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Luxembourg: Selected Issues

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LUXEMBOURG

Selected Issues

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Approved by the European Department

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Contents — Page

Overview ... 2
I. The Welfare System in International Comparison ... 3
A. Pillars of Public Income Support ... 3
B. Social Spending in International Context ... 4
II. Income Support and Employment ... 8
A. Unemployment Is Becoming Structural ... 8
B. Labor Force Participation and Early Retirement ... 10
III. Preserving the Sustainability of the Pension System ... 13
A. Policy Options ... 13
B. Strengthening the Assets of the Pension Fund ... 15
References ... 21

Box
III. 1. Luxembourg's Pension Fund ... 20

Figures
I. 1. Social Expenditures in Luxembourg, 1994-2002 ... 6
2. Benefit Replacement Rates ... 7
II. 1. Labor Market Indicators ... 9
2. Labor Market Participation ... 11
III. 1. Employment, Growth and Taxes ... 14
2. Pension Fund Projections – Scenario 1 ... 18
3. Pension Fund Projections – Scenario 2 ... 19

Tables
I. 1. Social Income Support Schemes ... 3
III. 1. Economic Assumptions, 2005-50 ... 16
2. Simulation Results—Supplementary Public Transfer to Achieve Actuarial Balance ... 17

OVERVIEW [1]

1. **Luxembourg has the most generous welfare system in Europe.** Social expenditures in per capita terms, even adjusted for the large number of cross-border workers, rank highest among European Union (EU) countries, primarily driven by high replacement rates of public income support, including for unemployment benefits, the minimum guaranteed income, and pensions.

2. **Exemplary high growth rates and prudent fiscal policies provided the financial basis for the welfare system.** Real growth averaged 5 percent per year during the "golden 1980s and 1990s," underpinning an annual average budget surplus of 2 percent of GDP. Consequently, net financial assets of the public sector peaked at 45 percent of GDP in 2001.

3. **High social spending commitments have tied the sustainability of the welfare system to a favorable long-term economic outlook.** Of potential concern is that Luxembourg's dominant financial sector is maturing—average real GDP growth this decade has slowed to 3 percent per annum—possibly marking a transition to lower trend growth. This study aims to provide further analytical underpinnings to the main policy recommendations of the Staff Report for the 2006 Article IV Consultation with Luxembourg:

- to increase old-age labor force participation by better linking benefit replacement ratios to the actual retirement age and through tighter access to early retirement programs;

- to reduce structural unemployment by more closely aligning income support to domestic job seekers with social benefits in neighboring countries, by making access to unemployment benefits for the young dependent on prior work experience, and by addressing skill mismatches through effective on-the job training; and

- to address an emerging funding gap of the pension system through pension benefit reforms to forestall harmful increases in contribution rates. Short of reforms sufficient to close the funding gap, increasing the assets of the pension fund—financed through savings in other areas of social spending—could serve as a complementary strategy to generate the income needed to fund future pension liabilities.

4. **This paper is divided into three chapters.** Chapter I provides an overview of Luxembourg's income support system and benchmarks existing entitlements against benefits in comparator countries. Chapter II examines the impact of the social system on unemployment and labor force participation. Chapter III discusses emerging vulnerabilities in the pension system and discusses policy options.

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[1] Prepared by Jürgen Odenius, Stephan Danninger, and Erik Lundback.

I. THE WELFARE SYSTEM IN INTERNATIONAL COMPARISON[2]

5. **This section gives a brief overview of the public income support system and assesses benefit levels from an international perspective.** The main elements of Luxembourg's social welfare system are old-age pension benefits, unemployed assistance, a guaranteed minimum income scheme, and various family benefits (Table 1). Together they account for roughly two-thirds of overall social spending, with the remainder going to health and long-term care.[3]

Table 1. Luxembourg: Social Income Support Schemes

	Eligibility	Financing	Benefit Level	Benefit Adjustment
Minimum guaranteed income	Residents (> 25 years old)	General revenue pool	€ 1,070 per month for single person, € 1,606 for a two member household	Automatic adjustment for consumer prices (2.5 percent trigger level) and for wage developments (every two years)
Unemployment insurance	Residents	Excise surcharge on petroleum, special income tax, and budget transfers	80 percent of last income with caps and minimum floor	
Public pensions	Residents and commuters	8 percent on gross wages from employer, employee, and government	Sum of fixed and contribution linked component	

Source: Social Security Administration.

A. Pillars of Public Income Support

6. **The bottom layer of the welfare system is a minimum guaranteed income (MGI) scheme.** It is a safety net for all residents unable to take on gainful employment. The MGI provides basic income—currently €1,070 per month for a single person—and varies by social need. Benefits are automatically indexed to consumer prices and aligned with wage growth based on a discretionary review undertaken every other year. The MGI is fully financed from general revenue. In 2004, the number of beneficiaries represented 6 percent of the resident labor force, up 40 percent since 2002.[4]

7. **The second layer of income support is unemployment benefits.** Similar to the MGI, eligibility is limited to residents and thus excludes non-resident employees (cross-border workers). The unemployment fund is primarily financed through a surcharge on

[2] Prepared by Stephan Danninger.

[3] Although health, long-term care, and related benefits are important elements of social spending, this paper does not address these issues.

[4] IGSS (2004) Rapport Général sur la Sécurité Sociale au Grand-Duché de Luxembourg.

petroleum consumption. Participants qualify after six months of registration and receive benefits for up to one year, although extensions of another 12 months are possible for workers older than 50 years. Benefits amount to 80 percent of last income, with a floor at 80 percent of the MGI and a cap for high-income earners. In tandem with the MGI, unemployment benefits are indexed to inflation and adjusted for wage growth. At end-2005, 4½ percent of the resident labor force was registered as unemployed and received benefits under the scheme. Unemployment recipients can transfer to the MGI program, if they meet eligibility criteria, at the end of the insurance period.

8. **The public pension system represents the third layer of public income support.** It comprises old age, invalidity, and survivor pensions. The pension system relies on mandatory participation and covers all workers employed in Luxembourg, including the fast-growing segment of cross-border employees. The statutory retirement age is 65 years, but retirement at an earlier age is common, given eligibility criteria.[5] In 2004, the actual retirement age was 59.3 years on average, lower than in most European countries.

9. **The public pension system operates as a pay-as-you-go system.** Pension benefits comprise a number of fixed benefit components and a component reflecting past contributions. Just as the MGI, pension benefits are adjusted to inflation and wage developments. The pension system is one-third publicly funded and two-thirds financed from wage contributions. Employers and employees each pay contributions of 8 percent on gross wages; another 8 percent comes from the public sector in the form of a transfer. The funding formula is revisited every seven years, based on an actuarial study of the pension system.[6] Contribution rates, by law, are adjusted only if the pension system becomes underfunded over the next seven years, leaving the system vulnerable to long-term developments.

10. **The pension fund was consistently in surplus over the last decade.** By end-2005, the fund accumulated assets worth 23 percent of GDP. The primary reason for the fund's strong financial position is the low dependency ratio of beneficiaries over pension insurance participants (41 percent in 2004). In large part, this stems from the rapid increase in mostly young cross-border workers during the 1990s; cross-border employment represented more than half of the domestic labor force in 2005.

