

# Globalisation, Inequality and the Rich Countries of the G-20: Evidence from the Luxembourg Income Study (LIS)

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## Abstract

The purpose of this study is to summarise and comment upon what we know about the determinants of both the level and trend in economic inequality over the past two decades, and to relate these findings to the progress of globalisation in these nations. While the fruits of economic progress in rich nations have not been equally spread, we argue that most citizens in rich OECD nations have benefited from the trend toward global economic progress. We begin with a summary of the differences in overall economic inequality within the G-20 nations based on Luxembourg Income Study (LIS) data and recent work by others. Here we find that social policies, wage distributions, time worked, social and labour market institutions, and demographic differences all have some influence on why there are large differences in inequality among rich nations at any point in time. In contrast, trade policy has not been shown to have any major impact on economic inequality.

Next, we turn to trends in inequality. We find modest and sometimes dissimilar changes in the distribution of income have taken place within most advanced nations, with most finding a higher level of inequality in the mid to late 1990s than in the 1980s. Inequality, however, has not risen markedly in some nations (e.g., Denmark, Germany, France and Canada) over this period, while its rise has slowed in several other nations during the late 1990s. The explanations for rising inequality in rich countries are many, and no one single set of explanations is ultimately convincing. In particular, there is no evidence that we know of that trade and globalisation is bad for rich countries.

This suggests that rising economic inequality is not inevitable, or that it necessarily hurts 'low-skill'/'low-income' families. Rather it suggests that globalisation does not force any single outcome on any country. Domestic policies and institutions still have large effects on the level and trend of inequality within rich and middle-income nations, even in a globalising world economy.

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## 1. Introduction: Cross-national Studies of Income Distribution

Increasingly, the rich and poor nations of the world face a common set of social and economic trends and policy issues: the cost of population aging; changing family structures (including a growing number of single parent families in many nations); the growing majority of two-earner families; and increasing numbers of immigrants from poorer nations. In particular, most rich and middle-income nations are experiencing rising economic inequality generated by skill-biased technological change (marked by rising returns to higher labour market skills), international trade, and other factors related to the globalisation of the world economy. While increasing economic inequality is not inevitable, and while public policy and labour market institutions can help prevent many of the downside effects of these trends, the facts of the matter are that income inequality has continued to increase in the large majority of the world's rich nations over the past decade (Gottschalk, Gustafsson and Palmer 1997; Atkinson 1999; Friedman 2000; Smeeding and Grodner 2000). All of these rich nations have also designed systems of social protection to shield their citizens against the risk of a fall in economic status due to unemployment, divorce, disability, retirement, and death of a spouse. The interaction of economic and demographic forces and social programs generates the distribution of net disposable income in each of these nations.

The recent evidence on the level and trend in economic and social inequality in rich and middle-income nations is the major topic of this brief paper. The emergence and availability of cross-nationally comparable databases has put us in a position to directly compare the experiences of rich nations in coping with the growth of market income inequality, and to begin to add middle-income nations as well. Additional comparable data of the type called for by the Canberra Report (Canberra Group 2001) will also allow better studies of this same type in coming years for a wider still range of countries.

The LIS project has pioneered the availability of online data that allows researchers to use microdata to measure inequality and to test their ideas and hypotheses about the sources and causes of that inequality using modern methods. One of the major purposes of this paper is to update the facts and figures in these reports by presenting evidence on the level and trend in income inequality as portrayed by the LIS data, and from other sources. We begin with a brief review of methodology. Then we turn briefly to the results for level of inequality. Trends in inequality come next and they are often more difficult to precisely assess than are levels, whether using LIS or other sources. We also include a brief discussion of recent research on the determinants of these levels and trends.

Comparisons of these experiences may help us to understand how one nation is similar to and different from other nations. It may also help us trace these differences to their economic, demographic, and policy-related sources. The institutions which emerge in nations to help mitigate the forces of market-driven economic inequality are also of interest. Global trade will benefit some groups and hurt (at least temporarily) others, even when the overall benefits exceed the costs for any nation

as a whole (Friedman 2000). Too often we forget that greater trade brings with it wider choices, better products, and better prices which benefit all citizens, regardless of their personal changes in earnings or incomes.

Cross-national research has also taught us that *every* nation must design its own set of social and economic policies tempered by its institutions, values, culture, and politics. And the conclusions of this paper are that these national policies continue to matter greatly.

