Session Number: 1
Session Title: Recording and Measuring International Flows
Paper Number: 5
Session Organiser: Mick Lucey
Discussant: Paul McCarthy

Version: 18th August, 2004

Ireland's Income Distribution in Comparative Perspective

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Paper Prepared for the 28th General Conference of

The International Association for Research in Income and Wealth

CORK, IRELAND, AUGUST 22 – 28, 2004

The authors would like to thank especially Kati Foley and also Paul Alkemade, Teresa Munzi, Holly Sutherland the Luxembourg Income Study sponsors for their help in preparing this paper. The conclusions are the responsibilities of the authors and do not represent the official opinions of our institutes.

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1. Introduction

One of the most frequently expressed concerns about the unprecedented economic boom that Ireland experienced in the second half of the 1990s has been that the benefits were not shared evenly, that rising living standards were accompanied by widening gaps leaving Ireland with a particularly unequal distribution of income. This paper examines Ireland's income distribution in comparative perspective, and seeks to shed some empirical light on what happened during the boom and how Ireland compares to other rich countries. It begins by using the data from the OECD and the Luxembourg Income Study to compare Ireland's degree of income inequality with other advanced countries. It then looks in some detail at what alternative sources of survey data suggest about key trends in income inequality in Ireland from 1994 to 2000. Since there is a particular interest in what happened right at the top of the distribution, this is then examined using data from the administration of the income tax system. Finally, we conclude with some reflections on the implications of the results presented.

The "Irish Miracle"

One extremely important fact to keep in mind as one begins to assess these distributional patterns is the rapid rate of economic growth which has favored Ireland for the past 25 years. Table 1.1 shows Ireland in comparison with nine other major OECD nations which we deploy in the next section of this paper. In 1980 poor Ireland had an OECD PPP adjusted GDP per capita of $10,926 (in 2000 US dollars). GDP per person at that time was only 48 percent that of the United States (compared to 77 percent for all other countries shown here). The UK, with 70 percent of the US level, was the nation closest to Ireland. By 1990, the Ireland to US ratio was up to 53, still far below the average of all others (77) and the UK (72). By 2000, Ireland had a GDP per person that was 81 percent that of the United States, just behind Canada (at 82 percent) while the UK remained at 73 percent of the US level. Obviously the 46 percent gain in GDP over the 1990s was unmatched by these nations (and even compares well to China and Korea whose base GDP is much smaller). By 2003, the latest OECD figures (not shown here)

Table 1.1. Gross Domestc Product per Head at the Price Levels and PPPs of 2000 (in 2000 US dollars)

Nation	1980	Index[1]	1990	Index[1]	2000	Index[1]	Percent Change 1980 to 1990	Percent Change 1990 to 2000	Percent Change 1980 to 2000
Belgium	$ 17,870	78	$ 21,512	76	$ 25,916	75	16.9	17.0	31.0
Canada	20,349	89	23,631	83	28,367	82	13.9	16.7	28.3
Finland	16,892	74	21,860	77	25,359	73	22.7	13.8	33.4
Germany	17,175	75	21,271	75	24,851	72	19.3	14.4	30.9
Ireland	**10,926**	**48**	**15,128**	**53**	**28,035**	**81**	**27.8**	**46.0**	**61.0**
Netherlands	18,272	80	21,580	76	26,982	78	15.3	20.0	32.3
Sweden	18,763	82	22,635	80	26,576	77	17.1	14.8	29.4
United Kingdom	16,034	70	20,473	72	25,322	73	21.7	19.1	36.7
United States	22,849	100	28,420	100	34,575	100	19.6	17.8	33.9
Overall Average	$ 17,681	77	$ 21,834	77	$ 27,331	79	19.4	20.0	35.2

Source: OECD. 2003. *Annual National Accounts for OECD Member Countries* , Gross Domestic Product and Household Final Consumption Expenditure Comparative Tables (B1-B12). (http://www.oecd.org/document/28/0,2340,en_2649_34259_2750044_1_1_1_1,00.html)

Note: [1] United States = 100.

have Ireland at 90 percent of the United States GDP per capita. Clearly we must interpret Ireland's distributional situation in the context of this rapid and fairly widespread economic boon.

2. Income Inequality and Poverty in Ireland in Comparative Perspective

Introduction

This section of the paper compares recent economic inequality in industrialized nations, largely those belonging to the Organization for Economic Cooperation and Development (OECD)[1], with inequality in Ireland. We find that Ireland has a rather high overall level of inequality, but a level below that found in the Unite States. In real income terms, Ireland's poor and rich improve relative to other comparable nations despite the fact that the Irish poor are still below average in terms of real levels of well being, compared to other nations. Next we examine the effects of government policies and social spending efforts on poverty and inequality, finding that Ireland has lower than average poverty reduction policies and a fairly high rate of overall relative poverty while its strong economy (not its tax-benefit policy) is mainly responsible for the level of overall inequality that is evident.

Methodological Details

First, some clarifications of our approach. Our analysis concentrates on income inequality among households and does not directly address the issue of individual earnings inequality. Granted that earnings are generally the largest part of income, nevertheless, these are very different phenomena. Earnings refers to persons, and income

[1] The research that we summarize, expand upon and update here is reported more fully in the following articles: Smeeding, T.M. 2004. "Government Programs and Social Outcomes: The United States in Comparative Perspective." Presented at the Poverty, the Distribution of Income and Public Policy Conference, University of California at Berkeley, Berkeley, CA, December 13, 2003, also available at http://www-cpr.maxwell.syr.edu/faculty/smeeding/pdf/campbell paper_5.17.04.pdf, revised April; Gottschalk, P., and T.M. Smeeding. 1997. "Cross-National Comparisons of Earnings and Income Inequality." *Journal of Economic Literature* 35(June):633-657; and Gottschalk, P., and T.M. Smeeding. 2000. "Empirical Evidence on Income Inequality in Industrialized Countries." In A. Atkinson, and F. Bourgignon (eds.), *Handbook of Income Distribution*, Amsterdam: North Holland Press; and also available on the LIS website (http://www.lisproject.org) as *Luxembourg Income Working Paper No. 154*; and in Smeeding, T.M. 1998. "U.S. Income Inequality in a Cross-National Perspective: Why Are We So Different?" In J. Auerhach and R. Belous (eds.), *The Inequality Paradox: Growth of Income Disparity*, Washington: National Policy Association.

to households. Income pools the earnings of household members, taxes, transfers, pensions, and capital income, each of which is liable to make the distribution of household income very different from the distribution of individual or household earnings.

We measure disposable money income. For most families, the primary income source is market income, which includes earned income from wages, salaries, and self-employment and other cash income from private sources—from property, from pensions, from alimony or child support. To reach disposable income, governments add public transfer payments (retirement, family allowances, unemployment compensation, and welfare benefits) and deduct income tax and social security contributions from market income. This cross-nationally comparable definition of income is hardly comprehensive, typically excluding much of capital gains, imputed rents, home production, and in-kind income. We take no account of indirect taxes or of the benefits from public spending on such social goods as health care, education, or most housing subsidies.[2] We also measure income on an annual basis. This may be too long an accounting period for families that are severely credit constrained, too short for those that can smooth consumption over multiple years—but almost all the available surveys report income for the calendar year.

