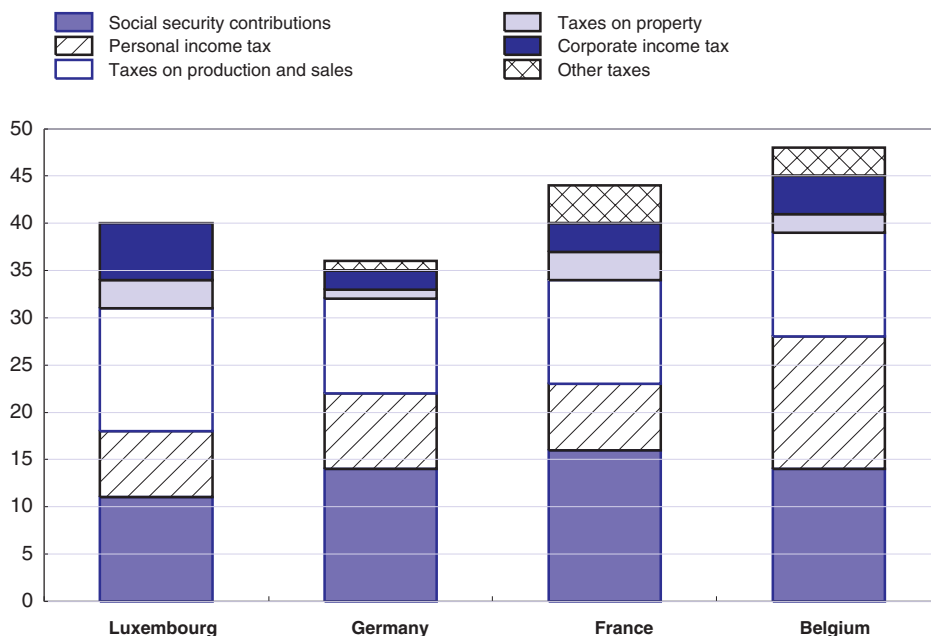
Source: OECD Tax Database.

earnings (*impôt commercial communal*).<sup>1</sup> As for indirect taxes, the standard rate of value added taxes (VAT) has remained fixed at 15%, i.e., at the lower end of VAT rates foreseen by EU law, and excise taxes on road fuels and tobacco are lower than in other countries. The authorities abolished the wealth tax (*impôt sur la fortune*) on private persons (*personnes physiques*) in 2006 but introduced a withholding tax of 10% on interest income of residents in excess of € 250 per year. Since 1 July 2005, a withholding tax has been applied to the interest income of non-residents from other EU states (in accordance with the EU Directive on the taxation of savings income in the form of interest payments). This tax rate will remain at 15% during the first three years, then increase to 20% during the following three years and finally will be kept at 35%. Three quarters of the proceeds of this tax are transferred to the fiscal authorities of the country in which the holder of the saving account resides.

Even though tax rates are low by international standards, general government receipts are comparable as a share of GDP to those in neighbouring countries (Figure 2.3). This is in part explained by the concentration of economic activity in sectors, such as financial services, which have an above-average level of productivity, remunerate employees at high wage rates and generate sizeable profits. It has been estimated that the financial sector contributes directly and indirectly 27% of central government receipts, even though it only accounts for 17% of employment (*Comité de Développement de la Place Financière*, 2005). In addition, there are significant excise tax receipts from the purchase of petrol and tobacco by non-residents. With tax receipts accounting for a relatively high proportion of GDP, and economic growth sustained at a rapid pace, the general government has been able to generate sizeable budgetary surpluses during most of the past decade, even though total expenditure has been growing at a fast pace. This virtuous circle of low tax rates, buoyant revenues and large budget surpluses worked to the country's advantage for many years.

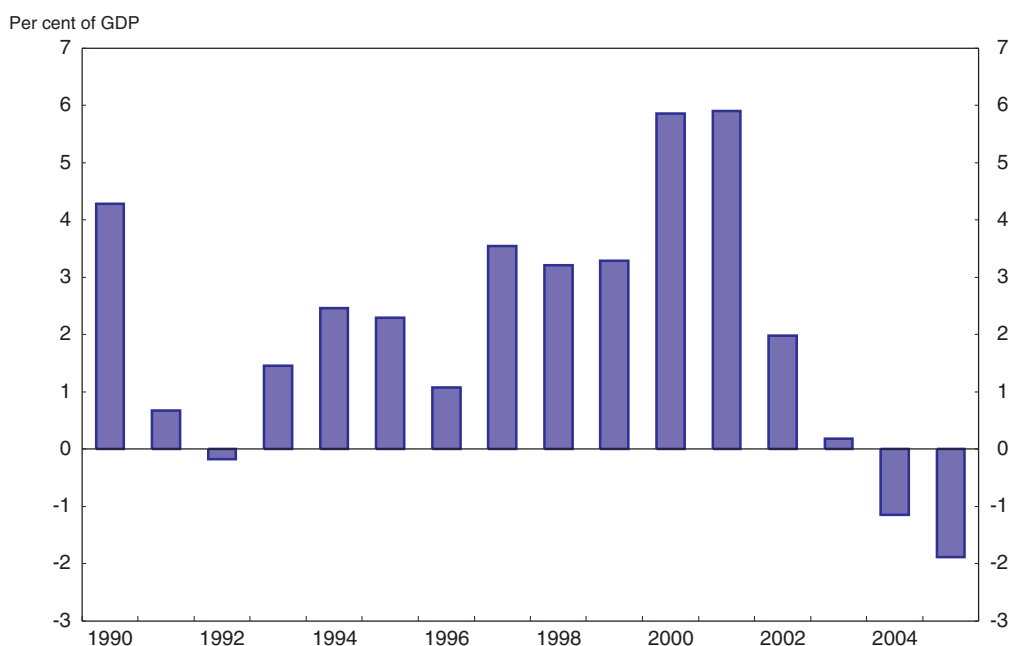
Figure 2.3. **General government receipts**

As a % of GDP, 2004



Source: OECD, *Revenue Statistics*, 2005.



Figure 2.4. **General government net lending**

Source: OECD Economic Outlook, No. 79.

The fiscal situation has, however, come under strain since 2001. The slowdown of activity, especially in the financial sector, has weighed on fiscal revenue. Even though activity has bounced back since then, growth has been less buoyant than in the late 1990s and growth in government revenues has slowed down considerably relative to past trends. The increase in general government receipts has dropped from an annual average of 8% during the 1990s to 4.8% during 2000-05 (Table 2.1). This would not have been a problem if public outlays had decelerated concomitantly. However, the pace of growth in public expenditure accelerated to reach 9.1% annually on average during 2000-05, compared with 7.5% in the 1990s. This divergence in the trends of government receipts and expenditure has resulted in a sharp turnaround in public finances. A deficit emerged in 2004 and the budgetary position deteriorated further in 2005, when the general government deficit is estimated to have reached 1.9% of GDP, by far the largest deficit on record in Luxembourg (general government budget data are only available from 1990 onwards) (Figure 2.4). If unchecked, these trends would imply growing deficits.

### **The 2006 budget**

The 2006 budget targets a general government deficit of 1.5%-1.8% of GDP. Little consolidation is expected to come from the revenue side of the budget, reflecting the modesty of tax measures.<sup>2</sup> However, owing to the improvement of cyclical conditions, corporate and personal income tax receipts are projected to increase, as are revenues more closely related to activities in the financial sector, notably the subscription tax (*taxe d'abonnement*). Notwithstanding potentially favourable trends on the revenue side, significant adjustment is also intended to take place on the expenditure side. The growth of total expenditure is assumed to fall to 5.2% in 2006, after having expanded at the annual pace of 9.1% during the previous five years. In addition to keeping a tight rein on central

**Table 2.1. General government expenditure, receipts and financial balance**  
As a per cent of nominal GDP

	2000	2001	2002	2003	2004	2005	Annual growth in %	
							1990-2000	2000-05
Government total disbursements	41.7	39.2	44.0	45.0	45.5	46.9	7.7	8.9
Government final consumption expenditure <sup>1</sup>	16.7	16.5	17.3	17.6	17.8	18.0	7.2	7.9
Interest paid	0.4	0.3	0.3	0.2	0.2	0.2	4.3	-11.5
Subsidies	1.7	1.6	1.6	1.6	1.7	1.8	4.0	7.1
Social security benefits in cash	14.5	14.3	15.5	16.1	15.8	15.9	8.1	8.3
Other current payments	5.1	4.3	4.7	5.0	5.6	5.5	9.1	8.3
Gross capital formation	4.2	4.4	5.1	4.9	4.6	5.0	7.5	9.9
Government total receipts	48.1	45.2	46.1	45.2	44.3	44.9	8.1	4.9
Total direct taxes	16.5	15.6	16.2	15.7	13.9	14.5	7.8	3.6
Social security contributions received	12.0	12.1	12.5	12.5	12.3	12.5	7.7	7.2
Indirect taxes	14.9	13.4	13.3	13.1	14.3	14.4	10.6	5.6
Property income received	2.5	2.4	2.1	1.7	1.6	1.3	1.2	-5.8
Other current receipts	2.0	1.7	1.8	1.9	1.9	1.9	7.7	4.4
Capital tax and transfer receipts	0.2	0.2	0.2	0.2	0.2	0.3	8.7	1.8
	Period averages							
Net lending	5.9	5.9	2.0	0.2	-1.1	-1.9	2.5	1.8
Structural balance	-2.8	-2.1	-5.6	-6.6	-7.6	-8.6		
General government gross debt	5.9	6.7	7.0	6.8	6.9	6.6		

1. Includes social benefits in kind.

Source: OECD Economic Outlook, No. 79 database.

government consumption expenditures, the costs linked to Luxembourg holding the Presidency of the Council of the European Union during the first half of 2005 will not recur, reducing spending by about 0.2% of GDP. Measures introduced since 2000 to curtail medical spending – notably the tighter control of sick leave, promotion of generic drugs, measures to facilitate the labour market participation of partially disabled workers, lower reimbursement of doctors' fees – are projected to have a downward effect on spending. Furthermore, growth in expenditure on public investment is to slow, albeit with such expenditure remaining high as a share of GDP (about 3.7%). The authorities remain committed to expanding the road and railroad infrastructure as well as to building a new air terminal, constructing new schools and long-term care institutions and investing in new information and telecommunication equipment used by public administrations. The better than expected budgetary outcome for 2005 (the general government deficit was revised downwards from 2.3% of GDP to 1.9% of GDP), robust revenue growth during the first quarter of 2006 and the authorities known propensity to overestimate investment expenditure in the budget suggest that the public deficit in 2006 could turn out to be smaller than projected.

### **Policies to curb expenditure growth**

Irrespective of the exact outcome of the 2006 budget, there is a need to strengthen the budgetary framework to achieve a long-lasting reduction in expenditure growth. Reducing expenditure growth will not be an easy task, given its present dynamism. The approach needs to be comprehensive because all categories of spending have strong dynamism, and laws will need to be amended to achieve the intended results, notably to curb the growth

of automatic entitlements. The following paragraphs discuss measures that have already been decided, and what else could be done.

### ***Measures agreed by the Tripartite Committee***

Members of the Tripartite Committee agreed that budget consolidation measures were necessary and that, given that the cause of the budget deterioration was rapid expenditure growth, the focus of such measures should be on expenditure restraint (Luxembourg Government, 2006a). In this regard, the Prime Minister recently announced a package of measures agreed by the Tripartite Committee (Luxembourg Government, 2006b):

- Automatic indexation of wages and social benefits is to be deferred without catch up: whereas indexation thresholds, entailing an increase of 2.5%, would have been breached in August 2006, 2007, 2008 and 2009 without a policy change, such increases will now occur in December 2006, January 2008 and January 2009.<sup>3</sup> The breaching of an indexation threshold presently increases general government expenditure by € 180 million (0.6% of GDP).
- Government pay scales are to be frozen in 2007 and 2008, resulting in a cumulative saving of € 80 million by 2009.
- Growth in government employment is to be reduced and economies in public administration operating costs are to be achieved, resulting in a cumulative saving of € 125 million by 2009.
- The 2% real increase in pensions that had been foreseen in January 2007 is to be delayed and paid in two instalments (1% in July 2007 and 1% in July 2008), already saving € 50 million in 2007.
- Growth in public investment is to be cut, lowering it from 3.7% of GDP in 2006 to 3.2% of GDP in 2009 and resulting in a cumulative saving of € 660 million by 2009.

Together with some small measures on the revenue side,<sup>4</sup> these expenditure measures are expected to result in a reduction of the structural budget deficit by 0.5% of GDP per year until 2009 and bring the budget back to balance.

### ***Welfare spending***

As in many other countries, social expenditure is the largest component of public spending. Total social expenditure accounts for about 21% of GDP, with the largest proportions going to old-age pensions, disability and health care benefits (Table 2.2). A factor that contributes to relatively high social spending is the high level of income replacement in relation to previous incomes. This is particularly the case of pension benefits, whose replacement rates are the highest in the OECD. Unemployment benefits during the initial phase also come with the highest replacement rates in the OECD (for a two-earner family paid at the average wage, with two children). For the time being, these elevated social benefits have been financed relatively painlessly – social security contributions are low by international standards. But this will not last forever. As discussed in the next section, the present low level of social security contributions owes a lot to the exceptional circumstances created by the participation of prime-age cross-border workers and immigrants, who contribute to the social security system but do not draw commensurate benefits at present. When these workers age, the situation will become much less favourable.

The rapid growth of social expenditure (see also Table 2.1) also stems from government decisions to establish numerous new social benefits. In 1999, parental leave (*cong  parental*) was established to allow each parent to take a six-month leave of absence for each child, with a monthly indemnity fixed in 2005 at € 1778. In 2002, the *Rentend sch* agreement made several pension rules more generous, increasing spending by € 130 million annually (7.6% of the previous year's spending), and introduced a pension income supplement to parents who educated their children (*forfait d' ducation*, € 80 million annually). These new benefits, and their subsequent indexation to nominal wages, have contributed to the rapid growth of social expenditure. In order to slow the growth of spending, the authorities have sought to combat abuse, notably of disability benefits and sickness leave, with some impact (Chapter 3). There is probably scope to reduce abuse further.

Table 2.2. **Social expenditure in OECD countries, 2001**

As per cent of GDP

	Total	Family	Health	Disability	Old-age
<i>Australia</i>	18.0	2.9	6.2	2.3	4.7
<i>Austria</i>	26.0	2.9	5.2	2.5	10.7
<i>Belgium</i>	27.2	2.3	6.4	3.3	8.7
<i>Canada</i>	17.8	0.9	6.7	0.8	4.8
<i>Czech Republic</i>	20.1	1.6	6.7	3.0	6.7
<i>Denmark</i>	29.2	3.8	7.1	3.9	8.3
<i>Finland</i>	24.8	3.0	5.3	3.9	7.9
<i>France</i>	28.5	2.8	7.2	2.2	10.6
<i>Germany</i>	27.4	1.9	8.0	2.3	11.7
<i>Greece</i>	24.3	1.8	5.2	1.8	12.7
<i>Hungary</i>	20.1	2.5	5.1	2.7	8.0
<i>Iceland</i>	19.8	2.6	7.5	2.8	5.5
<i>Ireland</i>	13.8	1.6	4.9	1.4	2.7
<i>Italy</i>	24.5	1.0	6.3	2.1	11.3
<i>Japan</i>	16.9	0.6	6.3	0.7	7.3
<i>Korea</i>	6.1	0.1	3.2	0.5	1.2
<b>Luxembourg</b>	<b>20.8</b>	<b>3.4</b>	<b>4.8</b>	<b>3.6</b>	<b>7.5</b>
<i>Mexico</i>	11.8	0.3	2.7	0.2	7.4
<i>Netherlands</i>	21.8	1.1	5.7	4.1	6.4
<i>New Zealand</i>	18.5	2.2	6.1	2.8	4.8
<i>Norway</i>	23.9	3.2	6.8	4.8	6.8
<i>Poland</i>	23.0	1.0	4.4	5.5	8.5
<i>Portugal</i>	21.1	1.2	6.3	2.5	7.9
<i>Slovak Republic</i>	17.9	1.5	5.0	2.3	6.7
<i>Spain</i>	19.6	0.5	5.4	2.4	8.3
<i>Sweden</i>	28.9	2.9	7.4	5.2	9.2
<i>Switzerland</i>	26.4	1.2	6.4	3.8	11.8
<i>United Kingdom</i>	21.8	2.2	6.1	2.5	8.1
<i>United States</i>	14.8	0.4	6.2	1.1	5.3

Source: OECD Social expenditure database.

There have been suggestions to make social benefits more frequently subject to means-testing. Currently, only 5% of the amount of spending on benefits is subject to means-testing, less than in several other EU countries (Math, 2003). For instance, disability benefits, parental leave and old-age financial support schemes are unconditional. Any step to introduce means-testing should however be considered carefully, so as to avoid

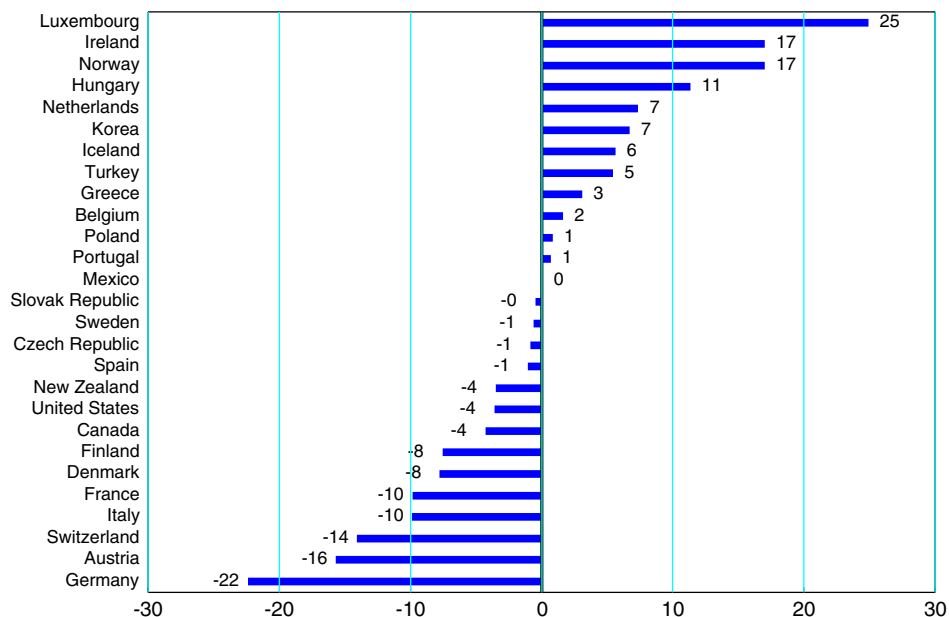
increasing net marginal effective tax rates, which would occur if benefits were automatically phased out when the beneficiary's income rises. In fact, it is possible that certain means-tested benefits (such as the RMG) are already reducing the work incentives of the beneficiary's dependants (Chapter 3). The two objectives of saving on benefit outlays and avoiding inactivity traps are difficult to reconcile in all OECD countries. It is therefore unlikely that much spending reduction could be achieved if such reform were implemented in a way that avoids reducing work incentives.

### Healthcare spending

There might a greater scope for restraining healthcare spending, which is the second largest category of social expenditure. At present, the level of healthcare spending in relation to GDP is relatively moderate by international comparison (6.2% of GDP in 2002). This is due to the composition of the labour force, i.e., the high share of cross-border and migrant workers, who are predominantly of prime-age and do not require costly medical treatments. The low level of spending also results from EU rules, stipulating that cross-border and migrant workers who stop working in Luxembourg are automatically enrolled in the health insurance system of their home countries, thus reducing the level of spending in Luxembourg.

Despite these moderating factors, the dynamism of healthcare spending has been strong since the start of the decade. Between 2000 and 2004, health spending increased at an annual pace of 9.9% in nominal terms. Over a longer period (1997-2003), the growth of health expenditure was faster in Luxembourg than in any other OECD country (Figure 2.5). Such high growth has only partly been attributable to robust growth in the insured population. This expenditure growth has been such that budget pressures have emerged in the *Union des Caisses de Maladie*, with the government reacting by hiking health insurance

Figure 2.5. **Health expenditure, change relative to OECD average**  
1997 to 2003, in percentage points (based on US\$ at PPP)



Source: OECD (2005), *Health at a Glance*.

contribution rates in 2005.<sup>5</sup> Spending on ambulatory care, which accelerated in 2004, has been boosted by rapid expansion in the number of practitioners (the number of general practitioners, specialists and dentists increased by 4.5% annually between 2000 and 2003) as well as by increases in doctors' fees (between 2000 and 2005, the fee charged for a visit to a general doctor rose from € 19.96 to € 29.80, an increase of 49%, compared with an increase in the CPI of 12% during the same period). The indexation of doctors' fees to wages in the overall economy since 2003 has contributed to this outcome. As well, in-patient hospital spending has increased rapidly following the government's decision to expand the supply of hospital care. This source of additional spending is likely to persist in the future in view of the construction of new hospitals (*Hôpital Kirchberg, Clinique St. Louis, Clinique Dr. Bohler*). It is welcome, by contrast, that sick-leave indemnities have stopped progressing, and even slightly declined in 2004, following the tightening of controls of possible abuse of the system.

The authorities have introduced a number of measures to slow the pace of growth in healthcare spending following the re-emergence of health budget pressures in 2005. In hospitals, the daily hospital fee (*forfait journalier hospitalier*) has been raised; the rules for the reimbursement of blood tests and other laboratory services have been tightened; co-payment of doctors' fees has been raised from 5% to 10%; and the requirements to obtain long-term sick leave indemnities have been made stricter.

More needs to be done, especially in the in-patient care sector, to rein in the growth of spending. The planning of new hospitals should be made carefully, as new institutions give rise to permanently higher spending. The authorities should further build co-operation agreements with care suppliers in regions of neighbouring countries so as to avoid duplication, rather than seek to provide the entire range of hospital treatments. Also, the authorities should continue their efforts to develop a Diagnostic Related Group (DRG) system, so that hospitals' funding more precisely reflects their actual activity, while avoiding that this new approach leads to unnecessary medical treatments. In the out-patient sector, there are needs to: further develop the use of generic drugs, including through the use of financial incentives; raise co-payments for the use of medical services; and increase the efficiency of service delivery.

As well, the authorities could consider introducing a gatekeeper system, by entrusting general practitioners with the responsibility to refer to specialists and pre-authorise hospital admissions, if so needed. A gatekeeper system would not only reduce the growth of spending – by avoiding unnecessary medical appointments – but it would also contribute to a better coordination of medical treatments by ensuring that the primary care physician receives all necessary medical information, formulates an appropriate treatment and oversees all aspects of it. While patients should retain the freedom to consult any doctor, the reimbursement of fees at the current high rate should be limited to visits in the context of the gatekeeper system.

### **Reforming the public expenditure framework**

#### ***The spending rule needs to be enhanced***

The growth of central government spending is governed by coalition agreements of 1999 and 2004, which stipulate that it cannot surpass that of nominal GDP medium-term growth. This type of fiscal rule is in principle sound because it aims at controlling expenditure, while allowing automatic stabilisers to operate freely on the revenue side of

the budget. However, the *Banque Centrale du Luxembourg* (BCL, 2005) estimates that the growth of consolidated central government expenditure (combined with that of special funds) exceeded that of medium-term (5-year) nominal GDP every year since 1999. Moreover, the usefulness of the framework has been reduced by the fact that it focuses on central government current spending; social security spending, a major driver of spending growth, has been excluded from the framework, making it overall relatively ineffective and reducing its credibility as a tool of fiscal discipline. Limiting spending growth below nominal GDP growth (i.e., no more than 6-7% per year) and bringing social security spending into the framework would make an important contribution to the effectiveness, transparency and credibility of the fiscal rule. The Tripartite Agreement of 28 April 2006 represents an important step in this regard as central government expenditure growth is to be limited to 4% in 2007.

Progress has been made in this direction with the regular updates of the Stability and Growth Programme, which encompasses social security spending. As well, the regular assessments of future pension spending by the *Inspection Générale de la Sécurité Sociale* and the fiscal policy analyses of the *Banque Centrale du Luxembourg* help to inform public opinion. More could be done, however, to foster a public debate on the consequences of fiscal choices. It would be useful if the draft central government budget submitted to Parliament included projections of social security expenditure, given the heavy involvement of the central government in the financing of social expenditure: financial transfers from the state budget amount to nearly 100% of expenditure for employment policy, 41% for health care and, more than 32% for old-age pension. At present, these decisions are made in the context of tripartite agreements (employees, employers and state), with automatic consequences for the budget. Parliamentary debates on the financing needed to support social expenditure programmes would make society feel more responsible for their effects. This would be similar to the practice in other countries, such as in France where the *Loi de Financement de la Sécurité Sociale* gives rise to a parliamentary debate and helps to steer a debate on social spending trends and, if needed, corrective measures. It would also be important for the draft budget to inform lawmakers about the extent of contingent liabilities; this is already done in the context of the 7-year IGSS reports, which provide long-term projections of old-age pension spending for the private sector, but limited information is provided about the special pension scheme of civil servants. In addition to this, the evaluation of implicit debt should encompass future healthcare expenditure which, as noted, will rise strongly with the ageing of the population.

### ***A more outcome-focused budgetary approach***

The draft budget presented to Parliament provides little information on the government's final objectives. The budget provides a detailed list of financial requests by ministry, with breakdowns by department and types of activity, accompanied by commentaries on the initiatives proposed by the government and general policy statements. However, the budget falls short of modern budgeting and management practices, which either focus on *government outputs* (goods and services to be delivered during the fiscal year) or *policy outcomes* (public goods to be delivered, such as improved welfare or increased security). As a result, it is not possible to relate the financial resources provided to agencies and the outputs that they aim to deliver to the public adequately, thus reducing transparency. This makes it difficult to hold government agencies accountable for

the efficiency of their budgeting management practices and to evaluate their performance. The Court of Accounts (*Cour des Comptes*) periodically scrutinises budget execution in the form of annual audits; however, this focuses on the budgetary procedure and differences between the actual budget and the approved budget, rather than on the scope of accomplishments. Moving towards budgetary management best practices could therefore make an important contribution to the efficiency of public spending. Such a move is indeed being considered by the authorities. The report on the 2006 Budget of the “*Commission des Finances et du Budget*” (Parliamentary commission in Luxembourg) devotes a special chapter on a possible reorientation of budgetary procedures towards a more output oriented focus in line with the French “*Loi d’Orientation de la Loi de Finances (LOLF)*”.

The effectiveness of public spending programmes could also be increased by making budgetary appropriations more fungible. At present, ministries are funded by line-by-line budgetary appropriations, with limited flexibility to modify the spending that has been authorised, even in a changing environment. With a single appropriation for all operating costs, budget managers would be in a better position to implement their programmes and reach pre-specified outcomes, as is becoming a widely accepted budget practice in OECD countries. This greater freedom should come with more responsibility to reach pre-specified outcomes and accountability for their successful achievement. For this to become operational, it would be necessary to introduce a greater degree of flexibility in human resource management, notably by encouraging greater mobility of employees between ministries and agencies, as discussed below.

Resources allocated to the 29 central government “special funds”, which have the responsibility of executing public sector projects – mostly capital outlays – in areas as diverse as military expenditure, computer equipment or railway-track construction, should also be made more fungible. The annual budgetary allocations to these funds vary with the cyclical fluctuations of tax receipts. Moreover, resources that remain unused at the end of the fiscal year can be carried forward to the next fiscal year. These arrangements make the funds an effective means of managing cyclical tax windfalls, setting them aside at the peak of the cycle and spending them during the slowdown; they also enable wasteful spending splurges at the end of the year to be avoided. Indeed, Luxembourg has been more successful than other countries in allowing the free play of automatic stabilisers at the peak of the cycle. This mechanism however comes at the cost of making budget resources less fungible, because resources attributed to one of the 29 funds cannot be taken back (unless Parliament changes the law). This makes it difficult to adapt spending programmes to changing circumstances. The authorities could consider making budget resources more fungible (while at the same time retaining the benefit of saving tax windfalls) by merging some of the special funds.

### ***Human resource management policies***

Luxembourg’s civil service is not oversized by international standards. The central government directly employs about 16 000 civil servants and there are also 21 000 workers in other parts of the public sector (notably health care) and 2 000 blue-collar workers, so that overall general government employment corresponds to about 20% of total employment. Thanks to a strict system of *numerus clausus*, a rampant increase in the civil service has been avoided and the proportion of the public sector in total employment has slightly declined over the past decade. However, the current system has made it difficult to reallocate resources to accompany the changing nature of society’s demands. With the



development of e-government, there is less of a need for traditional administrative services: but with present demographic trends, there is a growing need both for teachers and for long-term care workers. Hence, existing impediments to the reallocation of human resources across branches of public services need to be phased out. This will be important to avoid duplication of skills in some parts of government and understaffing elsewhere.

While the number of public employees is not exceptional, the high level of wages in comparison to those of the private sector (Box 2.1) inflates the government's wage bill. Generous remuneration, strict employment protection, significant periodic wage increases and seniority-based career advancement induce resident skilled workers to leave private

### Box 2.1. Why are public salaries so much higher than those of the private sector?

Public sector wages are high in Luxembourg, in particular for low- and intermediate-skilled workers and at the entry level (Table 2.3). In general, entry-level wages in the public sector start above the minimum wage (around 2-26% above the minimum wage for the *carrière inférieure*\* and 15-60% for the *carrière moyenne*) with steep seniority increases that reach – in particular in the early years of a career – up to 5% *per annum*. Moreover, *ad personam* promotion allows civil servants to reach higher salary levels without the creation of new posts, while maintaining similar yearly seniority pay increases within each grade. These promotions can usually be obtained through a promotion exam and are available for civil servants in the *carrière inférieure* after three years in each grade. In the case of an office assistant, this would mean earning more than 1.5 times the minimum wage after 10 years of civil service assuming that only one promotion exam had been passed. Although wage increases are far less generous at more advanced seniority levels in the *carrière supérieure* (compared with those for jobs in the private sector with similar skill requirements), wage differentials nevertheless remain attractive: the government has not experienced difficulty in retaining highly skilled civil servants.

Table 2.3. Public sector entry-level and mid-career wages for selected professions

In euros per month

		1 <sup>st</sup> year	After 1 promotion	5 years	10 years
Lower ranking civil servant ("Carrière inférieure")	Office assistant	1 535.30	1 736.18	1 937.06	2 252.73
	Road mender	1 736.18	1 894.02	2 137.94	2 467.96
	Craftsperson	1 894.02	2 209.69	2 295.78	2 797.98
Middle ranking civil servant ("Carrière moyenne")	Computer technician	2 525.36	2 912.77	3 041.91	3 687.59
	Technical engineer	2 525.36	3 128.00	3 041.91	3 687.59
	Certified instructor	2 912.77	3 816.73	3 429.32	4 118.05
Higher ranking civil servant ("Carrière supérieure")		4 161.10	4 591.56	5 165.50	5 882.93
Private Sector	Skilled			Unskilled	
Private sector minimum wage (2005)		1 804.11		1 503.42	
Average earnings			3 375		

Source: Ministère de la fonction publique, IGSS.

\* For lower ranking civil servant posts (*carrière inférieure*), candidates are only required to have a primary level school leaving certificate.

sector firms and to apply for public sector jobs, with the result that private-sector employers need to draw their workforce from cross-border and migrant workers. About 40% of active residents work in the public sector, a proportion that has been increasing as most new job vacancies in the private sector have been filled by cross-border workers and nearly all public-sector vacancies have been filled by residents. A reform of human resource management policy of the public sector has been advocated to ease this duality in the labour market, allow greater fluidity and permit private employers to more easily attract skilled workers (Fontagné, 2004; *Union des entreprises Luxembourgeoises*, 2003).

Reducing the wage premium of public sector jobs would slow public spending growth; it would also reduce labour market duality, allowing private employers to attract and retain resident workers more easily. While this cannot happen instantaneously, the government has started to move in this direction by moderating wage agreements. The evolution of the reference index (*indice de base des traitements des agents publics*), which guides real wages, has been contained at 1% in 2005 and 0.8% in 2006, less than under previous agreements (1.6% for each year between 2002 and 2004). Moreover, following the Tripartite Agreement of April 2006 (Luxembourg Government, 2006a), the government announced that public sector pay scales would be frozen in 2007 and 2008 (Luxembourg Government, 2006b). Nevertheless, the automatic drift of the wage bill, which reflects seniority-related wage increases, continues to inflate the government's wage bill by about 1.5% to 1.7% per year: under current rules, civil servants receive an automatic salary increase every two years (*avancement en échelon*), although it is actually paid yearly in two steps; and, civil servants having reached the top of their grade can, in the absence of promotion to a new grade, obtain the salary corresponding to the next higher grade after three to six years, depending on seniority in the job. Government employees also automatically receive an end-of-year allowance every year for an amount equivalent to one month of salary.

Public-sector pay arrangements should be reconsidered, especially automatic seniority bonuses and fringe benefits. More generally, the civil service would gain in efficiency if modern human resources management practices were introduced, such as recurrent performance evaluation, so as to introduce some degree of incentive in career developments.

### The medium-term challenge: pension system sustainability

The present public pension scheme for persons working in the private sector was established in 1985 as a pay-as-you-go system, augmented by a financial buffer. The scheme covers the bulk of pension commitments.<sup>6</sup> Detailed presentations of the pension benefit scheme can be found in previous OECD *Economic Surveys* of Luxembourg as well as in ILO (2001), Bouchet (2003), IMF (2004) and OECD (2004); the rules for calculating pension entitlements are summarised in Box 2.2.

As in other fast-growing economies, the pension system looks to be in an enviable shape. The number of workers contributing to the system is rising rapidly (nearly 4% per year), in line with the strong employment gains, while the number of pensioners is increasing at a much slower pace (some 2% per year). Thanks to these favourable trends, the system's dependency ratio (number of pensioners divided by number of contributors) has fallen since the mid-1990s (Figure 2.6). Examined over a relatively short-term horizon, the financial situation of the pension scheme thus appears to be favourable, as shown by the latest seven-year actuarial report of the *Inspection Générale de la Sécurité Sociale* (IGSS,

### Box 2.2. Rules for calculating pension entitlements

Persons of 65 years of age, having contributed for at least 10 years, are entitled to an old-age pension consisting of two components: an earnings-related element (*majoration proportionnelle*) and a basic amount unrelated to past incomes (*majoration forfaitaire*). Obtaining a full pension requires having participated in the system for at least 40 years, including years of **paid activity**, but also **imputed years for non-contributing periods** such as *tertiary education and unpaid traineeship* between ages of 18-27 (up to nine years), *child-rearing* for up to three children (up to 10 years), uncompensated unemployment periods and periods of disability benefit eligibility.

**Earnings-based element:** this component is accrued at the rate of 1.85% per year, based on life-time earnings. To calculate the pension, past earnings are adjusted to the wage and price level of the base year 1984, then they are multiplied by an index that reflects the evolution of prices since 1984 (*indice du coût de la vie*) and an adjustment factor that fully reflects the evolution of the general wage level at constant prices (*facteur d'ajustement*).

**Increase in earning-based element for additional years of contributions:** In order to encourage later retirement, the accrual rate of 1.85% is increased by 0.01% for each year of activity past age 55 and an additional 0.01% for each year of contribution beyond 38 years, up to a maximum accrual rate of 2.05% per year.