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[5] Retirement prior to age 65 is permissible, if a person has at least 480 months of mandatory or voluntary insurance at age 60, or 480 months of mandatory insurance at age 57.

[6] The latest actuarial study was published in 2005.

B. Social Spending in International Context

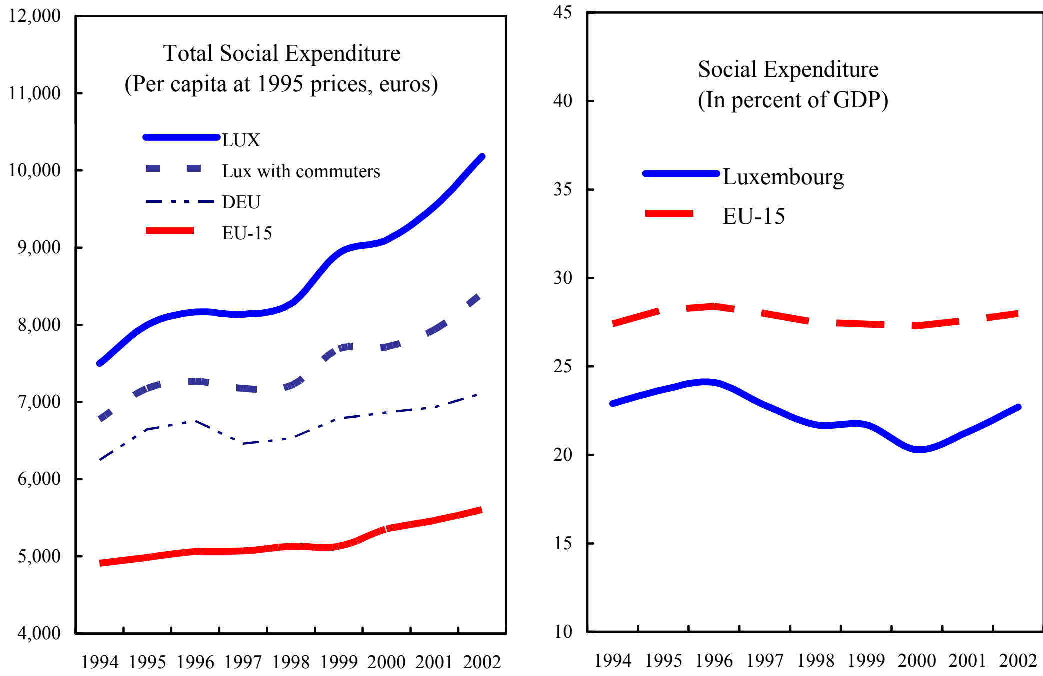
11. **Luxembourg has the most generous welfare system in Europe.** Social spending in 2002—the most recent year with internationally comparable data—was roughly twice as high as in the EU-15 (Figure 1, top panel). At 1995 price levels, Luxembourg spent about €10,000 per resident compared to about €7,000 in both Germany and France. This discrepancy is in part due to the large number of cross-border employees, who are not included in the resident concept. But even after adjusting for these workers, the per-capita measure for social spending in Luxembourg is still 50 percent above the EU-15 average. Spending pressures are largely related to the introduction of a long-term-care insurance scheme in 1998 and a significant increase of the MGI in 2002.

12. **Luxembourg's generous benefit system is the result of its economic success.** The economic boom of the golden 1980s and 1990s provided the wherewithal for a sharp increase in social spending starting in the mid-1990s. Nevertheless, the share of social spending in GDP remained below the EU-15 average by about 5 percentage points until 2002. Relatively low unemployment, the exclusion of cross-border employees from some benefits, including the MGI and unemployment benefits, and the beneficial effect of the young labor force on pension outlays explain the low expenditure-to-GDP ratio.

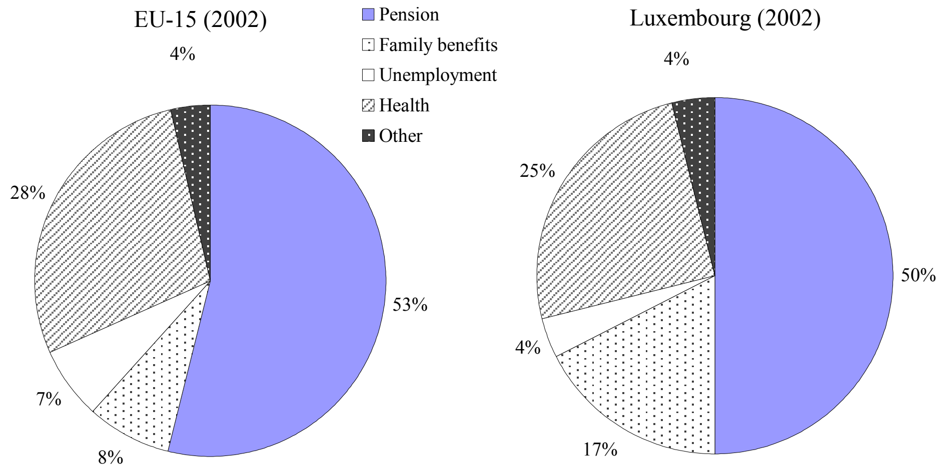
13. **Rapid social spending growth has funded substantial increases in unemployment and family benefits.** Family benefits and unemployment support accounted for more than 20 percent of social spending in Luxembourg in 2002 compared to 15 percent in the EU-15 (Figure 1, bottom panel). In particular, Luxembourg's MGI—part of the family benefits—stands out in its generosity and coverage.

14. **These increases have resulted in very high income replacement rates by international standards** (Figure 2). In particular, replacement rates of welfare and pension benefits exceed the OECD average by a significant margin. Based on 2002 data, they are estimated to be around 100 percent for pensions, and range between 65 and 95 percent for the MGI. Comparable estimates for OECD-wide averages are substantially lower. The gap in replacement rates for unemployment benefits is less striking, since the benefits in Luxembourg are largely comparable to those offered in France, Germany, and Belgium. Nevertheless, the gap with Germany has widened substantially, since the introduction of Hartz IV reforms in 2005. The high replacement rates have introduced significant distortions into labor markets, discussed in the next section.