## 2. Measuring Economic Inequality: The Basics

Here we briefly review the sources of our evidence and their strengths and weaknesses. There is currently a set of international standards for income distribution that parallel the international standards used for systems of national income accounts, that have been pioneered by the Canberra Group.<sup>2</sup> The LIS, which underlies much of this paper and the initial findings of the Canberra group, offers a place to start with these analyses. In fact the LIS definition of annual disposable income is the starting point from which this paper begins. LIS offers the reader many choices of perspective in terms of country, income measure, accounting unit and time frame. But its relatively short time frame (1979–1997 for most nations, but 1968–1997 for five countries) and limited number of observation periods per country (three to five periods per country at present), currently limits its usefulness for studying longer-term trends in income distribution. The purpose of this section of the paper is to explain the choices we have made in our use of LIS. The choices we, and others, have made to study longer-term trends in income distribution are more fully discussed in Gottschalk and Smeeding (1997, 2000) and Atkinson, Rainwater and Smeeding (1995). It is important to note that these income definitions are also the ones that have been initially used by the Inter-American Development Bank (IDB) in their work on this topic (Székely and Hilgert 1999a, 1999b) and are the starting point for the Canberra Group (2001) work on cross-nationally comparable income data.

Our attention is focused here on the distribution of *disposable money income*, that is, cash and near-cash money income, including earnings of all household members, after direct taxes and including transfer payments. Several points should be noted about this choice:

- income rather than consumption is taken as the indicator of economic well-being. Wealth is ignored except to the extent that it is represented by cash interest, rent and dividends. While for developing countries, consumption is liable to be a better definition and also very close to disposable income, we use income here;
- the LIS definition of income falls considerably short of a comprehensive definition, typically excluding much of capital gains, imputed rents, and most income in kind

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2. The ‘Canberra Group’ of National Statistical Offices and Organisations (including LIS, the World Bank, the United Nations and others) produced its final report on international standards for income distributions last year. See Canberra Group (2001) or <<http://www.lisproject.org>> for a summary of all of the Canberra meetings and the final report.

(with the exception of near-cash benefits and the measurement of home production in Mexico and Russian LIS surveys (Canberra Group (2001), chapter 8). But it is also much wider than the distribution of wages or earnings per worker used in much of the globalisation literature;

- no account is taken of indirect taxes or of the benefits from public spending (other than cash and near-cash transfers) such as those from health care, education, or most housing subsidies; and
- the period of income measurement is in general the calendar year, with income measured on an annual basis.<sup>3</sup>

Thus, variables measured may be less than ideal and results may not be fully comparable across countries. For example, it might be that one country may help low-income families through money benefits (included in cash income), whereas another provides subsidised housing, childcare, or education (which is not taken into account). And some types of benefits, e.g., education, may have quite different effects on longer-term national well-being. While one study (Smeeding *et al* 1993) finds that the distribution of housing, education, and health care benefits reinforces the general differences in income distribution for a subset of the western nations examined there, there is no guarantee that these relationships hold for alternative countries or methods of accounting (Gardiner *et al* 1995), nor that they are stable over a longer time frame. In fact, most studies show that countries which spend more on cash benefits tend to also spend more on non-cash benefits. Because non-cash benefits are more equally distributed than are cash benefits, levels of inequality within high non-cash spending countries are lessened, but the same rank ordering of these countries, with respect to inequality levels that are found here using cash alone, persists when non-cash benefits are added in. And while we use income, not consumption, as the basis for our comparisons, due to the relative ease of measurement and comparability of the former, there is evidence that consumption inequalities are similar to income inequalities in major European nations and in the US (Johnson and Smeeding 1997; Hagenaaars, deVos and Zaidi 1998).

The distribution of disposable income requires answers to both the ‘what’ and the ‘among whom’ questions. Regarding the former, earned income from wages, salaries, self-employment, cash property income (but not capital gains or losses), and other private cash income transfers (occupational pensions, alimony, and child support) or ‘market income’, is the primary source of disposable income for most families. To reach the disposable income concept used in this paper, we add public transfer payments (social retirement, family allowances, unemployment compensation, income support benefits) and deduct personal income tax and social security contributions from market income. Near-cash benefits – those that are virtually equivalent to cash (food stamps in the US and housing allowances in the UK and Sweden) – are also included in the disposable income measure used here.

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3. The UK data is the only exception to this rule as their Family Expenditure Survey (FES) uses a bi-weekly accounting period with rules for aggregating up to annual totals. In Germany, LIS has aggregated the monthly and quarterly data into annual income amounts.

The question of distribution ‘among whom’ is answered ‘among individuals’. When assessing disposable income inequality, however, the unit of aggregation is the household; the incomes of all household members are aggregated and then divided by an equivalence scale to arrive at individual equivalent income. The equivalence scale used is the square root of household size. All LIS-based income measures in this paper use this equivalence scale and the ‘adjusted disposable income’ concept, which is produced by dividing (unadjusted) disposable income by family size raised to the power of 0.5 (square root of family size). This is the same scale used in Atkinson *et al* (1995) (see also Buhmann *et al* (1988)).

For the most part, the household – all persons sharing the same housing unit regardless of familial relationship – is the common unit of analysis.<sup>4</sup> Complete intra-household income sharing is assumed, despite the fact that members of the same household probably do not equally share in all household resources. To assume that unrelated individuals living with others do not at all share in common household incomes or household ‘public goods’ (heat, durables, etc) is a worse assumption in our judgment. Thus, our unit of account is the household.

