

Poverty and income inequality in Luxembourg and the *Grande Région* in comparative perspective

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This paper adopts a comparative framework and examines rates of poverty and income inequality for Luxembourg between the mid-1980s and 2000. A dataset for the *Grande Région*, which combines data from four countries, is also constructed in order to perform cross- and inter-regional analyses. We find that levels of poverty and income inequality in Luxembourg are among the lowest in the world and that the 'depth' of poverty is comparatively low. In addition, we examine the so-called trade-off between growth and inequality and conclude that the mix of 'pro-growth' and 'pro-poor' policies is appropriate in Luxembourg. When examining the *Grande Région*, we show that Luxembourg stands apart as one of the richest regions in Europe and that disposable incomes in Luxembourg are some 70% higher than in the neighbouring regions. Finally, we conclude with a discussion on Luxembourg's social policy and call for improvements to the data currently available.

Keywords: poverty, income inequality, economic growth, elderly poverty, child poverty, regional inequality, international comparisons

JEL classification: C810 Methodology for Collecting, Estimating, and Organizing Microeconomic Data, J300, Wages, Compensation, and Labor Costs: General

1. Introduction

Since 1983, the Grand Duchy of Luxembourg has been the home of the Luxembourg Income Study (LIS). As of late 2003, 29 countries from four continents contributed data to the LIS. Of these, Luxembourg is by far the smallest. With its 2 586 square kilometres, Luxembourg is over 200 times smaller than neighbouring France and almost 150 times smaller than neighbouring Germany. Its surface area is only 0.03% of that of the United States.

In 2000, the population of Luxembourg was 436 000. In comparison, the total populations of the three neighbouring countries of Belgium, France and Germany were 10.2 million, 59.0 million and 82.0 million, respectively, and the population of the United States was 283.2 million.

The population of Luxembourg is extremely heterogeneous: over one-third of the resident population are foreigners and almost two out of three jobs in Luxembourg are filled by foreigners, either resident in Luxembourg or commuting to Luxembourg. In fact, there are over 100 000 cross-border workers commuting to jobs in Luxembourg every day.

In 2000, the GDP of Luxembourg was US\$18.9 billion. Although this is 0.2% of the GDP of the United States (US\$9 824.7 billion), Luxembourg's GDP per capita was US\$43 107 in 2000, compared to US\$35 019 for the United States, US\$22 814 for Germany and US\$21 620 for France (Statistics Finland, 2003). This is a clear indication that the economic power of Luxembourg far exceeds its miniscule size.

A tremendous economic success story starting in the wake of World War II is hiding behind these figures. From the early 1950s until the 1970s, the steel industry was the motor of economic growth in Luxembourg. During this period (until the first oil crisis in 1973), economic growth averaged a robust 3.9% per annum.

The first oil crisis and the ensuing turmoil in the world economy signalled the beginning of the decline of the steel industry. During 1975–85, the Luxembourg economy grew at a much more modest 2.3% per annum (on average). This period coincided with the large-scale restructuring of the steel industry, in which employment shrank by half.

However, the negative economic repercussions of the crisis of the steel industry were more than offset by the rapid development of the financial services industry in Luxembourg. By the late 1990s Luxembourg had risen to become one of the top ten financial services centres in the world, with the establishment of almost 200 foreign banks and a large investment fund segment. In fact, in 2000 there were 1 785 investment funds in Luxembourg, with assets totalling 874.6 billion EUR (more than 40 times the GDP of Luxembourg).

As a result of these developments, from the mid-1980s until 2000, GDP growth averaged more than 5% per annum. As domestic labour supply could not keep up with the pace of economic growth, Luxembourg's economy increased its reliance on a continued inflow of immigrant and cross-border workers (over 60% of the labour force are either resident foreigners or non-resident cross-border workers).

Furthermore, economic growth was fostered by an accommodating fiscal framework (low personal and corporate income tax, very low social security contributions) and by the strategic position of Luxembourg at the heart of the European Union. A healthy public finance situation is providing the basis for a generous welfare state that is shielding workers from the adverse effects of globalization. Industrial relations are governed by a strong neo-corporatist system and the labour

market is constrained by extensive protective legislation such as automatic wage indexation, minimum wages and a minimum guaranteed income.

Against the backdrop of this impressive economic success story, this paper examines changes in the income distribution and the standard of living in the smallest LIS member state from a comparative perspective. The approach adopted is both cross-national and inter-regional.

The cross-national perspective is justified by the fact that the social and economic institutions that are shaping the economic destiny of a country are devised at the level of the nation-state. The inter-regional perspective is justified by the fact that Luxembourg is a country that is scarcely larger than any region in the neighbouring countries, by the massive economic spillover effects that Luxembourg generates for the neighbouring regions and by the large amount of human resources that Luxembourg draws from the surrounding regions. Furthermore, since the introduction in 1991 of the EU internal market, national boundaries between member states of the EU have become increasingly irrelevant with regard to the free movement of factors of production (STATEC, 2003).

The structure of the paper is as follows. Section 1 will look at trends in income inequality and poverty in Luxembourg from 1985 to 2000, with comparisons being made in time and space. Section 2 will examine the extent of income redistribution that is taking place in Luxembourg. In this respect, international comparisons are particularly useful in order to assess the efficiency with which incomes are redistributed as well as the adequacy of the policy instruments deployed. In addition, an examination of the alleged trade-off between economic growth and income inequality is offered. In Section 3, the focus of comparison shifts from the cross-national to the inter-regional perspective. Luxembourg is embedded in the so-called *Grande Région*, an array of regions from Belgium, France, Germany and Luxembourg with a shared cultural and economic heritage. Accordingly, the paper discusses the likely implications for Luxembourg and the *Grande Région* of large income disparities between the constituent regions. Finally, Section 4 concludes.

2. Trends in income inequality and poverty

Table 1 provides an overview of income distribution summary statistics for Luxembourg 1985–2000.¹ By international standards, Luxembourg exhibits very low income inequality and poverty. In 2000, the Gini coefficient of income inequality was equal to 0.259, with a bootstrap standard error equal to 0.005.² The p90/p10

¹ All our summary income inequality and poverty figures in this section are drawn from LIS's Key Figures at <http://www.lisproject.org/keyfigures.htm>.

² Bootstrap standard errors for selected estimates are published in LIS's Key Figures at <http://www.lisproject.org/keyfigures/standarderrors.htm>.