Figure 1. Social Expenditures in Luxembourg, 1994-2002

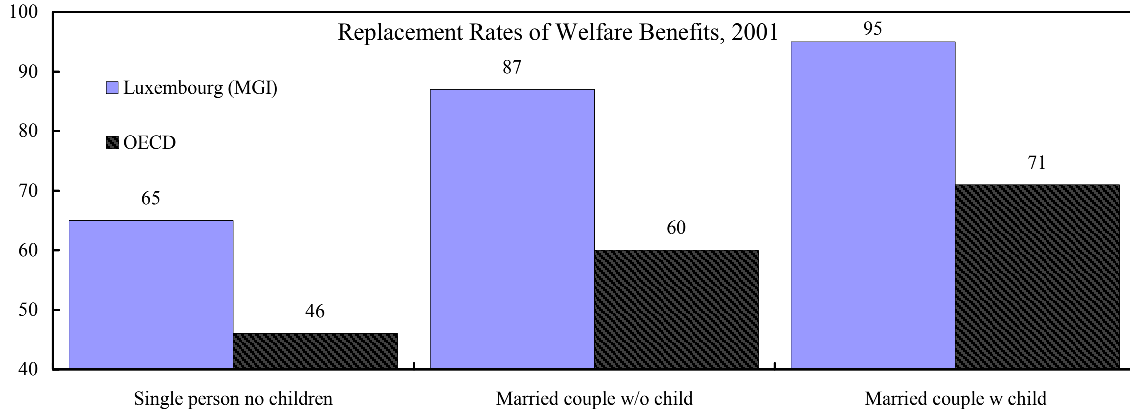


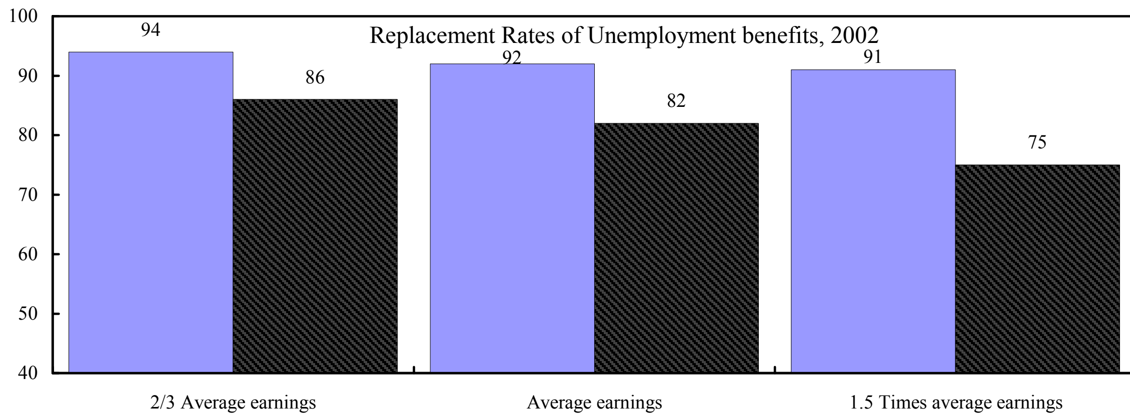
Composition of Social Expenditures

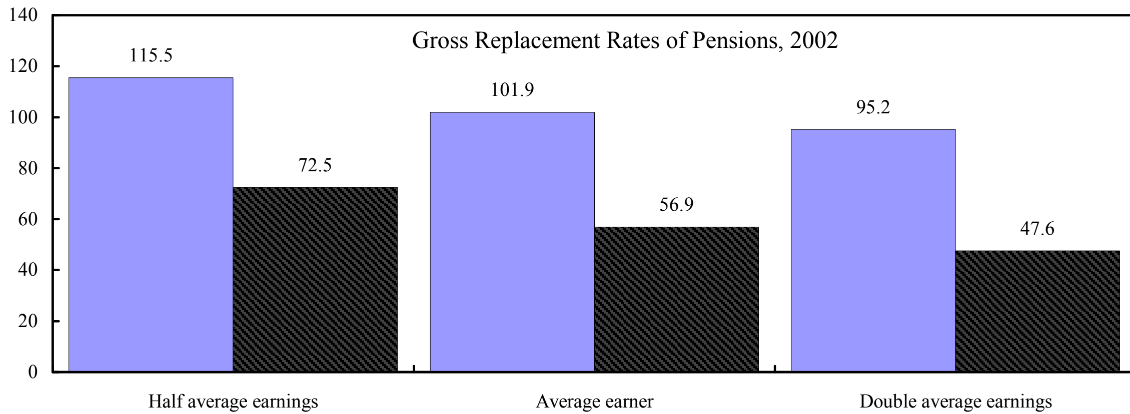


Sources: Statec, Social Security Administration, and OECD.

Figure 2. Luxembourg: Benefit Replacement Rates 1/
(In percent)







Sources: OECD 2004 and 2005.
1/ (Gross) replacement rate computed as the percentage of (gross) income support provided relative to most recent (gross) income from employment.

II. Income Support and Employment[7]

15. **Luxembourg lies at the heart of a regional labor market experiencing rising competition.** Benefit reforms in neighboring countries—including in Germany—have triggered a labor supply shock, affecting the regional labor market. The number of unemployed in the neighboring regions is estimated to have exceeded Luxembourg's resident labor force by three times last year, underscoring scope for intensifying wage competition.

Luxembourg's Regional Labor Market, 2005

	(In thsds)	(In percent) 1/
Resident labor force	210.9	100.0
Resident employment	201.9	95.8
Resident unemployment	8.9	4.2
Cross-border workers (net)	109.4	51.9
Unemployment in greater region 2/	650.0	308.3

Sources: Statec, and IMF staff calculations.
1/ Of resident labor force.
2/ Lorraine, France; Saarland and Rhineland-Palatinate, Germany; Walloon Region and the French- and German-speaking communities of Belgium; and the Grand Duchy of Luxembourg.

16. **Against this background, a key challenge for policymakers in Luxembourg is to ensure the competitiveness of the domestic labor force.** In this context, social policies—especially income support—are of particular importance. The disincentives effects imparted by these policies may result in a continued rise in unemployment of residents, as benefits reforms in neighboring countries have heightened competition from cross-border workers.

A. Unemployment Is Becoming Structural

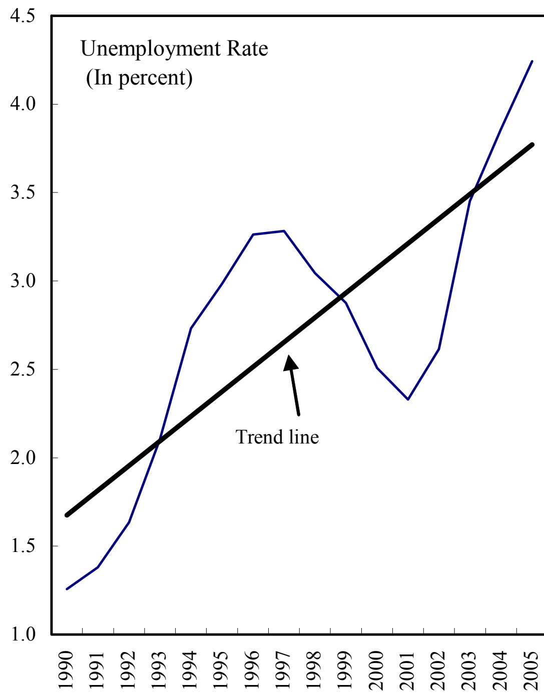
17. **The unemployment rate has been increasing on a trend line since the early 1990s (Figure 1).** A marked deviation from this trend coincides with the financial sector boom in the late 1990s. Long-term unemployment has risen sharply—especially in the last three years—although its share in overall unemployment has remained largely unchanged.