The approach adopted here, based in large part on data from the LIS, overcomes some, but not all, of the problems of making comparisons across countries and across time that plagued earlier studies. Some problems, for example, the use of data from different types of sources, still remain. But all of the data used in the analysis of levels of inequality are drawn from household income surveys, or their equivalent, and in no case are synthetic data used. One major advantage of LIS is the availability of microdata. The aim of the LIS project has been to assemble a single database containing survey data from many countries that is as consistent as possible. Access to the microdata means that it is possible to produce results on the same basis, starting from individual household records, and to test their sensitivity to alternative choices of units, definition, and other concepts. It is therefore possible to make any desired adjustment for household size. Aggregate adjustments, such as that from pre-tax (market income) to post-tax (disposable) income are not necessary, although in some cases imputations are necessary at the household level. The data all cover, at least in principle, the whole non-institutionalised population, though the treatment of immigrants may differ across nations. These data are supplemented here by data provided by one major nation not yet a member of LIS (Japan), where a national expert calculated income inequality measures with the consultation of the LIS staff (Ishikawa 1996), and by a recent LIS paper which adds Latin America estimates of similarly defined disposable income (Székely and Hilgert 1999a, 1999b). The rest of the calculations were made by the author and the LIS project team. Many of the results cited here are directly available from the LIS home page’s key figures section (at <<http://www.lisproject.org/keyfigures/ineqtable.htm>>).

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4. However, for Sweden and Canada more restrictive nuclear family (Sweden) and economic family (Canada) definitions of the accounting unit are necessary (see Atkinson *et al* (1995), chapter 2, for additional details).

While the aim of the LIS project is to increase the degree of cross-national comparability, complete cross-national comparability is not possible, even if we were to administer our own surveys in each nation. Comparability is a matter of degree, and all that one can hope for is to reach an acceptably high level. In economic and statistical terms, the data are noisy, but the ratio of signal to noise is reduced by LIS. Ultimately, the reader must decide the acceptability of the evidence before them. To skeptics, we can offer that most of the cross-national results provided here have been reviewed by a team of national experts – statisticians, social scientists and policy analysts – prior to their publication by the United Nations, OECD and in other forums, and they have appeared in refereed journals. And, because the LIS data are ultimately available to the research community at zero economic cost, researchers are free to repeat these calculations themselves. Moreover, recent attempts to mimic the LIS definitions by the IDB are used to demonstrate the value of these techniques for a wider range of nations, such as the G-20.

### 3. Comparing Levels of Inequality at a Point in Time

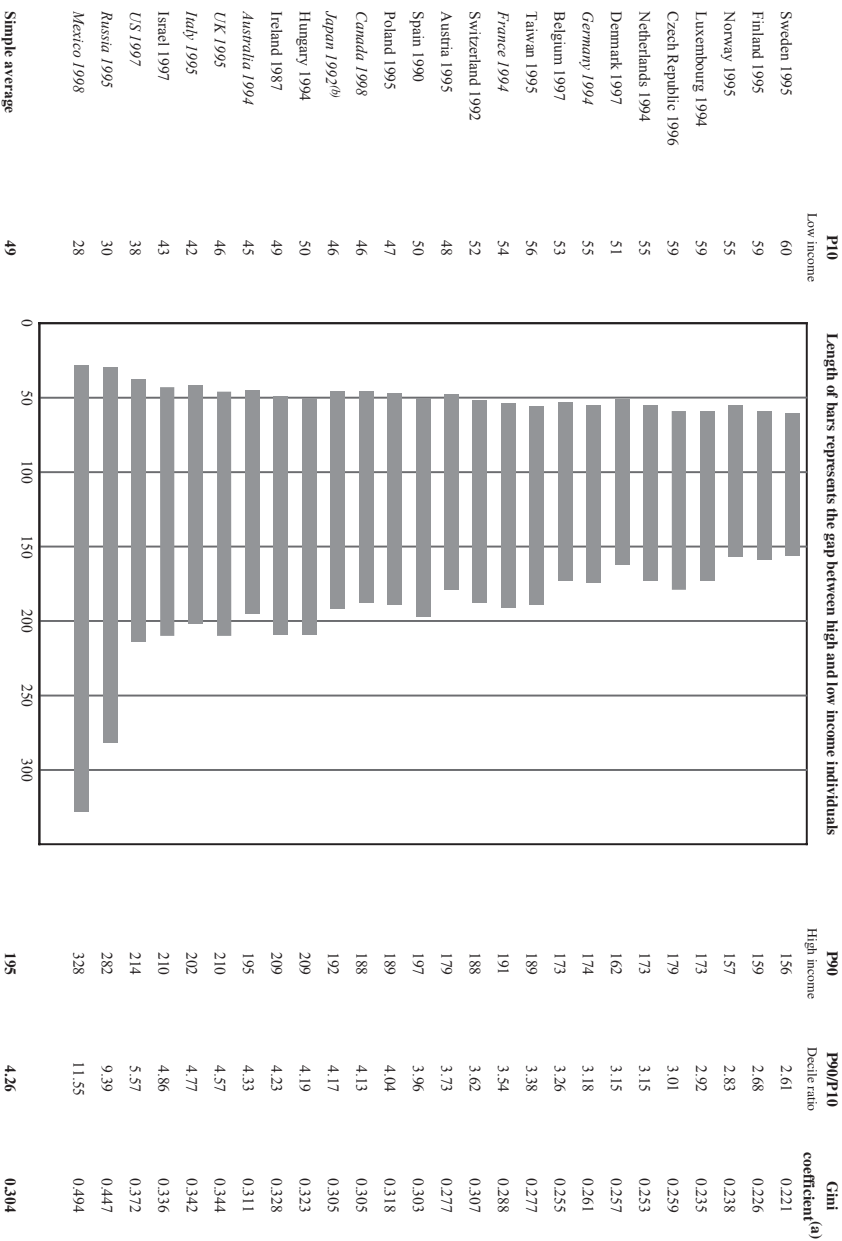
The LIS data sets are used here to compare the distribution of disposable income in 26 or more nations during the 1990s. We focus here on relative (Figure 1) income differences, not absolute income differences.<sup>5</sup> The relative inequality patterns found here correspond roughly to the results found in Atkinson *et al* (1995), which use earlier years' LIS data in most cases. Our choices of inequality measures are four: the income of the person at the bottom and top 10<sup>th</sup> percentiles ( $P_{10}$  and  $P_{90}$  respectively) as a ratio of median income ( $P_{50}$ ); the ratio of the income of the person at the 90<sup>th</sup> percentile to the person at the 10<sup>th</sup> percentile – the decile ratio – (a measure of 'social distance'); and the Gini coefficient.