Table 1 Income inequality and poverty in Luxembourg, 1985–2000

Survey	1985	1991	1994	1997	2000
	PSELL1 (panel) 2 044	PSELL1 (panel) 1 957	PSELL1 (panel) 1 813	PSELL2 (panel) 2 515	PSELL2 (panel) 2 418
Mean disposable income (in £, year 2000 prices)	14 125	20 290	21 999	23 009	25 137
Median disposable income (in £, year 2000 prices)	12 749	18 001	19 723	20 266	22 063
Gini coefficient	0.237	0.240	0.235	0.260	0.259
Bootstrap standard error	0.004	0.006	0.005	0.005	0.005
Atkinson index ($e = 1$)	0.089	0.090	0.087	0.106	0.103
Ratio p90/p10	2.95	2.98	2.92	3.22	3.24
Headcount rate (p.l. = 40% of median)	1.7	0.9	1.3	1.8	1.4
Headcount rate (p.l. = 50% of median)	5.3	4.7	3.9	6.2	6.0
Bootstrap standard error	0.55	0.71	0.53	0.59	0.79
Headcount rate (p.l. = 60% of median)	11.0	12.4	10.4	13.3	12.5
Ratio headcount (p.l. 50%)/ headcount (p.l. 40%)	3.12	5.22	3.00	3.44	4.29
Ratio headcount (p.l. 60%)/ headcount (p.l. 50%)	2.08	2.64	2.67	2.15	2.08
Child poverty rate (p.l. = 50% of median)	5.2	5.4	4.5	10.1	8.9
Bootstrap standard error	1.01	1.51	1.01	1.33	1.33
Elderly poverty rate (p.l. = 50% of median)	12.7	11.8	6.7	5.3	3.7
Bootstrap standard error	1.72	2.51	1.29	1.07	0.95

percentile ratio, roughly speaking the ratio between high and low incomes, amounted to 3.22. Using a poverty line equal to 50% of median equivalent income, 6% of Luxembourg's households were poor in 2000. When the poverty line is raised to 60% of the median, the poverty rate increases to 12.5%.

Observed Gini coefficients in LIS member states vary from 0.189 in the Slovak Republic in 1992 to 0.496 in Mexico in 1994. With a Gini coefficient between 0.235 and 0.260, Luxembourg is located at the lower end of the international distribution of Gini coefficients. The same applies for the p90/p10 percentile ratio, which varies from 2.25 in the Slovak Republic in 1992 to a high equal to 11.55 in Mexico in 1998. In the case of Luxembourg, the p90/p10 ratio takes values between 2.92 and 3.24.

From a geographical point of view, the low-inequality countries in LIS are located in three zones: Northern Europe (Denmark, Finland, Norway and Sweden), Central Europe (Czech Republic, Slovak Republic and Slovenia) and Benelux (Belgium, the Netherlands and Luxembourg).

In recent years (since 1994), Luxembourg has been sliding down in the rankings of the most egalitarian countries in the LIS, but overall the level of income inequality remains very low.

With a headcount poverty rate that at 50% of the median income varies between 3.9% and 6.2%, Luxembourg also exhibits very low relative income poverty. Geographically speaking, the low-poverty countries are the same as the low-inequality countries. Again, Luxembourg has been sliding down the rankings in recent years.

A distinguishing feature of the Luxembourg income distribution is the hypersensitivity of the headcount poverty rate to the location of the poverty line. For example, when lowering the poverty line from 60% of the median to 50% of the median, poverty is more than halved. If the poverty line is further reduced to 40% of the median, the headcount rate drops below 2%. On the one hand, this finding implies that extreme poverty is virtually non-existent in Luxembourg and also that poverty is relatively shallow. On the other hand, it also implies that a fairly large part of the Luxembourg population is at risk of becoming poor, in the sense that a small adverse shock to their incomes may cause them to slip into poverty. In fact, it is estimated that although overall the poverty level in Luxembourg is very low, there are twice as many households hovering just above the poverty line and that are therefore at the risk of becoming poor than there are households that are actually poor (see Behrendt, 2000).

In order to reach a better understanding of why this is so, it may be worthwhile to visualize the entire income distribution. Figure 1 depicts the density functions of household disposable income for 1991–2000, estimated using kernel density methods. The figure shows that disposable income in Luxembourg is roughly distributed log-normally. Furthermore, the figure shows a very heavy concentration of households to the left and the right of the median as well as very thin tails on both sides. The fatter ‘bodies’ of the 1991, 1997 and 2000 densities relative to the 1994 density imply a greater dispersion of incomes in the former years. Over time, the densities move to the right, implying a general increase in the well-being of all households. However, at the extreme end of the left-hand tail of the distribution, one can see that the densities for 1997 and 2000 are situated to the right of the density for 1994, hence confirming the tendency for the poor to lag behind the average, though the position of the poor in both relative and absolute terms has improved more than in any other country (see Kangas, 2001).

The transformed Lorenz curve in Figure 2 provides another way of looking at changes in Luxembourg’s income distribution over time. Notice that in this representation of the income distribution, Lorenz curves that are closer to the horizontal axis correspond to income distributions with lower inequality. The figure clearly shows that the 1994 income distribution is the most equal of the four distributions

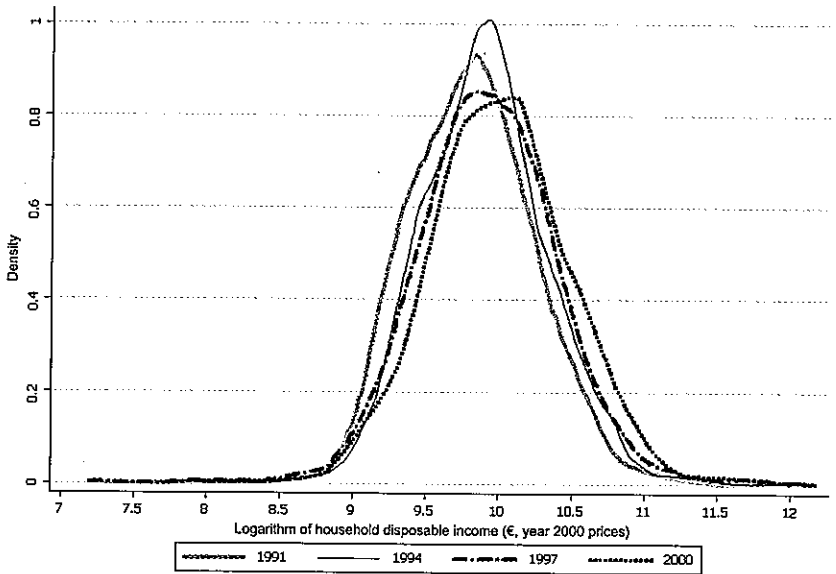


Figure 1 Estimated density functions of household disposable income, Luxembourg 1991–2000.