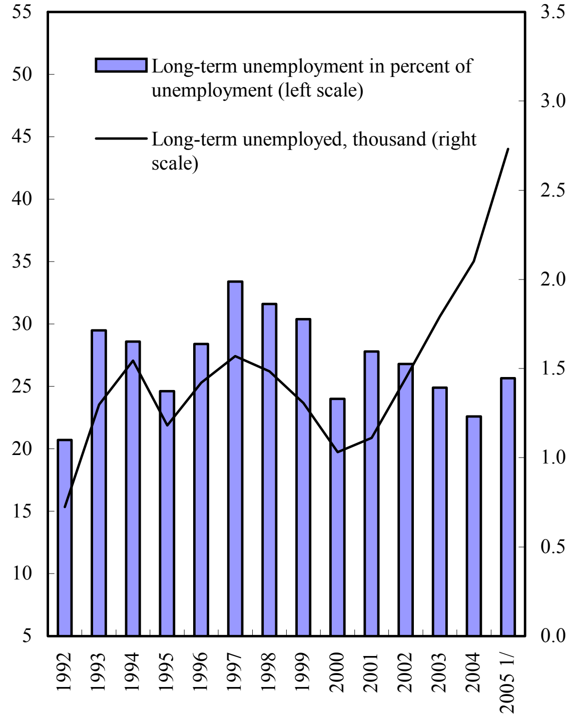
18. **Generous social welfare and high minimum wages pose serious impediments to entry into employment.** Staff calculations show that unemployment benefits for unemployed singles in Luxembourg are almost twice as high as those in neighboring countries, and a similar pattern holds for families. Furthermore, the net losses from the combined effects of higher taxes and smaller social benefits when moving from unemployment into employment are estimated to be among the highest in the OECD.[1] Moving from short-term unemployment into a full-time position leads to a loss of benefits by 85 percent in Luxembourg, which is about 10 percentage points higher than the EU-15 average.[8] The OECD thus maintains its longstanding recommendation that replacement rates in unemployment insurance be lowered and the withdrawal rate of social assistance be reduced as recipients' incomes rise in order to avoid unemployment and poverty traps. In addition, employment may be impeded because Luxembourg's minimum wage is the highest in the EU (18 percent of all employed are being paid at the minimum wage).

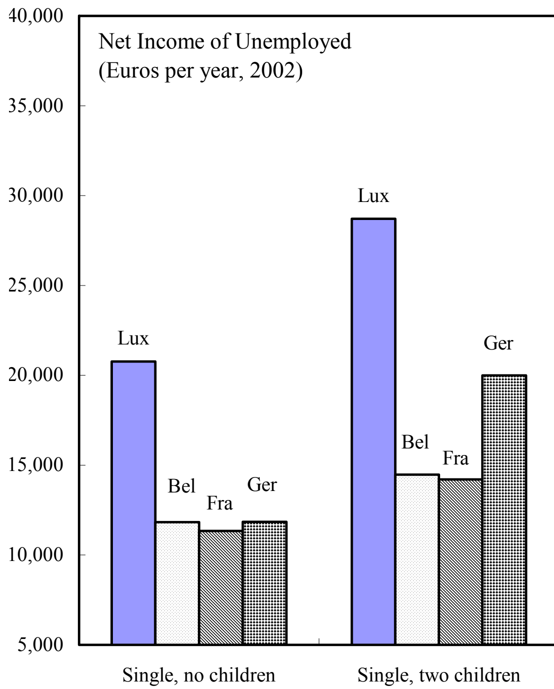
[7] Prepared by Erik Lundback.

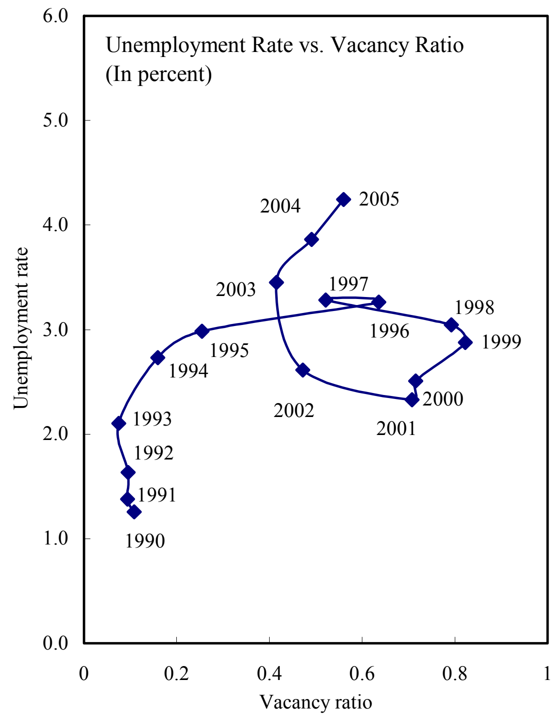
[8] See OECD (2004).

Figure 1. Luxembourg: Labor Market Indicators









Sources: Eurostat, OECD, and Statec.
1/ IMF estimates.

19. **Another disincentive arises from the possibility of labor market entrants to apply for unemployment benefits without prior work experience.** Especially for the young, unemployment insurance can function as an intermediate support system, bridging the time period until age 25, when residents become eligible for the MGI program.

20. **The skills gap is widening, reflecting the increasingly specialized needs of the financial sector.** Indicative of a mismatch between skills on offer and demanded, the vacancy ratio and unemployment rate have risen in parallel for most of the 1990s and again since 2003. Analysis confirms a deepening mismatch between job seekers and vacancies on a sectoral level.[9]