The answer to the question "distribution among whom?" is "among individuals." Some surveys focus on the individual as the unit of analysis, some on the household as the unit of income sharing. The most common unit of analysis is the household, defined as all persons sharing the same housing unit, regardless of any familial relationship.[3] We, therefore, estimate individual disposable income by aggregating the income of all household members and using an equivalence scale to arrive at individual equivalent income.[4] When examining poverty we count the number of persons with incomes below

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[2] In general, countries which spend more for cash benefits also tend to spend more for noncash benefits, so that the distribution of housing, education and health care benefits reinforces differences in income distribution for at least some western European nations. This is not necessarily so, however- for other countries or other methods of accounting.

[3] Some countries use more restrictive definitions, Sweden, for example, uses the nuclear family as the accounting unit.

[4] We use the square root of family size to obtain equivalent income.

half of the national median income, using these same market and disposable income definitions.

Differences in Inequality across Nations: Relative and Absolute Income Differences

Figure 2.1 compares the distribution of disposable income in 30 nations for various years around the turn of the century (2000). Within each country we focus on the relative differences between those at the bottom and those at the top of the income distribution. To do so we first measure, in each country, the ratio of the income of a household at the 10th percentile (P_{10}, in Figure 2.1) and a household at the 90th percentile (P_{90}) to median income. This gives us some indication of how far below or above the middle of the distribution the poor and the rich are located on the continuum of income. Second, we measure the ratio between the incomes of those at the 90th and 10th percentiles (the "decile ratio"). This gives us the size of the gap between the richest and the poorest in each country. These measures—measures of socio-economic distance, if one will—are easy to understand but focus on only a few points in the distribution of income. An alternative measure of inequality across the entire distribution is the Gini coefficient, much used by economists in studies of inequality.[5] We include this number also in Figure 2.1. Note that countries in Figure 2.1 are ranked by the P_{10} ratio. Ranking by P_{10}, the P90/10 or the Gini would give different rankings. This pint should be well knotted by those who prefer a single coefficient inequality measure to rank nations.

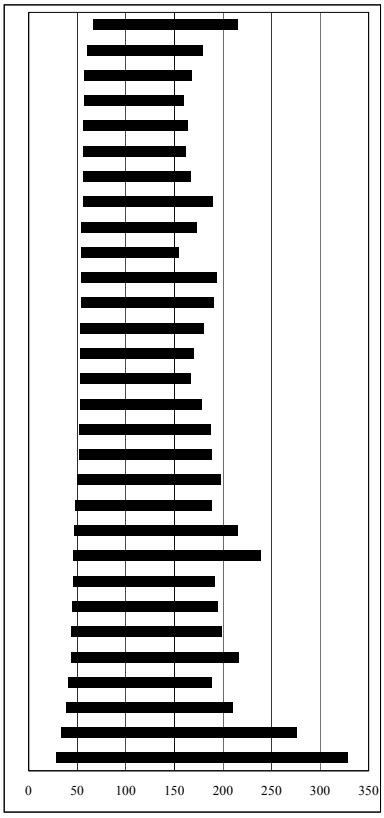
Figure 2.1 shows us that Ireland (bold) is indeed an outlier among rich nations. Only the United States, Russia and Mexico have higher levels of inequality and at least the latter two of these nations are thought of as still 'developing' by most analysts. Among the richest OECD nations Ireland has the second highest level of inequality. A low-income Irishman (or woman) at the 10th percentile in 2000 had an income that is only 41 percent of median income, whereas a high-income Ireland resident in the 90th percentile had an income that is 189 percent of the median. The income of the high-income Irish is roughly four and a half times the income of the low-income Irish, even

[5] The Gini coefficient uses a scale from 0, perfect equality, to 1, perfect inequality. Thus, in Figure 2.1, Denmark, with a Gini coefficient of 0.236, has the least inequality and Mexico, with a Gini coefficient of 0.494, has the highest level of inequality.

Figure 2.1. Social Distance and Social Exclusion

(numbers given are percent of median in each nation and Gini coefficient)

	P10 (Low Income)	Length of bars represents the gap between high and low income individuals	P90 (High Income)	P90/P10 (Decile Ratio)	Gini Coefficient[1]
Luxembourg 2000	66		215	3.24	.260
Czech Republic 1996	60		179	3.01	.259
Sweden 2000	57		168	2.96	.252
Norway 2000	57		159	2.80	.251
Finland 2000	57		164	2.90	.247
Slovak Republic 1996	56		162	2.88	.241
Netherlands 1999	56		167	2.98	.248
Taiwan 1995	56		189	3.38	.277
Germany 2000	54		173	3.18	.252
Denmark 1992	54		155	2.85	.236
Hungary 1999	54		194	3.57	.295
France 1994	54		191	3.54	.288
Romania 1997	53		180	3.38	.277
Belgium 1997	53		170	3.19	.250
Slovenia 1999	53		167	3.15	.249
Austria 1997	53		178	3.37	.266
Poland 1999	52		188	3.59	.293
Switzerland 1992	52		188	3.62	.307
Spain 1990	50		197	3.96	.303
Canada 2000	48		188	3.95	.302
United Kingdom 1999	47		215	4.58	.345
Estonia 2000	46		234	5.08	.361
Japan 1992[2]	46		192	4.17	.315
Australia 1994	45		195	4.33	.311
Italy 2000	44		199	4.48	.333
Israel 2001	43		216	5.01	.346
Ireland 2000	**41**		**189**	**4.57**	**.324**
United States 2000	39		210	5.45	.368
Russia 2000	33		276	8.37	.434
Mexico 1998	28		328	11.55	.494
Average[3]	**50**		**194**	**4.10**	**.299**



Source: Author's calculations from Luxembourg Income Study.

Notes: [1]Gini coefficients are based on incomes which are bottom coded at 1 percent of disposable income and top coded at 10 times the median disposable income.

[2]Japanese gini coefficient as calcuated in Gottschalk and Smeeding (2000) from 1993 Japanese Survey of Income Redistribution.

[3]Simple average.

after we have adjusted for taxes, transfers, and family size (the decile ratio is 4.57). In contrast, across the other countries in Figure 2.1, the income of the poor averages 50 percent of the income of middle-income persons; that of high-income person averages 194 percent of the median income. The average rich person has about 4.1 times the income of the average poor person. The rich Irish are a bit below average in relative terms (P_{90} of 189 vs 194 for all) but the poor Irish are amongst the least well off, with incomes at P_{10} of 41 compared to an overage of 50.