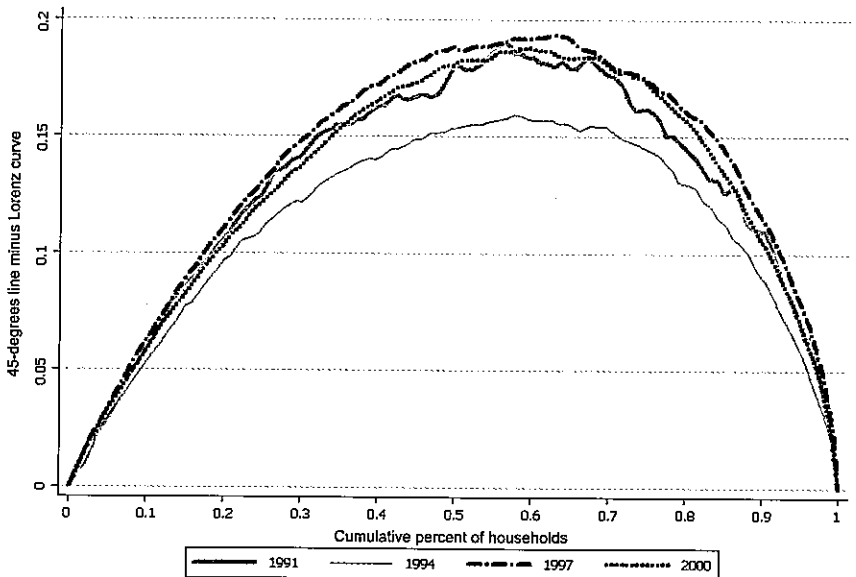


Figure 2 Transformed Lorenz curves, Luxembourg 1991–2000.

depicted: at any point along the horizontal axis, the 1994 Lorenz curve is closer to that axis than any of the other Lorenz curves. The 1997 distribution is the most unequal one. Of all the Lorenz curves, it is the furthest away from the horizontal axis. The 2000 distribution is more equal than the 1997 distribution.

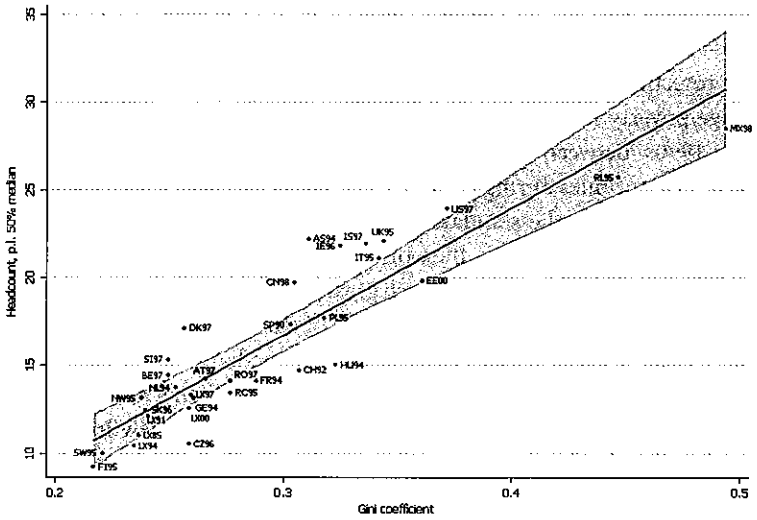


Figure 3 Income inequality and poverty in Luxembourg Income Study.

Income inequality and relative poverty are inextricably linked. In general, a higher level of income inequality implies a higher relative poverty incidence. The solid regression line in Figure 3 confirms the existence of a positive relationship between inequality and poverty in the LIS member countries. The shaded region on either side of the fitted line depicts the confidence region of the relationship between poverty and income inequality at the 99% level. All the data points for Luxembourg are located in the lower left-hand quadrant of the graph, hence backing up the earlier finding that the Luxembourg income distribution is characterized by both very low inequality and poverty.

Notice that all observations for Luxembourg lie below the solid regression line. This means that given the level of income inequality in Luxembourg, poverty is lower than average and hence it suggests that poverty reduction policies in Luxembourg are rather efficient and avoid a direct and full transmission from higher inequality into higher poverty. This result is robust to the choice of the poverty line (i.e., 40%, 50% and 60% of the median poverty line).

At the level of the population sub-groups, the standards of living of children and the elderly have been extensively researched using the LIS database. In Luxembourg, children exhibit higher poverty rates than the total population, while the elderly have lower poverty rates (for the second half of the 1990s). Furthermore, child poverty and old-age poverty have developed in opposite directions.

Poverty incidence among the elderly has decreased substantially during the 1990s. At a poverty line equal to 50% of the median, it exceeds 10% in 1985 and 1991. Thereafter, it decreases continuously to a very low rate equal to 3.7% in 2000. At the 40% of median cut-off, less than 1% of the elderly are poor. By international

standards, poverty incidence among elderly citizens is the lowest of all LIS member countries and the old-age income insurance system provides a very high degree of income protection to elderly citizens (see Smeeding and Williamson, 2001).

Old-age poverty incidence, on the other hand, exceeds 10% during the 1980s and early 1990s. Between 1991 and 1994, old-age poverty decreases significantly and this trend continues during the second half of the 1990s. From an international perspective, after 1991 the standard of living of elderly persons in Luxembourg improves to one of the highest in the world.

Children in Luxembourg are at a much greater risk from poverty than the elderly. During the 1980s and early 1990s, roughly 5% of children lived in households with disposable income equal to less than 50% of the median income. By 1997, child poverty had increased to 10% and then it dropped to less than 9% in 2000. By international standards, child poverty in Luxembourg was extremely low during the 1980s and the first half of the 1990s. However, during the second half of the 1990s, the ranking of Luxembourg deteriorated considerably. This notwithstanding, disadvantaged or poor children in Luxembourg still have one of the highest absolute standards of living by international standards (see Bradbury and Jännti, 1999). Notice that child poverty increases rapidly if the poverty threshold is raised. This implies that many children live in households that are at imminent risk of poverty.