#### 3.1 Relative differences in inequality across nations

We begin with a figure containing all four measures of inequality, with the LIS nations ordered by the decile ratio from lowest to highest. At the bottom of Figure 1 we find Mexico, with a low-income person at the 10<sup>th</sup> percentile in 1998 ( $P_{10}$ ) having an income that is 28 per cent of the median, followed by Russia at 30 per cent and the US at 38 per cent. A high-income person at the 90<sup>th</sup> percentile ( $P_{90}$ ), in contrast, has 328 per cent of the median in Mexico, 282 per cent in Russia and 214 per cent in the US. The Mexican, Russian, and US decile ratios are 11.55, 9.39 and 5.57 respectively, meaning the income of the typical high-income person is more than 11.5, 9.3 or 5.5 times the income of the typical low-income person, even after we have adjusted for taxes, transfers and family size. In contrast, the average low-income person has 49 per cent of the income of the middle person in the average country; the average rich person has 195 per cent as much, and the decile ratio shows an average 'economic distance' between rich and poor of 4.2 times  $P_{10}$ .

5. For more on absolute or 'real' income differences, see Gottschalk and Smeeding (2000) and Rainwater and Smeeding (1999).

**Figure 1: Decile Ratios and Gini Coefficient for Adjusted Disposable Income in 26 Nations**  
 P10 – P90 expressed as per cent of median in each nation; G-20 countries italicised



(a) Gini coefficients are based on incomes which are bottom coded at 1 per cent of disposable income and top coded at 10 times the median.  
 (b) Japanese Gini coefficient as calculated in Smeeding (1998) from the 1993 Japanese Survey of Income Redistribution.

Source: Author's calculations from the LIS

At the other end of the chart, a Swedish citizen at  $P_{10}$  has 60 per cent of the Swedish median income, at  $P_{90}$  has 156 per cent of the median, and the decile ratio is 2.61, less than one-half as large as the US value, and one-quarter or less of the Russian or Mexican values. This evidence suggests that the range of inequality and of social distance between rich and poor in the rich and medium-income nations of the world is rather large in the mid 1990s. It also begs for comparable information for additional middle-income and developing nations of the world.

Countries in Figure 1 fall into clusters, with inequality the least in Scandinavia (Sweden, Finland, Norway) and Northern Europe (Denmark, Netherlands, and Luxembourg). Here  $P_{10}$ 's average 58 per cent of median income, and decile ratios are about 3.0 or less. The Czech Republic comes in about average here (though inequality has risen since this date by most accounts). We also note that there are no G-20 nations represented here.

Central Europe comes next (Germany, Belgium, Austria and France) with decile ratios from 3.18 to 3.54, and Ginis from 0.255 to 0.288. The figures for Germany include East Germany as well as West Germany. And the first two G-20 nations – Germany and France – first appear (Figure 1).