The countries in Figure 2.1 fall into clusters despite the fact that different measures of inequality give different rankings. Inequality is least in Northern Europe (the Scandinavian countries, Belgium, the Netherlands), where the income of those at the 10th percentile is 57 percent of the median. Central Europe comes next (Switzerland, Germany, and France). They are followed by an eclectic mix. The large Anglo-Saxon nations: Canada, Australia, and United Kingdom are roughly at the same level, less equal than Europe, but still more equal than the United States, Ireland and Italy (which have the highest levels of inequality outside the United States). In some rich countries, for example, Luxembourg, Israel, Estonia, and the United Kingdom, the incomes of the richest (those at the 90th percentile) are all more than 200 percent of median income-a bit above the relative level of the Irish rich. In summary, Ireland differs, above all, in the relative disadvantage of its poorest residents. These persons have incomes only 41 percent of the median—in other rich nations (other than the United States) they are much higher – e.g. 47 percent in the UK, 48 percent in Canada.

Absolute Differences in Income Inequality across Nations

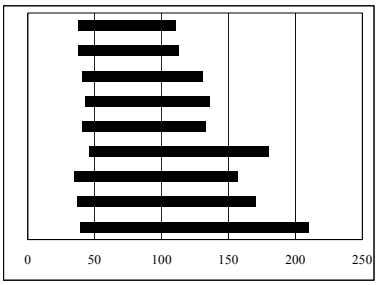
It is often argued that the higher the average standard of living in a particular nation, the better off are its citizens. By this argument, the typical Irish resident by 2000 was, "on average," better off than were residents of the United Kingdom, Belgium or Finland, because Irish real GDP (Gross Domestic Product) per capita in 2000 was $28,035, compared to $25,322 in the United Kingdom and $25,359 in Finland and $25,916 in Belgium (see Table 1.1 and also Appendix Table A-1). Does the higher average Irish standard of living extend to all levels of the income distribution? We examined this question by converting the incomes of a set of rich nations (from Figure 2.2) into real 2000 United States dollars, using the standard OECD measure of purchasing power parity (PPP). We then recomputed low-, median-, and high-incomes in these countries as a fraction of the United States median, creating "real incomes", and then present them in Figure 2.2. Because conversion of real income across countries is sensitive to the PPP index used and to other factors, these comparisons should be taken as rough indicators of "real living" standards.

Low-income people, whose relative incomes averaged 50 percent of median income in their own countries in Figure 1.1 (51 percent in the subsample selected here), now have real incomes only 40 percent of the United States median. When compared against median Irish income, for example, the median German whose living standard is only $24,851 or 88 percent as high as the typical Irish, would appear to enjoy a lower standard of living than the median Irish at $28,035. But the real incomes of Germans at the 10th percentile are on average 4 percentage points higher than the real incomes of the Irish at the 10th percentile. Low-income Canadians are even better off, with incomes 9 percentage points higher than the low-income Irish, while having about the same overall GDP per person as Ireland. Only in Great Britain (whose GDP per person is less than 90 percent of that in Ireland in Table 1.1) were the living standards of low-income house holds are a bit lower than in Ireland (35 vs. 37 percent). Overall, lower-income Irish are worse off than the low-income persons in all other nations, save

Figure 2.2 Real Income Well-being of All Persons in 8 Countries [1]

(as percentage of overall US 2000 median equivalent income in PPP terms)[2]

	P10 (Low Income)	Economic Distance — Length of bars represents the gap between high and low income individuals	P90 (High Income)	P90/P10 (Decile Ratio)	Real Income Gape Between Rich and Poor
Finland 2000	38		111	2.90	$ 17,780
Sweden 2000	38		113	2.95	$ 18,260
Germany 2000	41		131	3.17	$ 21,830
Belgium 1997	43		136	3.19	$ 22,760
Netherlands 1999	41		133	3.27	$ 22,510
Canada 2000	46		180	3.95	$ 32,720
United Kingdom 1999	35		157	4.54	$ 29,960
Ireland 2000	**37**		**170**	**4.57**	**$ 32,473**
United States 2000	39		210	5.43	$ 41,900
Average[3]	40		149	3.77	$ 26,688



Source: Author's calculations from Luxembourg Income Study.

Notes: [1]Figures given are adjusted dollars per equivalent person (child) in own currency as a percent of own overall national median income (P50), weighted for the number of persons in each unit.

[2]Figures given are adjusted dollars per equivalent person 2000 U.S. dollars, weighted for the number of persons in each unit size, and relative to the overall U.S. median of $24,416.

[3]Simple average.

Britain. But relative richness extends to high the high end as well, and here Ireland far surpasses the rich in any other nation observed (except for Canada and the United States)

and are far above the other country average. The average "rich" Irish is 21 percentage points above the average rich person and 13 points above the average rich British person.

We can also measure the income distance between top and bottom, all in US 2000 PPP adjusted dollars now. The gap in the Ireland is $32,473 per person—the lower-income person has resources of about $9,000 per person, while the rich person has about $41,500 per person. The gap is much higher than in most nations—higher than in Canada, and second only to the United States.

These real income measures are admittedly crude. They should be seen as measures of net spendable income rather than of total consumption. Total consumption would also include goods and services such as health care, education and child care that are provided at different prices and under different financing schemes in different nations. To the extent that low-income citizens elsewhere need to spend less out of pocket for such goods as these than do low-income Irish, the latter are at an even greater real income disadvantage. But we have no information on such differences.

The claim that Ireland enjoys the most rapidly rising living standards in the OECD must be evaluated alongside the equally valid claim that Ireland enjoys a relatively high level of real income inequality compared to the other countries we study. And the social costs of low absolute incomes may be quite high, especially for families with children. From other research, we know that young children living in households with incomes at 75 percent of the official United States poverty line—that is, households at roughly the 10th percentile in the income distribution in Ireland or the UK or the US are at severe risk of poor health, subsequent poor educational performance, and diminished achievement.[6]

Patterns of Redistribution

Every nation's tax and benefit system reduces market income inequality, but not all are equally effective in doing so. Figure 2.3 uses the Luxembourg Income Study to demonstrate both market income inequality and disposable income inequality amongst a set of 14 nations using the gini coefficient (rounded to two digits and multiplied by 100).

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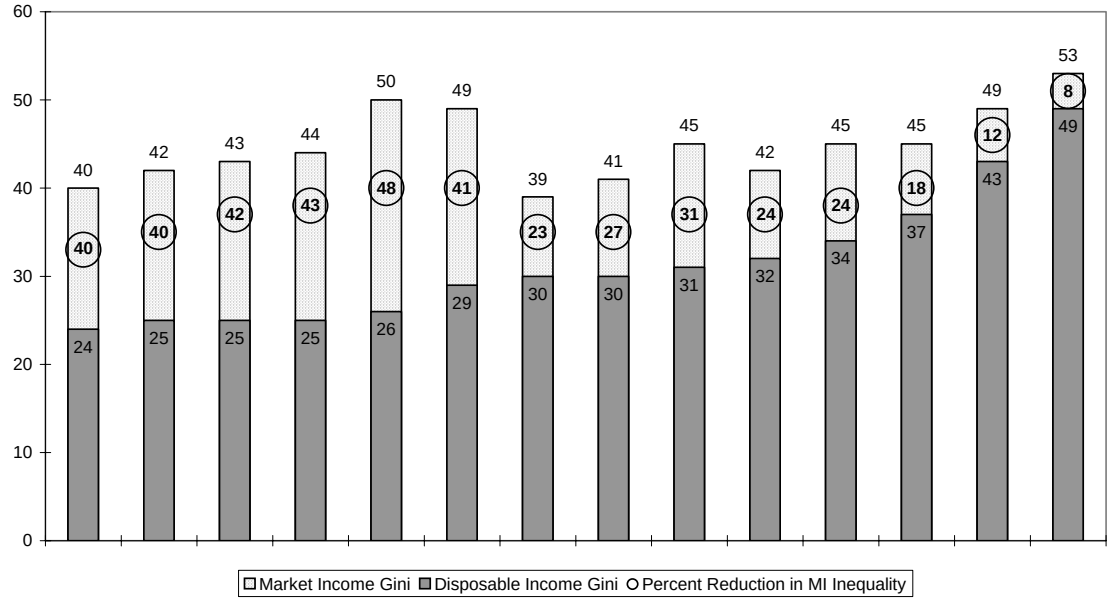
[6] G. Duncan, W. Yeung, J. Brooks-Gunn, and J. R. Smith. 1998. "How Much Does Childhood Poverty Affect the Life Chances of Children?"' *American Sociological Review* 63(3) (June):406-423.