Overall, Luxembourg is in a very favourable position by international standards: income inequality and poverty incidence are both very low and the absolute standard of living is very high. In general, children and the elderly are groups 'at risk' from suffering the consequences of low incomes. In Luxembourg, child poverty is higher than what one might expect on the basis of some of the general welfare indicators reviewed. Thus, despite a very generous system of family-related transfers (see Jeandidier and Albiser, 2001), a fairly large proportion of children grow up in precarious economic circumstances. On the other hand, old-age poverty is extremely low and the welfare of elderly citizens improved dramatically during the 1990s. Notice that for a given level of transfer spending, Luxembourg achieves a lower old-age poverty rate than most LIS member countries (see Smeeding and Williamson, 2001), suggesting that the poverty reduction is achieved in a fairly efficient way.

Finally, it should be pointed out that the two observations drawn from the PSELL2 socio-economic panel '*Liewen zu Lëtzebuerg*' (1997 and 2000) clearly exhibit higher inequality and higher poverty than the observations drawn from the PSELL1 (1985, 1991 and 1994). This observation begs the question of why this should be so and compels us to issue a caveat regarding inter-temporal comparisons for Luxembourg. In fact, in the PSELL1 there are only minor changes in inequality and poverty between waves and in any case these differences are not large enough to be statistically significant. The conclusion can thus only be that inequality and poverty remained more or less unchanged during 1985–94. The same applies for the observations drawn from the PSELL2. However, between 1994

and 1997 a fairly large and statistically significant increase in inequality and poverty is observed. In fact, the Gini increases from more or less 0.24 to 0.26, which corresponds to a relative increase of 10.6%. Relative poverty, at the 50% of median income threshold, increases from 3.9% to 6.2%, which corresponds to a relative increase of 59% in just three years. These changes seem rather large, especially as there were no major changes to the tax and transfer system or an economic shock between 1994 and 1997 that would account for such a large increase. Hence, one must wonder whether non-sampling errors could be the likely source of such a large increase in such a short space of time.

3. Redistribution and the efficiency of the welfare state

The Holy Grail of distributional analysis is the discovery of the optimal trade-off between efficiency and equity. The alleged existence of this trade-off implies that a country must devise institutions that deliver a social safety net without destroying economic incentives.

The available empirical evidence suggests that Luxembourg handles this challenge very well. The equity effect, defined as the percentage reduction in poverty as a result of fiscal policy, is extremely high in Luxembourg at 88.6% (see Pressman, 2003). Similarly strong equity effects can be found for Belgium, the Netherlands and the Nordic countries Finland, Norway and Sweden, though the effect is strongest in Luxembourg. At the other end of spectrum, the equity effect is less than 50% in the United States. However, a strongly redistributive fiscal policy does not appear to adversely affect economic growth. In fact, on the efficiency measure, defined as the percentage growth in real GDP per worker over the period 1979–90, Luxembourg also obtains one of the highest scores (+2.56% per annum, compared to +1.64% on average for the 17 countries included in the analysis).

The very strong poverty-reduction effect is robust, i.e., it also holds when ‘gap measures’ of poverty that take into account the size of the poverty gap and inequality among the poor are used (see DeFina and Thanawala, 2002). In fact, according to the ‘gap measures’, the reduction of poverty as a result of transfer policies almost reaches 100%, confirming that poverty in Luxembourg is fairly ‘shallow’ and that those persons who remain poor after transfers do not fall too far below the poverty line.

Redistributive policies also have a large impact on income inequality: after transfer payments, the Gini coefficient is reduced by ± 0.16 points, from 0.44 to 0.28 (in 1994) (see Milanovic, 2000). The reduction in income inequality obtained via income redistribution is slightly larger than the mean value observed for all LIS countries and years. In fact, only Belgium and Sweden exhibit significantly higher reductions of income inequality. For households in the lowest quintile of the factor income distribution, disposable income increases by $\pm 14\%$ as a result of transfer payments. For households in the bottom half of the distribution, income increases by $\pm 16\%$. These figures are

large by international standards, especially with respect to the ‘very poor’ (i.e., the low-est quintile of the factor income distribution).

Important components of the Luxembourg transfer system are family-related benefits to support households with children. These family-related transfers are very generous and provide effective child poverty relief (see Jeandidier and Albiser, 2001). In fact, after transfers, the child poverty rate is some 70% lower than the child poverty rate before transfers.

Although the transfer system achieves a very substantial reduction of child poverty, the absolute cost per child is extremely high: the average transfer per child is \$249 in Luxembourg, compared to \$153 in the UK, \$129 in France and \$60 in the US. The high cost per child is explained by the fact that family-related transfers are universal entitlements that are generous towards all children without particularly aiming at reducing child poverty: 70% of all transfers go to households with children that are non-poor even before transfers (in the US this figure is 14% and in the UK 37%). Thus it appears that efficiency gains are possible in the area of family-related transfers.

Despite the alleged existence of a trade-off between efficiency and equity, income growth does not reduce poverty unconditionally. An increase in the mean income of the population reduces poverty by pulling low-income households and individuals out of poverty. However, income growth may have a negative impact on inequality, in which case poverty may increase. This trade-off is specified in the inequality–growth trade-off index (IGTI) devised by Kakwani (2000), and is defined accordingly:

$$IGTI = \frac{\partial \mu}{\partial G} \frac{G}{\mu} = - \frac{\varepsilon_0}{\eta_0} \quad (1)$$

In this specification, μ equals the mean income of society, G represents the inequality measured by the Gini coefficient, ε equals the inequality elasticity (the effect on poverty of a change in inequality) and η is the growth elasticity (the effect on poverty of a change in the mean income of society). Thus an IGTI equal to 3.0 indicates that mean income must grow by 3% in order to offset the effect on poverty by an increase in income inequality equal to 1%. Conversely, in terms of poverty reduction, a 1% reduction in income inequality is equivalent to the growth of the mean income by 3% (see Heinrich, 2003, pp. 5–7). Therefore, if the trade-off is small, i.e., the growth effect is sizeable relative to the inequality effect, poverty reduction is best achieved by focusing on policies that foster economic growth. If the trade-off is large, i.e., the growth effect is small relative to the inequality effect, then poverty reduction is best achieved through redistributive policies.

Figure 4 shows that Luxembourg exhibits a higher growth elasticity than any other country in the LIS, but that it also exhibits a very high inequality elasticity. Disregarding the 1991 data, which are clearly outliers, the growth elasticity for Luxembourg lies between 4% and 5% in absolute value. This means that a 1% increase in the average income of society reduces poverty by 4–5%.