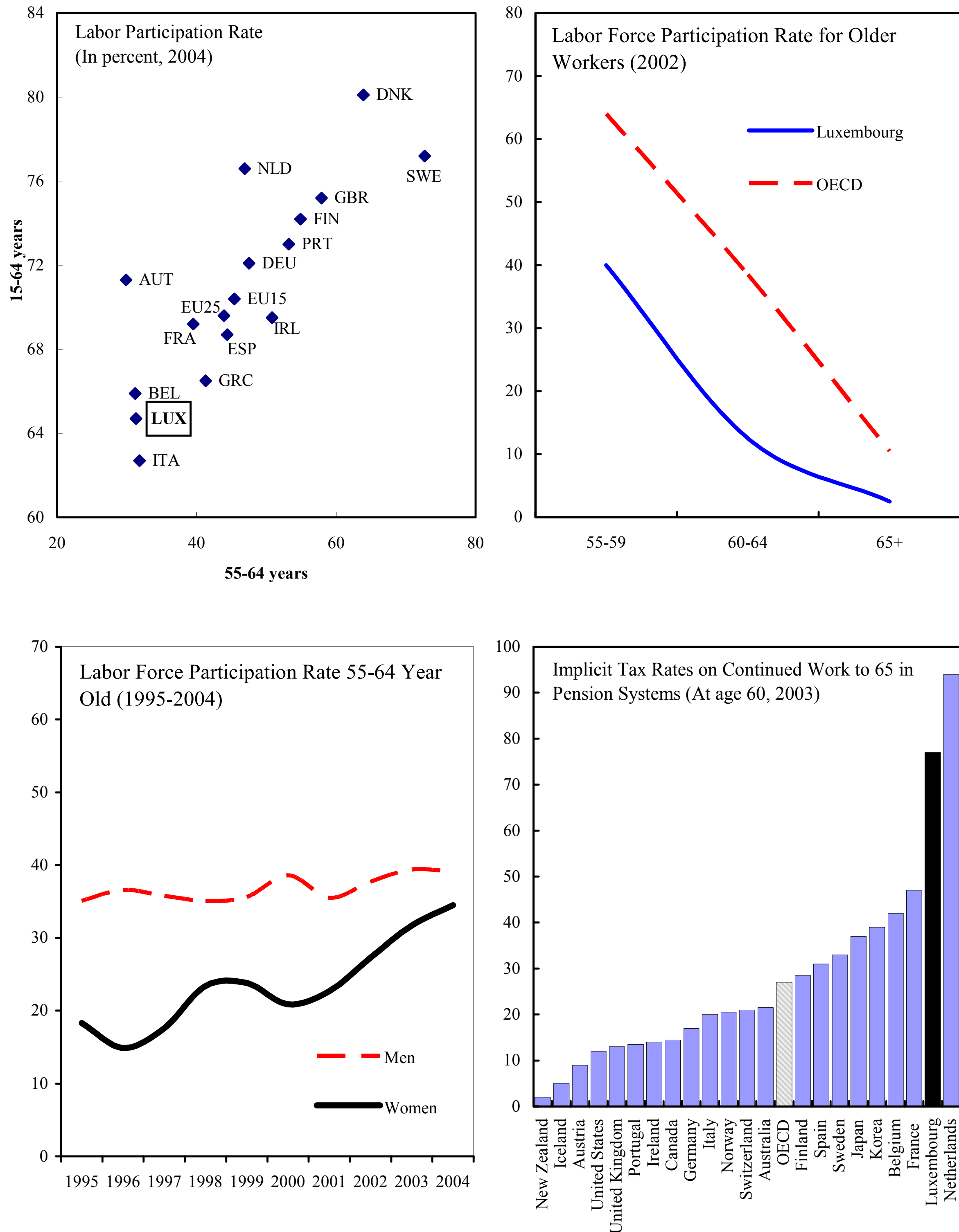
B. Labor Force Participation and Early Retirement

21. **The low rate of labor force participation among older workers is of particular concern, including for public finances (Figure 2).** While participation of the core working-age segment (25-55-year olds) is close to the EU-15 average, exit rates for older groups are higher. The OECD-wide average participation rate for 55-59-year olds was 65 percent in 2002. In comparison, the participation rate in Luxembourg was only 40 percent. The difference was particularly pronounced for women and for the early-retirement group of 55-59-year olds. Early exits from the labor force shorten contribution periods to the pension system and create additional fiscal liabilities, which are magnified by improvements in longevity.

22. **In recent years, the participation gap among older workers with the EU-15 narrowed somewhat, although there was no behavioral change.** Since 1995, the labor force participation rate among women in the age group of 55 to 64 years increased by over 7 percentage points to 31 percent in 2004. This increase was largely driven by a demographic shift, as women with work experience moved into older-age segments.

[9] See Banque Centrale de Luxembourg (2004).

Figure 2. Luxembourg: Labor Market Participation



Sources: Eurostat, OECD, and Statec.

23. **However, as some gains in labor force participation have been achieved by tightening access to disability pensions, these gains need to extended to early retirement programs.** Disability pensions served in the past as an entry portal to early retirement. To address this growing problem, the government tightened access to disability pensions in 2002, introducing a program for the reintegration of partially disabled workers into the labor market. As a result, labor force participation has increased, but the increase so far has tended to be counteracted by an increase in unemployment. The government is also considering limiting access to early retirement programs for older workers who are laid off for economic reasons. This system has tended to be used by employers and employees to pass on the costs of company restructuring, placing an undue financial burden on the public, although cost sharing was introduced in individual cases of company restructuring.

24. **A major obstacle to raising labor force participation of older workers are inadequate incentives to remain at work.** Continued work after the age of 55 carries a financial penalty, because there are limited costs for retiring early, once eligibility criteria are met. The costs of remaining in the labor force for another 5 years at age 60 are equivalent to an implicit tax on income of 75 percent (Figure 2). This is the second-highest penalty among OECD countries and roughly three times as high as the OECD average of 25 percent (OECD 2004). In many countries retirement prior to the mandatory age carries a financial penalty due to the income loss for the pension system from an early departure. Achieving a more actuarially fair system would require establishing a closer link between the actual retirement age and benefit replacement rates. Currently, such a link exists in the benefit formula, but the financial incentive effect is negligible.

III. Preserving the Sustainability of the Pension System[10]

25. **The major vulnerability of Luxembourg's pension system is the close link between the pension dependency ratio and the rate of economic growth.** The currently favorable position of the pension system—discussed in Chapter I— is largely the result of the increasing employment share of commuters. Cross-border workers tend to be young, and their participation in the pension scheme lowers the dependency ratio. However, since the employment growth of commuters is highly correlated with the rate of economic growth, a decline in trend growth poses financial risks to the pension system. The employment elasticity of commuters with respect to growth in the previous year was 0.9 during 1995-2004: an increase in real growth of 1 percent is associated with employment growth of commuters of 0.9 percent (Figure 1, top panel). Consequently, an economic slowdown would affect Luxembourg's pay-as-you-go system more directly than that of many other countries, given that a sudden outflux of cross-border workers would significantly raise the dependency ratio.

26. **Future pension liabilities would not be covered, if growth were to decline gradually.** Long-term projections in the authorities' actuarial study of the pension system show funding shortfalls in a baseline scenario.[11] The scenario assumes a gradual deceleration of economic growth to 3 percent by 2030. At that time, the pension fund would still hold assets of around 30 percent of GDP, but these resources would be depleted during the following 20 years, and a financing gap of 50 percent of GDP would open up by 2050. This trajectory corresponds to a drawdown of reserves of about 4 percent of GDP per year. The authorities' baseline scenario projects a growth path that lies permanently 1½ percentage points above the EU-15 average for the period of 2010-50, and thus may prove optimistic (Economic Policy Committee and EU Commission 2005).

A. Policy Options

27. **Pension benefit reform is a priority due to disincentive effects and financial costs, also stemming from rising life expectancy.** The high level of benefits and disincentives to remain in the labor force beyond the minimum retirement age impose a heavy financial burden that will have to be shouldered by future generations. The Fund recommended in the past to introduce an intergenerational solidarity factor into the benefit adjustment formula. This factor would serve as a feedback mechanism, automatically aligning benefits with the pension dependency ratio.[12] Additional reform options include raising the statutory retirement age to account for longer life expectancy, better differentiating early retirement benefits from the benefits provided at the statutory retirement age, and terminating subsidies for preretirement pensions (OECD 2003).