In all nations disposable income inequality is less than market income inequality, suggesting that the tax and benefit system reduces overall inequality. Leaving Russia and Mexico aside for a minute, we see that the market generates similar patterns of income inequality in all rich nations. The gini for market incomes varies only from 39 to 50 across these 12 rich nations and Ireland at 42 is at the lower end of these nations (owing mainly to its strong economy, see Appendix Table A-1). After tax and transfer disposable income inequality measures range from 24 to 37 and Ireland has a middle level remaining inequality at 32, consistent with Figure 2.1 earlier in the paper. The percentage reduction in before tax and benefit inequality in Ireland is 24 percent, roughly the same reduction as the UK and Switzerland, less than Canada (27) or Australia (31), but more than the UK (18) or the United States (12). These reductions are less than those found in Central and Northern Europe and in Scandinavia (e.g., France, Belgium, Sweden, Germany, Netherlands), but more than in Russia or Mexico. For instance, the Netherlands, which begins with the same MI gini (42), achieves a 40 percent reduction in inequality by means of its tax transfer system compared to 24 percent in Ireland.

Figure 2.3. Inequality of Market Income[1] and Net Disposable Income in OECD Countries: Gini Coefficients before and after Taxes and Benefits



Source: Author's calculations from the Luxembourg Income Study.

Note: [1]Estimate based on communication with Sutherland (2004). LIS does not contain market income estimate for Ireland.

Before tax and benefit inequality in Finland, Netherlands, Germany and Sweden are less than that found in Ireland. These are all relatively large and generous welfare states, compared to Ireland or the Anglo-Saxon nations. Those that redistribute the most are therefore not the ones who have indirectly created the greatest degree of market income inequality via their tax and benefit systems. When one looks at redistribution, they usually concentrate on how it affects poverty and the lowest part of the income distribution as well as how it affects overall inequality. And so we take a comparative look here as well.

The Antipoverty Effect of Taxes and Transfers

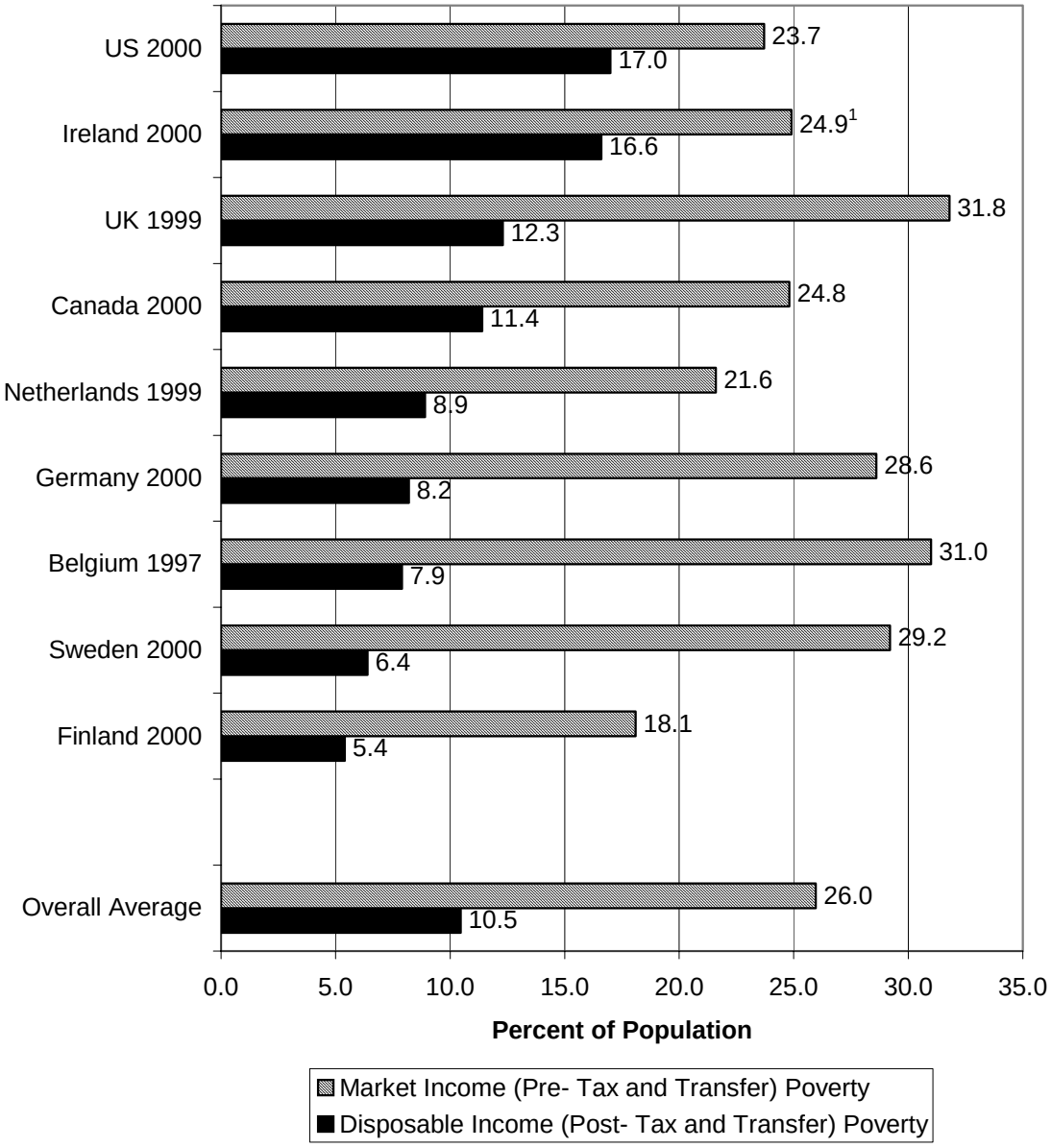
In every nation, benefits from governments, net of taxes, reduce income poverty. Figure 2.4 is taken from a recent paper (Smeeding 2004)[7]. Here we look at the poverty rate, the percent of persons with both market and disposable incomes less than half of the median disposable income, in nine nations. As with the inequality measures in Figure 2.3, poverty rates computed using before-tax-and-transfer household income does not differ among countries as much as do those calculated after taxes and transfers in Figure 2.4.