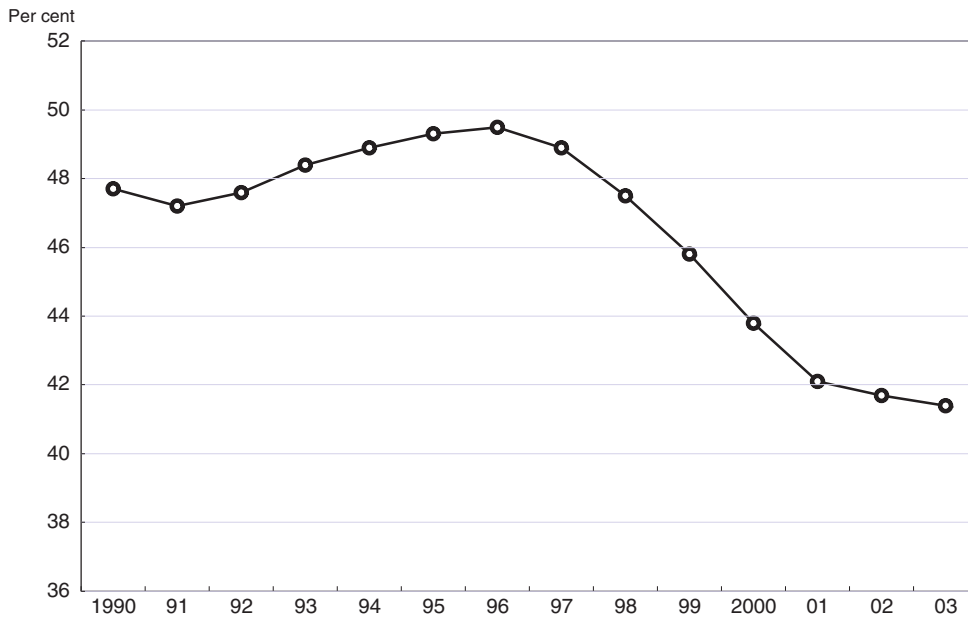
**Basic amount:** all pensioners having contributed during 40 years are allowed a fixed amount of € 311 per month (in 2002), reduced by 1/40<sup>th</sup> for each year missing to reach 40 years. This component is calculated on the basis of years of contribution and augmented by a flat end-of-year allowance.

The **minimum** pension for a person having contributed 40 years is € 1 353; the **maximum** pension is € 6 264.

**Age of retirement:** The normal age to draw a pension is 65, subject to a minimum period of contribution of 10 years. A full pension normally needs 40 years of contributions, including various credits for non-contributed periods. It is possible to get an early-retirement pension (*pension anticipée*) at an earlier age: people at age 60 having contributed to the system during at least 40 years, including credited non-contributory periods, are entitled to get an early-retirement pension, provided that they have at least 10 years of actual contributions. As well, people having reached age 57 are entitled to an early-retirement pension, provided that they made contributions at least during 40 years (excluding credited periods). Also, people who would be entitled to an early-pension at age 60 can retire three years before that age under one of existing pre-retirement schemes (*préretraite solidarité et préretraite ajustement*).

Pensions are not subject to the pension contribution of 8% of the wage, but they are subject to income tax and health care contributions. They are indexed to consumer prices and are automatically increased by 2.5% every time the consumer price index has risen by the same amount, breaching an indexation threshold. As well, they are adjusted every two years to the increase in wages and salaries in real terms, but this is subject to Parliamentary approval.

2006). The report evaluates whether the scheme is financially viable, with viability defined as the financial capacity of the pension system to keep pension promises while maintaining a level of reserves equivalent to at least 1.5 times annual pension spending during the next seven years. It shows that the pension scheme has been generating growing annual surpluses, which reached 1.9% of GDP in 2005. These surpluses have been

Figure 2.6. Pension system dependency ratio<sup>1</sup>

1. Number of pensioners/number of contributors.

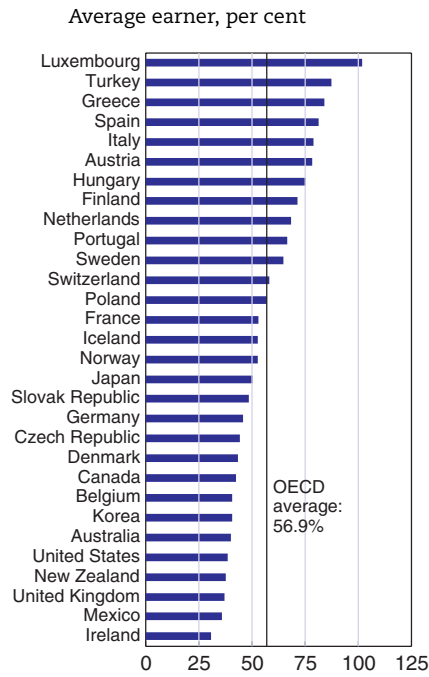
Source: IGSS, 2006.

accumulated in a reserve fund (*Fonds de compensation*) holding assets of € 6.6 billion at end-2005, the equivalent of three times annual pension spending - twice the minimum required amount.

The current situation of the pension scheme also benefits from effective replacement rates being relatively low. In principle, statutory net replacement rates can exceed 100% of pre-retirement individual income at all earnings levels up to 2.5 times average earnings (OECD, 2005) (Box 2.2 and Figure 2.7). At present, however, actual average replacement rates are lower because few workers have been able to acquire sufficient pension rights to obtain a full pension. Whereas the replacement rate of resident male workers reaches 78% of average life-time earnings, resident female workers receive pensions that on average represent only 48% of earnings. Non-resident workers, such as migrants and commuters, get even less because they have worked in another country for an extended period during part of their career and typically receive pension incomes from several sources. In the future, however, as women increasingly complete full careers and non-residents acquire more complete pension rights, replacement rates are expected to increase, putting the finances of the pension system under pressure (Figure 2.8).

Because of the deteriorating system dependency ratio and the increase in effective replacement rates, the financial position of the pension system will deteriorate. The dependency ratio is projected to rise from 4 pensioners for 10 contributors at present to between 5.5 and 7.5 pensioners for 10 contributors in 2050 (IGSS, 2006). At the same time, actual pension replacement rates are projected to rise from the current moderate level (48%) to a high level (65% in 2050), as a growing number of cross-border workers and women acquire full pension rights and hence, high replacement rates (see Figure 2.8). Even though the pension scheme has adequate resources to finance pension promises until

Figure 2.7. **Gross pension replacement rates**<sup>1</sup>

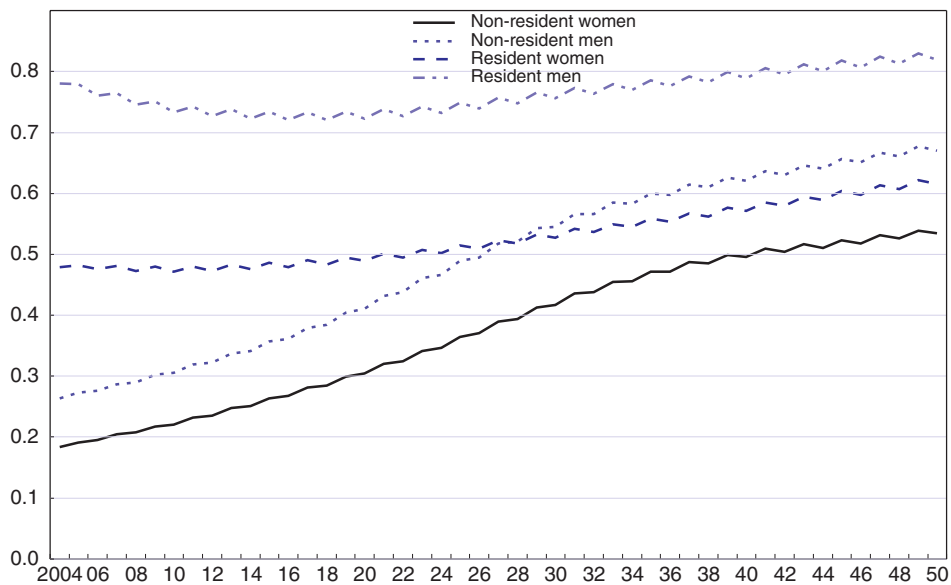


1. These replacement rates are based on calculations of future pension entitlements for workers starting their careers today, based on 2002 parameters and rules but including legislated changes being phased in over time.

Source: OECD Pensions at a Glance, 2005.

Figure 2.8. **Effective replacement rates**

Pensions in relation to wages received by worker in same category



Source: IGSS (2006), Bilan technique de la période de couverture 1999-2005.

approximately 2030, it is projected to face very large financing gaps thereafter, according to long-term projections by *Banque centrale du Luxembourg* (Bouchet, 2003), European Commission (2006), International Monetary Fund (2004), *Inspection Générale de la Sécurité Sociale* (IGSS, 2006) and International Labour Organisation (ILO, 2001). The system will at first be able to draw down the assets at present held in the reserve fund, but these assets are small in relation to pension fund assets in countries such as Switzerland and the Netherlands (pension fund assets exceed 100% of GDP) where there is greater reliance on funded pension schemes.

In the absence of reform, the actuarial estimate by the Social Security (IGSS, 2006) projects that the system's liabilities would reach in 2050 between 49% of GDP (under the assumption of average real GDP growth of 3% per year) and 151% of GDP (GDP growth slows to 2.2% per year). The financial situation could get even worse in the second half of the century. The study by the Luxembourg Central Bank (Bouchet, 2003) indicates that, even with a long-term GDP growth rate of 3% *per annum*, the social security would incur large liabilities in the long term (more than 150% of GDP by 2085). Such large liabilities are obviously unsustainable and would in most likelihood result in severe macroeconomic disruptions. In the absence of adjustment on the spending side, contribution rates would have to be raised to undesirably high levels. The pension system's revenue at present represents 24% of the wage bill, split in equal proportions between employees, employers and the central government. In the absence of reform, the contribution rate would have to rise to between 37% and 52% of the wage bill by 2050 to keep the reserve fund at 1.5 times annual current spending (IGSS, 2006), an evolution that would harm the attractiveness of Luxembourg as a production location, aggravating the difficulties of the pension system. Thus, adjustment has to come, mainly, from the spending side.

### **Reform options**

Pension reform needs to be designed in ways that address upcoming long-term challenges. There are two highly probable developments that need to be addressed in this context: i) the bunching of pension payments after 2030 resulting from the maturation of the system, that is, the sharp increase in the number of pensioners at a time when employment gains are likely to slow; and ii) the higher level of spending per beneficiary resulting from the lengthening of life expectancy. While different types of reforms could be envisaged to address these issues, the approach recommended here is twofold. First, the bunching of payments after 2030 should be addressed by setting aside more of the present and future high levels of contributions, thereby pre-funding a higher proportion of future pension payments. This would help to deal with the upcoming bunching in pension payments, but not with longer term consequences of increased longevity. Thus, a second more fundamental reform is needed: the effective average age of retirement needs to be raised, so that the increase in the lifespan is in part devoted to productive activity, rather than entirely used to increase leisure time.

### **Pre-funding increased pension payments**

How much pre-funding is needed to deal with the upcoming bunching of payments can be estimated using long-term economic and financial projections, although such estimates are inevitably fraught with many uncertainties and need to be reviewed at regular intervals (such as the 5-year review of the funded system in the Netherlands). Table 2.4 provides the result of an illustrative exercise, based on the latest actuarial report

Table 2.4. **Combined assumptions required to avoid the occurrence of pension scheme liabilities by 2050<sup>1</sup>**

	Deviation from baseline	
	Scenario of 3% real GDP growth after 2030	Scenario of 2.2% real GDP growth after 2030
Reduction in pension expenditure from 2006 (as a per cent of GDP)	0.5%	2.5%
Increase in rate of return from 2006 (percentage point)	1%	1%

1. The table shows the quantitative impact of different sets of assumptions for key parameters of the pension system. The baseline scenario is drawn from the actuarial report of the IGSS (2006), which projects the receipts and expenditure of the pension scheme through 2030. Based on these medium-term trends, a spreadsheet model was used to simulate the impact of different levels of spending, so as to identify levels of spending consistent with financial balance in 2030. The model re-evaluates the interest income received by the pension scheme based on the simulated level of financial assets, using the rate of return implicitly assumed in the IGSS calculations. Although these simulations are purely illustrative, they give an order of magnitude of the spending adjustment required, as well as the supplementary income coming from raising the rate of return on assets.

Source: OECD Secretariat calculations based on IGSS (2006).

of IGSS, which contains long-term projections to 2050. Two sets of projections were produced by IGSS, with an underlying assumption of potential output growth of 3% and 2.2%, respectively, after 2030 and corresponding differences in employment growth. The exercise presented below seeks to identify the changes to the level of spending and the rate of return on invested financial assets that would leave the financial reserve depleted by 2050, but would avoid incurring liabilities.

The above calculations, which are purely illustrative, suggest that measures introduced soon would have time to work their way through the system and keep the scheme on a sustainable basis between 2030 and 2050, when a large number of workers will start to claim pensions. In the scenario based on output growth slowing to 3%, the magnitude of adjustment to spending is relatively limited (0.5 percentage point compared to the baseline scenario), if it is combined with an increase in the rate of return on assets, provided that the measures are introduced soon, so that a “snowballing” effect of growing interest payments leading to rising debt can be avoided. Thanks to these savings, it would be possible to accumulate pension reserve assets equivalent to about 70% of GDP by 2030, which together with contributions at unchanged rates would be enough to cover pension promises until 2050. In the second scenario, where output growth falls to 2.2% after 2030, more significant spending measures are needed, so as to reduce the level of pension expenditure by 2.5 percentage points from the baseline scenario. This would be necessary to accumulate assets of about 100% of GDP by 2030, which together with contributions at unchanged rates would be necessary to meet pension commitments until 2050. This confirms that, to a large extent, the robustness of the pension system depends on the introduction of measures at an early stage to reduce the level of pensions in relation to past income and to increase the return on invested financial assets.

**Lowering replacement rates.** Lowering spending to put the pension scheme on a sustainable path, as shown in Table 2.4, would entail reducing replacement rates. This is likely to be made easier by the fact that, on unchanged policies, effective replacement rates are rising, as workers acquire fuller pension rights, especially women and non-resident workers. There are many different options to achieve this reduction, which are not quantified here. Replacement rates could be lowered gradually, for instance, by suspending the link between pensions and real wage for several years (i.e., not applying the *facteur*

*d'ajustement*); pensions would be frozen in real terms during this period. Another option would be to make the system of imputed years for non-contributory periods less generous. The imputation of years of tertiary education is particularly favourable by international standards. A consequence of this reform would be to require educated workers to work longer to acquire full pension rights; given the lengthening of longevity, later retirement appears to be an economically-effective solution, which would be fair given that educated workers have higher life expectancy than uneducated workers.

**Managing reserves more actively.** The *fonds de compensation* held reserves equivalent to about 24% of GDP at end-2005. Under the proposal described above, these reserves would increase considerably in the next three decades, to between 70% and 100% of GDP (depending on future real growth). Thus, it would be all the more important to actively manage the assets of the reserve fund, so as to increase the rate of return, which until now has been modest. According to simulations, increasing annual rates of return by 100 basis points would lower the necessary saving in pension expenditure by ½ per cent of GDP per year (IMF, 2004).

Because the pension reserve at present mostly invests in short-term monetary financial assets, the rate of return has been declining in line with short-term interest rates, yielding 3% in 2003 (IGSS, 2006). The modest return on short-term fixed deposits has been supplemented by a higher return from real estate holdings. Less than 10% of the pension reserve is invested in bonds and shares, which is unusually low given the long-term time horizon of these investments. The 2004 amendment to the pension fund law allows a more active management of reserves; the authorities have established a framework to implement this amendment and have called for bids from financial services firms. Under this new approach, the fund should adopt a longer horizon in its investment strategy, allowing slightly increased risk against a higher remuneration of assets.

### **Raising the pension age**

Although the legal pension age is 65, most workers take advantage of early-retirement arrangements and have left the labour market by age of 60. Participation rates thus drop significantly between the ages of 55 and 60. Between the ages of 50 and 54, a large proportion of men (91.4% of the population) still participate in the labour market, but between 55 and 59 participation drops significantly (58.2%) and becomes only marginal between 60 and 64 (14.9%) and virtually non-existent thereafter. For women, the downward trend is similar starting from a much lower level (respectively, 52.5%, 34.5%, and 9%). As a result, the IGSS (*ibid*) estimates that the average effective age of retirement was 57.1 years in 2005.

The average age of retirement is expected to increase in the future due to a number of factors. The number of persons taking advantage of pre-retirement should diminish, as eligibility to these schemes becomes less prevalent, notably among former steel workers. The greater participation of women in the labour market and the lengthening of education periods should also result in slightly later retirement. Likewise, the government has already introduced measures to encourage postponed exits such as i) reduced access to disability pensions, ii) introduction of an increase in the earning-related pension element for additional years of contributions (see Box 2.2), iii) measures encouraging later retirement of public-sector employees, and iv) public campaigns in favour of employing older workers. Nonetheless, in the absence of reform, the IGSS (*ibid*) expects that the age of



**Box 2.3. Policy recommendations to adjust public finances to lower growth****Restore fiscal policy discipline**

- *Bring the budget close to balance by 2009.* Following the sharp budgetary deterioration of 2004-05, the authorities have rightly decided to bring the general government cyclically-adjusted budget close to balance by 2009. This will be important to restore the environment of macroeconomic stability and low tax rates that has been so propitious to achieving high growth in the past.
- *Take measures to rein in expenditure.* Fiscal consolidation should mainly stem from reducing the strong dynamism of public expenditure, as planned. If the overall expenditure reductions announced in the Prime Minister's recent State of the Nation Speech (Luxembourg Government, 2006b) are to be realised, it will be important that the government stops introducing new social benefits and continues to curb abuse of existing ones. Should further expenditure reductions be required, the government should consider introducing means-testing of social benefits insofar as that would not result in excessive increases in marginal effective tax rates and temporarily de-linking benefits from national wages to lower replacement rates. For health care benefits, more needs to be done to promote generic drugs; the government should stop expanding the supply of hospital care and further cooperate with care suppliers in neighbouring countries to avoid duplication of specialised health care services.
- *Improve budget management practices.* The authorities should consider delegating more authority to budget managers; budgetary authorisations should be based on a fungible nominal allocation, with budget managers being held accountable for achieving pre-specified policy outcomes.
- *Modernise the human resource management of government employees.* The government should move away from the traditional model of seniority-based advancement and introduce performance-related wage progression. Public sector wage agreements should remain moderate for some time to come to allow private-sector wage rates to become relatively more competitive.

**Pre-fund future pension promises**

- *Adopt a long-term horizon for actuarial assessment.* The current approach of assessing viability within the next 7-year period fails to take into account the challenge of long-term liabilities. A new framework should be based on longer term projections (at least until 2050) and plan adequate pre-funding of pension promises at this horizon.
- *Build-up the pension reserve.* Annual surpluses need to be raised and accumulated in the pension reserve in the next two decades until the reserve reaches somewhere between 70% and 100% of GDP (depending on medium-term real growth). For this purpose, pension replacement rates should be lowered from the present exceptionally high level. This could be achieved by suspending the regular indexation of pensions to real wages (*coefficient d'ajustement*) or reconsidering the excessively generous system of imputed credits for non-contributing periods.
- *Raise the rate of return on financial assets.* The 2004 law on the reserve fund (*fonds de compensation*) provides the government with the authority to engage in more active management policy. The goal should be to raise the return on investment by allowing a slightly higher exposure to risk.
- *Establish conditions propitious to later retirement.* A comprehensive package of measures for this purpose is outlined in the OECD Study on *Ageing and Employment Policies* (OECD, 2004).

60 will remain the principal time of labour market exit. The effective pension age of 60 is deeply ingrained in workers' expectations. Indeed, a survey of 40-year old workers suggests that 61% of them expect to retire at age 60; a significant proportion (30%) even envisage retiring before reaching this age; only 9% are planning to exit activity after that age (CEPS-INSTEAD, 2005).

With life expectancy at 65 expected to increase by 4 years by 2050 (European Commission, 2006), the challenge will be to weaken incentives for this lengthening of the lifespan to be entirely devoted to leisure, and hence to avoid a disproportionate rise in pension spending. The authorities are aware of this challenge and have decided to include the objective of later retirement in their 2005 *National Plan for Innovation and Full Employment*. They intend to be guided by the results of the OECD study on *Ageing and Employment Policies* (OECD, 2004). The main recommendations of this review were to: i) shift away from the early retirement culture, ii) reform early-retirement schemes, iii) encourage employers to review their human resource management practices with regard to older workers, and iv) continue to promote employability among older members of the workforce. Overall, the objective is to bring the effective age of retirement closer to the legal age by various measures affecting the participation of and demand for older workers. This should be achieved while avoiding the transfers of pension beneficiaries to other welfare schemes, such as unemployment insurance or disability pensions, and therefore requires a comprehensive approach on the employability of older workers.

## Notes

1. Certain legal entities are exempt from corporate income tax, including investment vehicles (like unit trusts and mutual funds) and financial holdings. However, although they are exempt from corporate income tax, they are liable to registration duties (*droites d'enregistrement*) and the subscription tax (*taxe d'abonnement*).
2. According to STATEC (2006), these tax measures consist of the following: the social contribution on diesel fuel is raised by € 0.0125 per litre; excise tax on tobacco is raised from 1% to 1.3% of the *ad valorem* basis; certain soft drinks are made subject to a tax of € 1.5 per 0.25 litre; and taxation of savings income is reformed (see above).
3. The increases scheduled for January 2008 and January 2009 will be delayed by three months if the average price of oil between now and then exceeds US\$ 63 per barrel.
4. The main revenue measures are:
  - an increase in the solidarity levy on corporate income tax (*impôt sur le revenu des collectivités*) from 4% to 5% from January 2007;
  - an increase in the TVA rate applicable to the liberal professions from 12% to 15%; and
  - an increase in the long-term care social security (*assurance dépendance*) contribution rate from 1% to 1.4%. The contribution base is to be enlarged to include all income.
5. An *ex post* deficit in the healthcare budget is not permitted by law.
6. The pensions of civil servants are administered by a separate special scheme; the main parameters of pensions of private sector and public sector employees have been made equivalent following decisions introduced in 1999 and 2002.

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## Chapter 3

# Improving employment prospects of resident workers

Despite renewed employment growth in Luxembourg, the unemployment rate has continued to rise with new jobs going almost exclusively to cross-border workers. High unemployment benefit replacement rates, generous social assistance and attractive entry-level conditions in the civil service have encouraged residents to hold out for higher wage rates than cross-border workers are willing to accept. Moreover, the public employment service (ADEM) has had difficulties in matching job seekers with jobs owing to its bureaucratic structure and antiquated assignment system. Unemployment mostly affects youths and the unskilled, but not so much older workers, who benefit from generous exit routes from the labour market – such as pre-pension and early retirement systems. The participation rate for older workers is one of the lowest in the OECD. On the other hand, women have been able to increase their labour market participation considerably. However, this increase has mainly been through part-time jobs as incentives to work longer hours are low and there are not enough after-school and childcare facilities. The authorities have started to address the labour-market participation problem by increasing the number of childcare facilities and tightening access to disability benefits. They are now considering tightening access conditions to pre-pension and are studying how the public employment service can be improved. More emphasis should also be put on lowering reservation wages, by adjusting some of the social benefits in order to avoid higher unemployment rates becoming structural, as well as on weakening employment protection legislation, which is the strictest in the OECD.

## Overview

After having declined during the downturn, employment growth has picked up strongly, demonstrating that the economy remains competitive and can still create large numbers of jobs. Somewhat paradoxically, however, unemployment has been on the rise since the start of the decade. Cross-border workers have taken over two-thirds of new jobs in recent years. Hiring cross-border workers has been attractive for resident firms, because these workers are willing to accept wages that are on average 12% lower than those paid to residents. Job-seekers therefore find themselves being priced out of the market for private-sector jobs, in particular when they lack special skills or experience – a typical profile of young school leavers. A number of labour-market institutions explain the failure of reservation wages to converge with those of foreign workers, notably the high replacement income provided by unemployment benefits and social assistance (the Minimum Guaranteed Income, *Revenu Minimum Garanti* (RMG)). Labour-market participation of older workers, women and people with disabilities is weakened by other institutional arrangements.

The authorities are aware of these dilemmas and have attempted to forge a consensus for the adoption of labour market reforms. Modest steps have been introduced, notably a reform of disability benefits that focussed on facilitating re-integration into the workplace, although with mixed results. Other reforms are under discussion. There is a consensus that activation policies are ineffective and measures are being considered to address this problem, including calling on private placement services. Reform of the various pension arrangements, despite being an explicit target of the current government, remains hampered by collective agreements and the tripartite consensus system. The government has also met strong resistance in its attempts to slow the growth of replacement incomes, so as to lower reservation wages and hence increase the share of jobs taken by residents. Succeeding in this area is vital if the recent rise in unemployment in Luxembourg is not to become structural.

This chapter analyses these challenges and formulates policy recommendations. The first part examines why unemployment has been on the rise, focusing on the adverse work incentives stemming from the benefit system. The second part addresses the particular problem of low participation in the labour market of older workers and women. The third part addresses the labour market participation of disabled workers. A summary box of recommendations is provided at the end of the chapter.

## Addressing the growing problem of unemployment

Despite strong employment growth, unemployment has been trending upward throughout the last three cycles. The harmonised rate of unemployment was 5.6% at end-2005 (based on the labour force survey). Although still enviable by European standards, the unemployment rate has doubled since the start of the decade and could become entrenched at current high levels by Luxembourg standards as the return to work of the

long-term unemployed risks being increasingly hampered by the atrophy of their skills. Joblessness is particularly pervasive among young people (unemployment rate of 20.5% for people up to age 25) and is more common among women (8%) than men (3.9%). This concentration of unemployment among certain groups of people, despite there being plenty of job opportunities in the private sector, suggests that the labour market is not functioning adequately and that labour market institutions are in need of reform. In the absence of such reform, renewed volatility of output could raise the level of unemployment to a new high. Three factors explaining the rise of unemployment are discussed below: the reduced work incentives stemming from unemployment benefits and the RMG; competition between resident and cross-border workers; and the lack of effectiveness of activation policies undertaken by ADEM.

### **Work incentives faced by the unemployed**

#### ***Unemployment benefits are high during the initial period***

Luxembourg provides high levels of unemployment benefits, although for relatively short duration. At 80% of last gross wage,<sup>1</sup> the statutory replacement rate is rather high by international standards, weakening incentives to take a new job (Table 3.1). Benefits are subject to a relatively high ceiling of 2.5 times the minimum wage (*salaire social minimum*), falling to twice the minimum wage after 6 months.<sup>2</sup> Refusing a suitable job offer assigned by the public employment service ADEM leads to immediate termination of unemployment benefits, which seems harsh by international standards and is likely to produce adverse effects in so far as such sanctions are less likely to be applied other than in exceptional cases; instead a penalty system should be considered with increasing penalties for repeated job offer refusals.

Nevertheless, unemployment benefits and their conditionality are not considered by the authorities to constitute a major obstacle for workers to return to employment because of their relatively short duration. Indeed, benefits run out after one year.<sup>3</sup> However, they still hinder the return to work of the unemployed aged 50 or more, who can receive benefits for an additional period of 6 to 12 months if they have contributed to the unemployment scheme for a sufficiently long period.

Likewise, the return to work may be hampered by the high level and open-ended duration of the RMG, which is available from age 25 for Luxembourg residents<sup>4</sup> and only requires that beneficiaries able to work are available to do so. The RMG results in the net replacement income remaining at close to 80% for the worker in a one-earner couple with two children previously paid at the average wage (Figure 3.1). This disincentive has been maintained over time because indexation mechanisms tightly link the RMG to the minimum wage (at around 71% of the minimum wage). Moreover, various complementary allowances for dependent partners, children and disability, for instance, can lift the overall amount of replacement income beyond minimum wages (Table 3.2). The fact that these complementary allowances are reimbursable if the job-seeker finds a sufficiently well-paid job only aggravates the inactivity trap. All of these institutional arrangements raise the marginal effective tax rate, widening the inactivity trap for recipients.

#### ***Young people face weak work incentives and poor employment prospects***

As noted above, young people are heavily exposed to the risk of unemployment. This is particularly the case of young school leavers with a minimum educational background;

Table 3.1. **Net Replacement Rates for six family types: initial phase of unemployment**  
2004, different earnings level<sup>1</sup>

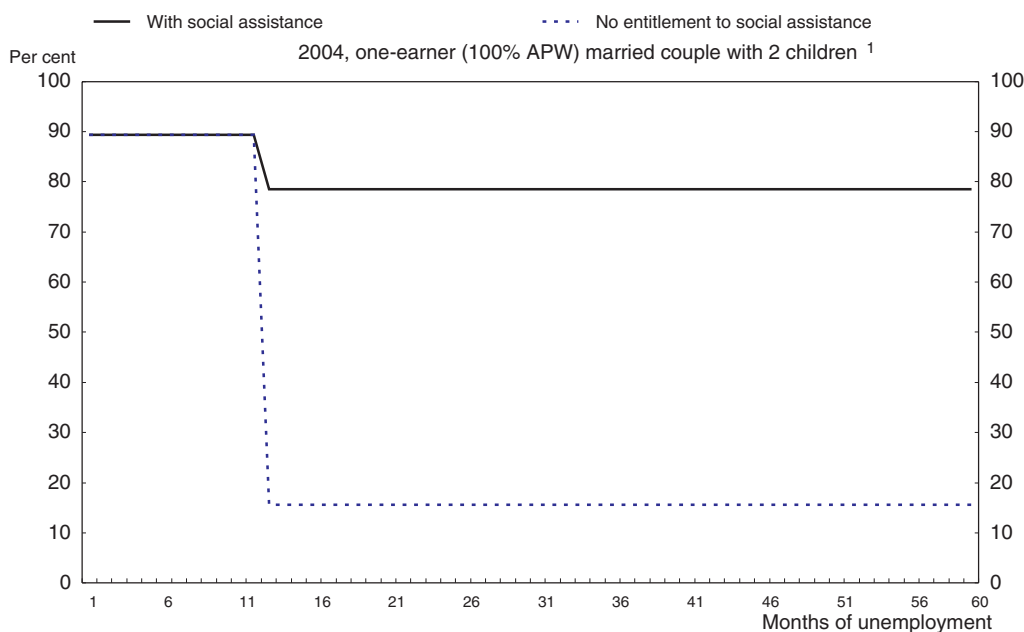
	67% of APW						100% of APW						150% of APW					
	No children			2 children			No children			2 children			No children			2 children		
	Single person	One-earner married couple	Two-earner married couple	Lone parent	One-earner married couple	Two-earner married couple	Single person	One-earner married couple	Two-earner married couple	Lone parent	One-earner married couple	Two-earner married couple	Single person	One-earner married couple	Two-earner married couple	Lone parent	One-earner married couple	Two-earner married couple
Australia	45	39	53	60	81	68	31	28	44	51	69	57	23	20	36	39	54	48
Austria	55	58	80	74	76	86	55	57	76	70	71	82	55	56	72	65	67	77
Belgium	83	71	83	79	75	85	63	64	71	64	59	74	46	41	59	49	46	63
Canada	65	67	81	70	71	87	62	64	77	75	76	83	43	45	60	56	57	67
Czech Republic	50	50	76	64	60	79	50	50	72	64	61	74	50	50	67	57	60	68
Denmark	84	85	91	90	89	94	61	63	74	76	73	77	47	48	62	65	60	66
Finland	73	80	81	88	85	86	60	67	75	80	79	79	48	52	66	65	62	70
France	77	79	90	90	89	89	73	69	84	77	77	84	67	67	78	67	67	78
Germany	62	65	89	82	82	93	61	60	86	75	77	91	62	61	83	69	71	88
Greece	71	71	74	81	81	74	48	48	59	55	55	60	34	34	48	38	38	48
Hungary	58	54	77	70	69	81	43	39	65	53	52	70	34	31	57	44	43	62
Iceland	69	60	84	82	73	88	51	47	71	67	61	77	37	35	58	52	48	65
Ireland	42	65	71	63	70	76	30	48	60	60	58	65	23	35	49	47	44	53
Italy	50	50	78	54	55	84	54	56	75	60	62	79	46	50	65	56	58	69
Japan	70	69	86	78	68	87	60	59	77	68	59	79	50	50	67	58	51	68
Korea	54	54	77	55	54	77	51	51	71	51	50	71	36	36	57	36	35	56
<b>Luxembourg</b>	<b>84</b>	<b>82</b>	<b>90</b>	<b>90</b>	<b>90</b>	<b>94</b>	<b>85</b>	<b>84</b>	<b>89</b>	<b>89</b>	<b>89</b>	<b>93</b>	<b>87</b>	<b>84</b>	<b>88</b>	<b>93</b>	<b>91</b>	<b>92</b>
Netherlands	81	87	84	85	87	85	71	76	82	80	80	83	59	60	72	64	62	73
New Zealand	53	79	55	78	83	62	37	54	45	63	67	50	26	38	36	44	48	40
Norway	65	67	82	89	74	86	66	67	80	83	73	83	53	53	69	65	58	71
Poland	75	78	76	76	70	84	52	54	62	81	54	68	35	37	48	56	41	53
Portugal	81	79	92	93	93	91	78	77	89	87	86	88	84	79	89	82	78	88
Slovak Republic	61	58	83	59	57	85	64	58	81	62	57	83	49	46	67	49	46	70
Spain	76	73	88	77	77	89	69	69	82	75	75	87	48	48	65	60	60	74
Sweden	82	82	91	92	90	92	77	77	87	88	81	88	55	55	70	67	59	71
Switzerland	80	79	88	82	82	88	70	71	81	81	81	87	71	68	79	80	79	86
UK	63	61	63	71	69	77	45	45	52	65	65	65	31	31	42	50	50	52
United States	62	61	82	52	51	84	62	62	77	59	61	80	45	45	62	43	43	64

1. Initial phase of unemployment but following any waiting period. No social assistance “top-ups” are assumed to be available in either the in-work or out-of-work situation. Any income taxes payable on unemployment benefits are determined in relation to annualised benefit values (i.e., monthly values multiplied by 12) even if the maximum benefit duration is shorter than 12 months. See Annex A for details. For married couples the percentage of APW relates to one spouse only; the second spouse is assumed to be “inactive” with no earnings in a one-earner couple and to have full-time earnings equal to 67% of APW in a two-earner couple. Children are aged 4 and 6 and neither childcare benefits nor childcare costs are considered. Comparatively with 1999 results [OECD (2003), Benefits and Wages]: for some countries, calculation models have been revised in line with clarifications received from country experts and this introduces a break in the time-series. Details are provided in Annex A and need to be kept in mind when interpreting observed changes as some of them are due to clarifications of the calculations rather than policy reforms.

Source: OECD, Tax-Benefit Mode [www.oecd.org/els/social/workincentive](http://www.oecd.org/els/social/workincentive). Other benefits become available after the initial period.



Figure 3.1. **Net replacement rates for the unemployed in Luxembourg with and without social assistance**



1. APW is average production worker wage.

Source: OECD, *Benefits and Wages*, 2006.