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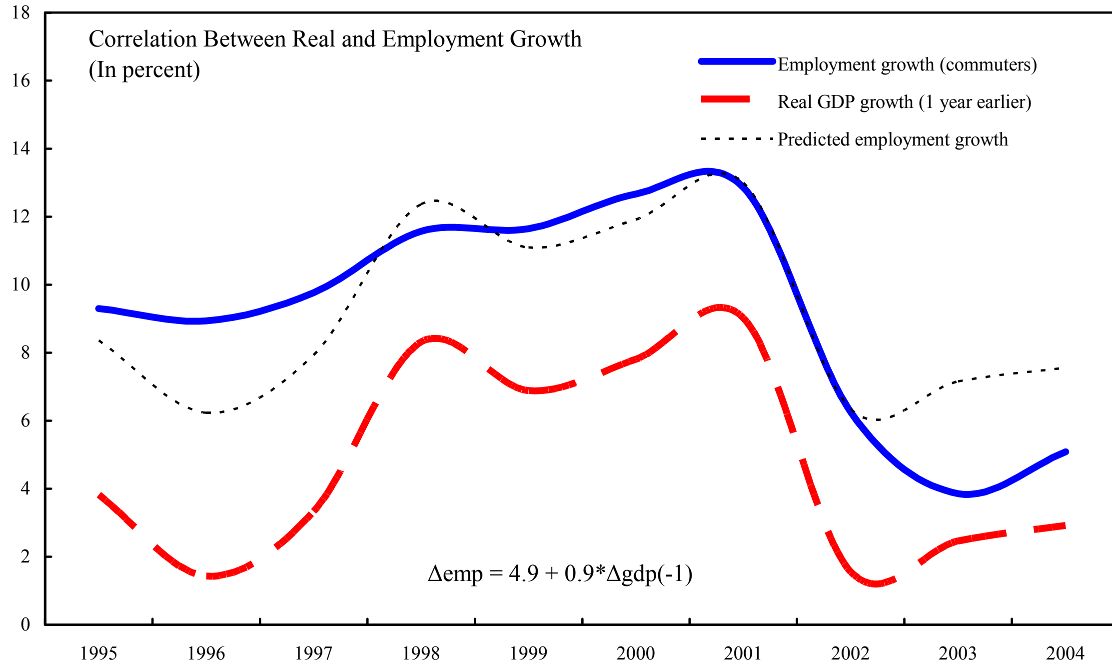
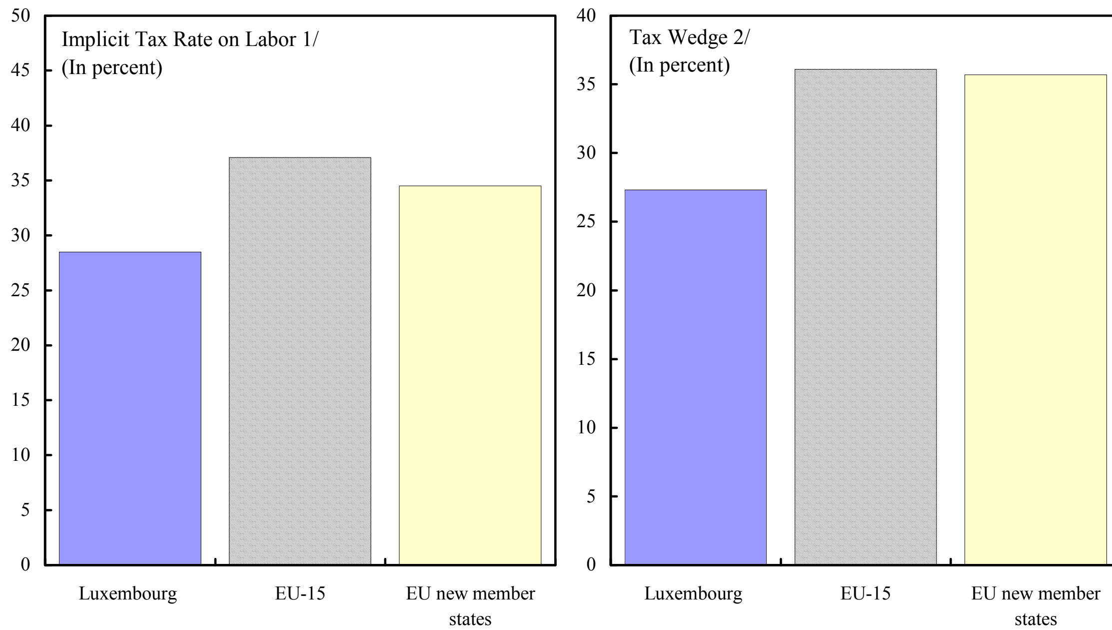
[10] Prepared by Stephan Danninger.

[11] Bilan Technique de la Période de Couverture 1999-2005, Ministère de la Sécurité Sociale (December 2005).

[12] See IMF Country Report No. 04/124.

Figure 1. Luxembourg: Employment, Growth and Taxes





Source: EU Commission Services, and Statec.
1/ Sum of all direct and indirect taxes and social contributions levied on employed labor income divided by total compensation.
2/ For a single worker at two-thirds of average earnings.

28. **Short of far-reaching pension benefit reforms, complementary adjustment measures are needed.** The mobilization of additional resources should rely on expenditure restraint rather than revenue measures. Tax hikes would risk undermining Luxembourg's competitiveness and its growth prospects, given its pronounced reliance on foreign labor and capital. In particular, the relatively low taxation of labor and favorable tax wedges should be maintained, since these have helped attracting and retaining foreign labor (Figure 1, lower panel). In contrast, increasing contribution rates to the pension fund would most likely have negative repercussions for employment growth and the financial sustainability of the pension system. [13] However, windfall revenue gains could be earmarked to the pension fund, including from excise taxes, as an alternative to raising contribution rates.

B. Strengthening the Assets of the Pension Fund

29. **Building up pension fund assets could serve as a complementary strategy to close the funding gap.** Comprehensive protection against a potential growth slowdown requires achieving actuarial balance. Actuarial balance of the pension system describes a state in which the pension fund becomes self-financing under long-term growth and demographic assumptions. Under current arrangements, future pension liabilities of Luxembourg's pension system substantially exceed the income stream that would be generated by its assets. To fill this income gap, the asset base, therefore, needs to be strengthened.[14]

30. **In practice, the government would supplement its wage-bill related contribution to the pension fund with an additional transfer financed by fiscal consolidation.** Additional expenditure savings—in areas other than for pensions—would be transferred to the pension fund to steadily augment its assets. Eventually this would isolate the pension system from the adverse effects of a growth slowdown by diversifying its income stream away from labor income.

31. **Two long-term projections were developed to compute the required transfer for the pension fund to achieve actuarial balance (Table 1).**

- The first scenario (scenario 1) is based on the same economic and demographic assumptions as the authorities' baseline projections presented in their December 2005 actuarial study. It assumes that real growth will remain above 4 percent until 2015, followed by a gradual slowdown to 3 percent by 2030.[15]

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[13] Employers' and employees' contribute 8 percent of gross wages to the pension fund. The central government budget contributes 8 percent as well.

[14] Alternatively, full funding of future pension liabilities could be achieved through a capital injection. Public sector financial assets—not committed to the pension fund—were 10 percent of GDP in 2004. Staff estimates that an injection of 30 percent of GDP would be necessary to close the funding gap in the authorities' baseline scenario.