Taiwan is an anomalous entry in the middle of the table, with a Gini (0.277) and decile ratio (3.38) in the middle European range. Spain, Poland, and Switzerland also form a curious group in the middle. Canada appears next with a lower Gini (0.305) and decile ratio (4.13) than any other Anglo-Saxon nation and with less inequality than is found in Hungary, Ireland, Israel or Italy. Japan has more or less the same income distribution characteristics as Canada, though the only estimate we have and trust is now a decade old.

Italy (4.77) and the English-speaking countries of Australia (4.33), the UK (4.57) and the US (5.57) come next with still higher levels of inequality. The highest levels of inequality and social distance that we can measure with good confidence are in Russia and Mexico.

While percentile ratios as measures of social distance have some obvious appeal (e.g., insensitivity to topcoding,<sup>6</sup> ease of understanding), they have the disadvantage of focusing on only a few points in the distribution and lack a normative basis. Figure 1 presents an alternative, more commonly employed, Lorenz-based summary measure of inequality, the Gini coefficient. As we saw above, relying on this measure, country rankings change little. Inequality is still lowest in Scandinavia, then Central Europe, Southern Europe, and Asia, with the English-speaking countries (except for Canada) having the highest inequality, and the US the highest among these, and then followed at last by Russia and Mexico. The other Central European nations show no clear pattern, and both Taiwan and Japan are close to the middle of the ranges displayed here. In sum, there is a wide range of inequality among rich and middle-income nations covered by LIS.

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6. Topcoding is the procedure by which a nation places a maximum value on reported incomes in the public release version of a survey. In countries with rapidly growing high incomes, arbitrary topcodes can have serious effects on measured inequality (e.g. Smeeding and Grodner (2000)).



### 3.2 Just the 12 G-20 nations

We can add two more G-20 nations to the 10 in Figure 1, by including the two Latin American G-20 countries from the IDB data harmonised by Székely and Hilgert (1999a, 1999b) to reach 12. We have grouped them geographically in Table 1, into five groups, with Latin America, European OECD nations, Anglo-Saxon OECD nations, Eastern Europe, and Asia (the latter two being represented by Russia and Japan alone). The range is now widened even further with Brazil and Argentina (albeit the urban areas only) having Ginis of 0.571 and 0.442 respectively, though we suspect that the true level of inequality in Argentina is higher than that shown here due to omission of the rural areas in the Székely and Hilgert database. The same clusters seem to hold, with the lowest inequality in Europe, then Asia (Japan), then the Anglo OECD countries, with Russia and Latin America having the most inequality.

**Table 1: Income Distribution in 12 G-20 Nations**

Rank	Country	Year	Gini
<b>A. Latin America</b>			
1	Brazil	1996	0.571
2	Mexico	1995	0.494
4	Argentina	1996	0.442
	Average		0.502
<b>B. Anglo OECD Countries</b>			
5	US	1997	0.372
6	UK	1995	0.344
9	Australia	1994	0.311
10	Canada	1998	0.305
	Average		0.333
<b>C. European OECD Countries</b>			
7	Italy	1995	0.342
11	France	1994	0.288
12	Germany	1994	0.261
	Average		0.297
<b>D. Eastern Europe</b>			
3	Russia	1995	0.447
<b>E. Asia</b>			
8	Japan	1992	0.315

Sources: Brazil and Argentina – Székely and Hilgert (1999a, 1999b); Japan – Smeeding (1998); all other data sourced from LIS database

There are no comparable, harmonised estimates for China, India, Indonesia, Korea, South Africa, Saudi Arabia, or Turkey (the other seven countries in the 19-nation G-20!). However, with a little work on the part of these nations and willingness to share their data with LIS and with other similar bodies – e.g., within the G-20 itself – even more comparable measures of overall inequality could be developed, and key nations such as China and India could be added to this table. Moreover, added observations for earlier years' data could also be used to create time series for all of these nations.

That is, there exists a foundation of data sources from these nations and from the World Bank and other data providers, which could be mobilised and harmonised to better illustrate the level and trend in inequality in the entire G-20, and to better understand the policy issues which affect and are affected by globalisation and increased trade within and across these economies.

### 3.3 Explaining the differences

There have been few attempts to explain the differences we find in economic inequality across the rich nations (Gottschalk and Smeeding 1997, 2000; Gustafsson and Johansson 1997; Jacobs and Gornick 2001; Jencks 2002), so what we have here is a piecemeal, but still instructive explanation of initial explorations of these differences.

First, it is important to note that explanations of differences in inequality across countries differ according to which end of the income distribution one is addressing. That is, rather than ad-hoc decompositions of aggregate indices, often more can be learned from addressing the explanations of the differences in incomes at each end of the income distribution separately. For instance, low incomes ( $P_{10}/P_{50}$  ratios or poverty rates) are quite well correlated with the prevalence of low-wage workers within each nation (Figure 2) and with levels of non-elderly social transfers within each nation (Figure 3). The effects of different policies to raise wages, e.g., by administrative fiat (minimum wages) or by increasing labour productivity, are clearly raised by this relationship.