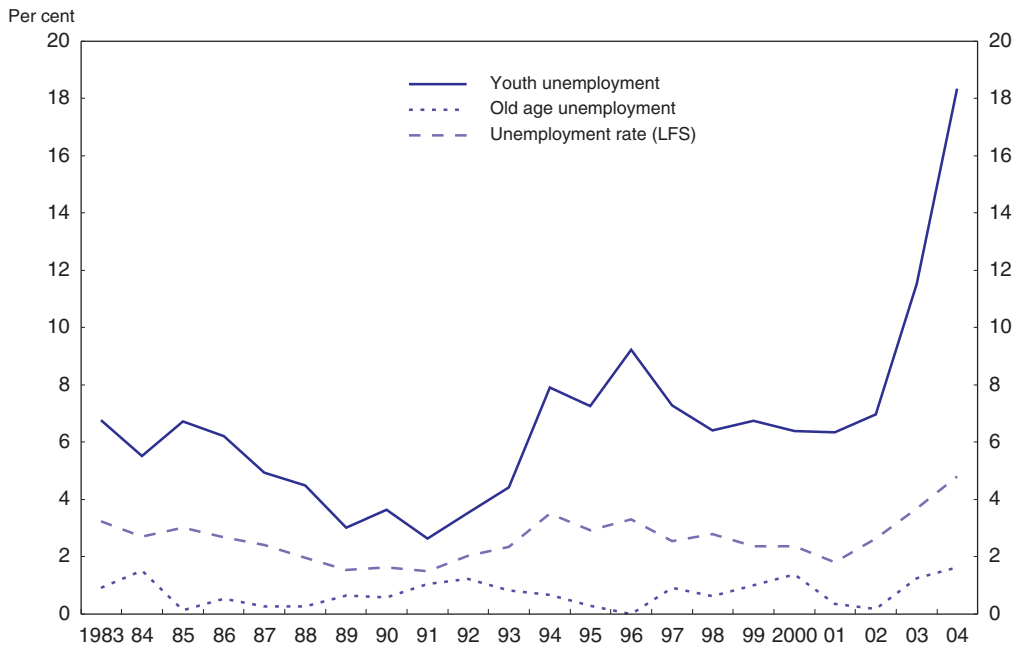
Table 3.2. **Minimum wages and social assistance**

	In euros per month
<b>Minimum wage</b>	
Unskilled	1 503.42
Skilled	1 804.11
<b>Revenue minimum guarantee (RMG)</b>	
1 adult	1 070.92
2 adult household	1 606.41
Additional adult	306.39
Child benefit top-up	97.44
Disability top-up	581.99

Source: IGSS.

as discussed in Chapter 4, about 20% of school leavers do not have school-leaving certificates. While over the 1990s, they could still find a first job relatively easily, they started to experience greater difficulty during the mid-1990s, when the unemployment rate for young workers (aged 15-24) rose to around 9%, i.e., almost three times the national unemployment rate. The youth unemployment rate subsided during the boom years of the late 1990s, but it started to climb again with the onset of the economic slowdown in 2001, reaching 18% in 2004, almost four times the national average.

The fact that young people can receive unemployment benefits directly after their education and without prior professional activity, after a waiting period of 26 to 39 weeks, may contribute to the high level of youth unemployment. To curtail such access to

Figure 3.2. **Unemployment decomposition by age level**

Source: OECD, Labour Force Database.

unemployment benefit, the Tripartite Committee (Luxembourg Government, 2006) recently agreed that:

- ADEM should offer an active labour market measure to every young unemployed person no later than six months after registering as unemployed, and preferably after three months. The modalities of this measure and its implications for the opening of entitlement to receive unemployment benefits, notably concerning the waiting period between the end of the labour-market measure and the beginning of payment of unemployment benefit, will be discussed by the Permanent Committee of Employment.
- The duration of unemployment benefit is to be made proportional to the duration of past employment. Again, the Permanent Committee of Employment will discuss the modalities for implementing this measure, it being understood that the duration of unemployment benefit will not be reduced for persons having worked more than 12 months.

As discussed in Chapter 4, young unemployed people should instead be eligible for the RMG; few would receive it as it is means tested and most such persons still live with their parents. In addition, the education cheque – while helping to bring dropouts back into the school system – should not be available until at least 12 months after the last attended school year to reduce incentives for students to drop out of school.

Strict EPL also weakens employment prospects for younger workers. It is relatively more restrictive for employees with low seniority and offers little alternative to employers than to hire on regular contracts (see Box 3.1). This may be a particular problem for those younger people who have lower skills, as prospective employers are less inclined to hire workers when they are uncertain about the productivity level of the employee. This

### Box 3.1. Employment protection legislation (EPL) in Luxembourg

Strict employment protection has adverse effects on the employment of persons at the margin of the labour market – such as younger, older and female workers – even though its effects on total employment and national unemployment rates may be ambiguous (OECD, 2004a; Nickell and Layard, 1998). By diminishing the flows into and out of employment, EPL reduces the turnover of the labour market, and makes unemployment spells longer. Consequently, as long as positive shocks to output and employment dominate, the effects of strict employment protection may not be felt (Chen, Snower and Zoega, 2002) while a more neutral environment or a predominance of adverse shocks may quickly raise the cost of strict EPL. In this regard, the recent slowdown of employment growth in Luxembourg and the prospects of permanently lower employment growth in the future (at least compared to the second half of the 1990s) means that existing employment protection legislation may not have shown its true cost. The recent strong rise in unemployment of younger workers and the increasing divergence of unemployment rates between men and women should be taken as a first sign of concern in this regard.

Besides its labour market impact, strict EPL may also have repercussions on product market competition. Strict EPL raises the costs for market entrants, in particular if provisions are made by firms for severance payments in case of dismissal; moreover, in the case of adverse productivity shocks, firms will stay longer in the market and hoard labour as they face high costs of reducing their workforce. Together, this will reduce the entry and exit of firms, thereby lowering product market competition. In addition, if introducing new technologies implies that parts of the labour force have to be shed, strict EPL has the potential to affect a firm's innovation strategy (Bassanini and Ernst, 2002). Strict EPL – in particular in combination with a high degree of unionisation – may also encourage high wage claims as it protects insiders from negative labour demand effects even when labour costs grow rapidly. Finally, if employment protection legislation differentiates between firms of different size, it introduces an additional distortion that hampers firm growth or leads to an inefficient split of the firm into several separate production units (Nicoletti, Bassanini, Ernst, Jean, Santiago and Swaim, 2001).

Luxembourg is characterised by protection for workers with regular contracts that is only slightly more restrictive than the OECD and the EU averages. However, it has very strict protection of workers on temporary contracts and collective dismissals are also strongly restricted (Table 3.3). Overall, EPL is the strictest in the OECD, well above countries such as Portugal and Turkey, which have either relaxed protection for temporary contracts (Portugal) or introduced less restrictive conditions for collective dismissals (Turkey). The indicator value for Luxembourg is based on employment protection for workers in a medium-sized enterprise above 20 employees, a threshold that is particularly relevant for notice periods and reclassification requirements for disabled employees. For smaller enterprises, the EPL indicator is somewhat lower, thereby creating distortions to firm growth in Luxembourg and with respect to the average entry size. No major legislative change has been introduced in Luxembourg over the 1990s, making the 2003 EPL indicator also a good approximation for earlier periods.

Notification requirements are relatively strict as employees have to be informed by registered letter alongside the “*Inspection du travail*” and the enterprise's work council. However, severance payments (*indemnité de départ*) are limited as they reach a maximum of 12 months pay for an employee with more than 30 years of seniority. As indicated before, different rules exist for enterprises with less than 20 employees that can choose between severance payments and an additional notice period, giving them some flexibility in spreading out the financial cost of the severance payments over several months (the additional notice period corresponds exactly to the months of severance payments the hired employee would get depending on their seniority status).

The trial period during which the employee is not fully covered by the provisions of the employment protection legislation (such as unfair dismissal claims) cannot exceed six months and involves a notice period of 24 days; the employer is free to offer shorter trial periods for which shorter notice periods apply. Unfair dismissals do not automatically lead to reinstatement of the employee. This is decided by the court.

### Box 3.1. **Employment protection legislation (EPL) in Luxembourg** (cont.)

In case of a formal irregularity as the basis for an unfair dismissal claim, the employee has the right to at most one month's pay as compensation, while with a material irregularity the compensation is supposed to cover the material prejudice to the employee; this depends on the length of the period until the court makes its decision, with an average length of around 1 year. Taken together, this gives Luxembourg an above average rank with respect to the difficulty of dismissals.

As noted above, regulatory provisions for *temporary contracts* are strict by international comparison. Luxembourg has not followed the route of some European countries where reform of temporary contracts has substituted for more encompassing reforms of regular contracts. Temporary contracts in Luxembourg are restricted to specific tasks, which are themselves supposed to be temporary in nature and specified by law. Such contracts may be renewed no more than twice and may not in total, exceed 24 months. However, special laws have introduced the facility to conclude temporary contracts with certain categories of employees that are neither limited in time nor in renewals. Temporary work agencies have the right to offer temporary contracts but are subject to the same regulations. Taken together, this represents the most restrictive regulation on temporary contracts in the OECD; only Mexico and Turkey have stricter rules regarding the use of temporary work agencies. The government should, therefore, undertake reforms to make the use of temporary contracts more attractive, which may be relevant for service industries in particular. In any case, the government should move towards legislation that is more neutral between regular and temporary contracts to avoid distortions in that regard. In particular, it should abandon the attempt to detail the types of jobs for which temporary work contracts can be used, leaving this to the appreciation of the employer. Moreover, the maximum cumulated duration of successive fixed term contracts should be raised beyond 24 months if not dropped altogether.

As for *collective dismissals*, Luxembourg's corporatist labour market structure is mirrored by a very strict approach to collective lay-offs. The limit at which the particular regulation applies is handled very restrictively with a limit of 7 people in a period of 30 days and 15 people within 90 days, which are among the most restrictive definitions in OECD countries. Moreover, there are additional requirements concerning notice to those for individual dismissals as both the work council and the *Inspection du travail* have to be notified. Once notice has been given, the negotiations on a social plan start and have to be closed within a delay of 2 weeks. In these negotiations, the employer may face either representatives of the work force or the trade unions if the firm is part of a collective agreement. The social plan itself contains the specific agreements regarding any internal and external reclassification measures and the amount of the compensation plan. It is only once the social plan has been agreed that the individual notification for dismissal can be given, but only after 75 days. As with the regulation for temporary contracts, the legal provisions for collective dismissals are the most restrictive in the OECD, notably due to the very long additional notice period and the presence of trade union representatives (all branches are subject to collective agreements). In light of the corporatist structure of the labour market, which implies a large and regular interaction of social partners and already provides a very high level of protection, the strictness of collective dismissals seems to be excessive and may hamper further firm growth as soon as a certain threshold has been reached. Besides reconsidering the very low thresholds at which dismissals are subject to the additional requirements for collective dismissals, the government should also revise downwards the additional delay that comes into force after the social plan has been decided and cut severance payments under the social plan to those prescribed for individual dismissals.

Besides reforming legislation on temporary contracts and collective dismissals, the government should also consider lowering protection for regular employment contracts. In the light of high and rising youth unemployment, measures that excessively protect younger workers with low seniority are likely to exacerbate their difficulties in finding employment. In this regard, the length of the notice period should be lowered for recent hires. Moreover, the trial period should not itself be subject to different degrees of protection by gradually increasing the length of the notice period with the length of the trial period. Rather,

### Box 3.1. Employment protection legislation (EPL) in Luxembourg (cont.)

there should be a unique trial period with relatively limited notice and unfair dismissal claim requirements that could be extended to 9 or 12 months to give the employer sufficient time to determine whether the newly recruited employee has the required profile. In any case, such reforms should be undertaken before the current model is in crisis, in contrast to what has happened in many other OECD countries, where a major crisis has been the trigger for labour market reforms (Høj and Nicoletti, 2006). As discussed above, first signs of problems are already visible but further social costs can be avoided if the reforms are undertaken early enough and during the current, more favourable period of employment growth.

Table 3.3. EPL overall index and subcomponents in the OECD in 2003<sup>1</sup>

	Regular procedural inconveniences	Notice and severance pay for no-fault individual dismissals	Difficulty of dismissal	Fixed-term contracts	Temporary work agency employment	Collective dismissals	EPLR	EPLT	Summary indicator
Australia	1.5	1.0	2.0	1.3	0.5	2.9	1.5	0.9	1.5
Austria	2.5	0.9	3.8	1.8	1.3	3.3	2.4	1.5	2.2
Belgium	1.0	2.4	1.8	1.5	3.8	4.1	1.7	2.6	2.5
Canada	1.0	1.0	2.0	0.0	0.5	2.9	1.3	0.3	1.1
Czech Rep.	3.5	2.7	3.8	0.5	0.5	2.1	3.3	0.5	1.9
Denmark	1.0	1.9	1.5	2.3	0.5	3.9	1.5	1.4	1.8
Finland	2.8	1.0	2.8	3.3	0.5	2.6	2.2	1.9	2.1
France	2.5	1.9	3.0	4.0	3.3	2.1	2.5	3.6	2.9
Germany	3.5	1.3	3.3	1.8	1.8	3.8	2.7	1.8	2.5
Greece	2.0	2.2	3.0	4.5	2.0	3.3	2.4	3.3	2.9
Hungary	1.5	1.8	2.5	1.8	0.5	2.9	1.9	1.1	1.7
Ireland	2.0	0.8	2.0	0.8	0.5	2.4	1.6	0.6	1.3
Italy	1.5	0.6	3.3	2.5	1.8	4.9	1.8	2.1	2.4
Japan	2.0	1.8	3.5	0.5	2.0	1.5	2.4	1.3	1.8
Korea	3.3	0.9	3.0	0.8	2.6	1.9	2.4	1.7	2.0
<b>Luxembourg</b>	<b>2.5</b>	<b>2.0</b>	<b>3.3</b>	<b>5.3</b>	<b>4.3</b>	<b>5.0</b>	<b>2.6</b>	<b>4.8</b>	<b>3.9</b>
Mexico	1.0	2.1	3.7	2.5	5.5	3.8	2.3	4.0	3.2
Netherlands	4.0	1.9	3.3	0.8	1.6	3.0	3.1	1.2	2.3
New Zealand	2.0	0.4	2.7	1.5	1.0	0.4	1.7	1.3	1.3
Norway	2.0	1.0	3.8	3.3	2.5	2.9	2.3	2.9	2.6
Poland	3.0	1.4	2.3	0.0	2.5	4.1	2.2	1.3	2.1
Portugal	3.5	5.0	4.0	1.8	3.8	3.6	4.2	2.8	3.5
Slovak Rep.	5.0	2.7	2.8	0.3	0.5	2.5	3.5	0.4	2.0
Spain	2.0	2.6	3.3	3.0	4.0	3.1	2.6	3.5	3.1
Sweden	3.0	1.6	4.0	1.8	1.5	4.5	2.9	1.6	2.6
Switzerland	0.5	1.5	1.5	1.3	1.0	3.9	1.2	1.1	1.6
Turkey	2.0	3.4	2.3	4.3	5.5	2.4	2.6	4.9	3.5
United Kingdom	1.0	1.1	1.3	0.3	0.5	2.9	1.1	0.4	1.1
United States	0.0	0.0	0.5	0.0	0.5	2.9	0.2	0.3	0.7
<i>Min</i>	0.0	0.0	0.5	0.0	0.5	0.4	0.2	0.3	0.7
<i>Max</i>	5.0	5.0	4.0	5.3	5.5	5.0	4.2	4.9	3.9
<i>OECD average</i>	2.2	1.7	2.8	1.8	2.0	3.1	2.2	1.9	2.2
<i>EU Average</i>	2.3	1.8	2.9	2.4	2.1	3.5	2.4	2.2	2.5

1. The summary EPL indicator is a weighted average of EPLR, EPLT and the strictness of collective dismissals, with weights 5/12, 5/12 and 2/12.

Source: OECD, 2004a; Ministry for Labour and employment.

uncertainty, however, shortens the person's work history, putting younger people at a disadvantage relative to other job-seekers.

### Policy reforms to combat unemployment

#### Lowering reservation wages

Current policy settings put resident workers at a disadvantage in the labour market. The Grand Duchy finds itself in the middle of the *Grande Region*,<sup>5</sup> which hosts approximately 204 000 unemployed job-seekers (Statec, 2006), a large number in relation to domestic employment in Luxembourg (about 313 000). With the freedom of circulation of labour across borders, the unemployed have to compete with numerous job applicants from other countries. The large gap between the level of unemployment benefits in Luxembourg and those of neighbouring countries results in a large gap in reservation wages, giving the unemployed in Luxembourg weaker incentives to search for a job than workers in neighbouring countries. At the same time, the high (net) minimum wage in Luxembourg (it is 19% higher than in Belgium and 12% higher than in France (Table 3.4)) gives incentives for job-seekers in neighbouring countries to take a job in Luxembourg while the lower minimum- and low-end wage rates in neighbouring countries are unattractive to Luxembourg job-seekers. Indeed, (net) minimum wage rates in the neighbouring countries are barely higher than RMG (see Table 3.4). The unemployed in Luxembourg rarely seek a job in neighbouring countries and are unattractive to employers relative to cross-border workers willing to work for lower wage rates.

Table 3.4. **Minimum and average salaries in Luxembourg and its neighbouring countries**<sup>1</sup>

In euros per month

	Net RMG	Net Minimum wage	Net 67% AE
Belgium		983	1 213
France		1 041	1 041
Germany			1 250
Luxembourg	899.57	1 170.67	1 493

1. The net minimum wage for Luxembourg is based on the adult minimum wage for unskilled workers. The 67% AE (average earnings) level corresponds to a single earner without children. RMG in Luxembourg is based on a single-person household.

Source: OECD, *Taxing Wages*, 2005; OECD, Minimum wages database, 2005.

A crucial element in reducing reservation wages in Luxembourg, therefore, seems to be to de-link social assistance – both RMG and complementary allowances – from average wage rates, possibly through a weakening of wage indexation, so as to avoid transmitting productivity gains to social benefits, while preserving inflation indexation. Work incentives would also be boosted by substituting a gradually declining replacement rate (after an initial period of, say, three months) for the current constant replacement rate, as occurs in many OECD countries. This would encourage greater job search intensity as time passes. The same would hold true if the criteria in unemployment benefit law that entail benefit loss in case of “unjustified refusal of an appropriate job” were reformulated. As it stands, this sanction is unlikely to be implemented in practice and therefore does not incite active job-seeking activity. Furthermore, the high marginal effective tax rate on resuming work should be lowered by reducing the rate at which RMG and unemployment benefits are withdrawn when the combined family income exceeds a certain threshold.



### Improving activation policies

The mismatch between labour demand and supply (Box 3.2) and the continued increase of unemployment has put mounting pressure on the public employment service (ADEM) to provide adequate placement services. ADEM has failed, however, to match job seekers with job offers, raising concerns for the authorities.<sup>6</sup> Job-seekers are classified into categories for which they are not qualified, while placement officers have no understanding of employers' needs and send candidates mechanically and too late, with the result that employers reject the candidates and instead hire cross-border workers. Bureaucratic delays are excessive – many hours of waiting at employment offices and

#### Box 3.2. Luxembourg's Beveridge Curve

Beveridge curves provide a useful measurement of structural characteristics of the labour market, in particular the mismatch between supply and demand of workers. High and increasing levels of unfilled job vacancies, especially at low levels of unemployment, may denote skilled worker shortages and labour market tightening. If combined with sustained levels of high unemployment, this may indicate a mismatch in the labour market between skills available and skills required. An outward (inward) shift of the curve over time may denote a decrease (increase) in the efficiency of labour market matching.

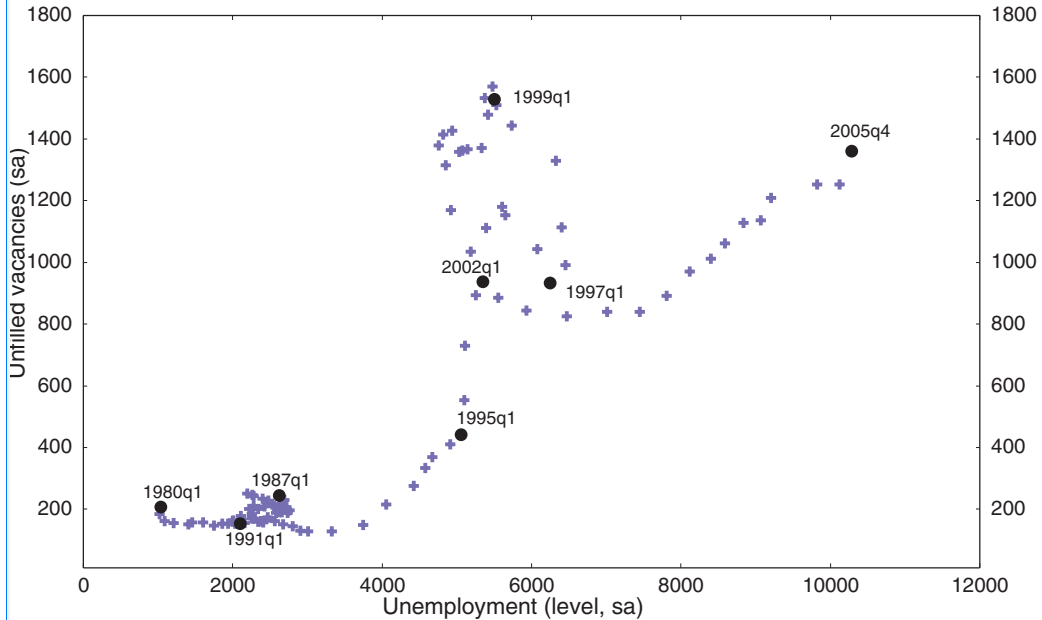
In analysing the Beveridge curve, it must be borne in mind that there are deficiencies in currently available job vacancy data, notably indicators of unsatisfied labour demand. Most job vacancy data are obtained from the Public Employment Service (PES). However, not all vacancies are reported to the PES. Also, definitions of job vacancies and the proportion of vacancies reported to the PES vary considerably across countries. Changing conditions in the labour market may affect the proportion of vacancies that is notified, making it difficult to interpret both current trends and shifts over time. Moreover, in Luxembourg, even though enterprises are legally obliged to inform ADEM about vacancies, compliance with the law seems to have decreased over time, notably because employers increasingly seek to fill vacancies with cross-border workers, rather than workers registered with ADEM.

A particular problem that arises in the case of Luxembourg concerns the integration of its labour market in the *Grande Région* (Lorraine, Wallonie, Saarland, Rheinland-Pfalz), of which Luxembourg only constitutes 4% of the total population. In this respect, the true vacancy/unemployment ratio – an indicator of wage-cost pressures – may be much lower for the *Grande Région* than for Luxembourg, overestimating the potential wage inflation risk from a tight labour market. Moreover, the Beveridge curve may shift simply due to institutional or legal reasons when cross-border workers decide to change their country of residence (for instance to get access to unemployment benefits), which may be unrelated to any structural shifts in the economy. Finally, not all vacancies may be notified to ADEM (see above), with the rate of reporting firms being endogenously determined by both characteristics and quality of the PES and labour market conditions in neighbouring regions; the ensuing volatility in the vacancy/unemployment rate may make the Beveridge curve unstable.

Bearing in mind these difficulties, Luxembourg's Beveridge curve shifted out over the 1990s, indicating an increasing degree of mismatch between supply and demand. This conclusion is also supported by alternative measures of structural change, such as the Lilien indicator of inter-sectoral structural change and the rate of unsatisfied sectoral labour demand over unsatisfied sectoral labour supply (BCL, 2003).

## Box 3.2. Luxembourg's Beveridge Curve (cont.)

Figure 3.3. Beveridge curve for Luxembourg



Source: OECD, Main Economic Indicators.

necessary forms not processed for months. These difficulties are partly due to ADEM having an antiquated computer system and to relying exclusively on direct referrals of workers to available jobs. Monopolistic Public Employment Service (PES) management of labour market flows is another problem. Moreover, segmentation of employment services among inadequate categories – such as regular placement, placement of younger workers, placement of female workers and placement of disabled workers – puts additional bureaucratic burden on ADEM and precludes information flows between different placement services. The failure to provide proper placement services is particularly damaging for ADEM as it also suffers from the small size of the Luxembourg labour pool and the ease with which employers can recruit from neighbouring regions. Moreover, cooperation between the different employment services in the *Grande Région* is not very well developed. Employers have started to rely on their own information networks to find suitable workers. While they are legally obliged to place all vacancies with ADEM, they increasingly disregard this obligation so as to avoid the bureaucratic burden and to fill any openings quickly.

Unsatisfied with their own placement services, several OECD countries (*e.g.*, Australia, the Netherlands, New Zealand) have recently started to experiment with introducing more competition in the market for employment services by contracting out job-placement services to private providers (OECD, 2005, Chapter 5). Such a strategy is not without risk, as cream-skimming (*i.e.*, selection by service providers of which clients to serve) has to be prevented, a proper evaluation of the services provided must be available (*i.e.*, measures of



outcomes and impacts must be hard to “game”) and individual entitlement to benefits has to be protected against incentives for service providers to report excessive refusals to participate in the labour market programme.

Such a market-based approach should be considered by the authorities but would need to take account of the fact that, due to the size of the country, entrants into the market for employment services could easily gain monopoly positions with damaging consequences for the quality and quantity of services provided. A less encompassing strategy that might nevertheless prove appropriate in Luxembourg would be to follow the Swiss reform strategy where a system of rating local employment office performance was implemented in 2000. The publication of these ratings was preceded by detailed research into the determinants of local office placement effectiveness. The ratings helped to improve local employment office performance, driving the registered unemployment rate down. Such a rating strategy can help to move closer to a situation that resembles competition between private placement services. In the same spirit, ADEM should be evaluated on the basis of employment outcomes and not in terms of benefit caseloads. Moreover, reorienting the objectives of ADEM towards a “return to work” policy would provide an additional step towards a public employment service that is an active player in matching supply and demand on the labour market. Finally, in order to reduce the bureaucratic burden of ADEM, placement services should be provided independently from the particular status and characteristics of the job applicant (women, young, immigrant, disabled etc.), so as to make the most efficient use of information on available jobs. At the same time, greater flexibility in applying sanctions for beneficiaries refusing job offers should be granted to ADEM, as suggested above; introducing a penalty system where penalties increase when job offers are repeatedly refused helps such a sanction to be applied more systematically, thereby reinforcing the overall activation framework.

The Tripartite Committee recently agreed the government proposal to intensify collaboration between ADEM and temporary work agencies (*Union des entreprises de travail intérimaire*) and to seek partnerships with individual temporary work agencies with a view to their taking charge of groups of unemployed persons that are difficult to place (Luxembourg Government, 2006).

## Enhancing labour market participation of older workers and women

While the overall employment rate in Luxembourg for the population aged 25-64 years old lies between the OECD and EU15 averages (see Figure 1.15), employment rates for women and especially for older workers are low by international comparison. So far, reforms to improve participation of older workers have been compromised by greater use of other exit routes from the labour market. Female employment has been promoted by various measures to improve child care availability but the rise of employment in full-term equivalent terms is still not satisfactory.

### Older workers

As noted in Chapters 1 and 2, employment rates of older workers are low in Luxembourg by international standards (Table 3.5). Partly, this is a reflection of the early-retirement policy introduced in the 1970s to cope with restructuring of the steel industry, which has gradually been extended to other sectors as well. The early retirement policy continues to depress older workers’ employment rates, even though the restructuring of the steel industry was completed a long time ago, in particular because new exit routes

**Table 3.5. Labour participation and employment rates:  
Older workers vs. rest of population in OECD countries, 2004**

	Labour force participation								
	Men			Women			Total		
	25-54	55-59	60-64	25-54	55-59	60-64	25-54	55-59	60-64
Luxembourg	95.2	58.2	14.9	68.5	34.5	9.0	81.9	46.5	12.0
Belgium	91.1	57.0	19.6	74.3	32.6	7.9	82.8	44.7	13.6
Netherlands	92.8	77.4	33.3	77.5	47.3	16.9	85.2	62.5	25.1
Germany	93.3	78.0	35.5	82.0	54.7	16.8	87.7	66.4	26.1
France	93.7	67.7	19.0	80.3	56.2	16.2	87.0	61.9	17.6
Italy	91.3	56.3	30.4	63.6	30.7	9.5	77.5	43.2	19.5
United Kingdom	91.0	77.5	55.7	76.8	62.5	30.1	83.8	69.9	42.6
United States	90.5	77.6	57.0	75.3	65.0	45.5	82.8	71.1	50.9
European Union	92.4	71.7	37.5	75.6	49.5	19.2	84.0	60.5	28.2
OECD	92.1	76.4	50.7	69.2	52.8	30.4	80.6	64.4	40.2

	Employment rate								
	Men			Women			Total		
	25-54	55-59	60-64	25-54	55-59	60-64	25-54	55-59	60-64
Luxembourg	92.5	57.1	14.9	64.6	33.9	8.8	78.7	45.6	92.5
Belgium	85.7	54.4	19.1	68.8	31.6	7.8	77.3	43.0	85.7
Netherlands	88.9	74.1	31.8	74.0	45.7	16.4	81.5	60.1	88.9
Germany	84.2	67.9	32.9	74.6	46.9	15.9	79.5	57.4	84.2
France	86.6	62.6	17.9	72.2	51.8	15.2	79.3	57.2	86.6
Italy	86.5	54.0	29.1	57.8	29.5	9.1	72.1	41.5	86.5
United Kingdom	87.5	74.6	53.4	74.2	61.0	29.7	80.7	67.7	87.5
United States	86.3	74.5	54.8	71.8	62.6	43.7	79.0	68.4	86.3
European Union	86.3	66.7	35.5	69.3	46.0	18.4	77.8	56.2	86.3
OECD	86.9	72.5	48.2	64.8	50.3	29.4	75.7	61.2	86.9

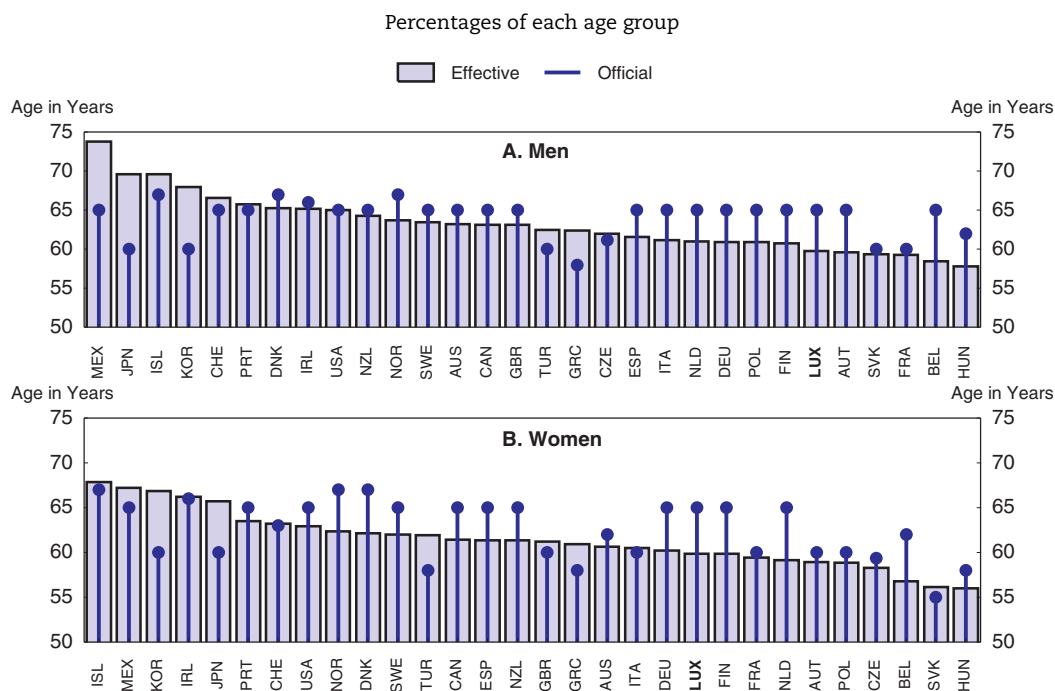
Source: OECD Employment Outlook, 2005.

were created. The government rightly recognises that labour utilisation of older workers needs to be made more consistent with rising longevity but has not yet undertaken concrete measures in that respect.

### **Early-retirement schemes are numerous**

At less than 60 years, the effective retirement age is one of the lowest among OECD countries (Figure 3.4). Early-retirement, pre-retirement and, until recently, disability benefits allow older workers to exit the labour market at an early age. While the reform of the disability benefit scheme in 2002 has now limited the abuse of disability benefits, early retirement regulation of both the public pension system and the collectively bargained sectoral pension plans still allow older workers to leave the labour market before the legal retirement age of 65. In addition, several pre-pension schemes open the possibility for workers to quit the labour market already at age 57, under the condition that they have accumulated forty years of pension contributions (see Box 3.3). Moreover, as a first step towards exiting the labour market, older workers have access to more extended periods of unemployment benefits, up to 12 additional months for workers over 50 years of age.<sup>7</sup>

Early retirement can be taken from age 60 provided the applicant has 40 years of actual or imputed service. Imputations are generous. In particular, years of post secondary

Figure 3.4. **Average effective and official age of retirement in OECD countries, 1997-2002**

Source: OECD estimates derived from the European Labour Force Survey and national labour force surveys.

### Box 3.3. The system of pre-pensions

Luxembourg residents are entitled to receive social security pensions from age 65; there are, however, many pathways to retire at a younger age. An early retirement system is available that allows retirement to be taken as early as age 57, conditional on having 40 years of actual pension contributions. Early-retirement can also be taken at age 60 with 40 years of pension contributions, including imputed years of service for education and child rearing. In addition, several pre-pension systems – designed during the 1970s to support industrial restructuring in the steel industry – allow older workers in Luxembourg to retire at age 57 under certain conditions (Figure 3.5). Four different pre-pension systems are available: *préretraite d'ajustement*, *préretraite solidarité*, *préretraite progressive*, and *préretraite des travailleurs postés et de nuit*. All four pre-pension systems are available for a maximum of three years and require the retiree to be eligible for early retirement pension thereafter.

The *préretraite d'ajustement* has seen its field of application increasingly expanded from accompanying the structural decline of the steel industry towards a measure more broadly available for industrial restructuring. Enterprises that face bankruptcy or large scale lay-offs have the possibility of offering this exit route to employees older than 57 years but can be obliged to participate for up to 50% of the costs for the public pension system if in an economic and financial situation to do so and the *Comité de conjuncture* (a tripartite committee at the Economics Ministry) advises accordingly. The Tripartite Committee recently agreed that participation of enterprises in these costs would be increased from 0-50% presently to 30-75% (Luxembourg Government, 2006).