Here we find that the Irish before-tax-and-transfer poverty rate is actually below average, owing mainly to its strong economy. As one might expect based on the previous analyses, the United States shows the least antipoverty effect of any nation analyzed. It reduces poverty by 28 percent compared to the average reduction of 62 percent in Figure 2.4. The nation closest to the United States in terms of overall net poverty is Ireland at 16.6 percent. Here government programs reduce market income-based poverty by 33 percent. In all other nations, the effects of programs on poverty are much higher than in the United States and Ireland.

This finding implies that different levels and mixes of government spending on the poor have sizable effects on national poverty rates (Burtless, Rainwater, and Smeeding 2001). In fact, detailed analysis shows that higher levels of government spending (as in Scandinavia and Northern Europe) and more careful targeting of government transfers on the poor (as in Canada, Sweden, and Finland) produce lower

[7] We have updated the Canadian figure to 2000 and added Ireland 2000.

Figure 2.4.
Relative Poverty Rates and Antipoverty Effects in 8 Rich Nations at the Turn of the Century
(Percent of Persons with Market Income and Disposable Income Less than Half of Adjusted National Disposable Median Income)



Source: Author's calculations from Luxembourg Income Study.

Note: [1]Market income unavailable for Ireland in LIS. Ireland's Market income poverty rate was estimated based on private communications with M. Corak (2004) and H. Sutherland (2004).

poverty rates (Smeeding 2004). Unemployment (Appendix Table A-1) is not well correlated with either market income poverty or disposable income poverty. Rather, earnings and wage disparities are important in determining both market income and disposable income poverty rates, especially among families with children (Jäntti and Danziger 2000; Bradbury and Jäntti 1999). Countries with an egalitarian wage structure tend to have lower child poverty rates, in part because the relative poverty rate among working-age adults is lower when wage disparities are small.

Other nations get a much larger poverty reduction from social insurance, In heavily insured countries like Sweden, Belgium, and Germany, social insurance (unemployment and workers' compensation, disability benefits, paid family leave) reduces poverty by over 70 percent. In the case of social assistance, large effects of targeted programs are found in Finland and the United Kingdom, while relatively lower ones are observed in the more socially insured nations where the heavy lifting has already been done by these benefits (e.g. in Germany, Belgium, the Netherlands, and Canada). It should be apparent that different nations use different instruments and different "income packages" to achieve their antipoverty effects. There is no one program or one type of policy instrument that is universally generous and common across these eight nations.

3. Trends in Income Inequality during the Economic Boom

How to Lie with Statistics?

Capturing trends in income inequality requires both reliable data and appropriate methods, and there are many pitfalls and challenges. To illustrate the sorts of difficulties that can arise, we begin our analysis of recent trends in Ireland by presenting three sets of figures. Each relates to disposable income and has been used elsewhere to represent what has been happening to income inequality over the period.

Table 3.1 shows key results from the Household Budget Surveys carried out by the Central Statistics Office in 1994-95 and 1999-2000, calculated from figures published in the official reports. The share of each decile in total disposable household income in each year is given, and a clear pattern is seen. The share of the bottom two deciles has declined from the mid-1990s to the end of the decade, by about half a percentage point in total, but the more pronounced shift has been towards the top, where the share of the top

decile has risen by one and a half percentage points. So this has been taken as constituting clear evidence of substantially "widening gaps".

Table 3.1: Decile Shares Ireland 1994-2000, Household Budget Surveys

Decile	1994-95 %	1999-2000 %
Bottom	2.2	1.9
2	3.5	3.3
3	4.7	4.5
4	6	5.9
5	7.6	7.5
6	9.2	9.2
7	11.3	11.1
8	13.6	13.4
9	16.7	16.6
Top	25.2	26.7
All	100	100

Source: Derived from *Household Budget Survey Reports* , 1994-95 and 1999-2000.

Table 3.2 shows figures taken from the authoritative EU source in this context, the recent *Joint Report by the Commission and the Council on Social Inclusion* (2004). This time a summary inequality measure, the ratio of the share of the top to the bottom quintile, is used to capture trends in the distribution, based on figures from the European Community Household Panel Survey (ECHP). We see that this ratio was considerably lower at the end of the decade than in the middle: inequality seems to have fallen sharply, gaps have narrowed!

Table 3.2: Decile Shares Ireland 1994-2000, Living in Ireland Surveys

	1995	1997	1999	2001
Top/bottom Quintile Ratio	5.1	5	4.9	4.5

Source: *Joint Report by the Commission and the Council on Social Inclusion* (2004), Statistical Annex Table 6, p. 13.

The third set of income distribution results are shown in Table 3.3, taken from a paper one of us published in 2003. The figures relate to decile shares once again and are

now from the Living in Ireland Survey, carried out by the ESRI between 1994 and 2001. The share of the bottom two deciles is now seen to have fallen sharply – by a total of 1 percentage point in all. However, the top decile has not been the gainer, indeed its share has also fallen, by not much less than 1 percentage point. It is the middle and upper parts of the distribution – deciles 4 to 9 – that have gained, at the expense of both top and bottom. So whether one regards this as "widening gaps" depends on which deciles are the focus. The ratio of the top to the bottom quintile has fallen, for example, but the bottom two deciles have clearly fallen markedly behind the rest. Unlike the figures from the HBS, these results most strikingly fail to confirm the widespread belief that the economic boom saw the top of the distribution do exceptionally well and pull away from the rest – as, indeed, might not be unexpected given the growth in profits which was indeed a feature of the Irish booms.

Table 3.3: Decile Shares Ireland 1994-2000, Living in Ireland Surveys

Decile	1994 (%)	2000 (%)
Bottom	3.8	3.2
2	4.9	4.5
3	5.6	5.5
4	6.4	6.9
5	7.5	8
6	8.9	9.3
7	10.6	10.8
8	12.6	12.7
9	15.3	15.6
Top	24.4	23.6
All	100	100

Source: Nolan (2003).

Teasing Out the Differences

So one could well be left divided between cynicism and despair – cynicism in that figures can be found to support whatever case one chooses to argue, despair in that there seems little hope of reconciling such apparently conflicting pictures of trends in such a key socio-economic indicator. However, as we now try to show, by teasing out exactly what these figures represent and where they come from, we can go some way towards such a reconciliation, though we will still be left with some critical areas of uncertainty. This involves focusing on issues that have become familiar in income distribution

analysis over the last quarter-century, namely how differences not only in data sources but also in the details of how income and its distribution are defined and measured can have major implications for measured income inequality levels and trends.

The first and most obvious point about the three sets of figures we have presented is that they do indeed come from different sources – the Household Budget Survey, the ECHP and the Living in Ireland Surveys. Those familiar with the Irish data will immediately object that the Living in Ireland Survey is in fact the Irish component of the ECHP: what should they be different? While the Living in Ireland Survey did indeed gather the data for Ireland that was sent to Eurostat as the ECHP results for Ireland, differences between the two could well arise, both because of the way income is measured and because of important differences in the datasets themselves despite their common survey base.