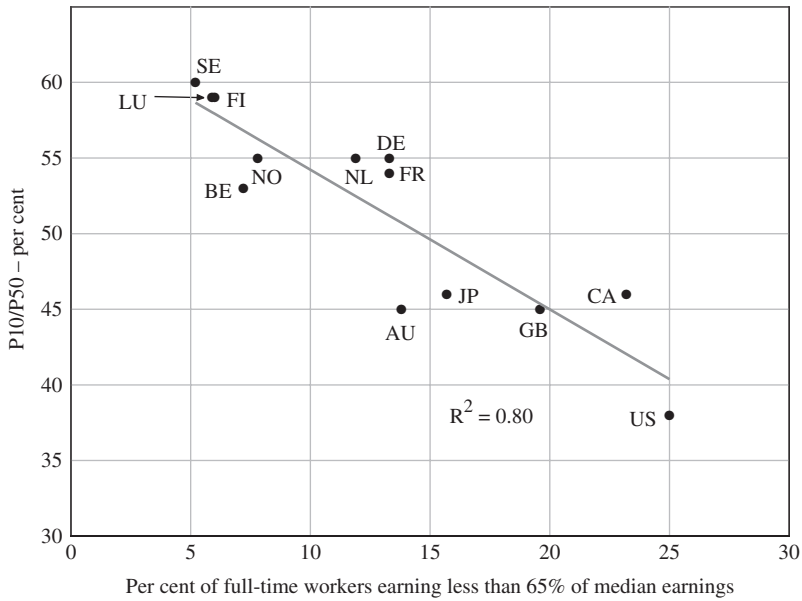
Countries that have many jobs at low wages, the US, Canada and the UK, tend to have lower  $P_{10}/P_{50}$  ratios than do nations with higher wages at the bottom end. Of course, many nations with higher minimum wages also suffer higher rates of unemployment. But unemployment is not highly correlated with  $P_{10}/P_{50}$  ratios (or Gini coefficients) across OECD nations, largely because those nations with the lowest fractions of low-wage workers have generous income transfer systems which provide low-income, unemployed workers with high net disposable incomes (see also Gustafsson and Johansson (1997); Gottschalk and Smeeding (1997)).

Similarly, the relationship between cash social transfers to the non-elderly and low incomes as measured by the  $P_{10}/P_{50}$  ratio is also strong (Figure 3).<sup>7</sup> Countries that

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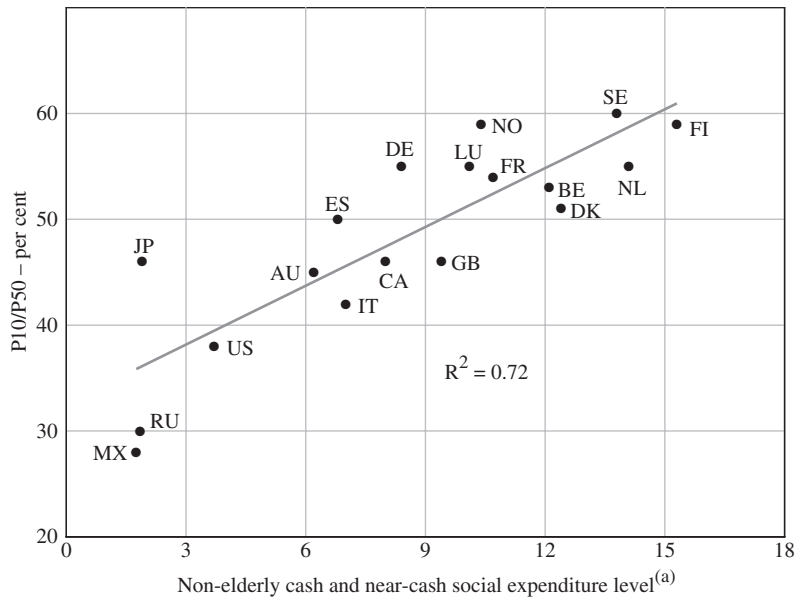
7. Here we have excluded transfers to the elderly, but even when they are included, the same relationship holds (see Smeeding (1998); Smeeding, Rainwater and Burtless (2001)).

**Figure 2: Low-Pay Employment and P10/P50 Ratios in Thirteen Industrialised Countries in the 1990s**



Notes: See Appendix A for sources and data. See Glossary for a listing of country codes.

**Figure 3: Cash Social Expenditures for the Non-elderly and P10/P50 Ratios in Eighteen Countries in the 1990s**



(a) See Appendix A for an explanation.