### Box 3.3. The system of pre-pensions (cont.)

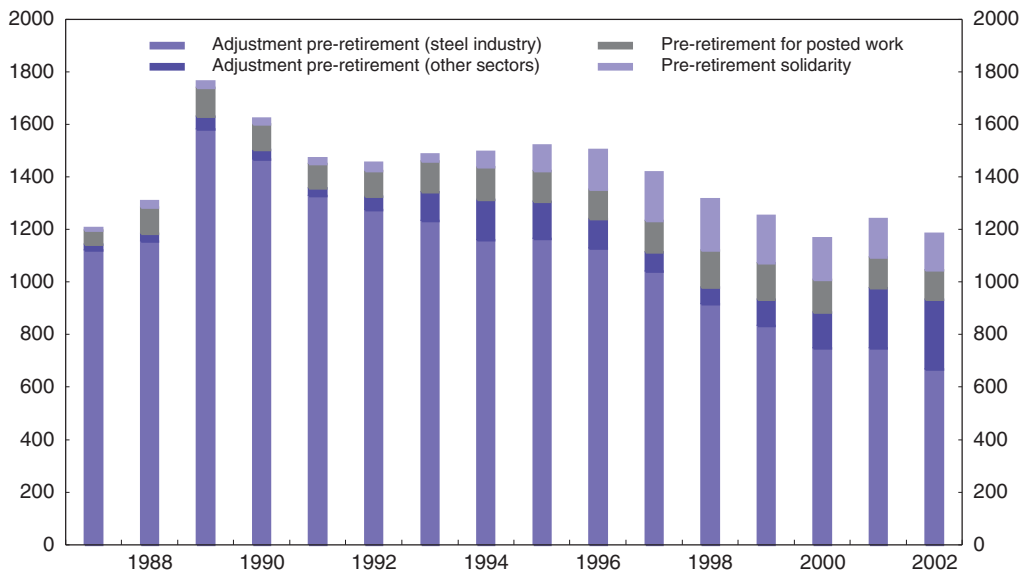
The *prétraite solidarité* aims at providing jobs to younger workers by encouraging departures of employees at age 57 or older, conditional on the firm hiring another worker out of the unemployment pool with ADEM or somebody whose current job is at risk for economic reasons. The new hire does not necessarily have to be for the same job and can also be done via a vocational training contract. In either case, the *fonds pour l'emploi* from Social Security will cover 70% of the financing costs of the worker's departure.

The *prétraite progressive* provides a way for partial withdrawal from the labour market for employees aged 57 or older by transforming a full-time position into a part-time one. Similar to the *prétraite solidarité*, Social Security reimburses the employer the supplement paid to the older worker conditional on hiring an unemployed person for the working time the older worker has reduced his or her full-time position.

Finally, the *prétraite des travailleurs postés et de nuit* is available for workers with 20 years or more in a position involving either shift work or night work. The admission to this form of pre-pension has to be decided by the Ministry of Labour and enables the worker to apply for it with his employer who – in turn – will be fully reimbursed for the pre-pension by the *fonds pour l'emploi*.

Figure 3.5. Pre-retirement beneficiaries 1987-2002<sup>1</sup>

Number of persons



1. No data are available for the number of progressive pre-retirement beneficiaries.

Source: Ministry of Labour and Employment.

education until the age of 27, child-rearing and periods of unemployment for younger workers without access to unemployment benefits are included. To reduce incentives for early retirement, these possibilities for acquiring imputed years of contributions should be scaled back. Moreover, the adjustment factor for reducing pensions taken before the official retirement age (65) should be raised to an actuarially neutral rate. In addition, the

official retirement age should be indexed to life expectancy. This would help to increase the average retirement age, while leaving in place existing schemes for pre- and early retirement. Indeed, provided that these schemes are not being made more generous at the same time, the official retirement age acts as a pivot as pre- and early retirement can only be taken at a cumulated maximum of 8 years before the official retirement age. Hence, its increase would gradually raise the actual age at which the average employee retires.

Pension replacement rates are high (see Chapter 2). They reach more than 100% of net income for lower and average income brackets and have increased in recent years, in particular following the tripartite pension negotiations in 2001 – also known as the *Rentendösch* – which raised basic pensions by 11.6%. Financial incentives for continuing employment are hence low and workers decide to quit the labour market as soon as they are legally entitled to a pension, in particular at the lower end of the skill and income level: employment rates fall significantly more rapidly with the age of the worker in this group (OECD, 2004b, p. 103). Both in light of making the pension system financially sustainable as it matures and in order to reduce incentives for early retirement, pension replacement rates should be reduced, for example by not completely indexing pensions to wage inflation for a period of time. Not adjusting pensions for productivity gains – while still following price indexation – for a period of 10 years would reduce replacement rates by 13-21%, putting them closer to the range of average OECD countries.<sup>8</sup>

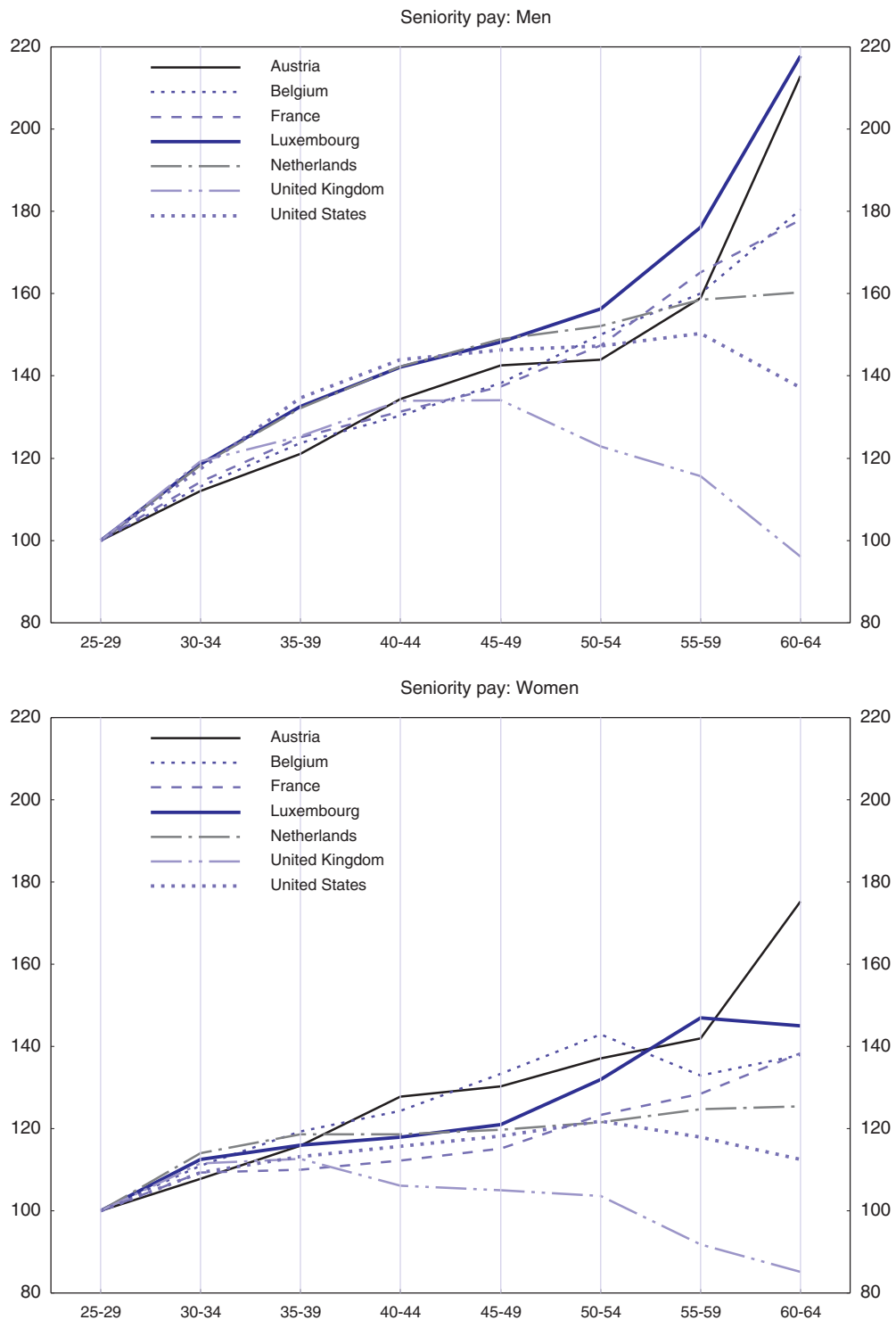
### ***The seniority wage premium is high by international standards***

Besides closing generous exit roads from the labour market, policies should also aim at strengthening demand for older workers. While labour demand responds in the long run to increases in effective labour supply (Layard, 2001), removing obstacles to labour demand can help to speed the transition to a new equilibrium with higher employment. This is recognised in the recently published *Plan national pour l'innovation et le plein emploi* where an employers' strategy for more actively hiring older workers is called for. However, such a strategy is unlikely to emerge as long as current structural obstacles for the employment of older workers are not removed. Steep seniority pay, especially for men, and a lack of continuous education for workers in the middle age group are putting a steep premium on (continuing) employment for older workers. On the other hand, removing age limits for hiring in the public sector – while important to make public policy in this area credible – is unlikely to provide much room for employment growth.

Wages and salaries tend to increase with seniority. However, as seniority rises less with age in countries where people switch jobs regularly, the final wage bill that firms face for (continuing) employment of older workers in such a country will be less than for a country with a similar wage profile but less mobile workers. The question, therefore, is how the seniority profile evolves with age. In this regard, seniority increases rapidly with age for (male) employees in Luxembourg, similar only to Belgium and to a lesser extent Italy, but much more than in the United Kingdom or the USA. On average, Luxembourg men between 55 and 59 have seniority of 27 years with their current employer compared to only 23 years in Belgium and barely 14 years in the United Kingdom and the USA. Seventy-eight per cent of male workers aged 50 to 64 have already worked 15 years or longer for the same employer, while for employees aged 25 to 49 this is only true for 29%.

Seniority wage *premia* in Luxembourg are part of collective agreements, as in many other OECD countries. Taken together, long seniority and steep wage *premia* create a wage profile in Luxembourg that is likely to make (continuing) employment of older workers

Figure 3.6. **Seniority pay in selected OECD countries**<sup>1</sup>  
Salaries of 25-29 years old = 100



1. In 2000 for Belgium, 2001 for Austria, 2001-2003 for the United States, 2002 for other countries.

Source: OECD, Wage Database of Full-time Workers.

costly for employers. In particular for male employees, wages increase to almost 220% of the level at age 25-29 when the employee reaches age 60 (Figure 3.6), while at age 55-59 wages have already reached 180% of the young-age wage level, a profile very dissimilar from other countries such as the United Kingdom and the USA but close to the wage profile for French employees. These steep seniority *premia* need to decrease if employment of older workers is to be encouraged. In part, it is the high employment protection for older workers which strengthened their insider position and hence fuelled high seniority *premia*. Policymakers should hence encourage social partners to reduce these *premia* while at the same time reducing employment protection to bring it more in line with that for employees with less seniority.

### **Investing in life-long training**

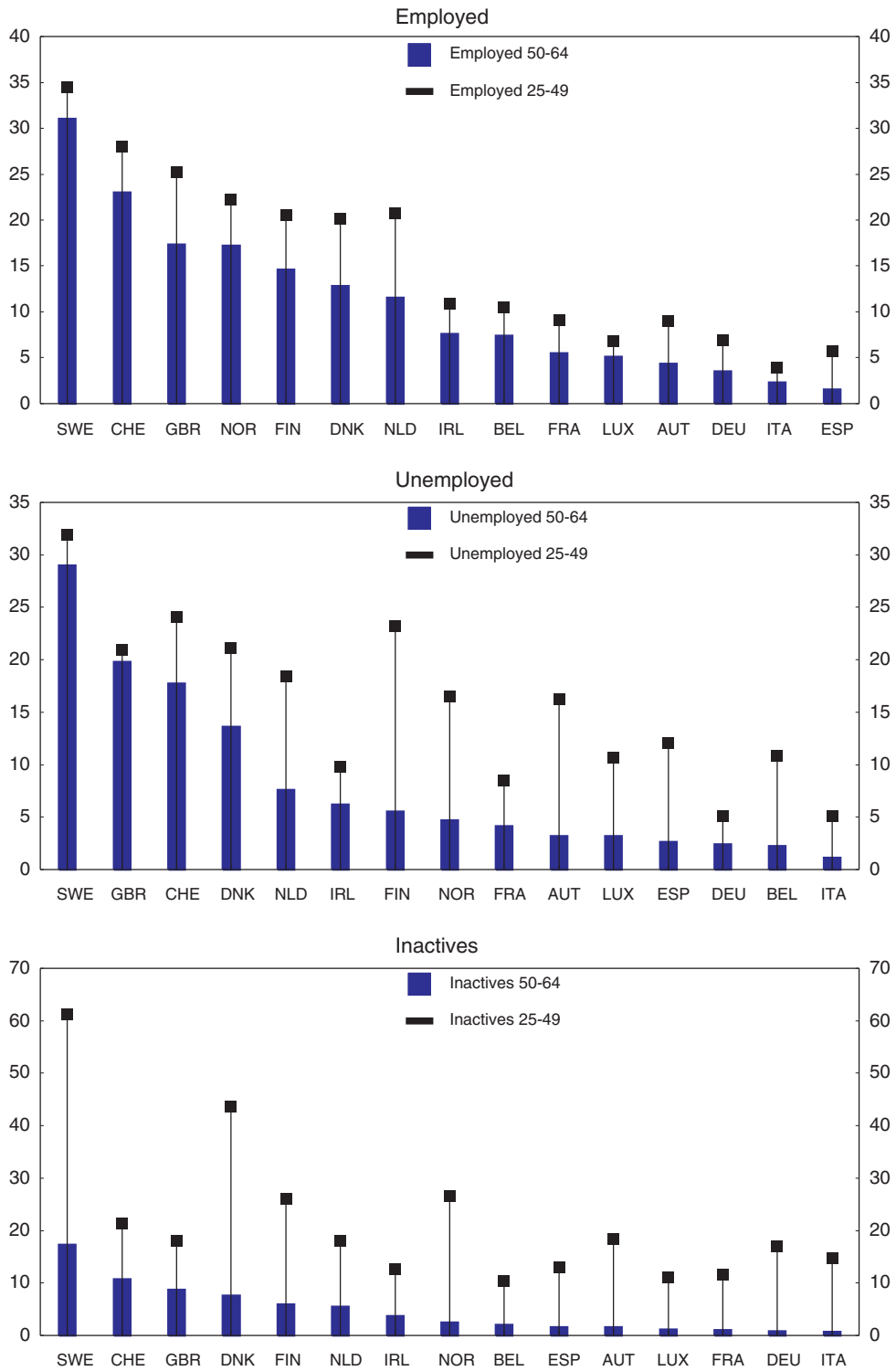
Besides seniority pay, lack of continuing professional training and formal recognition of work experience make a return to employment or a switch to a different job particularly difficult for older workers. While this problem may not be specific to Luxembourg, the overall amount of continuing education in Luxembourg is low (Figure 3.7). More important than formal training, on-the-job training is still the dominant form of continuing education. However, lack of certification usually precludes proper evaluation of such skills on the labour market and hampers chances for older unemployed to return to gainful employment. While both the legislator and social partners have intervened in this area in recent years, the rise in training is slow to emerge, partly – according to the *Conseil Économique et Social (CES)* – owing to overly bureaucratic and costly legal provisions of current measures. The authorities acknowledge that the introduction of individual training possibilities and certificates – for instance through training vouchers – would help to improve the demand for training.

### **Female workers**

Both female employment and participation rates are low. With a female participation rate as low as 54%, Luxembourg finds itself in the lowest quartile of OECD countries. A modest increase in female employment rates has been achieved during the 1990s thanks primarily to rising part-time employment, which reached 33% in 2004 and is now above the OECD average (25%). Nonetheless, female employment rates remain hampered both by the system of benefits that limits the financial burden of not participating in the labour market and institutional features of the childcare and educational sector that make labour market participation particularly difficult. In particular, when women reach child-rearing age, the labour participation rate drops significantly, falling more than 10 percentage points between ages 25 and 35, which is significantly more than in most other countries.

Up to their late twenties, women have similar participation and employment rates to men (OECD, 2004b, p. 47). Hence, the significant drop in their labour force participation at later ages is partly explained by the lack of affordable childcare and after-school facilities. To respond to this problem, the government enacted a law in 2005 to create such facilities, called *maisons relais*, which provide educational and recreational services for children out of regular school hours. Only limited data are available for the moment, but these show that more than 100 of these *maisons relais* have already opened their doors. In addition, a parental assistance allowance in the form of tax credits is under discussion that would provide subsidies for parents that do not benefit from an appropriate collective childcare or after-school offer and allow them to seek an individual solution for their children. This

Figure 3.7. **Professional training in OECD countries by age groups and employment status**  
 Percentage of each age group



Source: European Labour Force Survey.



#### Box 3.4. The 1997-2002 disability benefit reform

The legal framework governing access to disability benefits prior to 1997 allowed a wide access of workers to the disability scheme because work capacity was assessed only with respect to the current job, without taking into account other employment opportunities. A legal ruling in 1997/98 put an end to this practice, imposing a narrower interpretation of disability in which invalidity was defined with respect to the current and any alternative occupations. This considerably decreased inflows into the disability scheme. Consequently in 2001, public spending on disability had decreased to 1.8% of GDP, compared with 2.6% of GDP in 1995.

A new law came into force in 2002 to assess the stock of disability beneficiaries, not only new beneficiaries. The law strengthened the monitoring of persons on long-term sick leave and reformed the procedure for assessing their work capacity. Under the new law, a prolonged sickness leave leads to a compulsory medical examination by the Medical control service of the Social Security (stage one). When the worker applies for a disability pension (stage two), a second medical examination is carried out, leading to acceptance or rejection. In case of rejection, an independent medical assessment by the Occupational Medicine Department (Ministry of Health) determines whether or not the person can return to their last job. If he/she cannot, the new redeployment procedure is launched (stage three). In firms with more than 25 employees, priority is given to internal redeployment, to another post or a smaller workload, if the residual capacities of the claimant allow for it, unless the employer can prove that this would come at an excessive cost. If internal reclassification is not possible, ADEM helps workers with reduced capacity to find a suitable job in another company. During the process, the claimant receives regular unemployment benefits and has the same obligations as a regular unemployed person. If the search is not successful within the maximum benefit duration (see below), the claimant must stay ready to react to job offers and receives a waiting allowance (*indemnité d'attente*), equal to the regular disability pension (stage four). Although the medical criteria for claiming a disability pension have not changed, access to a general (i.e., full) disability benefit has been made more difficult in practice because the assessment of remaining work capacities now precedes any application for a pension and because of the enhanced placement efforts under the law for partially disabled workers.

Employers and employees involved in redeployment are given financial incentives. The employee (whether on internal or external redeployment) gets a compensatory benefit (*indemnité compensatoire*) to reach exactly the same salary as before the redeployment and enjoys special protection from dismissal during one year. Employers proceeding to internal redeployment or those hiring a person with reduced work capacity enjoy the same income tax credit as when hiring an unemployed person. Moreover, outlays for additional training and equipment are reimbursed. Furthermore, providing a job to persons with reduced capacity counts under the reclassification procedure against the company's employment quota for handicapped persons. This could allow employers currently paying the penalty for not fulfilling this quota to reduce or eliminate these payments. Non-compliance with an internal redeployment obligation leads to a penalty equivalent to 50% of the statutory minimum salary (*salaire social minimum*), payable for up to 24 months.

policy should be continued and developed further to reduce barriers to women working full time, notwithstanding the current generous parental leave arrangements that allow women (as well as men) to withdraw from the labour market for up to twelve months.

### Box 3.5. Summary of recommendations

#### **Strengthen work incentives.**

*De-link RMG (minimum income) and complementary benefits from minimum wage increases.* Not applying wage indexation to social benefits for some time would help to increase the gap between RMG and the minimum wage, hence avoiding the current inactivity trap.

*Tighten access conditions to unemployment benefits for younger unemployed, as agreed by the Tripartite Committee, and limit the use of education cheques.* These measures would limit the adverse effects these benefits have increasingly had in pushing younger people into unemployment without proper job-finding perspectives.

*Phase down unemployment benefit replacement rates after 3 months of benefit receipt.* This would sharpen incentives for the unemployed to find a new job.

#### **Reform employment protection legislation.**

*Make legislation more neutral between regular and temporary contracts by allowing a longer total duration of fixed-term contracts and more renewals.* This would help create employment demand in particular for marginal groups, which rely more on temporary employment contracts.

*Lift thresholds for collective dismissals and reduce additional notice periods.* This will help firms to carry out necessary restructuring more rapidly and at lower costs.

#### **Improve activation measures.**

*Introduce ratings to measure local employment office performance.* Ratings should be based on employment outcomes and not in terms of benefit caseloads in order to set incentives for ADEM to encourage transition into stable employment

*Reduce the bureaucratic burden of ADEM and improve activation by setting strategic objectives.* Placement services should be provided independently from the particular status and characteristics of the job applicant. Moreover, ADEM should encourage the unemployed to use all available channels to find employment and not exclusively rely on monopolistically provided job search services by ADEM.

*Strengthen the penalty system for unemployment benefits in case suitable job offers are refused.* Gradually increasing the penalty in receiving unemployment benefits would help activation as it would ensure that sanctions are effectively applied.

#### **Close exit routes from the labour market.**

*Phase out pre-pension systems, reduce the ease with which imputed years of contributions can be obtained, reduce net replacement rates for old age pensions, index the official retirement age to life expectancy and increase the discount on early retirement pensions relative to a pension taken at the official retirement age to the actuarially neutral rate.* These measures would help to strengthen incentives for older workers to stay longer in the labour force. The reduced scope for imputed pension contributions would also increase incentives for female labour-force participation.

*Strengthen labour demand for older workers by reducing seniority premia and investing in life-long learning.* This could be achieved by making employment protection less dependent on the employee's seniority as well as through less bureaucratic access to individual training measures.

Several institutional features of the old-age pension system further reduce incentives for women to join the labour market. In particular, the decision to withdraw partially or fully from the labour market is made easier for women as they face generous rules for imputed service for their old-age pensions: for the first child, six years are imputed, at the arrival of the second child, at least eight years and with the third child at least 10 years, i.e., each additional child increases imputed service by at least 2 years. Policymakers should, therefore, aim at lowering the rate at which service is imputed for child rearing.

## Addressing the unemployment of disabled persons

The recent reform of the disability benefit scheme, notably the recategorisation of beneficiaries with partial capacities as unemployed, seems to have left them in the unemployment pool without proper job opportunity perspectives. The 2002 law on disability benefits not only aimed at further reducing inflows but also at re-evaluating the status of recipients at regular intervals. Both new and existing beneficiaries have to follow several evaluation and reclassification procedures that have been put into place to help them to find (new) employment corresponding to their remaining work capacity. In addition, complementary benefits are available in case a new job has been found that pays less than the original position, while employers hiring disabled workers get tax credits and subsidies for their disabled employees.

The new disability law constitutes an improvement over the situation before 1997; but it is nevertheless likely to contribute to a rise in structural unemployment. First, a worker who has been found incapable of continuing his current job receives unemployment benefits during his reclassification procedure for up to 12 months, followed by a waiting allowance for an indefinite period in case no appropriate job alternative has been found. Moreover – and more importantly – the reclassification procedure only very weakly relies on the search effort by the worker concerned; it is mainly the current employer, a medical committee and a specialised ADEM service that assess the opportunities for reclassification. Finally, a reform of the disability law to improve activation of partially disabled workers would help to avoid a rise in the structural unemployment rate for these workers.

### Notes

1. The replacement rate rises to 85% for unemployed persons with dependent children.
2. The benefit ceiling is reduced to twice the amount of the minimum wage if the period of unemployment exceeds 182 days over a six-month period.
3. Benefits are limited to a maximum period of 365 days within a reference period of 24 months.
4. For residents from non-EU countries, access to RMG is subject to minimum residency requirements of at least 5 years during the last 20 years.
5. The *Grande Région* comprises Luxembourg, Lorraine, Rheinland-Pfalz, Saarland and Wallonie.
6. The Employment and Social Affairs Directorate of the OECD is looking into the characteristics and potential shortcomings of the public employment service, ADEM, at the request of the authorities.
7. The period can be extended by 12 months for workers who have 30 service years of pension contributions, by 9 months for 25 years and by 6 months for 20 years.
8. This estimate is based on a trend productivity growth assumption of between 1.2% and 2%.

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## Chapter 4

# Improving education achievement and attainment to compete in the labour market

*Student achievement in Luxembourg is below the OECD average according to the 2003 OECD PISA study, with the gap in achievement between immigrant- and native students being above average. Similarly, education attainment is below the OECD average. A factor that makes learning more difficult in Luxembourg than in other countries is that it has a trilingual education system (Lëtzebuergesch, German and French are used as languages of instruction). This contributes to social unity by educating students to speak all three languages fluently but is challenging for students from lower socio-economic and/or immigrant backgrounds. The authorities have worked hard to attenuate these difficulties, with considerable success given that the impacts of socio-economic background and immigrant status on PISA scores are around the OECD average. Nevertheless, the large size of the immigrant population, most of which is also from lower socio-economic backgrounds, makes improving performance further all the more important. The authorities are continuing to implement reforms aimed at improving achievement amongst these groups and plan further measures. Reforms are also underway or being considered to enhance achievement more generally, including by improving teacher skills and basing school programmes on key competences. These reforms, which should also contribute to raising education attainment, are important for equipping today's young people with the skills that they will need to compete successfully in the labour market. To monitor all these reforms, an advisory board composed of international and Luxembourg experts in education has been created.*

## Introduction

Education achievement in Luxembourg is below the OECD average and there are large differences in achievement between natives and immigrants. These weaknesses in achievement contribute to a relatively high secondary school drop-out rate and to the relatively low proportion of the population that attains tertiary qualifications. Such achievement and attainment results weigh on productivity and, in interaction with high minimum wages rates and reservation wages, on the employment rate. The authorities recognise the urgency of enhancing education outcomes and accordingly have implemented many reforms in recent years to improve performance and plan further reforms.

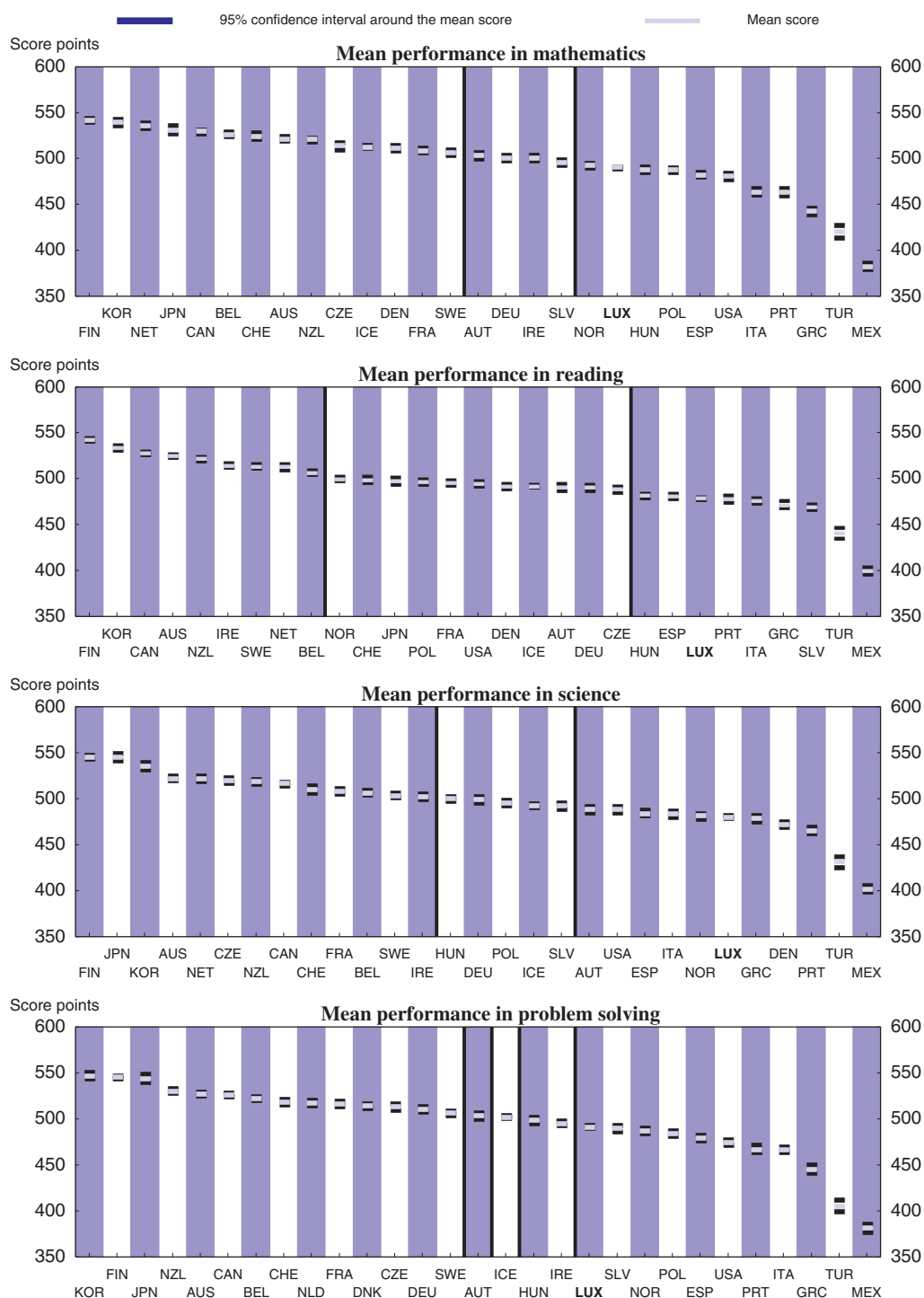
A particular challenge in Luxembourg arises from the country's geographical location at the border between French and German-speaking countries or regions. Both French and German are widely used in Luxembourg as is *Lëtzebuergesch*; all three languages are official languages. The education system endeavours to make students fluent in all three languages (as well as in English in most cases) to facilitate social cohesion. To this end, the education system is trilingual – all three languages are used as languages of instruction. However, this approach to education creates some learning difficulties for students from immigrant and lower socio-economic backgrounds. The authorities have undertaken reforms in recent years to reduce such barriers to achievement and plan to go further in this regard.

This chapter, which builds on the analysis on education and migration in the 2003 OECD *Economic Survey of Luxembourg*, begins with an overview of education achievement and attainment in Luxembourg. In the second section, the trilingual education system is described and evidence is presented indicating that it makes learning more difficult for some children from immigrant and/or lower socio-economic backgrounds. Recent reforms to reduce linguistic barriers to achievement are discussed along with planned and suggested reforms in this respect. The third section discusses a variety of education practices in Luxembourg that are being reformed or could be reformed to enhance achievement. A summary of the main policy recommendations can be found at the end of the chapter.

## Education outcomes are below the OECD average

### **Achievement is below the OECD average**

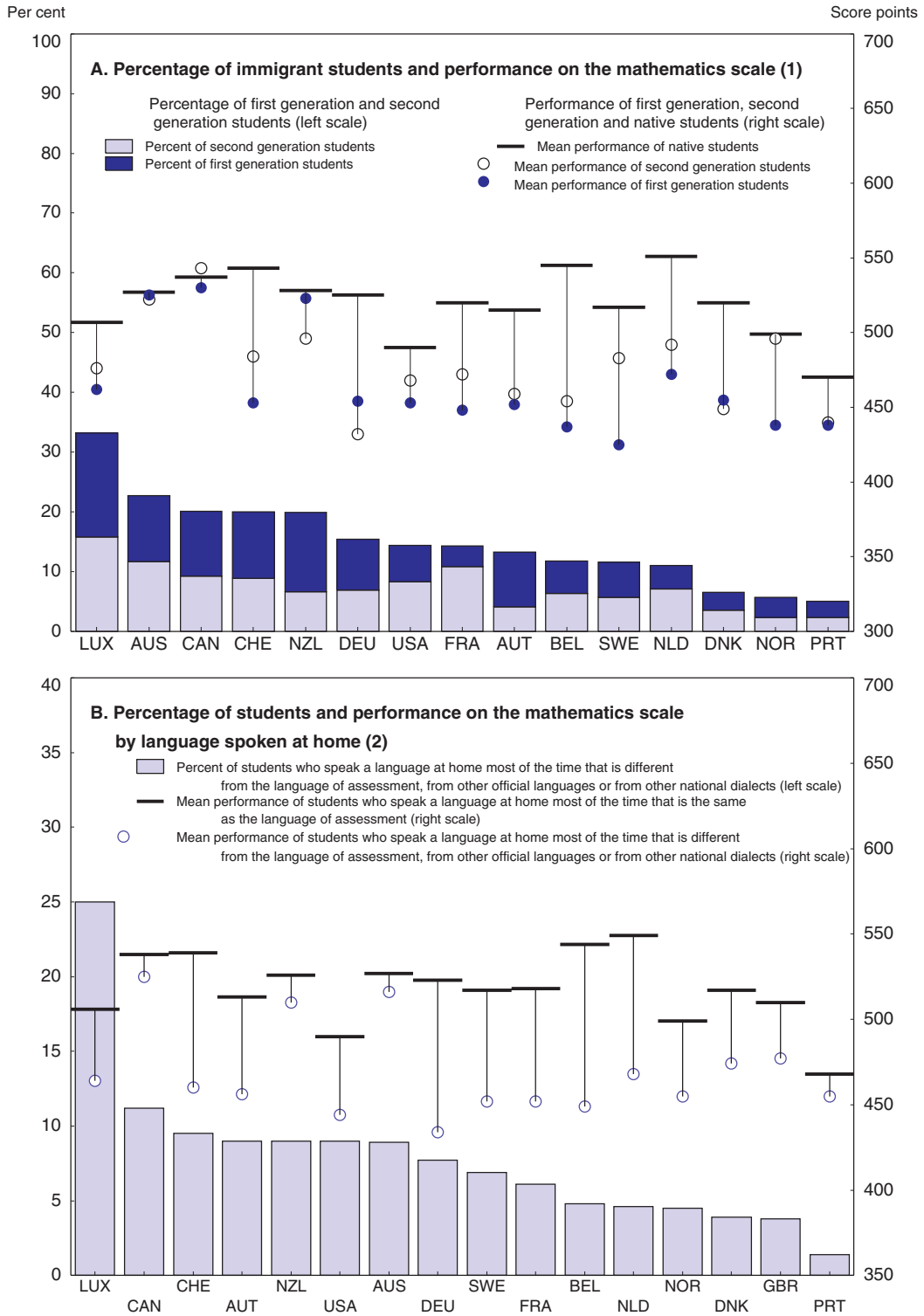
Luxembourg students scored below the OECD average in each of the subjects – mathematics, reading, science, and problem solving – included in the 2003 PISA study (Figure 4.1). The variances in results between schools and within schools in mathematics, the subject for which results were analysed in-depth in the 2003 PISA study,<sup>1</sup> were around the OECD average (OECD, 2004a, Figure 4.1). The shortfall in performance relative to the OECD average reflects low scores for immigrant students: native Luxembourg students (about 67% of the total) scored around the OECD average for native students in maths,

Figure 4.1. Student performance in the 2003 OECD PISA study<sup>1</sup>

1. Mean scores are not significantly different from the OECD average in countries in the middle sector of each panel. Countries to the left have mean scores that are significantly above the OECD average while the countries to the right, such as Luxembourg, have scores that are significantly below the OECD average. Although the mean score in problem solving in Iceland is lower than in Austria, this score nevertheless is significantly above the OECD average while that in Austria is not, owing to the narrower confidence interval around the mean for Iceland than for Austria - the 95% confidence interval around Iceland's mean lies above OECD average while that for Austria includes the OECD average.

Source: OECD PISA 2003 database. For further explanation, see OECD (2004a) and OECD (2004b).