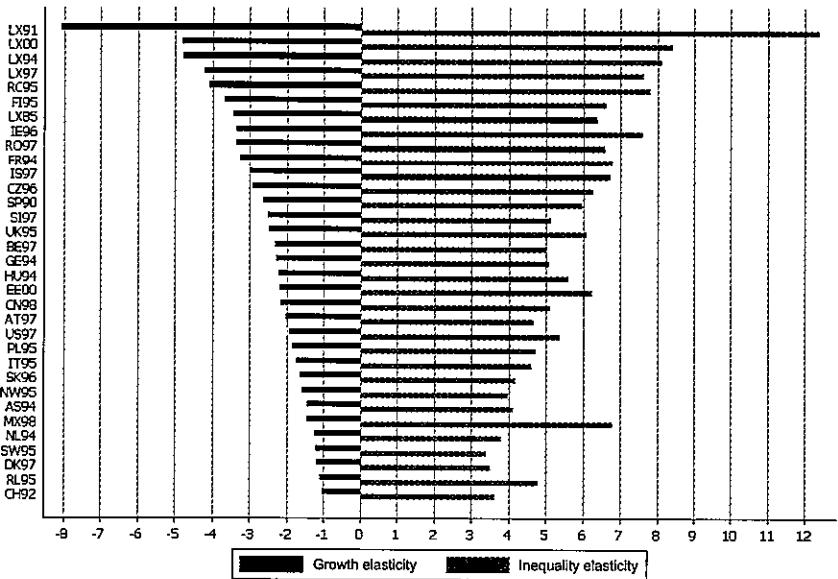


Figure 4 Growth and inequality elasticities.

The inequality elasticity amounts to about 8% (again disregarding the 1991 data). This means that holding the average income of society constant, a 1% increase in income inequality increases poverty by 8%.

Simply examining the growth and inequality elasticities in isolation from each other bears some information, but it is important to point out that the growth effect and the inequality effect work in opposite directions: growth reduces poverty, and inequality increases it. Thus, from a policy perspective what matters are not the elasticities *per se*, but rather the trade-off between the growth and inequality effects. This trade-off, summarized by the inequality–growth trade-off index (IGTI), is shown in Figure 5. The inequality–growth trade-off index for Luxembourg is the lowest in the LIS; it is consistently below 2%, implying that an increase of the mean income of society of $\pm 2\%$ is necessary in order to offset the adverse effect of income growth on inequality. Alternatively, it means that in terms of poverty reduction, a 1% reduction of income inequality is equivalent to a growth of the mean income of society by $\pm 2\%$.

Figure 6 shows that the growth and inequality elasticities are positively correlated, i.e., the higher the growth elasticity, the higher the inequality elasticity. In addition to the scatterplot, Figure 6 is completed with a straight line fitted to the data that captures the average correlation between the growth and inequality elasticities. This line is upward sloping, indicating that, on average, a higher growth elasticity entails a higher inequality elasticity. In addition, the graphs also show a grey area on either side of the fitted line that corresponds to the 99% confidence region of the relationship between the growth and inequality elasticities.

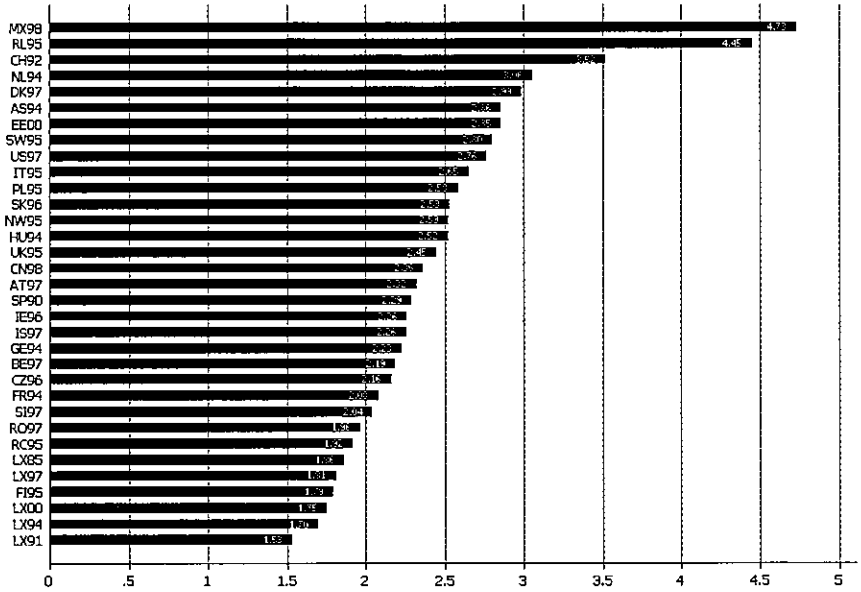


Figure 5 Inequality-growth trade-off index (IGTI).

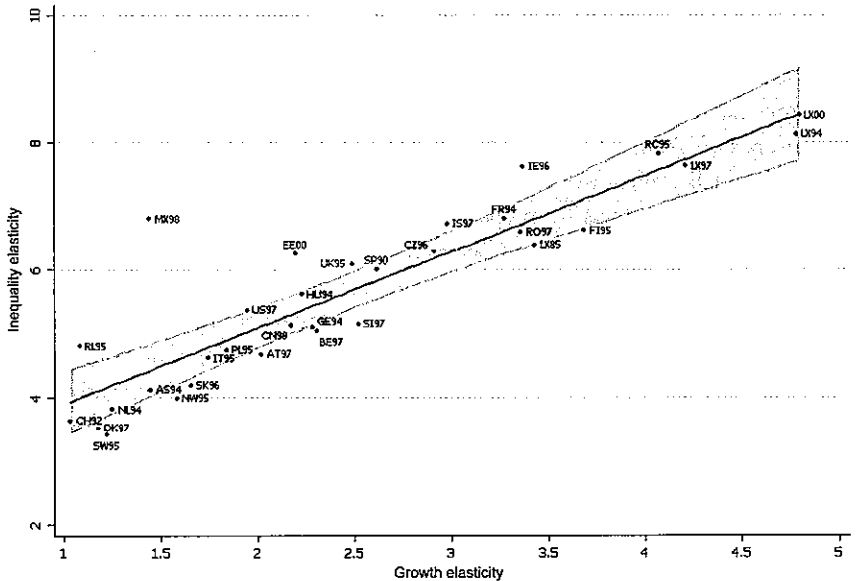


Figure 6 Average trade-off between inequality and growth.

A natural question to ask is whether countries are following the appropriate set of poverty reduction policies, or if they could achieve greater poverty reduction by following a different set of policies. In the absence of any clear benchmarks, answering this question inevitably entails considerable judgement. Nevertheless, we will

attempt to provide a tentative answer to this question by referring to the data depicted in Figure 6.