Focusing first on the way income is measured, the main income concept used in the ECHP refers to income received by all household members from all sources in the previous calendar year. Income reported in the 1995 survey thus refers to calendar 1994, and so on – so that the figures labelled "1995" and "2001" in Table 3.2 actually refer to 1994 and 2000 respectively. With the Irish survey concentrated in the latter part of each year, this means that respondents were often reporting on income for a period ending from 9-12 months earlier. In the Living in Ireland Survey, on the other hand, income is generally that received in the previous week or month – depending on the pay period – with only capital and self-employment income the weekly average of that received over a longer period, usually a year. So income in the Living in Ireland survey is "current" whereas that in the ECHP is annual, and for the previous year.

The other difference between the ECHP and LII figures quoted in terms of the income measure is that while both are equivalised to take differences in household size and composition into account, the equivalence scales used differ. The ECHP figures make use of the "modified OECD" scale which assigns a value of 1 to the first adult in the household, 0.5 to each other adult, and 0.3 to each child. This is now the scale favoured by Eurostat and amongst the most commonly used scales in international comparative research on income inequality. In the LII figures, on the other hand, a scale originally based on the relativities implicit in Irish social assistance rates is used, which

gives a value of 0.66 to the second and subsequent adults in the household and 0.33 to each child.

We will investigate the role of these differences in the measure of equivalised income shortly, but the ECHP and LII datasets also differ for other reasons. While both come from the same survey, they would not necessarily produce the same results even if the same income measure were used in each. This is first because Eurostat developed its own internal procedures for imputation of missing values, for dealing with outliers, and for weighting the responses. These were applied in a uniform way across all the participating member states, to maximise comparability, but the procedures adopted in preparing the Living in Ireland survey for analysis for domestic purposes may lead to differences in treatment of specific cases and in the weights applied to them in analysis. Furthermore, the sample used for domestic purposes was supplemented substantially in 2000 and 2001, in the light of the attrition that had taken place since the initiation of the survey in 1994. Since no such supplementation took place in the other participating countries, however, Eurostat did not include the data for these additional cases in the ECHP data for Ireland for those years.

While there are thus potentially significant differences between them, the results from the ECHP and the LII surveys in Tables 3.2 and 3.3 respectively do employ the same unit of analysis. That is, both take the individual rather than the household as the unit to be studied, and look at the share of total income going to the bottom 10% of individuals, next 10% etc. The household is taken to be the underlying income recipient unit and equal sharing among household members is assumed so each has the same living standard, but the individual rather than the household is the unit analysed. The results from the Household Budget Survey (HBS) shown in Table 3.1, by contrast, employ the household both as the income recipient unit and the unit of analysis – so the income shares shown are for the bottom 10% of households, next 10% etc. In addition, household income is not equivalised in the published results from the HBS from which these figures are derived. So whereas the ECHP and LII results we have quoted are person-weighted and equivalised, those from the HBS are household-weighted and unequivalised. As we shall see, this can make a big difference to the measured income distribution.

In addition, not only is the HBS a different survey it is also different in nature to the ECHP and LII. The HBS is a cross-section survey obtaining results from a different set of households in 1994-95 and 1999-2001, whereas the ECHP and LII are longitudinal surveys seeking to go back to the same set of people each year – though with the addition of a substantial supplement of new cases to the LII in 2000 as already described. All three seek to represent the underlying population and are weighted for analysis for that purpose, but their differing designs nonetheless need to be kept in mind in comparing their results – in particular, the impact that attrition might have in panel surveys.

Harmonising the Analysis

So we have pin-pointed a variety of factors which might explain why the results in the public domain from these three sources convey differing pictures of trends in income inequality over Ireland's boom. What we now want to do is tease out which factors actually do have a substantial impact on the results and, crucially, whether these sources still tell a different when we harmonise the methods employed in the analysis. We do so by re-analysing the LII, by analysing the ECHP micro-data directly rather than relying on published results, and by exploring further the HBS with the help of the CSO.[8]

So we now look at decile shares from the LII, the HBS and the ECHP but focus first simply on the household as unit of analysis and on disposable income without any equivalisation – in other words, align with the basis for the figures from the HBS in Table 3.1. These results are shown in Table 3.4 (where we also add in results for the LII from 2001 which have not previously been published). The pattern from the HBS is of course as before, but on this basis the trend in the ECHP is now falling shares for the bottom 3 deciles, increases for deciles 6-9, but a fall in the top decile's share. In the LII results by contrast we see some fall in shares throughout bottom half of distribution, and increases for most of the top half but not the top decile. So all three sources now show some decline towards the bottom over the period, but very different patterns at the top - the

[8]Micro-data from the HBS have been lodged in the Irish Social Science Data Archive and are available for analysis, but significant numbers of high incomes have been "top-coded" so this public use dataset is not suitable for analysis of the overall distribution of income.

HBS has the share of the top decile going up by 1.5 percentage points, the ECHP has ir falling by over half a percentage point, and the LII shows it to be stable!

Table 3.4: Decile Shares in Disposable Income among Households, Ireland 1994-2001

	Share in total disposable income (%)						
	Household Budget Surveys		ECHP		Living in Ireland Surveys		
Decile	**1994-95**	**1999-2000**	**1994**	**2001**	**1994**	**2000**	**2001**
Bottom	2.2	1.9	2.3	1.8	2.3	1.8	1.8
2	3.5	3.3	3.3	2.9	3.3	2.9	3.1
3	4.7	4.5	4.8	4.3	4.6	4.1	4.4
4	6	5.9	6	6.2	6	5.5	5.8
5	7.6	7.5	7.6	7.5	7.5	7.6	7.6
6	9.2	9.2	9.1	9.3	9.1	9.4	9.4
7	11.3	11.1	11	11.4	11.1	11.6	11.2
8	13.6	13.4	13.2	13.7	13.5	13.7	13.6
9	16.7	16.6	16.2	17.1	16.5	16.7	16.9
Top	25.2	26.7	26.6	26	26.4	26.8	26.4
All	100	100	100	100	100	100	100

Source: HBS as in Table 3.1; LII, ECHP calculated from microdata.

So what happens when we shift to persons rather than households as the unit of analysis, and to equivalised rather than unequivalised income? To facilitate this analysis the CSO very kindly produced figures for us from the HBS using person-weighting and equivalising income using the equivalence scale they (like many others) have employed in the past, namely the so-called "OECD scale". This assigns a value of 1 to the first adult, 0.7 to each other adult, and 0.5 to each child in the household. Table 3.5 shows decile shares from the three sources among persons with disposable income equivalised using that scale.

The patterns this reveals are different in many respects to those in Table 3.4. First, the shift in analytical focus makes a big difference to the trends shown by the HBS. In particular, the share of the top decile now increases rather modestly, by only 0.3 rather than 1.5 percentage points. This increase is also offset by a decline for the 9th. decile, so the top quintile sees no increase in share. So there is not a marked overall shift towards the top, though the bottom does lose out and the middle gain.