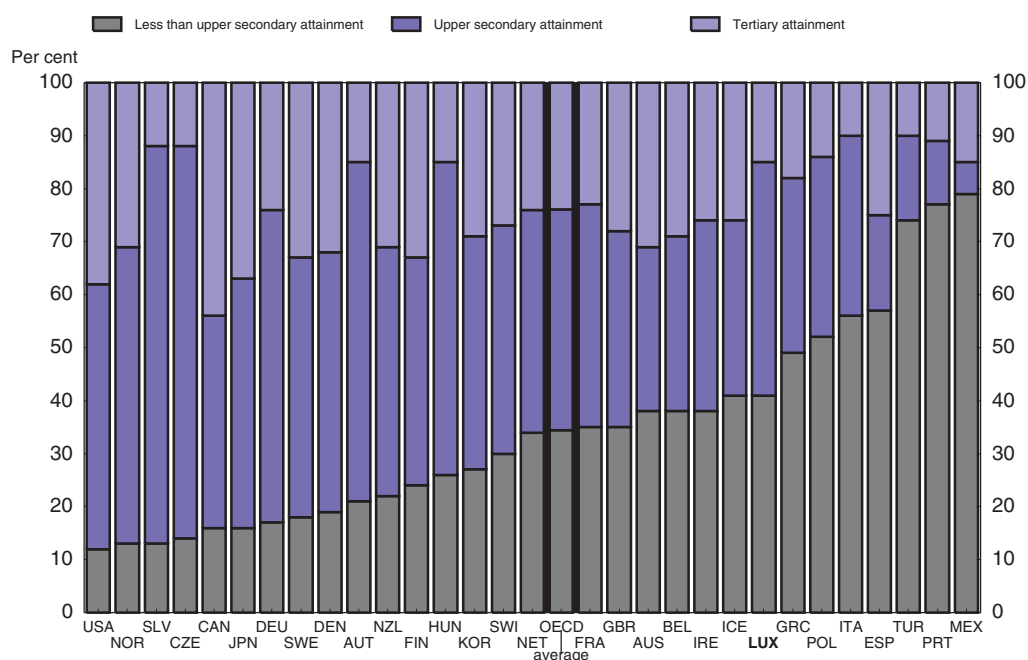
Figure 4.2. **Relative performance of immigrants and national secondary school students**



1. Only for countries where at least 3% of students are not native.
2. Only for countries where at least 3% of students speak a foreign language at home.

Source: OECD PISA 2003.



Figure 4.3. **Education attainment of the population aged 25-64, 2003**

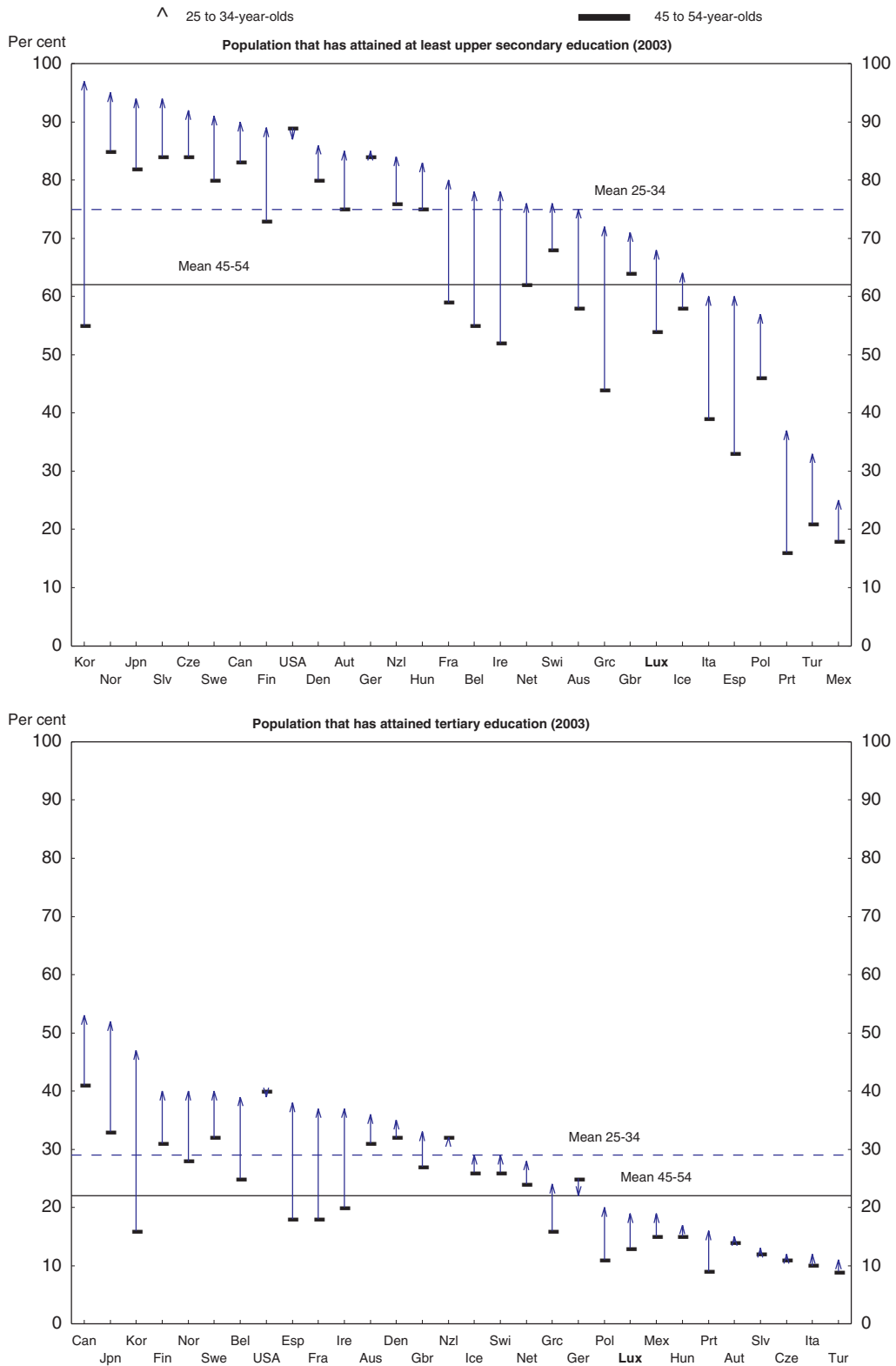
Source: OECD, *Education at a Glance*, 2005.

reading, and problem solving and slightly below the OECD average in science (*ibid*, Table 4.2f; OECD, 2004b, Table 5.6). The gap between scores for immigrant students, whether born abroad (first generation) or second-generation residents, was around the OECD average in mathematics and problem solving, but greater than average in reading (Figure 4.2; OECD, 2004a, Table 4.2f; OECD, 2004b, Table 5.6). In science, the gap was greater than the OECD average for first-generation students but average for second-generation students (OECD, 2004a, Table 4.2f). Similar results obtain when students are classified according to whether they speak a language at home most of the time that is different from the language of assessment, from other official languages or from other national dialects (*ibid*, Figure 4.3 and Table 4.2g; OECD 2004b, Table 5.7). This performance gap is a serious problem as the share of immigrant students in Luxembourg is relatively high (see Figure 4.2). Children from less privileged socio-economic backgrounds in Luxembourg have lower scores in mathematics (the subject analysed in depth in the 2003 PISA study), although the impact is not significantly different from the OECD average (OECD 2004a, Figure 4.9).

### **Attainment is low**

Education attainment is low in Luxembourg by international comparison. Forty-one per cent of the population aged 25-64 has not completed upper secondary school, compared with an OECD country mean of 24% (Figure 4.3). Only 15% of the population in this age group has completed tertiary education, which also compares unfavourably with the OECD country average. The proportion of the population with upper secondary attainment is similar to the OECD average. While fewer members of the younger cohorts fail to complete upper secondary education and more go on to attain a tertiary qualification than was the case for older cohorts, performance in these respects also compares unfavourably with most other OECD countries (Figure 4.4).

Figure 4.4. Education attainment by age group, 2003



Source: OECD, Education at a Glance, 2005.

### **Achievement and attainment are related**

Achievement and attainment at least to the upper secondary level are highly correlated across OECD countries. The relatively high proportion of the population aged 25-34 that has not completed upper secondary education is close to what might be expected on the basis of the cross-country relationship between average PISA results in mathematics, reading, science and problem solving and such attainment.<sup>2</sup> Raising achievement could make an important contribution to reducing the proportion of the population that does not complete upper secondary school.

## **Building on successful measures to help students cope with trilingual education**

### **Trilingual education is important for social unity but creates learning difficulties for students from immigrant and/or lower socio-economic backgrounds**

Luxembourg is in an unusual linguistic situation in that the three official languages – *Lëtzebuergesch*, German and French – are spoken in the same geographical area. In these circumstances, educating residents to be able to speak all three official languages fluently is important for social unity. This emphasis is reflected in the school curriculum, which devotes about 50% of time to language courses (including considerable time for teaching English), and in the weight given to performance in German and French in deciding whether students advance to the next grade;<sup>3</sup> the high amount of time spent on language education reduces the amount of time available for other subjects, weighing on the PISA results. The Luxembourg education system is said to be trilingual because the three official languages are used as languages of instruction: *Lëtzebuergesch* is used in pre-school and orally in primary school, German in primary school and both French and German in secondary school, the degree to which each is used depending on the track, the grade and the branch.<sup>4</sup> This approach differs from that in plurilingual<sup>5</sup> countries, such as Switzerland and Belgium, where a single language of instruction is used within a linguistic community and other languages are taught as foreign languages. The authorities consider that using both German and French as languages of instruction in schools results in greater fluency in the second language than if it were simply taught as a foreign language, as occurs in other countries.

### **Learning in German is challenging for students from Romance-language households**

While the emphasis on imparting skills in *Lëtzebuergesch*, which is a Germanic language, to immigrant children in pre-school prepares them for acquiring literacy skills in German in primary school, such children – 70% of whom speak a Romance language at home<sup>6</sup> – are nevertheless at a disadvantage as they are unlikely to speak *Lëtzebuergesch* as well as those for whom it is their mother tongue. As the primary school curriculum has been determined principally with native students in mind, German is taught at a faster pace than French. Acquisition of literacy skills in German slows down the acquisition of language skills by children from Romance-language homes and creates a barrier to the cognitive and communicative development of these children (Berg and Thoss, 1996). The learning problems in primary school caused by these children's weaknesses in German result in access being blocked for most of them to the prestigious academic track in secondary education (*Enseignement Secondaire*, ES; see Annex 4.A1 for a description of the school system) where French is the main language of instruction (Fehlen, 1997, p. 40) – children from Romance-language speaking households represent around 28% of primary students but only around 10% students in the academic track of secondary school (*ministère*

de l'Éducation nationale et de la Formation professionnelle, 2005, p. 20). Unfortunately for children in the vocational secondary education stream from Romance-language speaking households, the main language of instruction is German.<sup>7</sup>

For the minority of children from Romance-language households that make it into the academic track of secondary education, German remains a stumbling block: the failure rate in German is second only to that in mathematics whereas the failure rate in French is much lower (Berg and Weis, 2005, p. 90).

### ***French language requirements contribute to the failure of some native students***

For native Luxembourg children, the main linguistic challenge of the education system comes later as French grows in importance. Native children from lower socio-economic backgrounds tend to experience greater learning difficulties in French than in German (*ibid*, p. 92), contributing to the exclusion of most of them from the academic track in secondary education. With most vocational education being in German, French poses less of an obstacle to advancement for native students in this track. For many native children (irrespective of socio-economic background) in the academic track of secondary education, French remains a linguistic stumbling block: in contrast to the situation for children from Romance-language speaking households, the failure rate in French is second only to that in mathematics while the failure rate in German is much lower (*ibid*, p. 90).

### ***Measures have been taken to help children from immigrant and/or lower socio-economic backgrounds cope with trilingual system***

The authorities have long been aware that trilingual education creates a more challenging learning environment for many students. Consideration has even been given to offering children the option between the current arrangements and an alternative in which the roles of German and French would be reversed to reduce barriers to achievement for immigrant children.<sup>8</sup> However, following a debate in 2000 on language education and integration of immigrant children, Parliament rejected this option out of concern that it would undermine social unity by creating two distinct linguistic communities (German and French speaking).<sup>9</sup> Instead, the authorities have sought to compensate for the added challenge of learning in a trilingual environment for children from lower socio-economic and/or immigrant backgrounds by giving them more help and introducing more flexibility into the system.

### ***Pre-school has been extended to 3-year olds and courses are offered to help immigrant children master their mother tongue***

Pre-school plays a vital role in promoting social unity. The aim is to ensure not only that children learn to socialise, as in other countries, but also that those from non-Lëtzebuergesch-speaking homes learn to speak the language. As noted above, such language competency helps to prepare children from homes where neither Lëtzebuergesch nor German is spoken<sup>10</sup> for acquiring basic literacy skills in primary school in German. According to the authorities, immigrant children are able to speak Lëtzebuergesch when they begin primary school. Work is underway to elaborate the basic vocabulary that children should learn during these years.

Participation in pre-school is compulsory from age 4, and has been extended on a voluntary basis to children aged 3 since 1998 with a view to giving immigrant children more time to learn Lëtzebuergesch. Approximately 85% of municipalities now offer pre-

school education to 3-year olds and all must do so by 2009. About 75% of 3-year olds are enrolled.

Assistance is also provided in several pre-schools to children of Portuguese origin to help them to master their mother tongue as doing so enhances the development of cognitive and communication skills, facilitating the learning of other languages. The Portuguese-speaking persons who give these courses also explain to the students in Portuguese the course material to be taught in class (in *Lëtzebuergesch*). The authorities report that experience with these courses has been positive. Given that Portuguese-speaking students comprise around one half of immigrant students<sup>11</sup> and that the level of education attainment of their parents is lower than for most other immigrant groups, the emphasis on providing such courses in Portuguese is well founded.

### ***Extra help is available for immigrant children to follow the primary-school curriculum and learn German***

Classes have been offered since 1991 that enable students having difficulty learning in German to study material from the official primary-school programme in Portuguese or Italian. These classes, which take place during regular school hours, comprise introductory science from the 1st to the 4th year of primary school and, in the 5th and 6th years, natural science, history and geography. While few children of Italian nationality take them, they have proved increasingly popular with Portuguese students (Berg and Weis, 2005, p. 75). To help children from Romance-language households further in the second and third years of primary school, a series of mathematics manuals has been translated into French and the activity files for the introduction to science course have been produced in bilingual (French-German) form (*ibid*, p. 102). Moreover, supplementary courses in German are offered at the primary-school level to improve the German-language competence of immigrant children.

Integrating immigrant children who did not begin their education in the Luxembourg system is particularly challenging, especially if they have not acquired their literacy skills in a French or German speaking country. There are special classes for such students (the same holds for newly arrived students at secondary school) in which German and/or French are taught intensively with a view to enabling them to join the regular education programme as soon as possible. These classes have high teacher-pupil ratios to facilitate more rapid progress.

Greater efforts have also been made in recent years to inform immigrant parents about the education of their children (the same holds for secondary education) and to encourage such parents to take an interest in it (*ibid*, p. 101). To this end, meetings are organised to inform parents and encourage an exchange of views and information bulletins are produced in a variety of languages. Intercultural mediators facilitate communication between teachers and parents.

### ***Intensive language courses and more flexibility on language requirements help some children to succeed at secondary school***

A recent reform in vocational education has created the possibility for students to be instructed in French or German without having to achieve a high level of competence in the other language. The supply of courses in French has been enlarged, initially at the lower secondary level but more recently in the middle and upper levels of the more advanced tracks (*Régime technique* and *Régime de technicien*). The authorities report a positive

experience with this reform. Textbooks also have been produced in bilingual (German-French) versions in some subjects in the more advanced track and in French in some cases in the less advanced vocational track.

In the academic secondary education track, classes in which German is taught as a foreign language have been set up in four schools. These classes are intended for students that at the end of primary school are strong in mathematics and French but relatively weak in German. They receive intensive instruction in German during their first three years in secondary school with a view to joining the regular programme subsequently. In a similar vein, an academic secondary school (*Hubert Clement lycée* in *Esch/Alzette*) set up a pilot project to provide extra help for students having difficulty with German. The project is considered to have been very successful and to have given the children concerned a greater sense of belonging (*ibid*, p. 101).

### **These measures have helped to limit the adverse effect of immigrant and/or lower socio-economic backgrounds on PISA results to around the OECD average**

As discussed above, immigrant status is associated with lower PISA results in Luxembourg. At the same time, socio-economic status is positively associated with PISA results and most immigrants are from lower socio-economic-status households (OECD, 2004a, Figure 4.11 and Tables 4.5 and 4.2f). Hence, the relatively low PISA results for immigrant students could reflect their socio-economic status rather than their immigrant status. To disentangle these effects, it is necessary to do a multivariate regression analysis.

Such an analysis of the 2003 PISA results<sup>12</sup> (Table 4.1; see Annex 4.A2 for details) shows that socio-economic background has a significant positive effect on outcomes in Luxembourg while immigrant status (measured by being born abroad or having at least one foreign-born parent) has a negative impact on achievement (independently of socio-economic status).<sup>13</sup> In other words, privileged socio-economic backgrounds are associated with better scores and immigrant status is (independently) associated with lower scores. This relationship also holds in most other OECD countries (see Table 4.1). The effects of both socio-economic background and immigrant status on achievement in Luxembourg are not significantly different from the average for the OECD countries included in the analysis (Figures 4.5 and 4.6).<sup>14</sup> These results are a remarkable achievement in view of the added difficulty of learning in a trilingual education system. They attest to the success of the measures taken to compensate for this difficulty through extra inputs and flexibility in the system.

### **Building on measures to help children from immigrant and/or lower socio-economic backgrounds**

While limiting the impact of immigrant and/or lower socio-economic status on PISA results to around the OECD average is a laudable achievement, the size of the immigrant student population (most of whom are also from lower socio-economic backgrounds) in Luxembourg (see Figure 4.2) makes the payoff from reducing this effect particularly large. To this end, the measures outlined above to help immigrant children should be taken further in the following respects:

- *Make pre-school education for 3-year olds compulsory when such pre-school education is available in all municipalities.* The share of immigrant children (40%) in pre-school education for 3-year olds is slightly below their share in compulsory pre-school education (43%), suggesting that voluntary take-up of pre-school education for 3-year olds is slightly

Table 4.1. **Factors influencing 2003 PISA scores in selected OECD countries**<sup>1</sup>

	Grade	Gender	Occupational status of parents	Immigration status	Ability grouping	Extra-curriculum school activities	R <sup>2</sup>	Number of observations
Australia	0.74	-0.13	3.45	-0.13	ns	0.17	0.16	11 661
Austria	0.64	0.23	2.65	-0.41	-0.91	0.63	0.36	4 308
Belgium	1.29	0.06	2.62	-0.45	0.21	0.71	0.44	8 121
Canada	1.06	ns	2.67	-0.13	ns	0.04	0.16	24 995
Czech Republic	0.81	ns	3.99	ns	-0.22	0.17	0.18	5 987
Denmark	1.10	ns	3.14	-0.60	ns	ns	0.14	3 728
Finland	0.97	-0.28	2.74	-0.66	ns	ns	0.12	5 655
Germany	0.95	0.14	2.71	-0.45	-0.52	0.47	0.42	3 741
Greece	0.69	ns	3.11	ns	ns	0.31	0.19	4 126
Hungary	0.83	-0.07	4.41	ns	0.09	0.36	0.28	4 247
Iceland	ns	-0.57	1.87	-0.65	0.05	-0.18	0.06	2 840
Ireland	0.43	-0.04	4.05	ns	ns	0.23	0.17	3 283
Italy	1.06	ns	2.66	0.11	-0.30	0.38	0.22	10 928
Japan	ns	ns	2.53	-0.53	-0.36	0.28	0.07	4 143
Korea	0.62	ns	2.50	ns	0.12	0.57	0.12	5 197
<b>Luxembourg</b>	<b>1.05</b>	<b>ns</b>	<b>2.70</b>	<b>-0.34</b>	<b>-0.28</b>	<b>0.25</b>	<b>0.33</b>	<b>3 682</b>
Netherlands	1.07	0.12	2.57	-0.46	-0.21	1.13	0.40	3 532
New Zealand	1.17	-0.06	3.59	-0.22	-0.08	ns	0.16	3 644
Norway	0.76	-0.22	3.58	-0.57	-0.12	ns	0.12	3 779
Poland	1.98	ns	4.33	ns	ns	-0.06	0.22	4 207
Portugal	1.35	0.17	2.31	-0.42	ns	-0.10	0.52	4 428
Slovak Republic	0.41	ns	4.01	-0.79	-0.15	0.24	0.18	6 959
Spain	1.67	ns	2.19	-0.21	ns	0.09	0.32	9 678
Sweden	1.30	-0.15	3.17	-0.69	0.06	0.09	0.17	4 376
Switzerland	0.81	ns	2.18	-0.74	-0.44	0.75	0.33	7 684
Turkey	0.53	ns	3.35	ns	0.43	0.65	0.27	4 213
United Kingdom	0.32	-0.21	4.07	-0.15	ns	0.07	0.14	8 349
United States	0.67	ns	3.26	-0.26	ns	ns	0.16	4 192

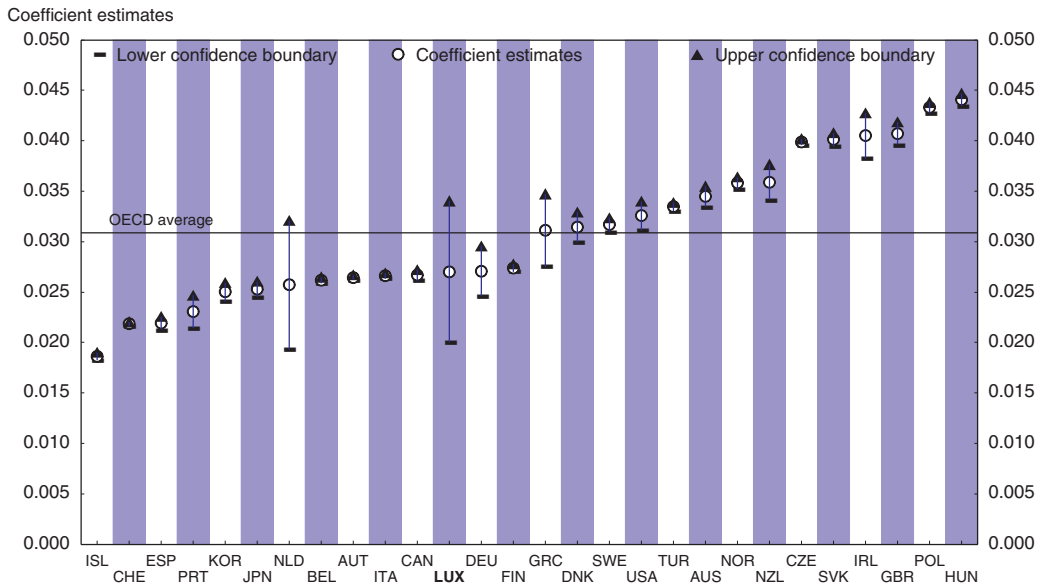
1. This table shows the coefficients estimated for each country individually by regressing the explanatory variables shown against 2003 PISA scores, which are summarised by the first principal component of the four PISA test scores (Mathematics, Science, Reading and Problem solving). The same specification is used for each country. "ns" means not statistically significant at the 5% level. France and Mexico are not included owing to missing observations of school-level data.

Source: PISA 2003, Secretariat's calculations.

lower for immigrants than for native students. Given that the focus on learning to speak *Lëtzebuergesch* in pre-school is intended especially to help immigrant children, further efforts are needed to boost their participation in pre-school education for 3-year olds, possibly including making such participation compulsory.

- Expand the availability of supplementary courses in German at the primary-school level for immigrant children. The authorities report a positive experience with these courses to date and consider that they should be expanded.
- Make more material available in bilingual form (French-German) in primary school to help immigrant children to follow the curriculum.
- Expand the availability of courses in French in the less advanced vocational education track (*Régime professionnel*) that leads to early labour-market participation. While the recent reform enabling students in vocational education to be instructed in French or German without having to achieve a high level of competence in the other language is promising, its impact on immigrant children may not be great as most of them are from Romance-language households while most vocational-education courses (80%) are still

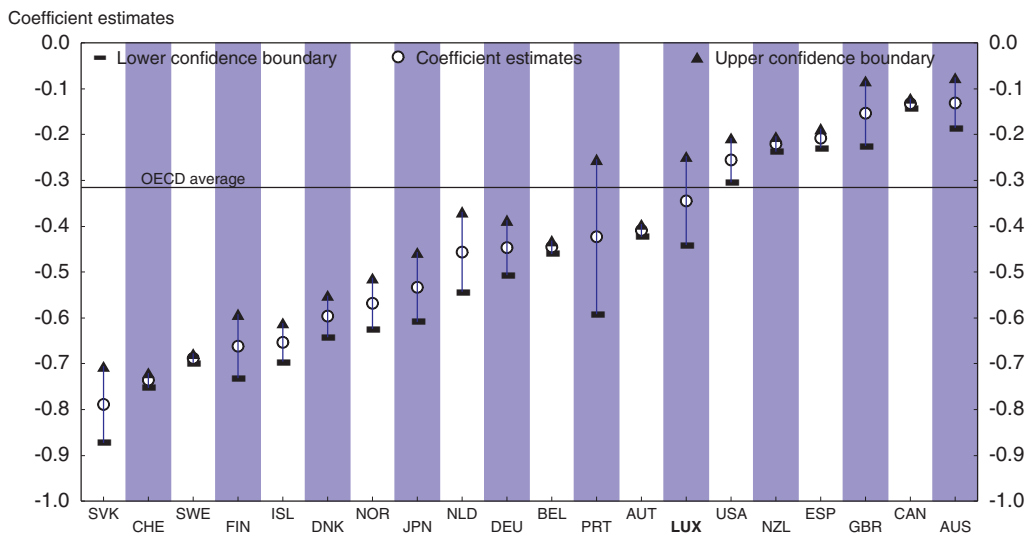
Figure 4.5. **The effect of socio-economic background on 2003 PISA scores in selected OECD countries<sup>1</sup>**



1. This graph shows coefficient estimates with 95% confidence intervals for the variable 'Highest occupational status of parents' from the multiple regression analysis summarised in Table 4.1 and described in more detail in Annex 4.A2. The OECD average is calculated for all OECD countries with available data (see Table 4.1).

Source: OECD, PISA 2003, Secretariat's calculations.

Figure 4.6. **The effect of immigrant status on 2003 PISA scores in selected OECD countries<sup>1</sup>**



1. This graph shows coefficient estimates with 95% confidence intervals for the variable 'Immigrant status' from the multiple regression analysis summarised in Table 4.1 and described in more detail in Annex 4.A2. Only coefficients significant at the 5% level have been reported. The OECD average is calculated for all OECD countries with available data (see Table 4.1), including zero values for countries for which the coefficient estimate was not significantly different from zero at the 5% confidence level.

Source: OECD, PISA 2003, Secretariat's calculations.



only available in German, with the proportion being higher still in the less advanced track where many Portuguese children find themselves after having done poorly in primary school.

As noted above, intensive courses in German and/or French are available to newly arrived immigrant children. Secondary school programmes entirely in French are also available to such children. Unfortunately, such programmes do not lead to any national qualifications as these require competence in both German and French. The authorities are considering offering the International Baccalaureate in French in a public secondary school to avoid this problem. They are also considering creating a secondary school jointly with the neighbouring Saar region in which there would be much less emphasis on French, which would reduce barriers to achievement for native children experiencing difficulty learning in French. These reforms could be very helpful for reducing linguistic barriers to achievement for some students.

## Reforms to education practices to enhance achievement

### **Reducing the impact of tracking and streaming**

Luxembourg's education system is highly stratified: it has a high number (four) of tracks into which students are sorted; selection between tracks starts at a young age (12);<sup>15</sup> academic and vocational programmes are generally separately provided; and the extent of grade repetition, which can be considered as a form of differentiation aimed at adapting curriculum content to student performance (OECD, 2005a, p. 401), is particularly high (*ibid.*, Table D6.1). (It should, however, be noted that the material taught in the academic (*Enseignement secondaire*, representing about 30% of students) and technical vocational (*Régime technique*, representing about 25% of students) tracks is at the same level of difficulty except for languages, which are less demanding in the technical vocational track. Both tracks lead to qualifications that have the same legal standing in the labour market and for access to university studies). Within tracks, students are also sorted according to performance. Based on the 2003 PISA mathematics results, the distribution of student performance between schools is wider and the impact of socio-economic background<sup>16</sup> on student performance is larger in countries with more differentiated systems (Table 4.2, row 9 and columns 1-3 and 6, row 10 and columns 8-9). On the other hand, stratification does not significantly affect a country's average score on the 2003 PISA mathematics scale (see Table 4.2, row 7), although it did so on the 2000 PISA reading scale (*ibid.*, p. 403; OECD, 2005b).

Hanushek and Woessman (2005) take this issue further by looking at the effects of tracking by comparing school outcomes in primary school (examined through the Progress in International Reading Literacy Study, PIRLS) with those in secondary school (based on PISA scores). In tracked school systems, inequality tends to increase between primary and secondary school, whereas this does not occur in comprehensive systems.

Possible explanations for the positive relationship between system stratification and variance in student performance include that: high-performing students may learn from each other in a homogenous environment and stimulate each other's performance whereas this may not happen so much where low performers are together; students not meeting performance standards can be relegated to other schools, tracks or streams with lower expectations in a highly differentiated system instead of being helped to improve their performance; and teachers may be obliged to give more individual attention to students in an environment that has a greater variety of abilities and backgrounds (OECD,

Table 4.2. **Intercorrelation matrix of averages of structural features across the OECD countries<sup>1</sup>**

	Number of school types or district educational programmes available to 15-year-olds.	Proportion of 15-year-olds enrolled in programmes that give access to vocational studies at the next programme level or direct access to the labour market	First age of selection in the education system	Proportion of repeaters in primary education	Proportion of repeaters in lower secondary education	Proportion of repeaters in upper secondary education	Performance on the mathematics scale- Mean score	Performance on the mathematics scale- standard deviation	Total variance in student performance between schools	Strength of the relationship between the index of economic, social and cultural background, and student performance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Number of school types or district educational programmes available to 15-year-olds.	1									
Proportion of 15-year-olds enrolled in programmes that give access to vocational studies at the next programme level or direct access to the labour market	<b>0.50</b>	1								
First age of selection in the education system	<b>0.76</b>	<b>0.52</b>	1							
Proportion of repeaters in primary education	<b>0.39</b>	0.27	0.23	1						
Proportion of repeaters in lower secondary education	0.22	0.02	0.11	<b>0.56</b>	1					
Proportion of repeaters in upper secondary education	<b>0.45</b>	0.22	<b>0.53</b>	0.23	0.27	1				
Performance on the mathematics scale- Mean score	0.09	0.26	0.23	0.21	0.17	0.40	1			
Performance on the mathematics scale- standard deviation	0.25	0.19	0.29	0.05	0.06	<b>0.58</b>	0.08	1		
Total variance in student performance between schools	<b>0.62</b>	0.63	<b>0.70</b>	0.15	0.16	<b>0.65</b>	0.14	<b>0.62</b>	1	
Strength of the relationship between the index of economic, social and cultural background, and student performance	<b>0.51</b>	0.24	<b>0.53</b>	0.29	0.17	<b>0.43</b>	0.19	<b>0.48</b>	<b>0.57</b>	1

1. Data marked in bold are statistically significant at the 0.05 level (2-tailed). The proportion of explained variance is obtained by squaring the correlations shown in this figure.

Source: OECD PISA 2003 database; OECD education database.

2005a, p. 404). Concerning the greater impact of socio-economic background in a more differentiated system, this may be partly attributable to early selection (see Table 4.2, row 10 and column 3) when children are more dependent upon their parents and parental resources (*ibid.*, p. 404). In these circumstances, some able children from lower socio-economic backgrounds who develop their abilities late would find doors to academic development closed.

The authorities have long recognised that the high degree of stratification in the education system has drawbacks, notably in terms of social equity. For this reason, they

seriously considered introducing comprehensive education in the 1970s, but did not do so owing to the linguistic complexity of the education system.<sup>17</sup> So as to enhance permeability between the different tracks and to increase social diversity, the government decided ten years ago that all new secondary schools would offer all three tracks (general academic education (*enseignement secondaire*), vocational secondary education (*enseignement secondaire technique*) and vocational training (*régime professionnel*)) in lower secondary education: there is too much diversity in programmes to offer all tracks beyond this level. Already established secondary schools, however, have refused to do likewise. Further efforts should be made to encourage these secondary schools to offer all three education tracks in lower secondary school.

Comprehensive education got a boost in 2005, when the government approved the creation of a publicly funded pilot school at the lower secondary level (*Neie Lycée*) that does not have separate education tracks or streams. The break with existing education practice, however, goes much further than this (Box 4.1). Education practices in this school, which opened at the beginning of this school year, are intended to address many of the weaknesses that have been identified in the education system. Experience with this school

#### Box 4.1. The new pilot school at lower secondary level (*Neie-Lycée*)<sup>1</sup>

In order to break with the hierarchy of disciplines in the rest of education system and the partitioning that exists between them, courses are organised into interdisciplinary branches, such as “arts and society”, “science and technology”, and “physical education, health and values”. Only mathematics and languages – French, German and English – are taught as separate disciplines, as in the rest of the system.<sup>2</sup> Such organisation should help students to be able to draw the links between knowledge in different subjects and to use this knowledge to solve problems, strengthening core competences (see below).

Teachers give classes not only in the discipline in which they have specialised, but also in other subjects. The relative ignorance of teachers in these other subjects obliges them to work closely with other teachers who are specialised in these topics. In each interdisciplinary class, there are two teachers, one of whom is not a specialist in the material being taught. These arrangements are intended to reduce the distance between teachers and students – to some extent, they are all learning together. Presumably, a non-specialist teacher is more easily aware of difficulties that students may encounter in learning than a specialist.

Daily classes are organised into three sessions of 100 minutes instead of the periods of 45 minutes in the rest of the education system. This is intended to reduce interruptions as material is explored and developed. Given that such long classes are tiring for students, they are interspersed with complementary activities, such as theatre, led by professionals. The school day is longer in the *Neie Lycée* than in other schools (school finishes at 4:30 pm instead of 2 pm), making it an all-day school (*Ganztagschule*). The extra time in the school day is for students to participate in activities intended to deepen their understanding of what was learnt in class or, as necessary, to participate in support activities. Staff are available to help students in these activities. They replace homework.

Students are not given grades in the *Neie Lycée* to determine whether or not they advance to the next level, i.e., there is no grade failure.

1. This box draws heavily on Perucca (2005).

2. English lessons start one year earlier in the *Neie Lycée* than in other secondary schools.

should provide inspiration for reforms that could be applied on a larger scale to improve education outcomes.

In a further move to increase permeability between education tracks, the government is considering introducing a module corresponding to the first two years of secondary school during which the general and technical vocational programmes would develop in parallel; the module would define key competences to be acquired during this period. This reform would facilitate entry into the more prestigious academic track for some children who were oriented to the vocational track from the beginning of secondary school. The government is also considering offering exams that would enable students having gained a CATP (*Certificat d’Aptitude Technique et Professionnelle*; see Box 4.1) at the end of vocational secondary education (*régime professionnel*) to do extra exams to gain a Baccalaureate and hence, access to tertiary education. Increasing permeability between tracks is vital for reducing the adverse impact of the current system on social equity.

The authorities should reflect on whether it makes sense to continue to direct such a large proportion (45%) of students into the vocational tracks (*Régime de technicien and Régime professionnel*) that mostly lead to particular occupations and trades. However, the labour market for Luxembourg residents is dominated by the public sector and financial services. Accordingly, there is less demand for these occupations and trades than in other countries (although the question of the continued relevance of vocational education to modern labour-market requirements is arising everywhere). A general education involving good literacy and numeracy skills may therefore be more appropriate for most of the available jobs.