As we have seen, income growth reduces poverty subject to the constraint that income inequality does not increase too much. If the poverty-reducing effect of growth is strong, an increase in income inequality is tolerable—up to a point. Now assume—and arguably, this is a strong assumption—that on average countries tolerate about the right amount of inequality given their growth elasticity. This entails that in Figure 6 the individual country observations should be located close to the fitted line. However, countries that depart significantly from the average pattern could achieve a better performance in terms of poverty reduction by choosing a set of policies that would more closely approach the fitted line.

All the observations for Luxembourg lie in the shaded area, suggesting that Luxembourg does not deviate significantly from the optimal trade-off. All the observations for Luxembourg are situated below the regression line, but over time, they move slightly upwards and closer to the regression line. A position below the regression line suggests that for a given growth elasticity, the inequality elasticity is lower than optimal and consequently, the policy mix could be adapted in favour of more growth-oriented policies at the expense of redistributive policies. However, in the case of Luxembourg, this is exactly what occurs and one may therefore conclude that Luxembourg is converging towards an optimal efficiency–equity trade-off.

4. Regional distribution analysis: the case of the *Grande Région*

Luxembourg is embedded in the so-called *Grande Région*, which covers four countries (see Figure 7).³ Roughly speaking, it is made up of Luxembourg and the surrounding regions that are within commuting distance from Luxembourg, i.e., the Saarland in Germany, large parts of the German federal state Rhineland–Palatinate, large parts of the French Lorraine and large parts of the Belgian Walloon. In order to assess income inequality and poverty for the *Grande Région* as whole, in this section we construct an LIS dataset based on four national LIS surveys for Waves III and IV: Belgium (1989, 1992), Germany (1989, 1994), France (1989, 1994) and Luxembourg (1989, 1994). Only those households located in regions comprising the *Grande Région*, mentioned above, are included in this dataset and following analyses.

Table 2 shows that in terms of their disposable income, the different parts of the *Grande Région* are fairly heterogeneous. In fact, the mean disposable income ranges from \$PPP 13 775 (1994 prices) in Walloon to \$PPP 24 340 in Luxembourg. Average income in Luxembourg is 66% higher than the average for the *Grande Région*. This single statistic provides a powerful economic rationale for migrating to Luxembourg or at least entering Luxembourg's labour market and explains the sizeable flows of immigrant and cross-border workers. Also notice that while

³ Source: <http://www.grande-region.lu/>.

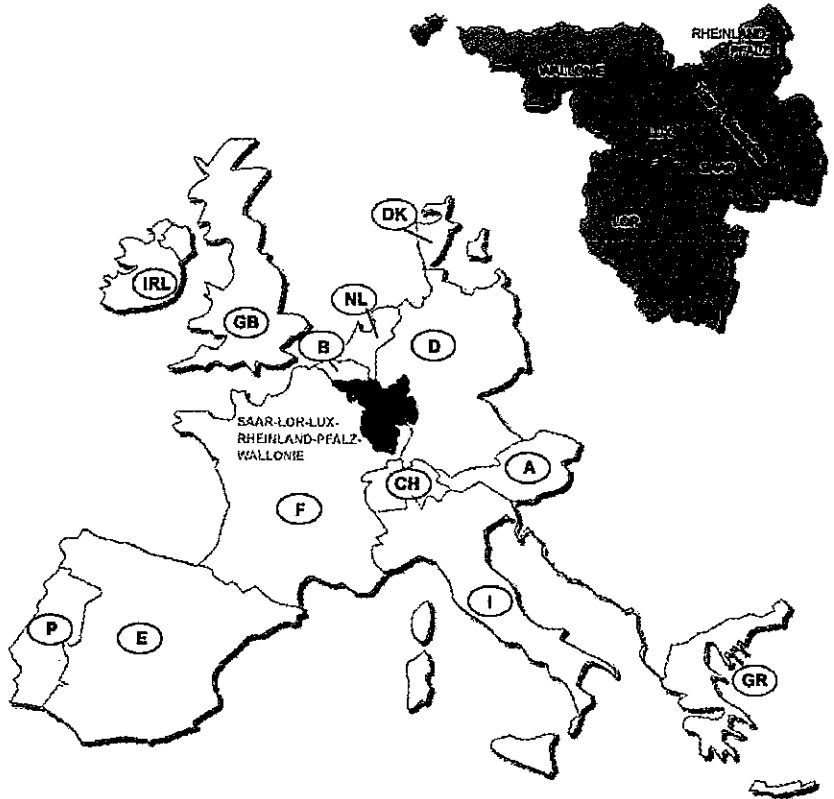


Figure 7 The *Grande Région*.

Luxembourg only accounts for less than 5% of the population of the *Grande Région*, it accounts for more than 7% of its total income.

The heterogeneity of the *Grande Région* also pertains to income inequality. Table 2 shows that Luxembourg and Walloon exhibit similar levels of income inequality, but that inequality is much higher in the other two regions of the *Grande Région*. Figure 8 reports Theil inequality indices for LIS Waves III and IV for the four countries that contribute to the make-up of the *Grande Région*. Italy is also included as a reference point. The Theil index is an additively decomposable index of income inequality that shows each sub-group's contribution to total income inequality within a population (see Cowell, 2000, p. 109). Furthermore, by converting the Theil indices to proportions we can determine the percentage of income inequality attributable to intra-regional inequalities versus inter-regional inequalities. Figure 8 reinforces our earlier finding that Luxembourg has one of the lowest levels of income inequality in the developed world, although Belgium (in 1992) has an even lower level, with a Theil index equal to 0.087. More significantly, these

Table 2 Income distribution in the *Grande Région* in Wave IV of LIS

	Population share	Mean income [†]	Relative mean	Income share	Theil coefficient	Poverty incidence [‡]		
						Regional	National	<i>Grande Région</i>
Lorraine	21.6%	15295	1.044	22.5%	0.167	8.2	9.7	8.9
Walloon	29.1%	13775	0.941	27.4%	0.098	11.0	14.7	13.0
Rhinel.–Pal. & Saarl.	45.0%	13966	0.954	42.9%	0.116	19.0	21.4	18.6
Luxembourg	4.3%	24340	1.662	7.2%	0.102	10.4	10.4	0.9
<i>Grande Région</i>	100.0%	14645	1.000	100.0%	0.135	14.1

[†]PPP-adjusted US\$ at 1994 prices.

[‡]Poverty line is 60% of the median of the reference population (i.e., region, country or *Grande Région*).