Turning to the ECHP, the trend it displays is now very different to Table 3.4. There is no decline in share for the bottom decile, and the top decile loses share dramatically – falling by 3% of total income.

Table 3.5: Decile Shares in Equivalised Disposable Income among Persons, Ireland 1994-2001 ("OECD equivalence scale" 1/0.7/0.5)

	Share in total equivalised disposable income (%)						
	Household Budget Surveys*		ECHP		Living in Ireland Surveys		
Decile	**1994-95**	**1999-2000**	**1994**	**2001**	**1994**	**2000**	**2001**
	%	%	%	%	%	%	%
Bottom	3.6	3.2	3.5	3.4	3.5	3.3	3.3
2	4.8	4.7	4.6	4.9	4.6	4.7	4.7
3	5.7	5.6	5.6	6	5.6	5.7	5.7
4	6.6	6.7	6.4	7.2	6.4	6.9	6.9
5	7.6	8	7.4	8.5	7.5	8.1	8.3
6	9	9.2	8.7	9.7	8.9	9.2	9.4
7	10.6	10.6	10.4	10.8	10.6	10.9	10.6
8	12.5	12.5	12.4	12.3	12.6	12.5	12.5
9	15.5	15	15.3	14.7	15.5	15.2	15
Top	24.1	24.4	25.7	22.6	24.8	23.4	23.6
All	100	100	100	100	100	100	100

* The assistance of the CSO in producing these figures is gratefully acknowledged.

Finally in the LII we also no longer see declines in shares for the bottom three deciles, although the share of the bottom decile does still fall slightly. Rather than deciles 6-9 it is now deciles 4 and 5 that gain substantially. At the top, the share of the top decile is no longer stable but now falls by over 1%.

So the shift in focus from household unequivalised income to person-weighted equivalised income certainly makes a substantial difference to measured inequality trends. However, even after harmonization in terms of the unit of analysis and equivalisation, we are left with substantially different trends being shown by the different sources. This is the case towards the bottom, where the HBS shows the share of the bottom quartile falling, the LII surveys show stability, and the ECHP shows an increase. However, this is dwarfed by the differences at the top, which range from stability to a drop of 3 percentage points. Clearly we have more work to do in trying to understand these measured differences.

One remaining potential source of difference is in the income measure itself. While all three sets of results in Table 3.5 relate to equivalised income among persons, the income concept used in the ECHP is still annual income in the previous calendar year rather than current as in both the LII and HBS. To see how much difference this makes we can compare those ECHP figures with decile shares for an alternative income measure also available in the ECHP database which relates mostly to income in the previous month. (This

is not identical with the current income measure employed in the LII and HBS, but is much closer to it than annual income in the previous year). In Table 3.6 we make this comparison for income equivalised once again with the 1/0.7/0.5 scale and distributed across persons.

We see that there is little difference between the annual and "current" income distributions in either 1994 or 2001, except that the share of the top decile is slightly higher with current than with annual income in 1994. This means that with current income the decline in the share of that decile from 1994-2001 is in fact even greater than the very substantial fall seen with annual income – and so the difference in trend between the ECHP and the other two sources is even wider when the income measure is (more) harmonized.

Table 3.6: Decile Shares in Equivalised Disposable Income among Persons Using Alternative Income Measures, ECHP (Equivalence scale 1/0.7/0.5)

	Share in total equivalised disposable income (%)			
	Annual		**Current**	
Decile	**1994**	**2001**	**1994**	**2001**
	%	%	%	%
Bottom	3.5	3.4	3.6	3.5
2	4.6	4.9	4.7	5.1
3	5.6	6	5.7	6.1
4	6.4	7.2	6.6	7.1
5	7.4	8.5	7.5	8.3
6	8.7	9.7	8.5	9.4
7	10.4	10.8	10	10.7
8	12.4	12.3	12	12.2
9	15.3	14.7	15.3	15
Top	25.7	22.6	26.1	22.6
All	100	100	100	100

Explaining the Remaining Differences?

To see why the decline in the share of the top decile is so much larger in the ECHP than the LII, we obviously need to focus on the levels of these shares in each year in each source. We see from Table 3.5 that in 1994 the share of the top decile was 1 percentage point higher in the ECHP than in the LII; in 2000/01, by contrast, it was 1 percentage point lower. With that share falling by 1 percentage point in the LII, this

reversal in relativities means that it falls by 3 percentage points in the ECHP. Several factors may be at work, though it is difficult to identify their effects precisely.

The first point to make is that a very small number of cases right at the top of the income distribution can make a substantial difference to the share of the top decile. Thus a handful of high-income households and the way they are weighted largely account for the gap observed in 1994 between the share of that decile in the ECHP versus the LII. Secondly, attrition in panel data over time may then have a substantial impact if a number of these households are "lost" to the sample. This can be amply demonstrated by reference to the LII survey for 2001, when the initial sample had been substantially supplemented by additional cases because of the scale of attrition. (Overall, by 2000 a total of 5,500 individuals had been followed since 1994, representing only about 40% of all the adults in the first wave; a new sample of 5,200 persons was then added).[9] If we compare the share of the top decile for the full 2001 sample after supplementation with the corresponding figure for the "continuing" sample only, we find that the latter is about 1.5 percentage points higher. So this suggests that the supplementation of the sample has indeed had a substantial impact – but these additional cases were not included in the ECHP.

This suggests that in assessing trends in the distribution over this period greater weight should be placed on the LII and HBS. Focusing on them, the broad pattern is similar in suggesting relatively modest declines in shares towards the bottom, but the picture at the top is still something of a contrast, a small increase (in the HBS) versus a fall of about 1 percentage point (in the LII). The LII may still be affected by its panel nature despite sample supplementation and appropriate reweighting, and the HBS has a sample size that is about twice as large, so perhaps most weight might be placed on the latter. The difference in overall trend in inequality between them should not in any case be exaggerated: the Gini coefficient in the HBS is roughly stable at about 0.31, whereas from the LII one would see a fall from just above that figure to just below it – 0.32 to 0.30. What is striking is that neither source suggests the substantial increase in income

[9] See Whelan *et al* (2003) Table 2.1 p. 6.

inequality that many domestic commentators have seen to be accompanying Ireland's economic convergence with its higher-income EU partners.

However, much of that commentary has been in terms of widening gaps between "the rich" and the rest. General household surveys may not be best placed to capture trends right at the top of the distribution, both because it is difficult to represent any small group with limited sample size, and because those at the top may be particularly elusive. For this reason we now go on to look at an alternative source of data which has information about that group, namely administrative records from the tax system – which as we shall see also faces particular problems, but is worth investigating.