### Reducing grade repetition

As noted above, Luxembourg has a high rate of grade repetition. Grade failure is particularly high in vocational secondary education (Table 4.3). Many children are older than the theoretical age for their grade (indicating that they have already repeated at least one year of schooling), especially in the vocational track of secondary education. As this track includes many students from Romance-language households (see above), it is probable that German language requirements are an important cause of failure (Berg and Weis, 2005, p. 90). Data on grade repetition by nationality in primary school show that it is higher for immigrants than for nationals and that it is highest (above 7%) for the Portuguese, Cape Verdians and ex-Yugoslavs (*Ministère de l’éducation nationale et de la formation professionnelle*, 2005, p. 69).

Table 4.3. **Grade failure, 2003/2004**

Per cent of students

	Primary school	Academic secondary	Vocational secondary
Repeating a grade in primary school or failing a grade in secondary school	20.0	21.2	62.2
Older than the theoretical age for their grade	5	8.5	22.0 <sup>1</sup>

1. This figure excludes students in the modular programmes in lower secondary school and students in tracks leading to a certificate rather than a diploma in upper secondary school (ie., only students in the *Régime technique* and the *Régime de technicien* are included in upper secondary school).

Source: *Ministère de l’Éducation nationale et de la Formation professionnelle*, 2005, pp. 37, 49 and 57 for students older than the theoretical age and 69, 73, 75, 77 and 79 for grade repetition or failure.

Recent reviews of international research evidence suggest that repeating years of study is a relatively ineffective means of helping students to catch up with their peers and that it tends to stigmatise those involved and is costly (Paul and Troncin, 2004). The Luxembourg authorities have come to similar conclusions in a recent study on the effects of repeating years ([www.gouvernement.lu/salle\\_presse/actualite/2005/09/28delvaux/index.html](http://www.gouvernement.lu/salle_presse/actualite/2005/09/28delvaux/index.html)).<sup>18</sup>

A longstanding factor contributing to the high rate of grade repetition is the system's focus on preparing an elite group for tertiary education. This has led to there being too much ambition for many children concerning the curriculum and the standards to be achieved. While criteria for advancement have not changed in primary school – students must pass in French, German and mathematics –, they were made less restrictive in secondary school after 1990. Previously, students had to pass in each branch<sup>19</sup> or repeat the whole year. Since then, partial compensation has been possible,<sup>20</sup> but only in cases where the student only just failed in some branches provided that they were not critical to the overall track being followed.<sup>21</sup> In view of the continuing high rate of grade repetition, a further reform was introduced during the current academic year that allows a student with a clear failure in one branch to advance to the next grade provided that he/she has an overall average score of two-thirds. This reform is expected to reduce repetition markedly.

The authorities direct more resources than average to students with learning difficulties so as to improve their level of achievement. The student-teacher ratio in classes for such students is much lower than for other classes.<sup>22</sup> Supplementary pay is offered to attract high quality teachers for classes of such students. Even so, the authorities report that there are not enough teachers trained for these children.<sup>23</sup> Schools also receive a teaching-hours credit to cover support courses and other activities to help weaker students. The school principal is responsible for deciding how to spend it. The allocation takes into account various factors, including the socio-economic background of students.

The government recently introduced remedial measures for all children falling behind. The teacher is obliged to propose remedial measures to such children identified after the first quarter of the academic year. These measures may include, for example, support courses and/or extra homework. This approach is intended to increase the responsibility of both students and teachers for performance. In certain cases, the measures may be proposed to parents for their agreement. Such an approach is intended to make them also feel more responsible for performance. There are also relay classes in vocational secondary education for students falling behind. If there are several students in this situation, they are taken out of class for six weeks and receive very intensive teaching to try to get them back to the required level.

Arrangements for children to be helped with their homework by teachers or tutors after school have been introduced in secondary schools in recent years. This is particularly important for children from lower socio-economic backgrounds as their parents are unlikely to be able or willing to provide the help with homework that is expected in the Luxembourg school system. Participation by children in these arrangements is voluntary. To ensure that all children that need help with their homework get it and to avoid the stigma of compulsory participation in such arrangements for children having difficulty coping with the curriculum, such arrangements should be integrated into an enlarged school programme, as has been done in the *Neie Lycée*. The government plans to extend such arrangements (which also include custodial services) to primary schools.

The government is considering reorganising primary (six years) education programmes into two-year modules with defined competences to be achieved at the end of each module. The curricula in these modules would be pared back, leaving an extra margin of 30% of course time for getting to the required level. Children not meeting the required standards in the first or second modules would at most be required to repeat one year while failure in the third cycle would result in children going into the modular vocational education track (*régime préparatoire*) that aims to equip them with the competences necessary to enter an apprenticeship at the minimum age for leaving school (15, soon to be 16).

### **Providing extra help for unqualified school leavers**

Educational failure is the most important reason for students leaving school for a job, labour-market measure or inactivity before having obtained an end of secondary-school qualification (Barthelemy, Unsen, and Vallando, 2005, pp. 12 and 15). Another reason frequently cited by such students is a lack of motivation to go to school (*ibid.*). The measures discussed above to improve achievement amongst students experiencing the most academic difficulties should help to reduce academic failure, de-motivation and hence early school leaving. Nevertheless, more could be done to adapt school programmes to the needs of these students. Students aged 16 or more remaining in modular education (lower secondary school) could benefit more from moving up to preparatory classes for the *Certificate d'initiation technique et professionnelle* (CITP) (Meyers and Plein, 2001, p. 40). Indeed, this is precisely the training that is offered by the *Centre national de formation professionnelle continue* (CNFPC) to youngsters aged 15-18 who have left school without a qualification and that lacked one or more modules at school to have access to classes leading to a CITP (*ibid.*, p. 38). Such a reform would be coherent with introducing a further two-year module into lower secondary education, taking children through to the end of compulsory education (soon to be at age 16).

Another important cause of early school leaving without qualifications is that many youngsters cannot find an apprenticeship, even though they fulfil the necessary conditions (*ibid.*, p. 40). More help with finding an apprenticeship should be provided to students (*ibid.*, p. 40). The reasons why there are not enough apprenticeship places should also be analysed with a view to providing solutions. It may be that the structure of apprenticeship courses offered at secondary school is no longer adapted to the structure of the economy.

For students who do leave secondary school without qualifications, there are second-chance arrangements, although they could be improved. Professional orientation and initiation courses (*Cours d'orientation et d'initiation professionnelle* (COIP) of the *Centre national de formation professionnelle continue* (CNFPC)) were created in the early 1980s for youngsters aged 15-18 leaving school without a qualification so as to facilitate the school-to-work transition for them. With only one half of students leaving such measures for a job, it may be time to re-orientate these arrangements more towards the acquisition and reinforcement of the basic competences that these students lack (*ibid.*, pp. 39-40). In addition to literacy skills, this includes elementary social skills. Such arrangements need to counter many characteristics of this population that inhibit the acquisition of competences.<sup>24</sup> As participation in courses offered by the CNFPC is strongly influenced by the availability of such a centre nearby (*ibid.*, p. 38), the government is considering offering such courses through distance learning arrangements.

A factor that may contribute to some young people leaving secondary school without qualifications for the labour market insertion training measure (*stage d'insertion*) is that it

can be financially attractive. Participants are paid € 600 per month and qualify for an unemployment benefit (UB) after completing the training. UB in such cases is € 1200 per month (which is 80% of the minimum monthly wage). This seems generous, especially as most (94%) school leavers without qualifications benefiting from a labour-market measure have low living costs as they live with their parents (Barthelemy, Unsen, and Vallando, 2005, p. 14). It may be preferable to replace the training indemnity and UB for these persons with social assistance (the *Revenu minimum garanti*, RMG), which is means tested, thereby ensuring that such persons needing financial support receive it. So as to curtail such access to unemployment benefit, the Tripartite Co-ordination Committee recently agreed (Luxembourg Government, 2006a) that:

- ADEM should offer an active labour market measure to each young unemployed person no later than six months after registering as unemployed, and preferably after three months, with the Permanent Employment Committee to decide on the waiting period to apply between the end of the labour-market measure and the beginning of payment of unemployment benefit; and that
- the duration of UB should be reduced for unemployed persons having worked for less than one year, the duration being made proportional to the length of previous employment.

The education cheque – while helping to bring dropouts back into the school system – may also encourage some youngsters to leave secondary school prematurely. So as to reduce such incentives, this cheque should not be available until at least 12 months after the last attended school year.

### **Improving teaching skills**

#### ***Enhancing second-chance arrangements for teachers to certify***

Approximately one quarter of teachers are not certified, with this proportion being higher in secondary school than in pre-school or primary school (Table 4.4). These teachers normally have passed the initial exams but have failed to pass the final exams for pre-school or primary teachers or vocational secondary teachers or, in the case of teachers in the academic track of secondary school, have failed to complete successfully the training period.<sup>25</sup> There is a particular shortage of qualified teachers giving support courses. The relatively high proportion of uncertified teachers is a cause for concern because empirical evidence suggests that this has an adverse effect on achievement (as measured by the 2003 PISA results).<sup>26</sup>

**Table 4.4. Certified teachers, 2003/2004**

	% of total	Total teaching staff
Pre-school	76.4	1 089
Primary	79.3	2 666
Special teaching <sup>1</sup>	72.3	47
Support courses <sup>2</sup>	57.0	165
Secondary	73.0	3 359

1. Special teaching includes welcome classes, waiting classes and special classes.
2. Support courses are for children with learning difficulties. Teachers giving these courses hold a certificate to do so but are not necessarily certified teachers.

Source: Ministère de l'Éducation nationale et de la Formation professionnelle (2005).

Another problem with the relatively high proportion of uncertified teachers is that it will no longer be possible to hire them on fixed-term contracts that can be renewed indefinitely following a recent court case. Rather, such contracts will be subject to the same rules as in the private sector – a contract may not exceed two years and can only be renewed once. The government will be obliged to transform many of these contracts into indefinite-term contracts or to change the law to exempt the Ministry of Education from the constraints on rolling over fixed-term contracts.

In view of these problems, the government should enhance access to second-chance opportunities through continuing education to enable more uncertified teachers to certify. In view of the limited arrangements for teacher performance evaluation,<sup>27</sup> the government should also focus more strongly on outcome results evaluated on in-class performance.

### ***Helping teachers to communicate with children from lower socio-economic and immigrant backgrounds***

Almost all teachers are natives of Luxembourg, partly because immigrants (including first- and second generation immigrants) rarely speak the three official languages well enough to enter the profession. Moreover, the vast majority of teachers come from middle-class households. At the same time, some 40% of students in younger age cohorts are from immigrant households, most of which are in the lower socio-economic categories. This situation creates much room for misunderstanding between teachers and students, resulting in poor communication and undermining the effectiveness of teaching. Teachers need to be given more training to overcome cultural differences between them and immigrant children that could otherwise stand in the way of effective learning. Efforts should also be made to overcome these differences directly by recruiting more students with immigrant backgrounds into the profession. This would also encourage immigrant children to improve their performance by providing them with positive role models.

### ***Basing school programmes on key competences***

As discussed above, mean test scores for Luxembourg students in the 2003 PISA were below the OECD country average. Given that the PISA study tests students' ability to apply knowledge to solve problems, the results suggest that there are weaknesses in key competences, i.e., in students' demonstrated ability to apply knowledge in key areas to solve real-world problems. Such weaknesses could inhibit the capacity of future cohorts of workers to adapt and thrive in the labour market, notably by continuously updating skills. Against this background, it is vital that students learn how to learn.<sup>28</sup>

The Ministry of Education is currently revising education programmes so that they lead students to acquiring key competences (Luxembourg Government, 2006b). Moving to education programmes based on key competences represents a major paradigm shift for teachers – it makes it clear that their role is not just to impart knowledge but to ensure that students know how to use it to solve real-world problems. Equally, such programmes make it clear to students that they must learn to apply the knowledge they acquire to solve problems. Such an approach should also motivate students by making it clear to them how the things they are learning can help them to solve problems of interest to them. With a more positive experience of learning at school, more students are likely to take with them a lifelong thirst for learning, which would support subsequent skill development. Once the revised programmes have been developed, they need to be implemented. Subsequently,



#### Box 4.2. Policy recommendations to strengthen education achievement and attainment

##### Overcoming challenges arising from trilingual education

*Encourage more participation in early pre-school education by immigrants. If this does not result in a satisfactory increase in participation, consider making it compulsory in 2009, when such education facilities must be available in all parts of the country.*

*Encourage more children of Portuguese and Cape Verdian origin to participate in pre-school courses to help them master their mother tongue. Consider extending the availability of such courses to other immigrant groups, notably those from ex-Yugoslavia.*

*Make more primary-school-course material available in French or in bilingual (German-French) form. This would help children from Romance-language households to follow the curriculum.*

*Increase the participation of immigrant children in supplementary German-language courses at the primary-school level. This would increase these children's command of German, making it easier for them to follow the curriculum.*

*Make intensive German- or French-language classes available to immigrant students who began their education in a French- or German-speaking country, respectively. The French courses would only be needed for German-speaking immigrant children arriving after the third year of primary school.*

*Increase the proportion of courses in the vocational track of secondary education that are taught in French, especially in the less advanced vocational track (*Régime professionnel*), to facilitate achievement of children from Romance-language households. This would build on the recent reform that created the possibility for students to be instructed in French or German without having to achieve a high level of competence in the other language.*

*Make classes in which German is taught as a foreign language or which provide extra help for students having difficulty with German more widely available in secondary schools. Experience with such classes in pilot projects has been positive.*

*Implement the reforms currently being considered which would entail offering the International Baccalaureate in French in a public secondary school and creating a German-oriented public secondary school in co-operation with the neighbouring Saar region in which there would be less emphasis on French-language competence. The first of these reforms would overcome on a local or regional level the current problem for newly arrived immigrant children who participate in secondary school programmes entirely in French that do not lead to any national qualifications as these require competence in both German and French. The other reform would reduce barriers to achievement to native children having difficulty with French who are able to attend this school.*

##### Reforming education practices to enhance achievement

*Oblige already established secondary schools to offer all three education tracks (academic, advanced and less advanced vocational) in lower secondary school, as is already the case for all new schools since the mid-1990s. This would enhance permeability between the different tracks and increase social diversity at schools, which should help to narrow the distribution of achievement without affecting the average level of achievement.*

*Implement the other reforms being considered to increase permeability between education tracks: introduce a module corresponding to the first two years of secondary school during which the academic and advanced vocational programmes would develop in parallel; and offer exams that would enable students having gained a CATP (*Certificat d'Aptitude Technique et Professionnelle*) at the end of vocational secondary education to do extra exams to gain a diploma and hence, access to tertiary education.*

**Box 4.2. Policy recommendations to strengthen education achievement and attainment (cont.)**

The authorities should reflect on whether they should direct a higher proportion of students into general education. Such an education leading to good literacy and numeracy skills may be appropriate than vocational education given modern labour-market requirements and the structure of Luxembourg's economy.

Implement the reform being considered to reorganise primary education into three two-year modules with defined competences to be achieved at the end of each module. This would reduce grade repetition to at most one year, thereby helping to reduce the variance of achievement.

Expand school hours so as to integrate after-school support arrangements into the regular programme, as is done in the Neie Lycée and, as planned, extend such arrangements to primary school. Such measures would enhance achievement, notably of weaker students.

Enhance second-chance arrangements for unqualified school leavers. More help should be given to help students find an apprenticeship and, if necessary, the structure of apprenticeship courses offered at secondary school should be adapted to the structure of the economy. CNFPC (Centre national de formation professionnelle continue) courses should be reoriented towards the acquisition and reinforcement of basic competences that early school leavers lack.

Adapt financial incentives for poorly performing students to leave school prematurely for the labour-market-insertion measure (stage d'insertion) followed by a spell on unemployment benefit in order to strengthen responsibility and motivation. This would entail replacing the training indemnity and access to unemployment benefit that follows with social assistance (the Revenu minimum garanti, RMG), which is means tested. As most such children live with their parents, they would not be eligible for the RMG. The recent agreement of the Tripartite Committee goes in this direction by limiting access to unemployment benefit and its duration for young unemployed persons. -

Enhance second-chance arrangements for uncertified teachers, provide more training for teachers to overcome cultural differences between them and immigrant children, and recruit more students from immigrant backgrounds into the profession. These measures should increase both average achievement and narrow its distribution, including by providing positive role models for immigrant children.

Complete the reform underway to base school programmes on key competences. This will help to focus the education system on the acquisition of skills that will help future cohorts of Luxembourg residents to adapt and prosper in the labour market.

the reform will be evaluated to see how performance can be improved. This is an important reform that should help the education system to equip young people with the skills that they will need to prosper in the labour market.

**Notes**

1. The 2000 PISA study focused on reading while the 2006 PISA study will focus on science.
2. This statement is based on the following least squares regression (t-statistics are shown in brackets):

$$AT = 75.552 - 0.229 * pc1 + e$$

$$(34.555)(-6.653)$$

R bar sq. = 0.607; DW = 2.428; F = 44.260

Where:

AT = proportion of the population aged 25-34 with at least upper secondary attainment in 2003; and

Pcp1 = is the first principal component of 2003 PISA scores in mathematics, reading, science and problem solving. This principal component explains 94% of the variation in the four achievement series. As they load negatively onto this principal component, a negative coefficient means that achievement is positively correlated with attainment.

While it would be preferable to relate PISA scores to attainment of the same cohort, this cannot be done as the necessary data are not available. The fact that the relationship is nevertheless significant suggests that cross-country achievement of 15 year-olds probably has been relatively stable over time – countries with high (low) achievement for 15 year-olds in 2003 probably also had high (low) achievement when 25-34 year-olds in 2003 were the same age (i.e., between 1984 and 1993).

3. In primary school, advancement depends on results in French, German and mathematics (Berg and Weis, 2005, p. 82). In secondary school, advancement also depends on results in other branches, although where a student relies on compensation (see below) from a branch in which he/she has done well for an unsatisfactory performance in another branch, French, German and mathematics are weighted so that advancement is more difficult with an unsatisfactory performance in one of these branches; branches are listed in the annex to Berg and Weis (2005). In general, they correspond to disciplines, such as German, French or mathematics, but sometimes cover related disciplines, such as the social sciences branch in lower vocational secondary school, which comprises geography and history.
4. A summary of languages of instruction by track and grade can be found in Berg and Weis (2005), pp 69-73.
5. Plurilingual countries juxtapose different linguistic communities while multilingual individuals or communities master several languages (Fehlen, 2006).
6. The largest groups of immigrant students are the following: Portuguese (52.7%), Italians (7.7%), French (7.6%), Belgians (4.5%), and Cape Verdians (1.8%) (Berg and Weis, 2005, p. 99). Thus, approximately  $\frac{3}{4}$  of immigrants are from Romance-language speaking households, with Portuguese being by far the most important such language, followed by French.
7. German is the language of instruction in 80% of vocational education courses at secondary school and French is the language of instruction for the remaining 20% of courses, although the authorities report that the number of courses offered in French is rising.
8. Concerning this option, Martin (1995, p. 32) wrote (in French) that for the moment “it seems materially and structurally impossible to establish in Luxembourg a complete curriculum parallel to the current curriculum in which the respective roles of French and German as they are conceived in the current system would be reversed (this would therefore entail French, in other words a Romance language being the first language of instruction and German being taught at a slower pace as the second language; such a system could facilitate bilingualism for immigrant children).”
9. Tonnar-Meyer (2003, p. 86) report that the following conclusions emerged from the parliamentary debate – the education system must:
  - preserve the unity of the Luxembourg school as well as its qualifications, given that native and immigrant children going to the same school is more than ever an indispensable element of preserving social cohesion in Luxembourg in the medium- to long term;
  - maintain the principle of trilingual education (*Lëtzebuergesch*, German and French) in Luxembourg schools; and
  - promote specific measures, from the pre-school level, aimed at learning to use *Lëtzebuergesch* as the language of communication, thereby enabling this language also to play its role as an integrating factor in Luxembourg society.
10. Sixty-four per cent of students come from households in which *Lëtzebuergesch* is spoken, with 86% of these students coming from households in which only *Lëtzebuergesch* is used, while a further 1% of students come from households in which only German is used (Berg and Weis, 2005, p. 22).

11. The breakdown by nationality of pre-school immigrant students in 2003/2004 was: Portuguese 49.6%; Ex-Yugoslav 11.8%; French 10.0%; Italian 6.6%; Belgian 5.8%; German 3.3%; and other 12.9% (Source. *ministère de l'Éducation nationale et de la Formation professionnelle*, 2005, p. 25).
12. The dependent variable is instrumented scores in mathematics, reading, science and problem solving.
13. The same applies when immigrant status is represented by speaking a language at home other than one of the official languages or national dialects.
14. These results are consistent with those in the forthcoming OECD report on immigrants in PISA by Petra Stanat.
15. See Figure 4.A1.1. There seems to be an error in OECD (2005a, Table D6.1), where the first age of selection in the education system is reported as being 13.
16. Social selectivity in this analysis is derived by averaging the standardised (0.1) indexes of the first age of selection, the number of school types or distinct educational programmes available to 15-year olds, the proportion of grade repeaters at the different levels, and the proportion of 15-year olds enrolled in programmes that give access to vocational studies at the next vocational level or direct access to the labour market (OECD, 2005a, Table D6.1, footnote 3).
17. The large differences in student command of the languages of instruction would have made teaching heterogeneous groups of children together particularly difficult.
18. The main results of this study are that:
  - statistics, opinions of national experts and international studies do not support grade repetition;
  - grade repetition does not reduce the school drop-out rate;
  - grade repetition remains too high in Luxembourg's primary and secondary schools; and
  - grade repetition is rarely a satisfactory response to individual learning difficulties.
19. As noted earlier, branches in secondary school are listed in the annex to Berg and Weis (2005).
20. However, compensation is not permitted between fundamental branches in upper general secondary education.
21. Advancement decisions are based on assessment for the year, taking into account results by branch, the sum of the coefficients (1 to 4) used for weighting branches to reflect the importance of failed branches and the student's weighted average score. A score of less than 30 points out of 60 is classified as failed and a score of 25-29 (27-29 in the academic track) is classified as just failed. Compensation of just failed branches is allowed for advancing in the same track (in a lower track just failed falls to 20 points or more) provided that the weighted average score for all branches is greater than or equal to 35 (30), and the sum of the coefficients of the insufficient score is 6 (9) or less (Berg and Weis, 2005, p. 85).
22. For example, there are only 10-12 students per class in the modular vocational education track (*régime préparatoire*) for weaker students that aims to equip students with the competences needed to learn a métier at age 15.
23. Of the teachers giving support courses, only 57% are qualified (*ministère de l'Éducation nationale et de la Formation professionnelle*, 2005, p. 104).
24. Unqualified school leavers often share some of the following characteristics that inhibit the acquisition of competences: a negative self image, no personal project, the memory of particular teachers experienced as good or bad, a weak structuring of time and space, the refusal to be in a learning situation in the traditional school environment, major shortcomings in linguistic competences and oral expression, and weaknesses in terms of basic social competences (Meyers and Plein, 2001, p. 39).
25. To become a pre-school or primary school teacher, candidates must first pass an exam in linguistic competences (German, French and orally in *Lëtzebuergesch*) and then gain a Certificate of Pedagogical Studies (*certificat d'études pédagogiques*) with a specialisation in pre-school education or primary education, respectively. The course to obtain this certificate takes three years, but will soon be converted into a four-year degree programme. To become a teacher in the academic track of secondary education, applicants must have gained a four-year degree (soon to be a five-year master's degree) in the discipline that they plan to teach and have passed an exam in linguistic competences in the three national languages (only oral competences are required in *Lëtzebuergesch*). Then, applicants must pass the recruitment exam in the discipline that they plan to teach. Passing this exam opens access to the three-year training period that must be successfully completed to become a certified teacher in the academic track of secondary

education. In vocational secondary education, applicants must pass the exam in linguistic competences and then successfully complete teacher training in the area that they plan to teach: for example, in science or in engineering and architecture.

26. This statement is based on the following regression estimates (t-statistics in brackets):

$$\text{ACH} = 0.942 \text{ GR} + 0.480 \text{ GN} + 0.347 \text{ ESCS} - 0.424 \text{ IMM} - 0.257 \text{ ABG} + 0.091 \text{ AMA} + 1.857 \text{ PCT} + e$$

$$(5.51) \quad (3.22) \quad (4.02) \quad (-8.59) \quad (-3.09) \quad (1.04) \quad (3.49)$$

No. of observations = 2268; R<sup>2</sup> = 0.355

Where:

ACH is instrumented PISA 2003 scores in mathematics, reading, science and problem solving;

GR is grade (−1 for a lower grade than the theoretical grade for the age; 0 for the same grade as the theoretical grade for the age; and 1 for a higher grade than the theoretical grade for the age);

GN is gender (1 for female, 2 for male);

ESCS is socio-economic background (based on parental education and occupation status and on cultural possessions in the home; a higher value reflects higher a socio-economic background);

IMM is immigrant status;

ABG is ability grouping;

AMA is additional mathematics activities; and

PCT is the instrumented (proportion of certified teachers in PISA 2000, school size, GR) proportion of certified teachers.

All variables except AMA are significant at the 5% level.

27. Perucca (2005, p. 56) reports that teachers are left in peace after qualifying as there is no teaching inspectorate.

28. This could entail, for example, a guided approach to problem solving. Students would endeavour to solve a problem, note how they had gone about doing so, and then reflect on the results of the different approaches. This could help students to recognise and acquire the knowledge they need to solve problems more quickly in the future.

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## ANNEX 4.A1

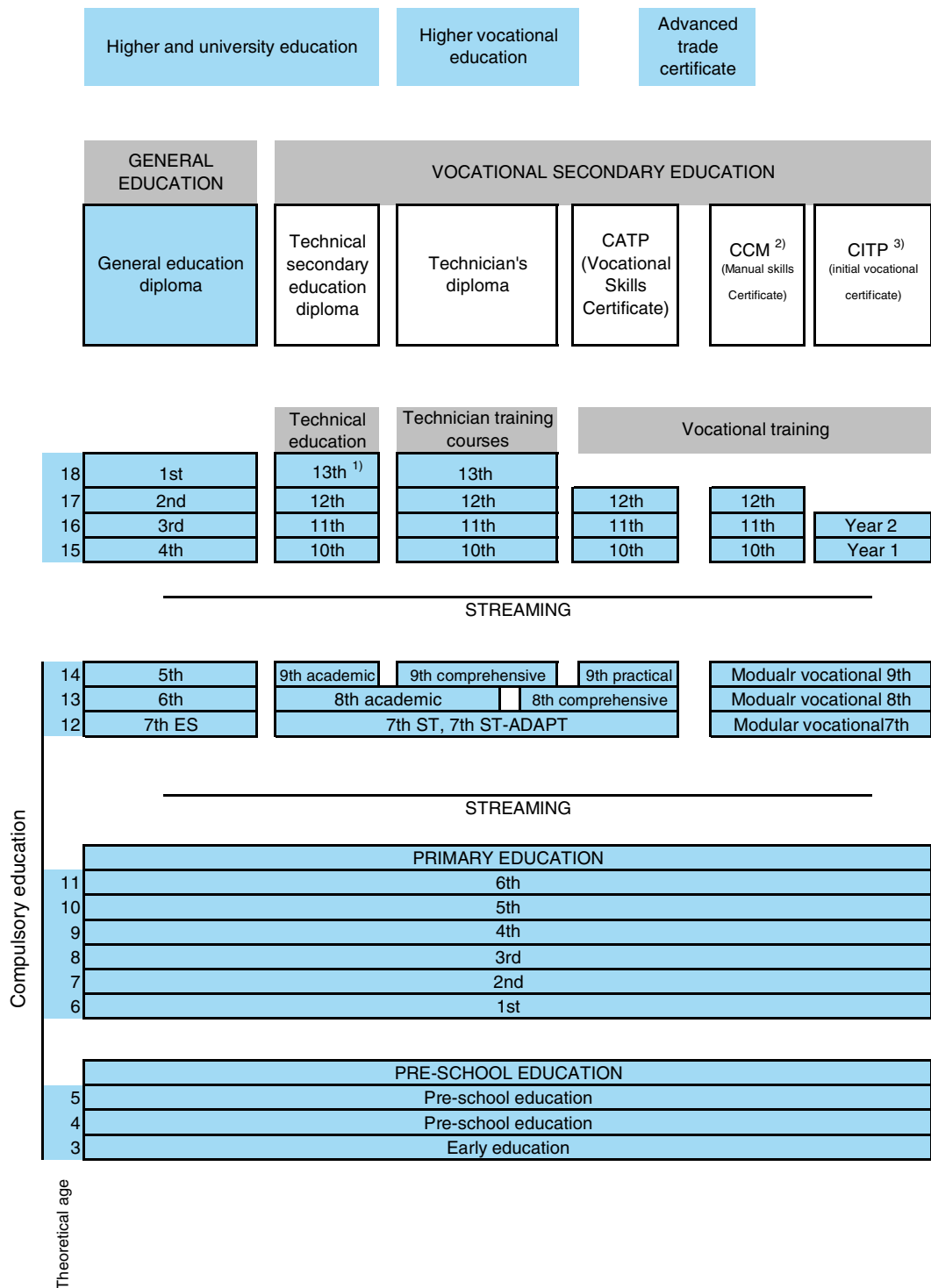
### *Structure of the Luxembourg education system*

Participation in the Luxembourg education system begins with early preschool education (*enseignement précoce*) at the age of three (Figure 4.A1.1). Such education is optional. Preschool education (*enseignement préscolaire*) begins at the age of four and lasts for two years. It is compulsory. Primary school (*enseignement primaire*) education starts at the age of six and continues for six years.

At the end of primary school, students are oriented into one of three main tracks in lower secondary education: academic general education (*enseignement secondaire*, ES, 30.3% of students in 2003-04), vocational secondary education (*enseignement secondaire technique*, 58.2% of students in 2003-04), and, for the students having more educational difficulties, modular vocational education (*régime préparatoire modulaire*, 11.5% of students in 2003-04). Lower secondary education lasts three years.

At the end of lower secondary education, students are again oriented into the different education tracks in middle- and upper secondary school: academic general education (*enseignement secondaire*), technical vocational secondary education (*Régime technique*), technician training courses (*Régime de technicien*) and vocational training (*Régime professionnel*). Academic general education lasts four more years and prepares students for university studies. The technical branch (*régime technique*) of vocational (middle- to upper-) secondary education lasts four or five years<sup>1</sup> and leads to a Baccalaureate-level qualification (*diplôme de fin d'études secondaires techniques*) that gives access to university studies. There are three sub-branches in this track: general technical division (*division Technique générale*); commerce and administration division (*division administrative et commerciale*); and health professions division (*division Professions de santé*). The technician branch (*régime technicien*) of vocational (middle-to-upper) secondary education lasts four years and leads to a qualification (*diplôme de Technicien*) that prepares students for tertiary vocational education at a less advanced level than university (corresponding to that offered by the institutions formerly known as poly-technical institutes in the United Kingdom) in the area of specialisation. There are nine sub-branches in this track: commerce and administration; agriculture; arts; chemical; electro-technical; civil engineering; hotel services and tourism; computing; and mechanical. Finally, the branch in middle- to upper-secondary school in which students acquire vocational qualifications through dual (study-work) arrangements (*régime professionnel*) lasts three years and leads to either the vocational skills certificate (*Certificate d'Aptitude Technique et Professionnelle*, CATP) or the manual skills certificate (*Certificat de Capacité Manuelle*, CCM). Persons with a CATP or CCM can continue their vocational education to obtain an advanced trade qualification (*maîtrise*). Students

Figure 4.A1.1. **Structure of the school system**



1. 14th for the healthcare and social work stream.  
 2. After the CCM, students can move on to a CATP course in adult education.  
 3. The CITP is generally a two-year course, with an optional two-year extension. Students may then attend a CCM or CATP course in either vocational further educational or initial education.  
 \* Differentiated education (for children with special learning needs) exists at all levels.



experiencing educational difficulties continue for two years in modular vocational education and can extend this for another two years. This path leads to the certificate of technical and vocational initiation (*Certificat d'Initiation Technique et Professionnelle*, CITP). Persons with a CITP can subsequently prepare for a CCM or CATP, either in the context of continuing vocational education or initial education.

The minimum school-leaving age is 15 but will soon be raised to 16.

At the tertiary level, Luxembourg has institutions that teach shorter, vocational courses, such as for primary-school teacher training. Since the 2004/2005 academic year, Luxembourg also has a research university. It offers mainly post-graduate programmes, although it will also offer four-year degree programmes for primary-school teachers.<sup>2</sup> The new university only has three faculties: human sciences; law, economics and finance; and science, technology and communications. These faculties have been chosen for their relevance to the Luxembourg economy. In contrast to the school system, university teachers are not civil servants – they are hired on fixed-term contracts that are subject to the same regulations as in the private sector except that the university may renew these contracts indefinitely (instead of just twice). Most students will still need to go abroad for university studies.

### Notes

1. The duration is five years for the health professions division.
2. The current three-year diploma programme is to be upgraded into a four-year degree programme.

## ANNEX 4.A2

# *Analysis of the 2003 PISA results for Luxembourg*

### **Introduction**

This Annex describes the econometric analysis of Luxembourg data in the 2003 PISA study (OECD, 2004a, 2004b) that lies behind the results presented in Table 4.1. The annex begins with a description of features of the 2003 PISA database that have a bearing on the appropriate estimation methodology to use and on statistical inference. In the second section, the estimation methodology is discussed while in the third section, the results of the preferred specification are presented. As this specification is subject to a potential endogenous variable bias, an instrumental variable estimation that addresses this problem is presented in the final section.

### **The 2003 PISA database<sup>1</sup>**

#### ***Sampling design***

The sampling design used for the PISA assessment was a two-stage stratified sample in most countries, where stratification in the case of Luxembourg was based on whether the school was public or private or the European school. The first-stage sampling units consisted of individual schools having 15-year-old students. The second-stage sampling units in countries using the two-stage design were students within sampled schools.

A minimum of 150 schools (or all schools if there were fewer than 150 schools in a participating jurisdiction) had to be selected in each country. Within each participating school, a sample of the PISA eligible students was selected with equal probability. The within-school sample size (sometimes referred to as the “target cluster size”) was usually 35 students. In schools where there were fewer eligible students than the target cluster size, all students were sampled. In total, a minimum sample size of 4 500 assessed students was to be achieved. It was possible for countries to negotiate a different target cluster size, but if it was reduced then the sample size of schools was increased beyond 150, so as to ensure that at least 4 500 students in total would be assessed. The target cluster size had to be at least 20 so as to ensure adequate accuracy in estimating variance components within and between schools – an analytical objective of PISA. Hence, given the size of Luxembourg, all students were sampled.

#### ***Plausible values***

Education tests such as PISA aim at measuring proficiencies of both individual students and the population at large. Student proficiencies (or measures) are not directly observed; they are missing data that must be inferred from the observed item responses.

There are several possible alternative approaches for making this inference. PISA uses the imputation methodology, usually referred to as plausible values.