Notes: See Appendix A for sources and data. See Glossary for a listing of country codes.

spend less on their safety nets suffer higher levels of inequality as measured by the  $P_{10}/P_{50}$  ratio. Social insurance against falls in consumption due to illness and other factors are not widely available in many middle-income countries (e.g., see Gertler and Gruber (2002) on Indonesia). Social benefits also have fallen drastically in both value and frequency in most transition economies of Central Europe. Thus, Mexico and Russia are just two examples of what one would find were we able to extend this chart to other middle-income nations.

Other explanations for differences in incomes and inequality across nations are many and complex, especially as they affect incomes at the top of the distribution. First, consider the arguments that the US is richer than other nations because it is more efficient. Jencks (2002) recently addressed this question using LIS data and OECD data, summarised in Table 2. He concludes that one major reason the US is richer is because it employs more people who work longer hours than do their counterparts in, say, Germany or France. When he corrects gross domestic product (GDP) per capita for hours worked, and labour force participation, GDP per hour is actually about the same in the US as in Germany or France. Correcting for

**Table 2: Economic Inequality, Output, Effort, and Efficiency  
in Six Rich G-20 Democracies in the Late 1990s**

	US	UK	Australia	Canada	France	Germany
<b>Inequality (1994–97)</b>						
90/10 ratio (Figure 1)	5.6	4.6	4.3	4.1	3.5	3.2
<b>Output (1998, US\$)</b>						
OECD: GDP per capita	32 184	21 673	24 192	25 179	21 132	23 010
<b>Effort (1998)</b>						
Per cent of population employed	49	46	46	47	38	44
Hours per worker per year (No)	1 864	1 731	1 860	1 779	1 567	1 510
<b>Efficiency (1998, US\$)</b>						
GDP per worker	60 106	44 280	47 558	49 007	55 714	50 616
GDP per hour	32.25	25.58	25.57	27.55	35.55	33.52
GDP per 'available' hour	30.81	23.65	23.51	25.26	31.38	30.38

Note: GDP converted to US\$ using purchasing power parity, not exchange rate.

Sources: Jencks (2002); LIS; OECD

unemployment, by adding the total number of hours unemployed workers in these countries want to work – even if unemployed (GDP per available hour) – does not change this result.

While these data say nothing about inequality *per se*, the number of hours worked is clearly an important ingredient for measured inequality (just as the distribution of wage rates is important). But other studies of Germany and the US (Devroye and Freeman 2001), and a set of countries including Canada and Germany (Jacobs and Gornick 2001), indicate that not only do US workers work more hours overall, but high-income US workers work many more hours per year than do their counterparts in other nations. Moreover, high-income US workers are more likely to be married to spouses who also work multiple hours than in other nations (Jacobs and Gornick 2001). While the effects of these differences are yet to be completely and systematically worked out, the amount of work effort at each end of the distribution, as well as the reward for that work, are both clearly important. And it appears that both the rich and the poor in the US work more hours than do their counterparts in other rich nations (Osberg 2002).

Closely tied to the number of hours worked and earnings are demographic differences in household composition across nations. In general, nations with relatively higher levels of immigrants and relatively more single parents will have greater inequalities, especially at the lower end of the income distribution, than nations which have fewer single parents and lower levels of immigration, all else equal. But the fraction of elderly households in a nation does not affect income distribution comparisons across countries, largely because the elderly have levels of inequality that are similar to those of the non-elderly (Osberg 2000). Casual comparisons of the high-immigrant, high single-parent, Anglo-Saxon countries (e.g., Canada, Australia, the UK and the US) with Central and Northern Europe tend to bear out this finding well.

Other factors are less easily accounted for. Many authors find that labour market institutions, especially collective bargaining, wage setting, levels and penetration of minimum wages, are important for determining the level of inequality in wages and earnings across nations (Gottschalk and Smeeding 1997; Gustafsson and Johansson 1997). Differences in educational attainment are also important as the better educated earn more than the less well-educated, all else equal, in every country (see Smeeding and Sullivan (1998); Rehme (2002a, 2002b)). But recent evidence suggests that it is the former (institutions) rather than the latter (skills *per se*) that is more important in explaining differences in the cross-section. Blau and Kahn (2001) find that workers within single categories of education and adult test scores in the US (e.g., high school graduates with median-level skills as measured by the OECD individual adult cognitive literacy survey) have distributions of wages and earnings which differ amongst themselves by more than does the entire distribution of wages (across all skill and education groupings) in Germany, the Netherlands and Sweden. The differences in wage-setting institutions across countries therefore account for many of the differences in pay that we find at any point in time.

Finally, consider the arguments of Frank and Cook's (1996) book, *The Winner-Take-All-Society*. In an increasingly global economy, where markets are ever widening, where pay is tied to output and productivity – not only for chief executives and business men, but for professionals (like lawyers, physicians and scientists) as well, and where labour and firms can migrate to the highest profit areas, we expect that the wage distribution at the top of the market will continue to widen. This has been observed in some nations, notably the US and the UK, but now also in Sweden, Germany, France and Canada.