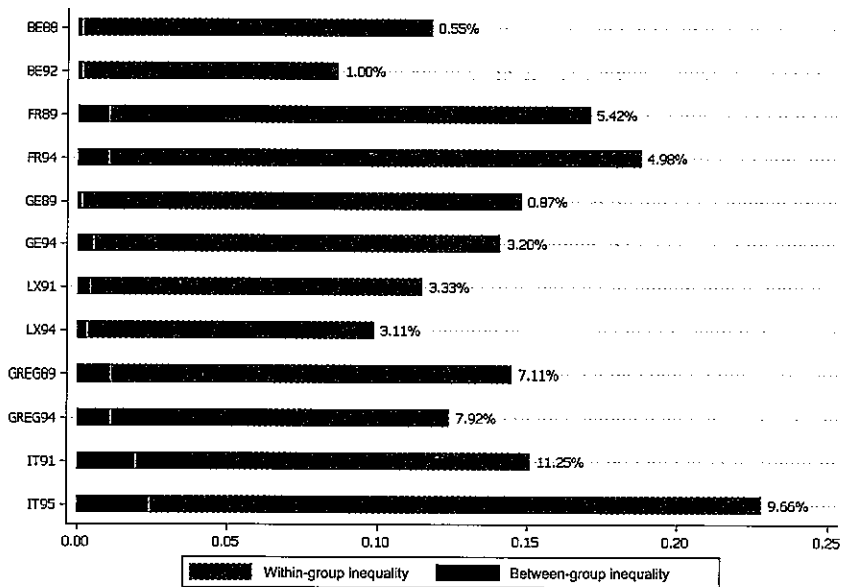


Figure 8 Theil income inequality index and 'within' and 'between' decomposition for the *Grande Région*.

results indicate that overall levels of income inequality, both within and between regions, increase substantially when we examine the *Grande Région*. In fact, inter-regional disparities within the *Grande Région* are significantly larger than within each of the countries that comprise it. For example, roughly 3% of total inequality in Luxembourg is due to inequality between the Cantons and just 1% is due to disparities between the Belgian Federal States in Waves III and IV.⁴ Within the *Grande Région*, however, between 7% and 8% of total income inequality is attributable to inter-regional inequality. Indeed, although a relatively small share of total inequality in each of the countries is due to inter-regional rather than intra-regional disparities, it is significant to note that this value is considerably larger than inter-regional inequality in France and approaches the value of 9.7% found for Italy in Wave IV. The latter country is widely known to have the largest regional disparities within Western Europe (see also Förster, Jesuit and Smeeding, 2002). Furthermore, although inter-regional disparities slightly decreased within Luxembourg between Waves III and IV, inter-regional inequality increased somewhat within the *Grande Région* to 7.9% of total income inequality, up from 7.1%. In sum, although the *Grande Région* as a whole still has a relatively equal distribution of income, a

⁴ This finding is somewhat surprising given the strong federal character of the Belgian state and the well-known disparities between Flanders and Walloon. Accordingly, we have also computed Theil indices for 1985, 1988 and 1997 but found similar results, even when examining inequality at the provincial level in the case of 1985.

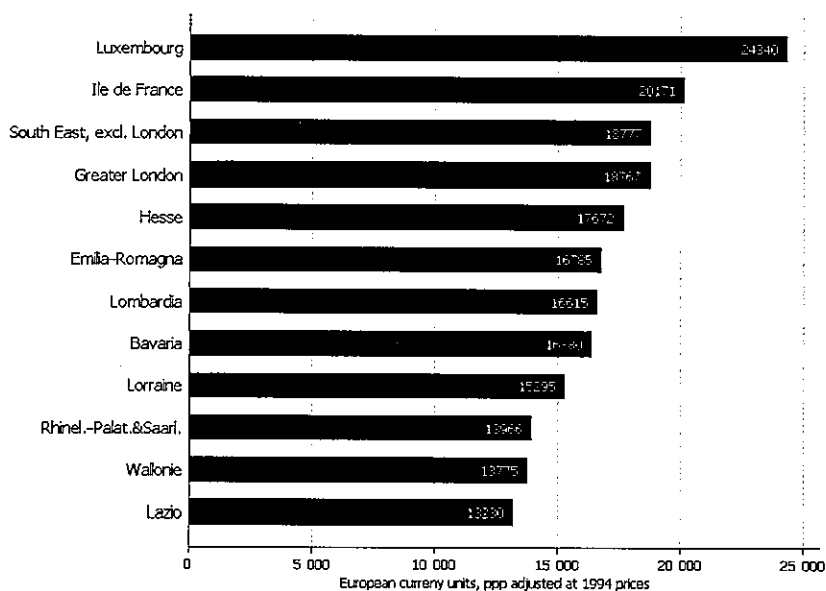


Figure 9 Average incomes by regions.

comparatively large share of the gap between the rich and the poor is found between the regions comprising the *Grande Région*.

Examining inter-regional inequalities within the *Grande Région* from a somewhat different perspective, Figure 9 reports mean equivalized income, adjusted to 1994 purchasing power parities, and relative mean equivalized income for the regions within the *Grande Région* as well as other 'rich' and 'poor' European regions. This figure shows that even when compared to other wealthy regions in Europe, such as Emilia-Romagna in Italy, London, and Ile-de-France (the greater Paris region), Luxembourg stands apart as one of the richest 'regions' in Europe with an average income equal to \$PPP 24 340 in 1994. As shown in this figure, the income gap between Luxembourg and Walloon, which equalled \$PPP 10 565 in 1994, is about three times wider than the absolute gap in mean income between Emilia-Romagna and Lazio and more than twice as wide as the income disparities between Ile-de-France and Lorraine.

The previous results indicate that despite the relatively low levels of income inequality in Luxembourg and the countries of the *Grande Région*, inter-regional disparities within the *Grande Région* are among the highest in Europe. None the less, apart from the absolute figures for mean income reported above, this tells us little about the less well-off within the *Grande Région*. Accordingly, the next section examines relative poverty rates within the *Grande Région* as a whole and in each of its components. It also raises questions about the appropriate poverty line one should adopt in comparative regional analyses.