Plausible values are a selection of likely proficiencies for students that attained each score based on posterior distributions that have been estimated using the student's replies to the PISA questionnaire. They can be described as a representation of the range of abilities that a student might have. Instead of directly estimating a student's ability, a probability distribution of a student's ability is estimated. That is, instead of obtaining a point estimate of his or her ability, a range of possible values for a student's ability is estimated along with an associated probability for each of these values. Plausible values are random draws from this (estimated) distribution of a student's ability (Wu and Adams, 2002). The probability distribution from which a student's plausible values are drawn has been based both on the cognitive data, i.e., the item response pattern, and on additional information (student gender, social background). Overall, this methodology aims at building a continuous measure of a student's proficiency level from a collection of discontinuous variables (i.e., the test score). It is meant to prevent biased inferences occurring as a result of measuring an unobservable underlying ability through a test using a relatively small number of items.<sup>2</sup>

## Estimation methodology

Instead of estimating individual equations for scores in each of the four test fields – mathematics, reading, science and problem solving –, information regarding student performance has been summarised across them using principal components analysis. This can be justified on the grounds that the interest of this analysis lies with the overall design of the school system and the student's success within this system independently of the field of excellence. Moreover, the first component of each plausible value captures between 92.4% and 95.2% of the total variance across test fields, i.e., the student's performance across fields is highly correlated overall and a single measure captures quite well the student's success in school.

Each student-level equation has to be estimated for each of the five plausible values that are available in PISA.<sup>3</sup> In order to obtain the corresponding coefficient for the different variables, a simple arithmetic average can be taken from these five estimates. The standard error of the coefficient, however, is equal to the square root of the error variance, which itself is the (weighted) sum of the sampling variance and the imputation variance. The sampling variance is simply the arithmetic average of the variances of the five different coefficient estimates. The imputation variance is related to the fact that the five different coefficient estimates have to be considered as random draws from a sample (much as the plausible values are random draws from the posterior distribution around the student's test score) and is calculated as the variance of the five coefficient estimates.

In the process of running the regressions for the different plausible values, the estimations have to be adjusted for the sample design as observations (students) have not been drawn randomly. As all schools in Luxembourg were included in the sample, tracks (general or vocational) were first selected (instead of schools in countries large enough to sample schools) and then, within each track (selected school in larger countries), classes or students were randomly sampled. One of the differences between simple random sampling and such two-stage sampling is that for the latter, selected students in the same track (attending the same school in larger countries) cannot be considered as independent

observations. This is because students within a track (school) will usually have more common characteristics with each other than with students from different tracks (educational institutions).

## Results

### Baseline equation

Table 4.A2.1 presents the results of the baseline equation using the variables found to be most relevant in the international comparison of educational surveys. The baseline equation only includes the relative grade of the student (in years relative to the normal grade at age 15, taking a negative value if the student has repeated one or more grades), gender (one for a girl, two for a boy) and the student's socio-economic background. For comparative reasons, the same equation is also presented for all four test fields; note, however, that the coefficients of the equations for the different test fields are not comparable to those obtained by estimating the equation on the summary performance scores owing to the principal components variable transformation. Both the coefficients of the variable indicating the relative grade of the student and the variable reflecting the socio-economic background are highly significant for all five equations. Whether the student is a boy or a girl plays a role for three of the four different sub-fields (and in opposite directions) but not for the student's test score on problem solving nor on the overall test score across all four fields (a positive coefficient indicates that being a boy leads to better test scores in the respective domain). Replacing the variable on the socio-economic background with alternatives in the PISA database such as the highest occupational status of parents or parental education level did not alter the resulting baseline equation.

Table 4.A2.1. **Baseline equation: Principle components and four test fields**<sup>1</sup>

	Baseline	Test fields			
		Mathematics	Science	Reading	Problem solving
Grade	1.010*** (4.03)	50.033*** (4.14)	50.944*** (4.10)	45.113*** (3.69)	47.677*** (4.08)
Gender	0.149 (1.19)	24.145*** (3.99)	19.849*** (3.09)	-26.193*** (-4.07)	8.990 (1.57)
Economic, social and cultural status	0.602*** (3.76)	27.451*** (3.61)	32.086*** (3.94)	30.825*** (3.96)	25.801*** (3.46)
Number of observations	3 865	3 865	3 865	3 865	3 865
R square	0.30	0.30	0.28	0.28	0.26

1. t-statistics are in parentheses. Significance levels are indicated by asterisks: \*\*\*: 1% level, \*\*: 5% level, \*: 10% level. Source: PISA 2003, Secretariat's calculations.

### Full specification

Many other variables in the PISA database representing school-level and student characteristics were also tested for significance. After discarding insignificant variables, the preferred specifications shown in Table 4.A2.2 remained. The first adds to the baseline specification immigration status (0 for a native student, 1 for a first or second generation immigrant), quality and quantity of educational resources (such as libraries), extra-curricular mathematics activities (number of different activities to promote engagement with mathematics per school), and ability grouping (i.e., grouping students into different

Table 4.A2.2. **Joint impact equation**<sup>1</sup>

	Baseline	Joint impact	
		1	2
Grade	1.010*** (4.03)	0.954*** (6.35)	0.937*** (6.91)
Gender	0.149 (1.19)	0.218* (2.00)	0.204* (1.73)
Economic, social and cultural status	0.602*** (3.76)	0.426*** (3.36)	0.371*** (3.11)
Immigration status		-0.288*** (-4.18)	-0.278*** (-4.12)
Certified teachers (%)			1.722*** (6.56)
School infrastructure		0.427*** (4.86)	0.392*** (4.76)
Mathematical activities		0.203** (2.60)	0.123 (1.48)
Ability grouping		-0.229*** (-3.87)	-0.200*** (-3.10)
Number of observations	3 865	3 759	3 391
R square	0.30	0.37	0.37

1. t-Statistics are in parentheses. Significance levels are indicated by asterisks: \*\*\*: 1% level, \*\*: 5% level, \*: 10% level. Source: PISA 2003, Secretariat's calculations.

classes according to the past performance) at the school level (taking the value zero if there is no grouping, one if there is grouping only in some classes, and two if there is grouping in all classes). The second adds to the first specification the proportion of certified teachers as an indicator of teacher quality. Immigration status and ability grouping both have negative impacts on PISA scores in both specifications, while school infrastructure has a positive effect. The proportion of certified teachers has a positive effect on scores, but the mathematical activities variable loses significance in this specification. Unfortunately, the coefficient of the certified teachers variable may be biased owing to endogeneity problems in the selection of teachers and their attribution to different schools. In the case of Luxembourg, this seems indeed to be a problem as teachers who have passed the final pedagogical exam appear on a ranking, which can be used as a guideline by the central authorities when they attribute teachers to available posts. The severity of this problem is assessed in the next section.

## Sensitivity analysis

### **Instrumental variable analysis**

In order to assess the severity of the endogeneity problem for the proportion of certified teachers variable, the preferred specification was rerun substituting an instrument for the proportion of certified teachers. The instruments used are the size of the school and its geographical location (rural vs. urban schools) as reported in the 2000 PISA study:<sup>4</sup> bigger schools in cities are likely to attract more certified teachers than smaller schools in remote villages. The results of the instrumental variable regression are reproduced in the Table 4.A2.3 and show that the instrumented variable for the proportion of certified teachers remains (weakly) statistically significant but increases considerably in economic importance (the coefficient more than triples), with the main controls – the student's grade, socio-economic and immigrant background and the school

Table 4.A2.3. **Joint impact instrumental variable regression**<sup>1</sup>

	Grade	Gender	Economics, social and cultural status	Immigration status	School infrastructure	Mathematical activities	Ability grouping	Certified teachers (iV)
Coefficient	0.900***	0.191	0.330***	-0.298***	2.414***	-0.082	0.109	5.521*
t-Statistic	(5.41)	(1.65)	(3.10)	(-4.34)	(3.06)	(-0.49)	(0.57)	(1.91)
R <sup>2</sup>	0.30							
Number of observations	2 392							

1. t-Statistics are in parentheses. Significance levels are indicated by asterisks: \*\*\*: 1% level, \*\*: 5% level, \*: 10% level. Source: PISA 2003, Secretariat's calculations.

infrastructure – keeping their significance level whereas mathematical activities and ability grouping are no longer significant. However, given the considerable loss in observations owing to the inclusion of instruments, this should not be taken as a reason for concern about the preferred specifications shown in Table 4.A2.2.

### Notes

1. For a detailed overview of the set-up and the structure of the PISA database, see OECD (2005a).
2. This approach reflects the greater importance accorded to reducing errors in inferences about the target population than to minimizing the measurement error associated with each individual's estimate.
3. For a discussion of how to use the PISA database for bi- and multivariate analysis, see OECD (2005b)
4. The 2000 PISA database was used to find instruments because most of the school-level variables in the 2003 PISA database are highly correlated with students' test performance, with the exception of the size of schools.

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## Chapter 5

# Increasing product market competition to boost productivity

*Being a small economy with open borders and small travelling distance to neighbouring countries, Luxembourg already enjoys many of the gains coming with competitive pressures on product markets. However, several segments of the economy remain sheltered from competitive pressures. The recent introduction of the Competition Law should be used as a vehicle to reduce these remaining regulatory barriers. This chapter identifies three sectors where the competition authorities could play their essential role of promoting competition in the economy. First, easing the regulation of professional services, a relatively important sector in terms of employment, could foster competition and hence create beneficial effects on, currently adverse, productivity developments. Competition in network industries should also be enhanced, especially in broadband internet access, where the dominance of the incumbent has been scaled back, but conditions for market entry still fall short of international best practice. Finally, existing hurdles to market entry in retail distribution should be lowered, so as to improve consumer welfare, notably with an easing of zoning policy and longer shop opening hours.*

## Introduction

Being a small economy with open borders and small travelling distance to neighbouring countries, Luxembourg already enjoys many of the gains coming with competitive pressures in product markets. Consumers have the privilege of being able to choose among suppliers from three different countries and shop for the best opportunities before making their decision. There are, however, several segments of the economy that remain sheltered from competitive pressures. In a context of low within-sector productivity growth (Chapter 1), removing remaining regulatory barriers to enhance product market competition would have a beneficial impact on productivity both through static and dynamic gains (OECD, 2005a). An important step in this direction has been the approval of a new Competition Law in 2004, which introduced a legal framework satisfying EU requirements. So far, however, enforcement has been inadequate, as the competition authorities have not yet finalised the investigation of a single case and hence no sanctions have been applied. This chapter looks at three sectors where competition problems have been identified and where the competition authorities could prove their essential role for the Luxembourg economy.

*First*, professional services regulation, which has been extensively documented by the competition authorities, is one of the strictest in the OECD especially for architects and engineers. Professional services represent a relatively large part of total employment, but are characterised by poor productivity developments. In many countries, regulation of this sector has been the focus of important reforms over the past decade, but very few changes have been implemented in Luxembourg. *Second*, competition in network industries should be enhanced, especially in broadband internet access, so as bring access tariffs towards marginal costs. *Finally*, market entry into the retail trade sector should be eased. The moratorium on the opening of new large stores imposed during 1997-2005 has hurt productivity growth in this sector, which has fallen short of that in the most competitive retail markets, such as the United Kingdom or the United States. Despite the moratorium having lapsed, some institutional and regulatory features remain in place, like entry restrictions and shop opening hours, which are stricter than in neighbouring countries. Their loosening may further spur productivity growth.

## Competition legislation and enforcement

An adequate design of competition policy is crucial for promoting competition throughout the economy. To this end, the Luxembourg government adopted a new competition law in May 2004. The law introduced major changes in that it replaced an amended Act of June 1970 on restrictive business practices, so as to ensure conformity with the basic competition rules of the EU. It serves as an overall framework for the institutional design of the competition authorities, the legal framework wherein they operate and the enforcement instruments they have at their disposition.



According to the initial OECD Competition Law and Policy (CLP) indicator, which reflects the situation in 2003, Luxembourg ranks 20th out of the 30 OECD countries in terms of having an environment that is favourable to competition (Figure 5.1). However, if the 2004 competition law is taken into account, Luxembourg's rank rises to 11th (assuming no change in other countries). This CLP indicator was constructed recently by the OECD in order to summarise and compare competition policies across countries. The aim of the indicator is to measure the strength of competition policies in individual countries, encompassing actual application as well as formal legal and institutional structures. Although the competition law in a country may to a large extent comply with EU law obligations, a country may be rated as less favourable to competition owing to a lack of actual application of competition laws or because there is room for improvement to comply with what is considered as best practice by the OECD.

The CLP indicator can be separated into two low-level indicators. The first measures policies enhancing competition in general and their *ex post* enforcement by the competition authorities. For Luxembourg, this antitrust framework indicator ranks relatively unfavourably in a cross-country comparison. However, taking into account all aspects of the 2004 Competition Law, it improves considerably to around the OECD average. The second low-level indicator concerns policies encouraging competition in deregulated network industries, which are typically implemented *ex ante* by more or less independent sector regulators. In Luxembourg, such regulation is implemented by the *Institut Luxembourgeois de Régulation* (ILR). Luxembourg scores as a “middle-of-the-road” country on this indicator. A more detailed description of the construction of this indicator can be found in Annex 5.A1.

### **Strengthening the antitrust framework**

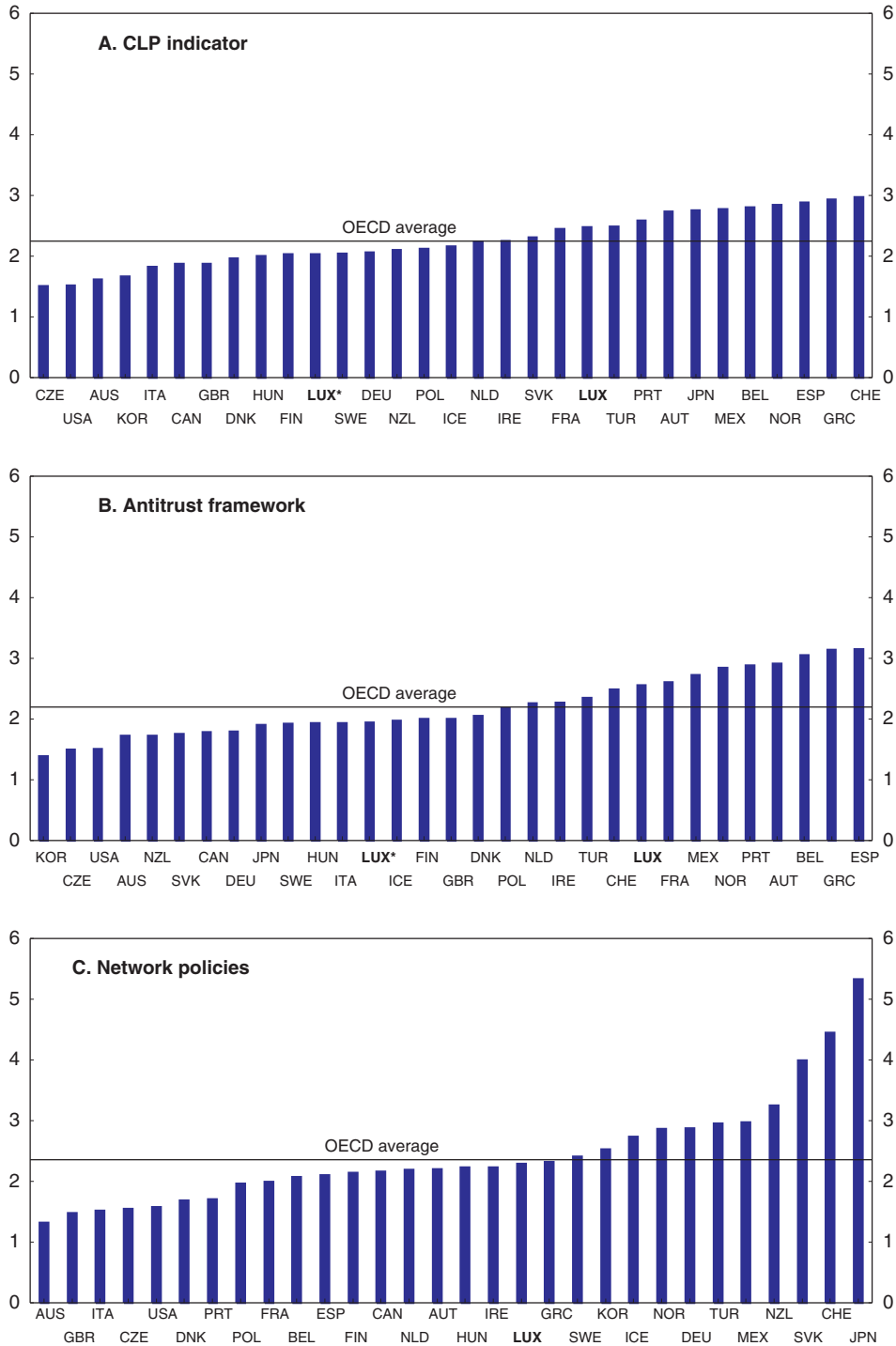
#### ***Increase the field of competences***

The framework of Luxembourg's competition law largely coincides with the key features of the European Union Treaty.<sup>1</sup> Thus, to a large extent, the law limits the field of competences of the competition authorities to restrictive agreements and abuse of dominance. There is, however, scope to widen competences to include competition advocacy in sectoral inquiries and in relation to laws and regulations issued by legislative and administrative bodies. Moreover, as in a number of other OECD countries, the competition authorities could also be made responsible for applying laws to protect consumers against unfair marketing practices and similar abuses, such as deceptive advertising. Competition and consumer policies are usually considered strongly complementary, as each seeks to correct and improve the functioning of markets to the benefit of consumers.

As described in the present chapter, the competition authorities could already make greater use of competences in the existing legal framework and play an active role in at least three sectors with restrictive regulation. For *professional services*, the competition authorities could bring the study on professional services that was recently produced (*Conseil de la concurrence*, 2005) to the next stage of formulating recommendations. As well, the recent *telecommunications law* gives the competition authorities an opportunity to be actively involved in promoting competition in this sector, especially broadband access. Finally, the competition authorities could advocate easing market entry rules in *retail trade*.

Figure 5.1. **The Competition Law and Policy (CLP) indicators and its main sub-components<sup>1</sup>**

2003



1. 0 to 6 scale from most to least favourable to competition. \*: Updated value for Luxembourg taking into account the 2004 Competition Law.

Source: OECD (2005b).

### Enhance enforcement

According to the CLP indicator, Luxembourg scores very low on enforcement both because of the institutional and legal design and because in practice the competition law has hardly been applied so far (Table 5.1). Although a number of claims have been submitted to the Competition Inspectorate, which has investigating powers, no single investigation has been finalised and passed through to the Competition Council, which is an independent administrative decision-making body with sanctioning powers. This could indicate that the Inspectorate's current staffing – three staff members – is inadequate. An increase in resources, possibly entailing outsourcing, would allow it to make more progress on investigations underway and engage in investigations on its own initiative if deemed necessary. A cross-country comparison clearly shows that, when taking into account the size of the economy, staffing of the Inspectorate and Council combined is among the lowest in the OECD (Figure 5.2).

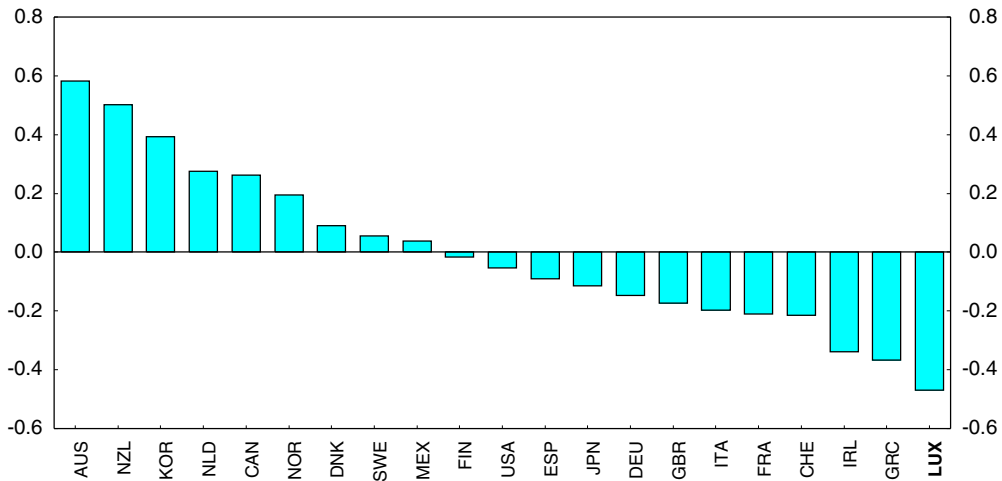
Table 5.1. **Scope of law and enforcement**<sup>1</sup>

	Domain	Sub-domain			
	Scope of Law and enforcement	Legal framework and rules	Exemptions	Merger Regimes	Enforcement
Australia	2.1	2.6	2.1	1.9	1.9
Austria	3.7	4.4	2.3	1.3	5.3
Belgium	3.3	2.9	2.0	3.0	4.2
Canada	1.6	2.2	2.7	0.6	1.5
Czech Republic	1.9	1.8	1.0	1.2	2.6
Denmark	2.3	2.0	1.7	1.3	3.3
Finland	2.2	1.6	1.0	2.2	3.1
France	2.8	1.4	2.4	3.8	3.1
Germany	2.1	2.7	1.0	1.2	2.4
Greece	3.6	3.2	2.0	3.3	4.5
Hungary	2.5	1.7	3.0	1.8	3.1
Iceland	1.9	2.1	1.0	1.2	2.5
Ireland	2.2	3.5	1.0	0.0	3.2
Italy	2.5	2.1	1.0	2.7	3.2
Japan	2.2	2.6	1.0	0.6	3.4
Korea	1.5	1.7	1.9	1.6	1.1
<b>Luxembourg</b>	<b>3.4</b>	<b>3.6</b>	<b>1.0</b>	<b>2.1</b>	<b>4.8</b>
Mexico	3.3	2.7	4.1	1.3	4.5
Netherlands	2.1	1.8	2.0	1.4	2.7
New Zealand	2.0	1.7	0.3	2.5	2.5
Norway	2.6	2.6	1.0	2.7	3.1
Poland	2.2	1.2	1.0	1.8	3.5
Portugal	3.1	2.7	1.0	3.0	4.3
Slovak Republic	2.2	1.8	0.0	1.8	3.4
Spain	3.1	1.6	2.0	4.1	3.8
Sweden	2.3	2.7	1.0	0.6	3.4
Switzerland	2.7	3.2	1.0	1.6	3.7
Turkey	2.8	3.2	2.0	2.5	3.2
United Kingdom	2.5	1.2	1.0	3.1	3.4
United States	1.3	2.1	3.4	0.9	0.3
European Union	1.4	1.8	1.0	2.3	0.8
Average	2.4	2.3	1.6	1.9	3.1

1. The scale of indicators is 0-6 from least to most restrictive.

Source: OECD (2005b), Secretariat's calculations.

Figure 5.2. **Staff resources of competition authorities**<sup>1</sup>  
2001<sup>2</sup>



1. The effect of the size of the economy on staff/GDP ratios has been estimated by the following equation (t-statistics in parentheses):  $\log(\text{staff/GDP}) = 0.299635 - 0.29355 \cdot \log(\text{GDP})$   
(1.08) (-2.86);  
S.E.: 0.29; R2: 0.30. The chart shows the residuals after controlling for effects of country size.
2. 2002 for the Netherlands, 2003 for Switzerland and Spain and 2004 for Luxembourg.

The credible threat of sanctions, which can be imposed by the Luxembourg competition law, is insufficient according to the CLP indicator. Like most European countries, Luxembourg follows the European Union model, setting the maximum fine at 10% of the annual affected turnover but the fact that no fines have been imposed implies a lack of credible threats. Moreover, the deterrent effect of competition law could be increased if sanctions could be applied to individuals, especially if individuals faced the threat of criminal liability and possible incarceration.

Luxembourg has benefited greatly from openness to foreign investment flows and maintaining a business-friendly regulatory environment. Despite some apparent hesitations, the Luxembourg authorities wisely maintained this approach in the Arcelor-Mittal affair, deciding against using legislative means to block the takeover. In the end, the authorities simply accelerated implementation of the EU Directive on Takeovers and left the two companies to deal with the takeover issue within this framework.

### Easing regulation in professional services

Professional services, such as legal, health, architectural, engineering and financial advice, are typically characterised by high levels of education and practical training, codes of conduct and personal accountability and by financial independence. Their quality and competitiveness can have substantial spill-over effects to the rest of the economy. Although the STAN database does not single out the professional services sector, it is an important part of the sector “Other business activities”. This sector is relatively important in Luxembourg as it accounts for a large share of employment compared to other countries. Moreover, productivity levels are low and (negative) productivity growth has been very weak over the past decade (Table 5.2).

The main economic rationale for regulating professional services is to alleviate significant market failures. The particular market failure in professional services is that of

Table 5.2. **Importance of “other business activities”, including professional services<sup>1</sup>**2003<sup>2</sup>

	Share in total employment (per cent)	Share in total value added (per cent)	Labour productivity per employee	
			Level (in per cent of the whole economy)	Growth 1995-2003
Austria	7.7	6.1	76.4	-2.6
Germany	9.2	9.6	94.2	-2.7
Denmark	6.8	5.6	75.6	-0.5
Spain	5.9	4.8	79.8	-0.4
France	9.4	9.3	87.5	-1.4
Greece	5.9	2.5	41.0	-2.5
Italy	8.5	8.1	90.9	-0.7
<b>Luxembourg</b>	<b>13.6</b>	<b>6.1</b>	<b>42.4</b>	<b>-3.5</b>
Netherlands	12.3	8.8	65.3	0.3
Sweden	7.6	7.4	95.2	-0.3
Norway	7.0	4.8	61.5	-1.3

1. The sector “Other business activities” (74, ISIC rev. 3) includes legal, technical and advertising services and business activities, such as labour recruitment and packaging.

2. 2002 for Germany, France, Norway. 2001 for Spain.

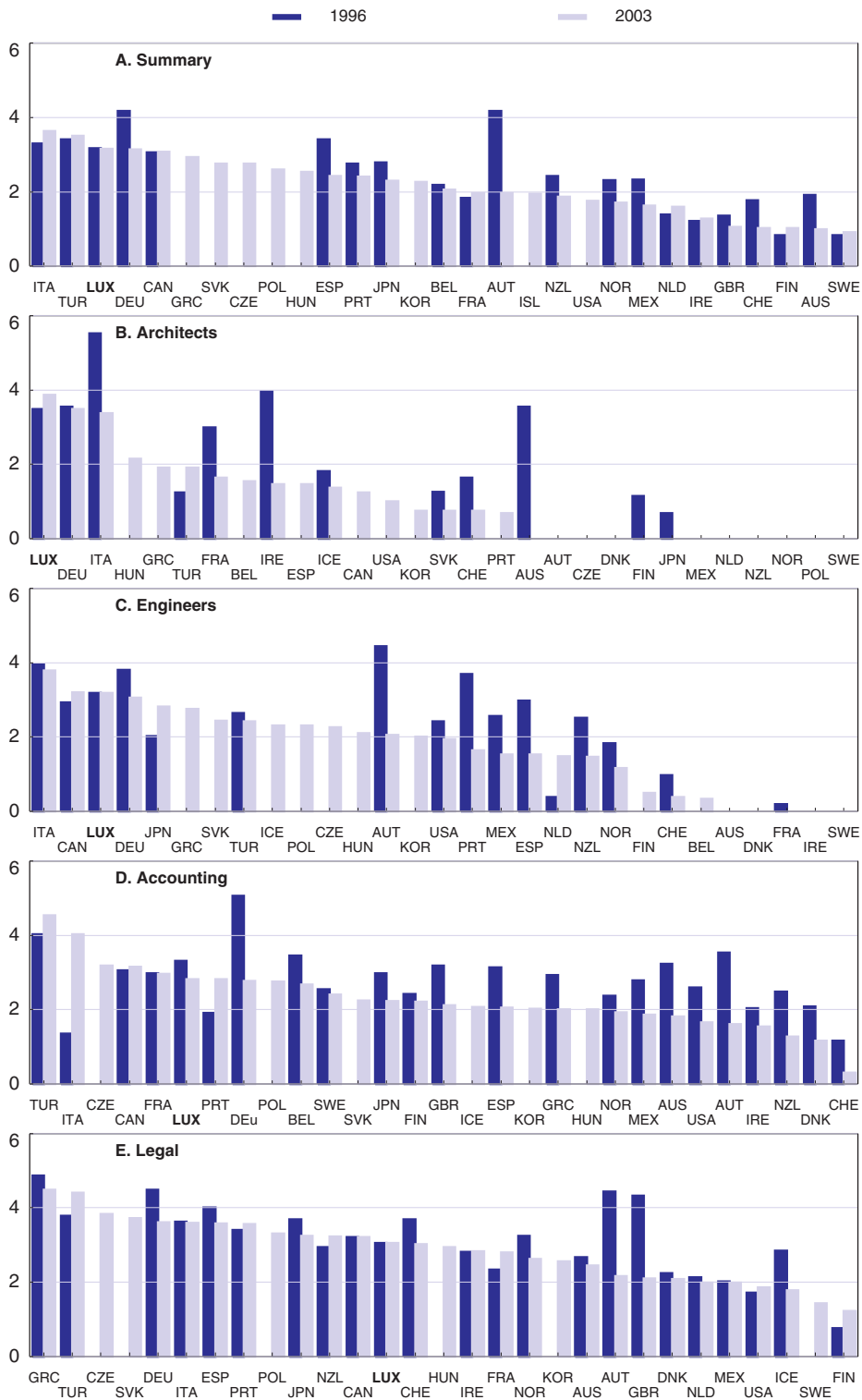
Source: OECD, STAN Database.

information asymmetry as consumers lack a high level of technical knowledge, making it difficult for them to judge the quality of the services being purchased. Moreover, many professional services may be regarded as credence goods as suppliers not only provide the service, but they also act as experts determining the customer’s requirements. Such advice is provided because consumers are unfamiliar with the good in question and there is an absence of repeated purchases (Emons, 2001). Regulation can also be of interest to take externalities into account as the provision of low-quality services might have an adverse effect on third parties. Also, certain professional services are deemed to produce public goods under the form of information provision on the proper functioning of markets, such as legal and accounting services.

Regulation in this sector contains significant elements of self-regulation, which can be in the interests of both consumers and the profession if it improves quality and prevents market failure. However, professional services are often subject to pervasive regulation hindering competition, which reduces incentives to work cost-efficiently, lower prices, increase quality and offer innovative services. The OECD indicator for benchmarking regulation of professional services shows that Luxembourg has a considerable scope to align its regulation in professional services and thus reverse the poor productivity developments. In 1996, Luxembourg ranked as the 6th most restrictive country for regulation on professional services according to the OECD summary indicator constructed for available countries (Figure 5.3) and as the 3rd most restrictive in 2003, reflecting unchanged regulation in Luxembourg while in almost all OECD countries this sector has been the focus of important reform efforts to ease unnecessarily strict regulation. The indicator has been calculated as the average of regulation in four professional services i.e., architects, engineers, accountants and legal professions; a more detailed description can be found in Annex 5.A2. Concerning regulation of each of these professions:

- Regulation for architects ranks as the strictest in a cross country comparison.

Figure 5.3. Indicators of regulation of professional services<sup>1</sup>



1. Sorted by 2003 values. The scale of indicators is 0-6 from least to more restrictive.

Source: Conway, P. and Nicoletti, G. (2006), "Product market regulation in the non-manufacturing sectors of OECD countries: measurement and highlights", *OECD Economics Department Working Papers*. Forthcoming.

- In the OECD, the profession of engineers is on average the least subject to regulation among the professional services analysed. However, regulation of engineers in Luxembourg is comparable to that for architects and is the sixth most restrictive on a cross-country basis.
- Of the four professional services discussed, the liberalisation effort in regulation for accountants in the OECD has been the largest between 1996 and 2003. The same is true for Luxembourg. Nevertheless, such regulation remains far above the OECD average, being the 6th most restrictive on a cross-country basis.
- Regulation of the legal profession is strict in Luxembourg, as in almost all OECD countries. The indicator value in Luxembourg is close to the OECD average.

The scope of regulation varies in different professions but generally includes two categories of regulation. First, structural or entry regulation contains licensing, education requirements and quotas and economic needs tests. Second, behavioural or conduct regulation looks at regulations on prices and fees, regulations on advertising, regulation on form of business and inter-professional business.

### **Reducing entry barriers**

Luxembourg has very restrictive regulations in the field of licensing and education requirements, especially for the accounting and legal professions, which have a high number of exclusive or shared exclusive rights to provide services. However, education requirements might be disproportionate to the complexity of the profession's tasks and paraprofessionals could be introduced to perform limited services with lower entry barriers. For example, conveyancing continues to be a reserved area<sup>2</sup> of activity for notaries while in some countries this monopoly was abolished, leading to lower prices without any apparent detriment to quality.<sup>3</sup>

In Luxembourg, architects and engineers have a high degree of licensing while in some other countries certification without or with only very limited exclusive tasks reserved to the professions is the standard model. Mechanisms exist that are less restrictive than licensing and nevertheless guarantee quality (Svorny, 1999). Certification enables consumers to orient their market decisions by reference to certified producers, but leaves open the option of purchasing from non-certified practitioners, especially where lower quality needs can be satisfied by such practitioners at a lower purchase price. Moreover introducing mechanisms of legal responsibility for architects and engineers could also function as a sufficient alternative to licensing. Finland is a good example for technical professions like architects and engineers where the quality of services may be guided by market mechanisms instead of extensive professional regulations without obvious sub-optimal outcomes or even a "breakdown" of the market due to adverse selection (Paterson, 2003, part 2 case studies: technical professions in Finland).

### **Reducing conduct regulation**

According to the OECD indicator on professional services, Luxembourg is very restrictive in the field of behavioural or conduct regulation. For architects and engineers, conduct regulation is respectively the most and 2nd most restrictive in the OECD (OECD, 2005b). Minimum prices for architectural and engineering services are often evaluated as the regulatory instruments that are likely to have the most detrimental effects on competition and on reducing the benefits that competitive markets deliver for consumers (European Commission, 2004). Less restrictive mechanisms than imposing minimum prices are

available without losing quality and protection for consumers. These mechanisms might consist of the publication of historical or survey-based price information by independent parties, like consumer organisations, which might provide a more trustworthy price guide for consumers and hence distort competition to a lesser extent.

In addition to a more liberal stance on regulation of prices and fees, advertising may play a role in the consumers' perception of the appropriate price level. In general, advertising facilitates competition by informing consumers about different products and allowing them to make more informed decisions. Advertising is allowed but regulated for all four professional services included in the OECD indicator in Luxembourg. For architects and engineers, however, there are no specific regulations on advertising in a majority of OECD countries. Restrictions increase the cost of gaining information to obtain the quality and price that best meets the consumer's needs. Moreover, advertising can be crucial for new firms to enter and hence quickly create goodwill and for existing firms to launch new products. Research suggests that under certain circumstances restrictions on advertising, in particular on advertising prices, may increase the fees without a positive effect on quality of services, which implies that advertising restrictions are not a remedy for asymmetric information (Stephen and Love, 2000). Truthful and objective advertising, which should be guaranteed by general legislation and preferably not by sector-specific regulation, may help consumers to make more informed purchasing decisions. For example, Danish lawyers are only subject to the Code of Good Conduct in which it is mainly stated that advertising and personal publicity must not contain incorrect, misleading or unreasonably faulty information. In Finland and Spain, advertising is allowed without restrictions for technical professions.