4. Top Incomes in Ireland during the Boom

Income tax data was used in the past to study the income distribution in many countries, a notable example being Kuznets' mid-century study of US data on which he based his hypothesis about a long-term tendency for inequality to rise and then fall as development occurs. There has recently been a resurgence of interest in exploiting such data following the influential study by Piketty (2001, 2003) of long-term trends in the shares of top income groups in France. This study used data from income tax records over the 20th. century to produce some fascinating and indeed dramatic findings. Together with the depth and sophistication of the analysis, this has encouraged others to look again at data from this source to examine long-run trends in top incomes in various countries – notably Atkinson (2001) for the UK, and Piketty with Saez (2003) for the USA. In the same spirit Nolan (2004) uses this type of information to look for the first time at long-run trends in top income groups in Ireland from the 1930s up to the end of the 20th. century. Here we employ the methods described in that paper but extend the analysis to produce more detailed results for the period on which this paper is focused, namely the 1990s.

For the years from 1990 to 2000, figures were published each year in the Statistical Report of the Revenue Commissioners showing taxpayers categorised by income range and mean income for each category. Two distinct income concepts are used. The first is referred to as "total income", that is the total income of taxpayers from all sources "as estimated in accordance with the provisions of the Income Tax Acts". It is

thus net of such items as capital allowances, allowable interest paid, losses, allowable expenses, retirement annuities and superannuation contributions. Figures have also been published for the years from 1989-90 onwards using a concept referred to as "gross income", which includes all those items except superannuation contributions. The results for the two are similar, and we concentrate on those for "gross income" (whereas Nolan 2004 focuses on "total income" since it is the concept employed in the data published in earlier years).

To use this type of information to derive estimates of top income shares, one needs figures for the total number of tax units in the population and for total household income, in order to convert the tax data into percentages of total income recipients and income. One then needs to interpolate/extrapolate from these to the shares for the specific groups of interest. The unit of tax we take to be the single adult or married couple with dependent children if any. (From the 1980s married persons could submit separate returns if they so wished though their total tax liability would not be affected, but only a relatively small number do so; the more recent move towards separate assessment does not affect the years for which data have been published). We thus require a control total for the aggregate number of such units in the population as a whole (rather than the total appearing in the tax statistics). We can derive this directly for year in which there was a Census of Population, by taking the total number of adults (aged 18 or over) and subtracting the total number of married women. We then interpolate to produce figures for inter-Censal years, using linear interpolation (though a more sophisticated method of interpolating incorporating the official population estimates for each inter-Censal year could also be employed).

We then require an appropriate aggregate income figure for each year to allow income shares to be computed. For this purpose we simply employ the national accounts personal income aggregate as control total, without adjustment. This is problematic, because that national accounts aggregate includes some income that will not be in the tax data. The most obvious is the income that does not go to households but to non-profit institutions such as charities and life assurance funds. In addition, employers' social security contributions and imputed rent of owner-occupiers are included in the personal

sector aggregate but not in the income tax figures. This is a priority for further investigation, but for the present we have made no such adjustment.

Using these aggregates for the total number of tax units and total income in the population, we then convert the numbers within each income range from the tax statistics and the total income accruing to them into shares, of all tax units and of total income respectively. To move from that point to estimated shares for the groups of interest, we then interpolate assuming a Pareto distribution. We could extrapolate into the open range to produce an estimate for that group, also assuming a Pareto distribution, but that would raise questions which interpolation within closed ranges does not face and here we do not seek to distinguish shares which would require extrapolation into the open-ended range. We concentrate on the share of those at the top of the income distribution, looking at the top 10% and the top 1% of taxpayers (whereas Nolan 2004 looks only at the top 1% or 0.5%).

The results are shown in Table 4.1. Looking first at the top 10%, a substantial increase in share is seen from 1995, accelerating in 1999 and 2000. Over the decade this meant that the share had risen from under 22% to over 25%. Turning to the top 1%, this also rose sharply in the second half of the decade, from under 5% to almost 8% - so all the growth in share for the top decile was actually concentrated in the top 1%. This meant that by the end of the 1990s the share of the top 1% was more than twice the level prevailing through the 1970s and 1980s.

So this is very different to the picture suggested by the survey data, and seems to confirm the anecdotal assertions that those at the top did particularly well during the economic boom. However, the obvious issue in relation to data from tax records, for Ireland as elsewhere, is whether we can believe they give a broadly accurate reflection of reality. Some would argue instead that they are so polluted by attempts by the wealthy to evade and avoid tax that they cannot be relied on. In the Irish case, one would certainly be concerned that changes in the reporting of top incomes may have played a significant role in the last decade. The rigour with which income tax was administered has certainly tightened significantly, including some high-profile investigations into tax evasion of

Table 4.1: Estimated Share of Top One Percent in Total Personal Income, Ireland, 1990-2000

Year	Share of top 10% (%)	Share of top 1% (%)
1990	21.77	4.84
1991	22.41	5.21
1992	23.4	5.51
1993	21.12	4.78
1994	21.95	4.99
1995	22.23	5.15
1996	22.48	5.36
1997	22.53	5.54
1998	23.03	6.21
1999	24.44	7.16
2000	25.29	7.86

Source: Calculated from Annual Reports of the Revenue Commissioners using methods described in Nolan (2004).

various sorts, and the marginal rate of income tax has also come down significantly. Both these factors could lead to a greater proportion of income being reported to the tax man, as evasion is seen to become more risky and avoidance less necessary. It is thus difficult to assess the extent to which the rapid increase in incomes right at the top reflects trends in actual incomes versus reporting behaviour: the likelihood is that both contribute to the observed rise in top income shares.

5. Conclusions

By any and all measure of well-being, the Irish are a lucky lot. All the boats have risen, even if it seems like the yachts (top) have gone up faster than the tugboats (middle) or the row boats (bottom). This growth has not greatly affected the Irish position in its relative inequality rankings. The Irish remain an unequal nation, likely the most unequal in Europe by many inequality measures (though the UK would be a close second). Irish poverty rates are also high and close to those in the United States.

As in the United States, the Irish have the economic capacity to achieve a more equal society. And the increasingly Irish "social dividend" due to rapid growth makes such equality more affordable than in the Bush United States. Whether the Irish social

dividend will end up in large tax cuts for the rich (USA) or in better income packages for working families, especially lone parents, remains to be seen.

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Appendix Table A-1.
Macroeconomic Comparison: Most Recent Year

Nation (year)	Average Standard of Living: GDP/Capita (in 2000 US$)[1]	Average Standard of Living: Index	OECD Standardized Unemployment Rate	OECD Social Expenditures on Non-elderly[2]
United States (00)	34,575	100	4.0	2.8
Ireland (00)	**28,035**	**81**	**4.2**	**NA**
Sweden (00)	26,576	77	5.6	12.6
Netherlands (99)	26,517	77	3.2	10.5
Finland (00)	25,359	73	9.8	12.1
Canada (97)	25,044	72	9.1	6.0
Germany (00)	24,851	72	7.8	8.9
United Kingdom (99)	23,723	69	5.9	6.4
Belgium (97)	23,541	68	9.2	8.9

Source: US Bureau of Labor Statistics (http://www.bls.gov); OECD (http://www.oecd.org); and OECD (2002).

Notes: [1]Using 2000 PPPs, price adjusted in each nation to correct year.

[2]Countries with data year 2000 are given the most recent (1999) values available from OECD. Definition of nonelderly social expenditures is given in note to Figure 7.