Table 2 reports relative poverty rates using three different reference groups to establish a poverty line equal to 60% of median equivalent income of the country, the region and the *Grande Région* for LIS Waves III and IV. As the previous results established, poverty in Luxembourg is exceptionally low by international standards, equalling 10.4% in 1994. However, when using France's national median equivalent income to establish a poverty threshold, the rate of poverty in Lorraine is even lower than Luxembourg's, suggesting that Lorraine is better off than its neighbouring country to the north. At the other extreme, just over 21% of Germans living in Rhineland–Palatinate and Saarland are poor when the German poverty line is adopted. Furthermore, this high rate of poverty represents a significant increase, equal to about 8 percentage points since Wave III, which was the largest increase witnessed in any of the regions under investigation.⁵

On the other hand, when using the *Grande Région* as the reference society, as opposed to the country, poverty is virtually non-existent in Luxembourg, having values for both waves equal to less than 1% poor. Rates in the other areas of the *Grande Région* range from a high of 18.6% in Rhineland–Palatinate and Saarland to a low of 8.9% in Lorraine, both in Wave IV. This finding adds even greater weight to the earlier findings: from the perspective of others in the *Grande Région*, there are no poor persons living in Luxembourg! Examining the *Grande Région* as whole, these results indicate that poverty rates remain among the lowest in the world, equalling 12.6% in Wave III and 14.1% in Wave IV. As these figures suggest, however, nearly all of these poor persons in the *Grande Région* reside outside Luxembourg.

In sum, our examination of the *Grande Région* allows us to formulate several important conclusions. First, as shown by the Theil indices, the proportion of total income inequality within the *Grande Région* that is attributable to inequality between the regions is among the highest in Western Europe, even approaching levels of inter-regional income inequality found in Italy. In fact, in both relative and absolute terms, the income gaps between Luxembourg and the regions comprising the *Grande Région* are even wider than the gap between northern and southern Italy. If one takes seriously the notion that social cohesion is threatened by inter-regional disparities, one should be concerned about this enormous gap. Second, the adoption of a *Grande Région* poverty line reinforces the above conclusion since poverty in Luxembourg is virtually non-existent when using the *Grande Région* as the reference society. In short, from the perspective of the other residents of the *Grande Région*, no one is poor in Luxembourg. Finally, it is evident that even when a *Grande Région* poverty line is adopted, the poverty rate within the *Grande Région* is still among the lowest in the world. These findings point to fundamental aspects

⁵ Jesuit, Rainwater and Smeeding (2003) report 95% confidence intervals for this German region as well as Walloon and Lorraine. Using this strict criterion, they conclude that the difference in the poverty rate between Waves III and IV in Rhineland–Palatinate/Saarland is not statistically significant.

of the debate concerning the appropriate reference society for establishing relative poverty lines. In short, is the *Grande Région* the relevant 'community standard' by which persons living in Lorraine, Walloon and Rhineland–Palatinate and Saarland should be judged to be 'poor' or is the whole of France, Belgium or Germany more appropriate? What should we make of recent efforts to establish a poverty line using a European standard? Our findings suggest that such an effort may be misguided. Indeed, if, as some suggest, national poverty lines 'mask' or 'disguise' geographical inequalities and concentrations of poor persons within countries (see Jesuit, Rainwater and Smeeding, 2003 and Stewart, 2002), a European-wide poverty threshold simply compounds the problem. Thus, rather than adopting a common poverty threshold for all of the EU countries, we advocate adopting individual poverty lines at lower levels of aggregation, such as NUTS 2 regions. In this way the 'community standard', which is fundamental to the concept of a relative poverty line, is established in a manner that more accurately reflects the core theoretical basis for such indicators of economic (and social) well-being.

5. Conclusion

This paper has provided an overview of key facts that 20 years of LIS have taught us about the distribution of incomes in Luxembourg.

The income distribution before and after transfers is very equal by international standards. The transfer system—including pensions—provides very effective income redistribution and poverty relief. The available evidence suggests that pension benefits are better targeted towards supplementing low incomes than are family-related transfers. Our analysis therefore suggests that a generous welfare state successfully subdues the twin evils of inequality and poverty. In fact, we also observe that the level and the 'depth' (i.e. average shortfall from the poverty line) of poverty are among the lowest in the world.

Our analysis also shows that the relative poverty incidence in Luxembourg is particularly sensitive to changes in the poverty line. On the one hand, this implies that poverty is fairly 'shallow' and that extreme poverty (households with income below 40% of the median) is virtually non-existent. On the other hand, it also implies that a sizeable share of the population is threatened by the risk of poverty, in the sense that a relatively small negative shock to their income may cause them to descend into poverty.

Economic growth generates higher incomes and does therefore, in principle, contribute to reducing poverty. However, to the extent that income growth exacerbates inequality, some or all of the benefits stemming from economic growth may be offset by the adverse inequality effect.

In Luxembourg, increases in household disposable income have a large negative effect on poverty, but also a large positive effect on inequality. On balance, however, the trade-off between income growth and income inequality is relatively favourable

by international standards. Furthermore, we find tentative evidence suggesting that the mix of 'pro-growth' and 'pro-poor' policies is appropriate given the structure of the income distribution.

Our analysis also suggests that there are still some unresolved methodological issues pertaining to the Luxembourg datasets covering the period 1985–2000. First, in order to reach a more complete understanding of the Luxembourg tax and transfer system—and to analyse behavioural responses—it is absolutely crucial that data on gross incomes and taxes be made available for Luxembourg. This will also enhance the international comparability of Luxembourg's income data. Furthermore, the apparent break that occurs in the inequality and poverty indices between the 1985–94 and the 1997–2000 episodes remains a cause for concern and needs more careful consideration.

It is sometimes argued that due to its small size, the case of Luxembourg is not comparable to other nation-states. In order to investigate this claim, LIS data are used to construct a dataset for the *Grande Région* and other regions in Europe. The inter-regional income distribution analysis carried out at the level of the *Grande Région* suggests that Luxembourg's absolute and relative wealth cannot be explained away by its size. Even at the regional level, Luxembourg stands apart as one of the richest regions in Europe. Disposable incomes in Luxembourg are some 70% higher than in the neighbouring regions. This gap is much wider than regional disparities observed elsewhere in Europe, e.g. between northern and southern Italy.

The analysis at the level of the *Grande Région* also shows that while a regional focus may be appropriate to understand regional phenomena (e.g. cross-border work in the *Grande Région*), the bigger picture (e.g. relative performance of the tax and transfer systems, labour market institutions) only emerges when nation-states and their institutions are compared to each other. Consequently, the case of Luxembourg deserves investigation in its own right rather than exclusion from the analysis on the grounds of non-comparability due to its small size. In fact, Luxembourg has put in place a set of economic and social institutions that have successfully tamed income inequality, poverty and unemployment and it therefore provides an interesting reference point in internationally comparative research.

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