[15] This trajectory matches the assumptions underlying the November 2005 Stability Program.

- The second scenario (scenario 2) assumes a faster slowdown of real growth, although the overall trajectory would remain strong. Growth is assumed to decelerate to 3 percent by 2020 and further to 2½ percent by 2030.[16] Staff considers this second scenario as more realistic given that it is based on a gradual narrowing of the growth gap to the EU 15 average.

Table 1. Luxembourg: Economic Assumptions, 2005-50
(In percent)

	2005	2010	2020	2030	2040	2050
Real GDP growth						
Scenario 1: real growth slowdown to 3 percent	4.1	4.3	3.6	3.0	3.0	3.0
Scenario 2: real growth slowdown to 2 percent	4.1	3.5	3.0	2.5	2.3	1.9

Sources: Ministere de la Securite Sociale; and IMF staff calculations.

32. **The simulations underscore the necessity of substantial pension benefit reforms (Table 2).** In both scenarios the required transfers to the pension fund are large, especially in case of a faster slowdown of growth (i.e. scenario 2). Graphical representations of these scenarios are shown in the top panels of Figures 2 and 3.

- In the first scenario the pension fund would run deficits starting in 2030, deplete its assets by 2042, and accumulate gross debt of about 50 percent of GDP by 2050. To fill this gap, pension fund assets would need to be augmented through a permanent transfer of 2.4 percent of GDP per year during the period starting in 2007.

- Less buoyant growth in the second scenario results in a wider funding gap and, therefore, higher required transfers. Simulations indicate that the pension fund would run deficits starting in 2025, deplete its assets by 2035, and accumulate a debt stock of 100 percent of GDP by 2050. Filling this wider gap by building assets requires a permanent transfer to the pension fund of 3.9 percent of GDP per year beginning in 2007.

[16] The projections for the second scenario are based on average expenditure and revenue elasticities with respect to growth derived from the two models presented in the authorities actuarial study (scenario 2.2 percent and scenario 3 percent).

Table 2. Luxembourg: Simulation Results--Supplementary Public Transfer to Achieve Actuarial Balance 1/

	Without entitlement reform	With entitlement reform 2/	With entitlement reform and improved returns on assets 2/ 3/
		(In percent of GDP)	
Scenario 1: growth slowdown to 3 percent 4/	2.4	0.2	-0.3
Scenario 2: growth slowdown to 2 percent 5/	3.9	1.7	1.0

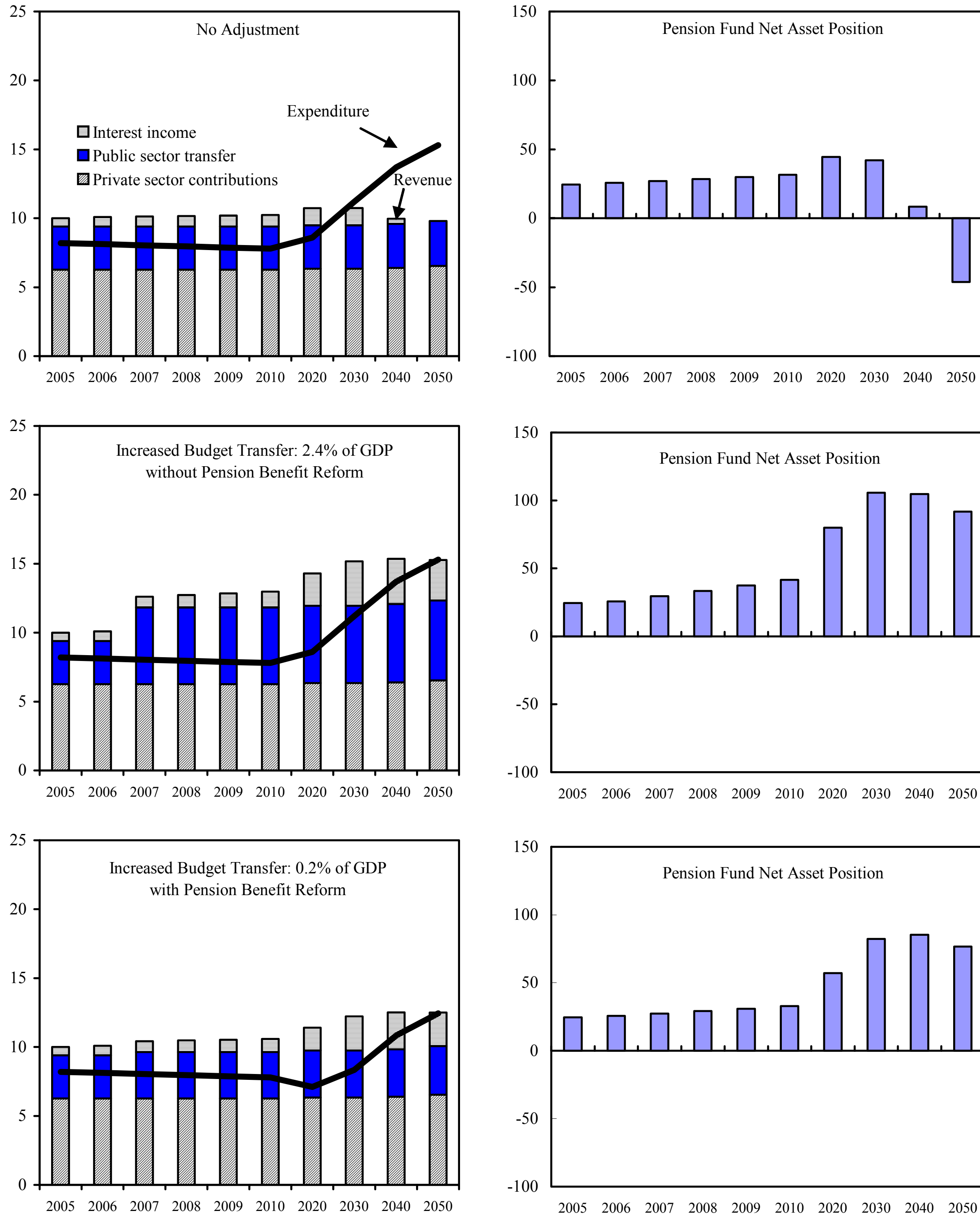
1/ Public transfer to pension fund in addition to wage-related contribution beginning in 2007.
2/ Cumulative decrease in pension liabilities by 3 percent of GDP phased in at equal increments beginning in 2010 for 20 years.
3/ Increase of return on pension fund assets by 100 basis points relative to baseline projections.
4/ Deceleration of real growth to 3 percent by 2030 (Stability Program 2005).
5/ Deceleration of real growth below 3 percent by 2020.

33. **In a second step, pension benefit reforms are built into the simulations.** Benefit reforms— such as an increase in the effective retirement age or a modification of the formula for benefit increases—are assumed to generate savings of 0.15 percent of GDP per year for a period of 20 years, starting in 2010. Therefore, these reforms would generate 3 percent of GDP in cumulative savings. Such an adjustment would cover approximately half of the financing gap that arises by 2050 in the authorities' baseline projections. These savings would lower the required annual transfer to the pension fund to 0.2 percent of GDP in scenario 1 (Figure 2, bottom panel) and 1.7 percent in scenario 2 (Figure 3, bottom panel).