Currently, any form of inter-professional cooperation for lawyers is forbidden in Luxembourg, while restrictive regulation on inter-professional cooperation and on the form of business may hinder the development of new services or cost-efficient business models. More specifically, this inhibits the creation of integrated legal and accountancy advice for tax issues and prevents the creation of one-stop shops for professional services. Moreover, lawyers are subject to the restriction of having only one address, which prohibits the opening of branches, franchises or chains. Liberalisation from these restrictions could lead to a reduction in costs and lower prices for the clients, thanks to economies of scale. Moreover, architectural and engineering professions, which are less subject to the need to protect the practitioner's independence than is the case for lawyers, function effectively without regulations on the form of business in most EU member states. Hence, those restrictions which do not seem essential to protect consumers should be dropped.

### ***Allowing for more competition in network industries, in particular broadband access***

Cross-country evidence has shown that liberalisation policies and regulatory reform that introduced competition in network industries over the 1980s and 1990s have led to higher productivity, better quality and, often, lower prices (OECD, 2001). The effectiveness of the currently applied network policies to foster competition is a function of the independence of the sector regulators and conditions for network access. The independence of the Luxembourg sector regulator is relatively high on a cross-country comparison according to the Competition Law and Policy Indicator, which measures independence by means of the institutional design and the regulator's accountability and powers (Table 5.3). On the other hand, network access has been complicated by a high degree of vertical integration and to some extent entry restrictions.



Table 5.3. **Network policies**<sup>1</sup>

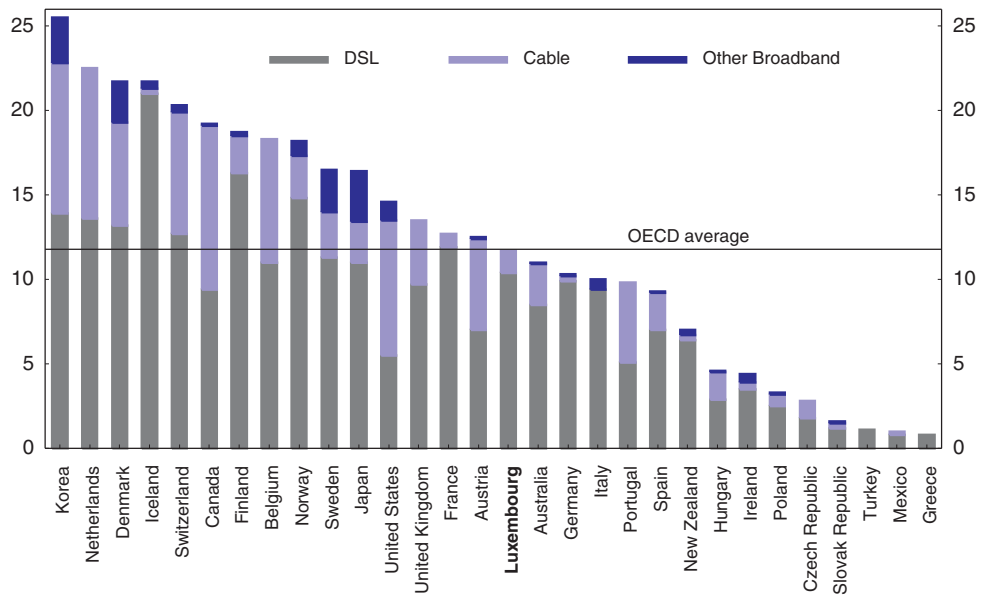
	Domain	Sub-domain	
	Network sector regulation	Network access	Independence of sector regulators
Australia	1.32	0.83	1.6
Austria	2.20	1.97	2.2
Belgium	2.07	2.15	1.9
Canada	2.16	2.28	1.7
Czech Republic	1.54	2.23	0.9
Denmark	1.68	0.81	2.2
Finland	2.14	2.44	1.8
France	1.99	2.60	1.3
Germany	2.87	1.77	3.4
Greece	2.32	3.21	1.7
Hungary	2.23	2.74	1.7
Iceland	2.73	0.39	4.4
Ireland	2.23	2.77	1.8
Italy	1.51	1.00	1.7
Japan	5.33	3.48	6.0
Korea	2.52	4.79	0.7
<b>Luxembourg</b>	<b>2.29</b>	<b>3.08</b>	<b>1.4</b>
Mexico	2.97	2.89	2.6
Netherlands	2.19	1.51	2.6
New Zealand	3.25	2.40	3.7
Norway	2.86	2.31	3.1
Poland	1.96	2.05	1.5
Portugal	1.70	2.23	1.6
Slovak Republic	3.99	2.30	4.9
Spain	2.10	2.25	1.9
Sweden	2.41	1.40	2.9
Switzerland	4.44	3.74	4.6
Turkey	2.95	3.89	2.1
United Kingdom	1.47	0.83	1.8
United States	1.57	2.39	0.8
Average	2.4	2.3	2.3

1. The scale of indicators is 0-6 from least to most restrictive.

Source: OECD, 2005b.

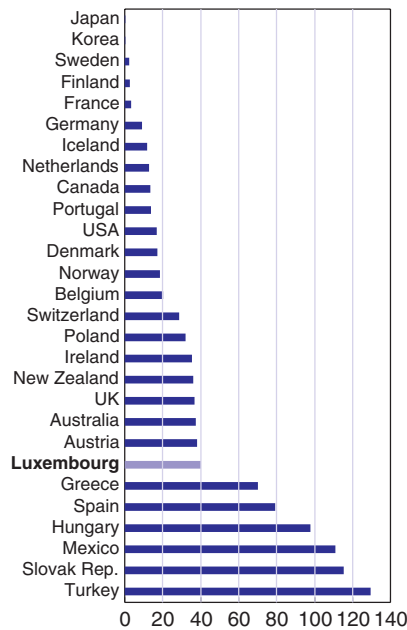
In recent years, the lack of competition in broadband internet access, due to a high degree of vertical integration of the incumbent telecommunications company and a lack of sufficient powers of the ILR, has been clearly identified and well documented. The situation has recently improved. The penetration of broadband internet access is now around the OECD average (Figure 5.4), even though it remains relatively low when compared with other high income countries. One of the major problems was the high connection prices to the local loop being charged by the incumbent. Although these prices were lowered in early-2005, monthly prices of full unbundled loop and shared access remain higher than in neighbouring countries, as reflected in the high broadband price per Megabit (Figure 5.5). Moreover, bit stream access remained extremely restrained, due to a lack of investment in adequate equipment. Reflecting these remaining hurdles, the incumbent company continues to hold a dominant market share of around 75% of fixed broadband retail lines.<sup>4</sup> Finally, competition in the cable operator market may be hampered by the fact that the incumbent telecommunications company owns equity in one cable company established in Luxembourg.

Figure 5.4. **Broadband subscribers per 100 inhabitants, June 2005**



Source: OECD Communications Outlook database.

Figure 5.5. **Broadband prices per Mbit, September 2005**  
USD, PPP



Source: OECD Broadband Statistics, 2005.

To some extent, the slow progress in reducing connection prices to the local loop reflects the late transposition by Luxembourg of the EU telecommunication policy framework, which enables regulatory authorities to request from the incumbent the type of information needed to conduct proper pricing and market analyses.<sup>5</sup> However, the ILR has so far not imposed meaningful sanctions that would punish operators for prolonged failure to conform to its decisions. This is in part due to the fact that no agency has been assigned the task of collecting such fines (European Commission, 2006). Overall, so as to lower access prices and raise broadband access, the regulator should compel the incumbent operator to open access to its local loop at prices reflecting marginal costs and require that it divests its cross-holdings in cable internet services.

Luxembourg is still in the process of liberalising its *electricity and natural gas* markets. The corresponding EU directives have not yet been transposed into national law, a non-observance that the European Commission has referred to the European Court of Justice. Nonetheless, initial market opening has started, with the freedom since July 2004 for non-residential users to choose their suppliers, and the authorities intend to fully liberalise the market by 1 July 2007. Further market opening is unlikely to harm domestic electricity producers, since imported electricity already represents more than 90% of total consumption. Also, using imports to meet rising electricity demand in the future would reduce growth in the amounts of Greenhouse Gases (GHG) produced by Luxembourg, making it easier to comply with the burden sharing target for EU implementation of the Kyoto protocol (see Box 5.1). The government recently announced that it would encourage direct connection of the Luxembourg electricity network with all three of the networks in the neighbouring countries (presently, there are only direct connections to the networks in Germany and Belgium) and interconnection among these networks (Luxembourg Government, 2006a).

Despite initial liberalisation measures, electricity prices remain above the European average, especially for smaller industrial and domestic consumers (Table 5.4). This appears

**Table 5.4. Pre-tax electricity prices in Europe**

In euro cents per kilowatt hour (kWh), 1 July 2005<sup>1</sup>

	Industrial consumers			Domestic consumers	
	Small	Medium	Large	Small	Large
Belgium	11.6	7.5	5.6	11.0	7.5
Denmark	7.6	6.5	..	9.6	8.1
France	..	5.3	..	9.1	..
Germany	16.8	8.1	7.0	13.5	7.6
<b>Luxembourg<sup>2</sup></b>	<b>16.0</b>	<b>7.0</b>	<b>3.9</b>	<b>13.1</b>	<b>7.8</b>
Netherlands	11.0	8.1	5.3	11.1	7.1
Norway	6.7	5.5	3.5	11.8	6.5
Sweden	7.0	5.4	4.5	8.1	6.5
United Kingdom	7.7	6.4	4.8	8.8	5.7
Unweighted average					
EU 15	10.8	6.9	5.3	10.5	6.9
Liberalised markets <sup>3</sup>	7.0	5.8	4.2	9.2	6.3

1. 1 January 2005 for France; 1 July 2004 for industrial consumers in Luxembourg. The level of consumption is based on an annual rate of 30, 2 000 and 70 000 MWh for industrial consumers, 3 500 and 20 000 kWh for domestic consumers.

2. Fifty per cent power reduction during hours of heavy loading for industrial consumers.

3. Nordic countries and the United Kingdom.

Source: Eurostat database, November 2005.

### Box 5.1. Sustainable Development: aiming for cost-effectiveness

Under the EU agreement for the implementation of the Kyoto protocol target, Luxembourg has agreed to cut its Greenhouse Gas (GHG) emissions by 28% by 2008-2012. During the nineties, total emissions fell by more than 25% mainly due to one-off structural changes in the industrial sector, with the steel industry replacing coal-fired blast furnaces by more efficient electric arc processes. In recent years, however, transport-related emissions and the construction of a power plant have brought total emissions in 2004 back to the level of 1990 and official business-as-usual projections imply that the burden-sharing target for 2008-2012 is expected to be missed by more than 40%. Luxembourg participates in the EU-wide trading scheme for large emitters in 2005-2007. Furthermore, it plans to purchase emission trading under the Kyoto's flexible project-based instruments Clean Development Mechanism and Joint Implementation; as such, Luxembourg plans to participate in projects in El Salvador, Chile and Russia.<sup>1</sup>

A range of policy measures has been introduced in order to limit emissions. Energy-efficiency will be promoted by means of financial incentives for fuel-efficient vehicles and for both existing and newly constructed homes and commercial premises (Luxembourg Government, 2006b). From 1 January 2007, motor vehicles will be taxed according to their CO<sub>2</sub> emissions, instead of their horsepower, as occurs presently. For hybrid cars, taxation will remain at around current levels whereas for cars with high emissions, there will be a substantial increase in taxation.<sup>2</sup> The government will continue to encourage a shift in the modal split between individual and public transport, with the aim of doubling the share of the latter to 25% by 2020. Thermal insulation regulations for new buildings will be stricter from the beginning of 2007: the new regulations will be close to the standards for low-energy houses. For existing houses, the government may offer grants rising to € 1500 per tonne of carbon abated (with a 50% limit of the investment costs). Support for energy produced from renewable sources and co-generation has been provided by different programmes. As the scale of support is very different across suppliers, abatement costs differ significantly and give rise to significant inefficiencies. The premium paid for electricity from renewable energy supplied to the national grid varies from € 0.025 per kilowatt-hour to € 0.56 per kilowatt-hour,<sup>3</sup> resulting in costs per tonne of saved carbon emissions ranging from € 109 for most sources to € 2 445 for photovoltaic electricity.<sup>4</sup> In addition, the government gives grants for the initial investment costs for renewable energy, which may rise to 15% in the case of photovoltaic energy with a limit of € 900 per kilowatt-crest.

A significant abatement effort is required to attain the EU burden-sharing target domestically, and the pursuit of cost-effectiveness is therefore necessary to avoid excessively harming economic activity. This would require abatement effort to be concentrated in activities where emissions can be cut at a lower cost and hence the termination of some high-cost programmes. Two benchmarks are currently available: Kyoto permits might be available and are estimated at a price of around € 5 per tonne of CO<sub>2</sub> (OECD, 2004), and the permits under the European emissions trading system for enterprises, which are not allowed to tap into the supply of Kyoto permits, were trading according to the International Emissions Trading Association (IETA) at € 27 at the beginning of March 2006 against an average of € 17 in 2005.<sup>5</sup> The government recently announced the introduction of a "special Kyoto contribution", which takes the form of an increase in excise taxes on road fuels that will be used to finance the purchase of Kyoto permits and related national measures to reduce CO<sub>2</sub> emissions (Luxembourg Government, 2006b).

1. Pressekonferenz vom Umweltminister Lucien Lux: "Nationale Klimaschutzstrategie".
2. For example, the tax on a car that emits 260kg of CO<sub>2</sub> per kilometre will rise from € 126 presently to € 526.
3. Under the law of 3 August 2005, suppliers of renewable energy to the national grid may receive a premium of euro 0.025 per kWh. Suppliers of renewable energy other than photovoltaic are eligible under the law of 23 August 2005 to receive a reward of between € 0.0541 and € 0.0776 per kWh. For photovoltaic generated electricity, suppliers may receive up to € 0.56 per kWh.
4. For this estimate, the marginal alternative fuel source being replaced is coal for domestic heating. According to Sims *et al.* (2003), such use of coal generates an emission of 229 grams per kWh. This implies 4 367 kWh per tonne of carbon emissions. A subsidy of € 0.56 per kWh then results in an abatement cost per tonne of carbon emissions of € 2 445.
5. [www.ieta.org/](http://www.ieta.org/).

to reflect existing hurdles for market entrants to access the transmission and distribution networks at reasonable prices. Currently, network tariffs are proposed by the companies themselves for approval by the Minister. However, given that the major energy company is partly owned by the public authorities,<sup>6</sup> there is scope to enhance the role of the regulator, which is currently restricted to an advisory role. Also, network access would be facilitated if the ownership of the transmission and distribution electricity systems were separated, rather than being subject only to legal separation, as currently.

### Fostering productivity in the retail trade

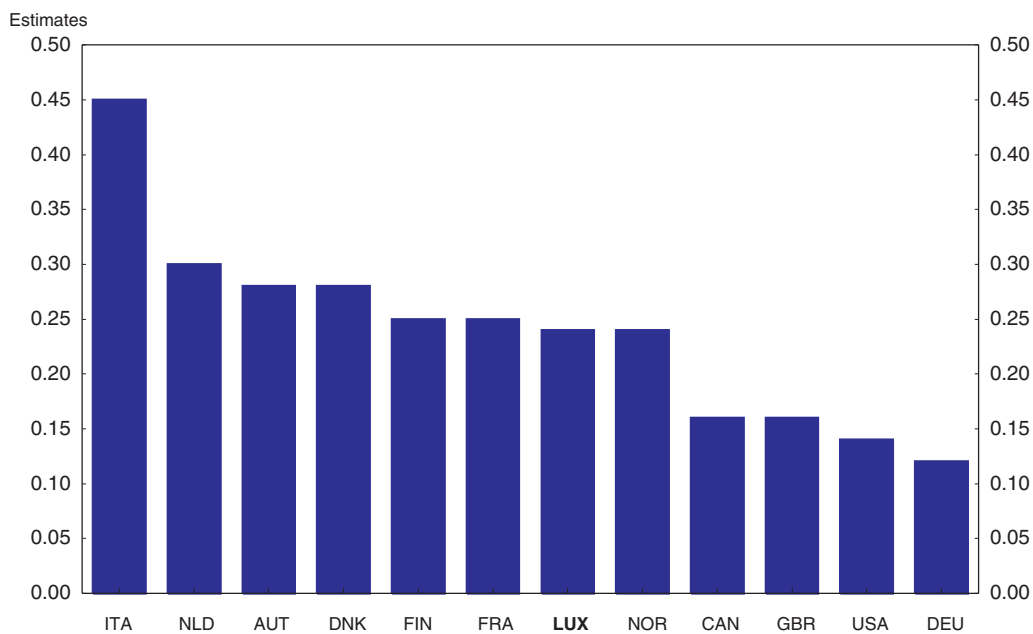
Productivity growth in the distribution sector, which consists of retail and wholesale trade and is a major ICT-using sector, explains half of the economy-wide shortfall in productivity growth of the EU *vis-à-vis* the United States (Conference Board, 2005). In the United States, productivity growth was spurred by more productive establishments displacing less productive ones (Foster *et al.*, 2002). These new, more productive stores tended to be “big box” establishments that took full advantage of the benefits of ICT; for instance, linking barcodes to ICT (Electronic Data Interchange) has resulted in more efficient use of shelf space, trucking and shipping and reduced inventory (Conference Board, 2005). Although ICT is a “general purpose” technology that is readily available in worldwide markets, only a limited number of OECD countries have been reaping its significant potential benefits to the full. This hints at the potential role of policy and institutional factors in explaining the differing abilities of countries to integrate ICT into the production process.

In many countries, the retail distribution sector benefits from economies of scale and scope, which is apparent in the ongoing process of structural change involving larger shopping centres, consolidation in retail chains and greater concentration and vertical integration. In Luxembourg, however, these developments were partially halted by the introduction of a moratorium on the authorisation of large shopping centres in 1997, which expired on 30 November 2005. This ban was imposed after successful lobbying by incumbent companies, who were confronted by a first wave of new large shopping centres in the mid-nineties. Given the relatively high purchasing power of the Luxembourg population and cross-border workers and the small distances to borders of neighbouring countries, the opening of new large shopping centres has been observed in neighbouring areas during this eight-year period.

Indirect indicators of the intensity of product market competition in the retail distribution sector indicate an average position in a cross-country comparison, with further room for improvement. The profit mark-up in the retail and wholesale sector, which is an indicator of competition intensity, is comparable to that of France and other European countries, but almost double that of countries with a highly competitive retail trade sector like the United Kingdom and the United States (Figure 5.6). Likewise, the relatively low density of outlets and the average size of shops (as measured by the number of employees per enterprise) (Table 5.5) suggest that the retail sector has been experiencing a certain level of competition, but could become more concentrated. Overall, a greater degree of competition could have beneficial effects - including higher consumer welfare through increased diversity and lower prices.

The abolition of the moratorium should lead to greater entry of major retail outlets, increasing productivity growth in Luxembourg. However, institutional and regulatory

Figure 5.6. **Mark-ups in retail and wholesale in selected OECD countries**  
Average mark-ups 1975-2002



Source: OECD STAN database.

Table 5.5. **Key structural features of the retail distribution sector**  
2002-2003

	Outlet density <sup>1</sup>	Employees per enterprise
Austria	52	7.5
Belgium	74	4.0
Czech Republic	137	3.0
Denmark	45	8.4
Finland	44	5.7
France	70	4.1
Germany	30	9.9
Hungary	114	3.0
Ireland	47	8.7
Italy	124	2.5
<b>Luxembourg</b>	<b>60</b>	<b>6.6</b>
Netherlands	49	8.9
Norway	65	6.3
Poland	113	3.0
Portugal	138	2.6
Slovak Republic	9	15.0
Spain	125	3.1
Sweden	64	4.5
United Kingdom	43	15.4
European Union	73	4.4

1. Number of enterprises per 10 000 inhabitants.

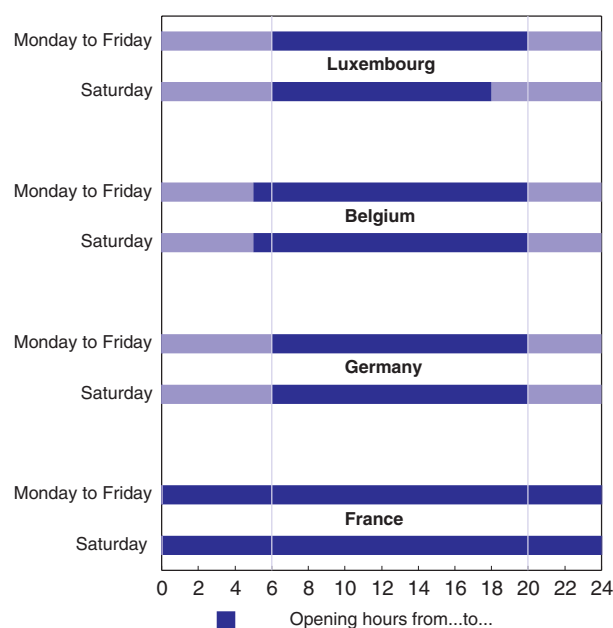
Source: Eurostat, New Cronos.

features that remain in place may hinder such entry. Government authorisation is still subject to whether a new outlet is likely to induce an economic imbalance in the local market. It is often claimed that there is a cost for consumers of entry of large retail outlets owing to the decline of traditional retailing, which offers specialisation or location convenience. However, evidence seems to suggest that small shops still survive because consumers are willing to pay a premium for their services (Dobson and Waterson, 1999). Furthermore, granting planning permission for large retail outlets may suffer from the fact that municipalities have to draw up zoning plans and that these are more subject to pressure from incumbents. The scarcity of land made available to the distribution sector was identified as one of the major problems discouraging new operators from entering the market. This could hamper large-scale operators from developing new sites or expanding existing ones and limit their ability to realize their potential. Indeed, scarcity of land has been identified by a recent extensive stocktaking exercise by the UEL (*Union des Entreprises Luxembourgeoises*) in collaboration with SYVICOL (*Syndicat des villes et communes Luxembourgeoises*) as an important impediment for further development of all business activities (UEL, 2005).

Another important remaining restriction affecting operations in the retail sector is related to shop opening hours. There are three main channels through which restrictions on shop opening hours can limit incentives to introduce new innovative retail formats, and thus enhance productivity (Conference Board, 2005). The first and most straightforward reason is that there is decreased shopping as some items are not purchased due to the lack of time for consumers, especially for cross-border workers. Second, benefits related to large stores decline, like time-saving for consumers. Third, the consumer will prefer nearby shops instead of taking the risk of arriving late due to traffic jams at a more distant large retail outlet. Currently, shop opening hours in Luxembourg are more restrictive than those

Figure 5.7. **Shop opening hours**

In hours



Source: KPMG (2004), OECD.

of the three neighbouring countries, which are important benchmarks given the relatively small distance for most Luxembourg consumers to the border (Figure 5.7). More specifically, shop opening hours are more restrictive than in France on every working day and more restrictive than in all three neighbouring countries on Saturday. Some relaxation<sup>7</sup> has been allowed in recent years but this has to be decided upon every year and is subject to a yearly evaluation. According to a survey,<sup>8</sup> consumers, especially young people living in a city and foreigners, were in favour of longer shop opening hours on Saturday.

**Box 5.2. Policy recommendations to intensify product market competition to boost productivity**

**Strengthen enforcement capabilities of the competition authorities**

- Improve the scope of law and enforcement of the Competition Council and Inspectorate by broadening the field of competences beyond abuse of dominance and restrictive agreements.
- Improve enforcement by the Competition authorities by increasing resources, including by outsourcing, and consider increasing the deterrent effect of sanctions by including criminal liability and possible incarceration of individuals.

**Ease regulation on professional services**

- Reduce excessive licensing and consider mechanisms like certification and the use of paraprofessionals as alternatives.
- Abolish minimum prices for architects and engineers as well as regulation on advertising to facilitate consumers' perceptions of the appropriate price level.
- Liberalise rules governing the form of business and inter-professional co-operation, so that they do not hinder the development of new services and cost-efficient business models.

**Enhance competition in broadband internet access**

- To lower internet prices and raise access, barriers to competition in broadband services should be reduced by imposing lower access charges to the local loop and by forcing the incumbent telecom company to withdraw from the market for cable internet services.
- Enhance the role of the ILR from advisory to decision-making on setting unbundled cost-based tariffs for the use of the electricity networks.

**Enhance competition in retail trade by reducing regulatory barriers**

- Monitor the land-use policies of municipalities more closely to ensure that these are not unduly responsive to incumbent's interests.

Consider further relaxing the rules on shop opening hours to levels comparable to those in the most liberal neighbouring countries.

**Notes**

1. Articles 3-5 of the Competition Law of 4 May, 2004 largely coincide with articles 81 and 82 of the European Treaty.
2. There are exceptions to this monopoly as some public legal entities (*personnes de droit public*) can register mortgages (*actes hypothécaires*, *Banque et Caisse d'Épargne de l'État*) or land title transfers



(l'État, communes, Société nationale des chemins de fer, Fonds du logement). Source: Conseil de la Concurrence (2005).

3. Baker (1996) reported a fall in conveyancing fees of 17% in New South Wales in Australia in the early 1990s resulting from an opening up of the legal market to non-lawyers with appropriate qualifications, and Domberger and Sherr (1995) found that an end to lawyers' monopoly on conveyancing led to a 33% reduction in fees in England and in Wales. OECD (2004) reported that in the Netherlands the abolition of entry restrictions for real estate agents has led to an increase in new entrants, lower prices for real estate transactions and more flexible provision of services.
4. The incumbent DSL operator has a market share of 76% of the fixed broadband retail market (by number of lines). DSL represents 89% of this fixed broadband market, of which the incumbent has 84%, with the rest being taken up by one large and a few smaller operators. Source: EC (2006).
5. A new telecommunication law ("Paquet Télécom") was introduced on 7 June 2005 following a decision by the European Court of Justice to condemn Luxembourg for its failure to ensure timely transposition.
6. The Luxembourg state has a direct 33% share in the CEGEDEL S.A. and an indirect share of 12% via the Société nationale de crédit et d'investissement (SNCI). CEGEDEL S.A. holds 100% in CEGEDEL NET.
7. Shop opening hours have been extended from 18:00 to 20:00 on a limited number of days like the days before public holidays (*vielle de jour férié*) and some Saturdays during the month of December. In 2005, 11 days were subject to this relaxation.
8. ILRES market research conducted a survey of 1 000 consumers.

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## ANNEX 5.A1

*The indicator of regulation in professional services*

The indicator of regulation in professional services summarises regulatory conditions in this sector. The professional services indicators have been estimated for 1996 and 2003 and cover entry and conduct regulations in the legal, accounting, engineering, and architectural professions. These indicators are based on the methodology developed by Paterson *et al.*, (2003). The professional services indicator has been constructed using regulatory data from the OECD International Regulation database. The primary sources of these data are the answers of member countries to two waves of the *OECD Regulatory Indicators Questionnaire*. In addition, data from an OECD publication – OECD (1996), *International Trade in Professional Services*, OECD, Paris – were used to construct the 1996 observation of the professional services indicator.

The regulatory coverage of the retail and professional services indicators reflects both data availability and relevance. The data and method used to construct these two indicators are summarised in Figure 5.A1.1. The regulatory indicator for each of the four professions is the simple average of the indicators of entry and conduct regulation. The

Figure 5.A1.1. **The indicators of regulation in Professional services**

Panel A: Entry regulation

	Weights by theme (b <sub>j</sub> )	Question weights (c <sub>k</sub> )	Coding of data				
			0	1	2	3	>3
<b>Licensing:</b>	2/5		0	1	2	3	>3
How many services does the profession have an exclusive or shared exclusive right to provide?		1	0	1.5	3	4.5	6
<b>Education requirements (only applies if Licensing not 0):</b>	2/5						
What is the duration of special education/university/or other higher degree?		1/3	equals number of years of education (max of 6)				
What is the duration of compulsory practise necessary to become a full member of the profession?		1/3	equals number of years of compulsory practise (max of 6)				
What is the number of professional exams that must be passed to become a full member of the profession?		1/3	equals the number of professional exams * 2 (max of 6)				
<b>Quotas and economic needs tests</b>	1/5						
Is the number of foreign professionals/firms permitted to practice restricted by quotas or economic needs tests?		1	no			yes	
			0			6	
<b>Country scores (0-6)</b>			$\sum_j b_j \sum_k c_k \text{answer}_{jk}$				

Panel B: Conduct regulation

	Weights by theme (b) <sup>1</sup>	Question weights (c) <sub>k</sub>	Coding of data						
			no regulation	non-binding recommended prices on some services	non-binding recommended prices on all services	maximum prices on some services	maximum prices on all services	minimum prices on some services	minimum prices on all services
<b>Regulations on prices and fees</b>	0.38								
Are the fees or prices that a profession charges regulated in any way (by government or self-regulated)?		1	0	1	2	3	4	5	6
<b>Regulations on advertising</b>	0.23								
Is advertising and marketing by the profession regulated in any way?		1	no specific regulations		advertising is regulated		advertising is prohibited		
			0		3			6	
<b>Regulation on form of business</b>	0.19								
Is the legal form of business restricted to a particular type?		1	no restrictions	partnership and some incorporation allowed	incorporation forbidden	sole practitioner only			
			0	2	5	6			
<b>Inter-professional cooperation</b>	0.19								
Is cooperation between professionals restricted?		1	all forms allowed	generally allowed	only allowed with comparable professions	generally forbidden			
			0	3	4.5	6			
<b>Country scores (0-6)</b>			€ <sub>b</sub> , € <sub>c</sub> , answer <sub>k</sub>						

Source: OECD (2005), *Product Market Regulation and Productivity Growth*, ECO/CPE/WP1(2005)16/ANN2.

overall indicator of regulatory conditions in professional services in each country is the simple average of the indicators for each profession.

## ANNEX 5.A2

*The competition law and policy indicator system*

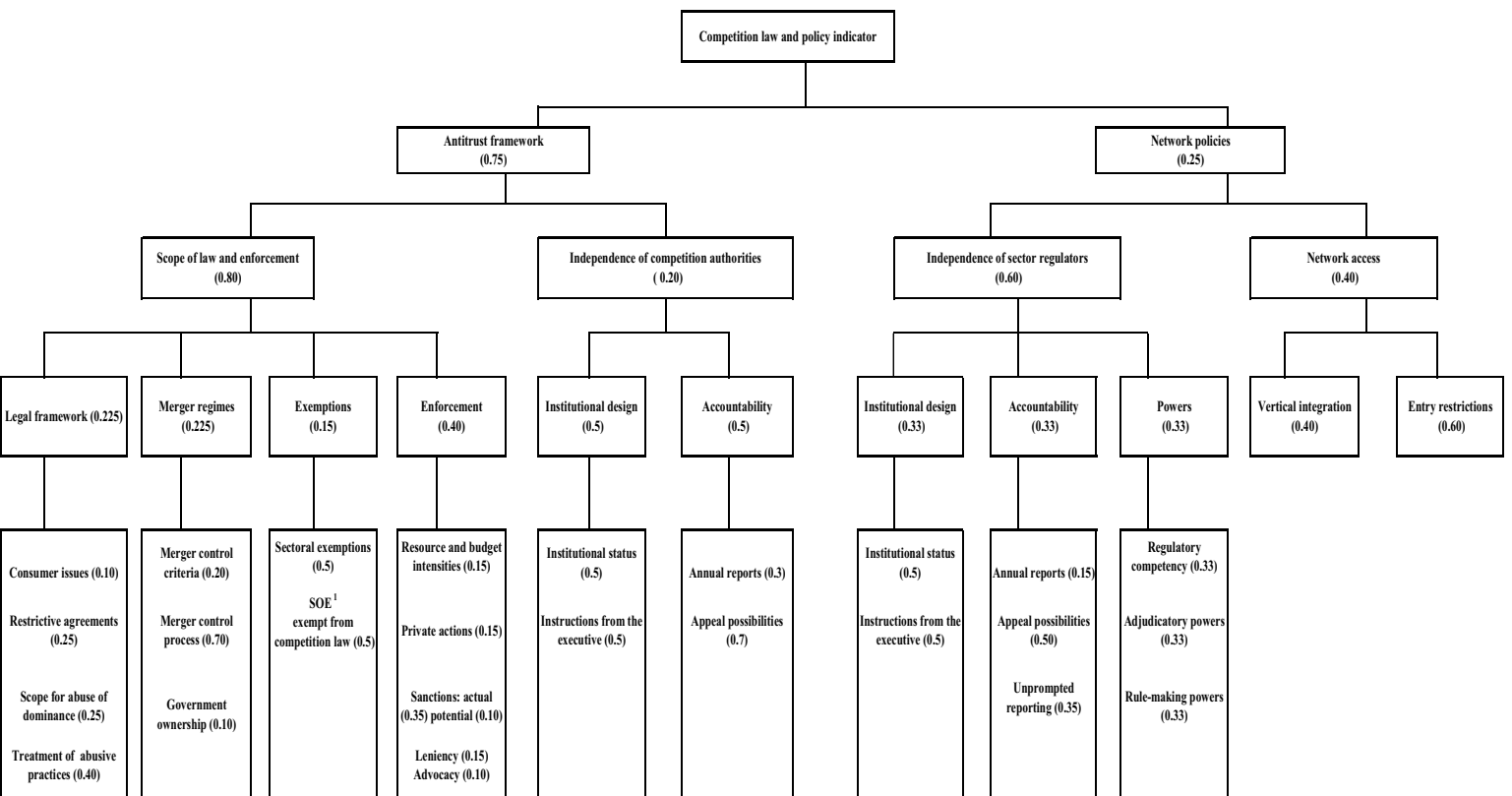
The indicator is an extension of previous OECD work on constructing more general product market regulation (PMR) indicators (Conway *et al.*, 2005). While the latter aim at measuring restrictions to competition due to inappropriate regulations (*e.g.*, on entry or business activities), the Competition Law and Policy (CLP) indicator focuses on policies aimed at promoting competition (*e.g.*, antitrust or access to networks). Thus, the PMR and CLP indicators are broadly distinct and complementary. The CLP indicator was constructed in close cooperation with the Directorate for Financial and Enterprise Affairs (DAF).

The indicator system is built as a pyramid with three layers (Figure 5.A2.1). The bottom layer summarises the basic information into 11 low-level indicators. These, in turn, are aggregated into four middle-level indicators, covering i) the scope and enforcement of antitrust law; ii) the degree of independence of competition authorities; iii) the degree of independence of sector regulators and iv) restrictions to access in network industries. These mid-level indicators feed into the two main sub-indicators of the antitrust framework and network policies. Aggregation of these two indicators yields the top-level indicator of Competition Law and Policy. Each of the lower-level indicators captures specific and clearly identifiable competition policy features.

The construction of the indicator begins by assigning values on a scale 0-6 from best to worst performance for each of the basic data points. Qualitative information (such as presence or absence of an exemption to antitrust law) is coded accordingly and the quantitative information (such as resources devoted to enforcement) is assigned a value using a system of thresholds. The coded information is then aggregated into the 11 low-level indicators using subjective weights. Using a similar weighting system, the low-level indicators are subsequently aggregated into mid- and top-level indicators. Figure 5.A2.1 shows the weights used in the aggregation. Thus, the value of the top level indicator can be traced to the value of lower-level indicators, further down the pyramid, to specific data points in the databases.\*

\* The work here follows closely the methods applied in the construction of the OECD's Product Market Regulation indicator; see Conway *et al.* (2005).

Figure 5.A2.1. The Competition Law and Policy indicator system



1. State Owned Enterprises

Source: OECD (2005), Product Market Competition in OECD Countries: a Synthesis, ECO/CPE/WP1(2005)17/ANN3.

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