34. **In a third step, the simulations build in higher returns on the assets of the pension fund (Box 1).** Augmenting hitherto low returns by 100 basis points on average could be achieved without risking undue income volatility. The simulations show that the required annual transfers would be lowered by ½ percent of GDP on average.[17] In the more realistic second scenario closing the funding gap at higher returns to assets requires transfers of 1 percent of GDP.

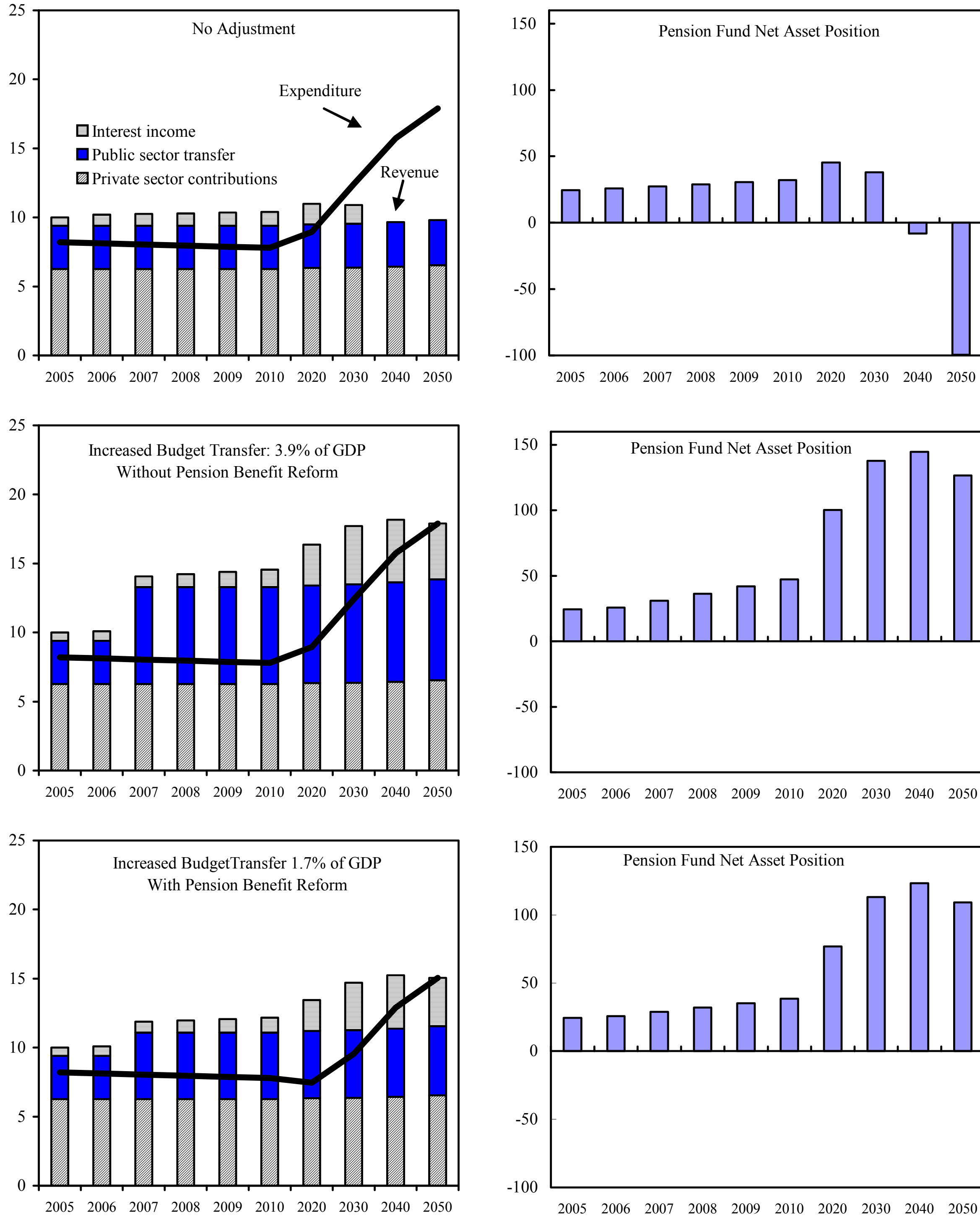
[17] For a similar assessment on the role on assets returns see M. Bouchet (2003).

Figure 2. Luxembourg: Pension Fund Projections - Scenario 1
(In Percent of GDP)



Source: IMF staff estimates.

Figure 3. Luxembourg: Pension Fund Projections - Scenario 2
(In Percent of GDP)



Source: IMF staff estimates.

Box 1. Luxembourg's Pension Fund

The assets and liabilities of Luxembourg's public pension system are held in a pension fund that is part of the general government. Given the low dependency ratio—resulting from steady immigration and the high share of cross-border employees in employment—the pension fund held assets of 5.4 billion euro at end 2004 or 21.3 percent of GDP.

Until a legal change in 2004, the investment policy governing the pension fund was restrictive and, therefore, returns were low. Over the five years since 2000, annual returns on pension fund assets averaged 3.6 percent. In comparison, the Dutch public pension fund earned 4.4 percent over the same period, but its annual return averaged 8 percent since 1995 owing to its exposure to equities. The return on assets of the Norwegian Public Pension Fund (77.5 percent of GDP) was 7.3 percent in between 2000 and 2004.[18]

Luxembourg Pension Fund Assets 2004

	EUR billion	In percent of GDP	In percent of total assets
Total	5.4	21.2	100
Real estate	0.2	0.8	3.7
Equity holding in industry	0.2	0.9	4.1
Loans	0.4	1.7	8.2
Time deposits	4.2	16.2	76.8
Bonds	0.4	1.5	7.2

Source: Social Security Administration

Clearly, higher returns tend to come at the risk of greater income variability. At the same time, the high share of time deposits—representing three quarters of Luxembourg's pension fund assets in 2004—suggests that there remains ample scope for enhancing returns through diversification of assets without inviting undue income volatility. The 2004 amendment to the fund's investment policy provides the legal mandate for diversifying assets and enhancing returns.

35. **Strengthening the assets of the pension fund requires adopting a more prudent fiscal policy target.** Following four years of deteriorating public finances, the budget deficit reached an estimated 2.3 percent of GDP in 2005. In line with the November 2005 Stability Program, the authorities intend to restore budget balance soon after 2008. However, consideration should be given to setting medium-term targets consistent with long-term sustainability requirements, including for public pension finances. The general government budget, therefore, would need to target a surplus of 1 percent of GDP, assuming that pension fund returns are enhanced and growth unfolds in line with the assumptions underlying scenario 2. If long-term growth disappoints relative to this scenario, further adjustment would be necessary to resolve the underfunding of the public pension system.

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[18] Management of the Government Petroleum Fund Report for the third quarter of 2005 Norske Bank http://www.norges-bank.no/english/petroleum_fund/reports/2005-03/.

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