### 3.4 Summary

There exists a wide range of inequalities across the nations of the rich world and the rich nations of the G-20 as well, though the range across the rich G-20 members is narrower because the high-equality nations of Scandinavia and Northern Europe are not represented. And adding the comparable data we have on Russia and Mexico, not to mention fairly comparable data for Argentina and Brazil, suggests that even wider ranges of inequality are found as we move down the development ladder to the 'middle-income' nations.

The explanations of these differences at a point in time are many, and to quote one article on this topic, there is no one 'smoking gun' explanation (Gustafsson and Johansson 1997). Public policies toward the poor and jobless, the multiple institutions of the labour market, levels of education and training, demographic differences and even hours worked, all can play a role in explaining these differences at a point in time.

But, regardless of these differences, economies are not fixed but rather dynamic and ever changing, as this conference attests. Hence, explanations of the trends in inequality across nations may be more important than explaining levels of inequality at any point in time. Certainly, the literature on this topic suggests that trends in inequality of both earnings and income are more readily studied and across a wider range of nations, even if the data used to make these studies are not the best we have available (Atkinson and Brandolini 2001).

## 4. Trends in Inequality

Do the differences in inequality in OECD countries in the late 1980s and 1990s reflect convergence to a common level of inequality or are the less equal countries (e.g., the US, the UK, Russia and Mexico) becoming even less equal? To answer these questions we compare recent trends in inequality (from 1979 onwards). Because the LIS data cover only two to five data points in each nation, we also rely on published and unpublished data from other sources to assess the trend in income inequality (Atkinson *et al* 1995; Gottschalk and Smeeding 1997, 2000; Gottschalk *et al* 1997; Atkinson 1999; Forster 2000; Atkinson and Brandolini 2001) and to analyse differences across rich nations.

While differences in units, income measures, equivalence adjustments and other factors in different studies make it difficult to compare levels of inequality across

these studies, trends in inequality will be more comparable than are differences, as long as income concepts, surveys (and their methodologies) and inequality measures remain constant within countries over time (Gottschalk and Smeeding 2000). Unfortunately, nations do not always follow this rule. But taking advantage of a series of adjustments when assessing the trend in income inequality within any single nation and across nations, we are able to piece together a rather robust story for the rich nations of the world (Smeeding and Grodner 2000; Atkinson, Brandolini and Smeeding 2001).

As we begin this investigation, one should be warned that we are assessing mainly differences within the rich nations of the G-20, and to a much lesser extent the differences among the middle-income nations (Mexico and Russia) and the lower-income, but much larger nations, e.g., China and India with about one-third of the world's population. The trend in global inequality depends not only on income distribution changes within any set of nations, but also on the growth of average incomes across nations. Hence, rapid economic growth within China and India – even when inequalities are also increasing within these nations, can drastically reduce world income inequality (Quah 2002; Sala-i-Martin 2002). We do not address the question of the rates of growth within poor nations compared to rich nations, as do others (Dowrick and Akmal 2002; Dowrick and DeLong 2001; Sala-i-Martin 2002). Ideally, one would want to use purchasing power parities (PPPs) to convert incomes for a comparable set of national household surveys into one single survey, and then to compare the levels and changes in incomes for all respondents in every sample in all nations. However, that task is not yet accomplished, except for the European Countries (see Beblo and Knaus (2000)). And the development of key data, such as directly measured PPPs for China, is needed to make this exercise even more meaningful.

#### **4.1 Trends in income inequality over time – the evidence from LIS and elsewhere**

In general, nations with multiple data series from different sources, and countries that clearly identify survey differences and changes in survey practices over time, provide the best sources of distributional trend comparisons. Nations with very few data points and those without well-identified survey practices or concepts do not always provide accurate sources for trend analysis. Decisions about which nations to include and exclude, based on data quality considerations, should be at the forefront of the user's agenda. Many of these issues have been raised by others (Atkinson *et al* 1995; Gottschalk and Smeeding 2000; Atkinson and Brandolini 2001), so we do not delve deeper into them here. The Canberra Group (2001, chapter 9) offers a convenient summary of pitfalls for those who desire such a technical review.

Given these differences, we should go slowly and carefully when assessing trends in economic inequality across and within nations. For instance, LIS does its best to guarantee differences in inequality measurement *at a point in time*, and is less well suited for measuring changes in inequality over time. For most nations, LIS has few data points. Moreover, in choosing the best data for comparisons at a point in time,

different surveys are used in different nations. For instance, in Germany, three different data sets have been used by LIS, and these three do not lend themselves easily to trend analyses. Even though LIS is careful to note when different data sets, income definitions, or other changes take place in national data sets, the availability of data alone does not guarantee its consistency over time. Over these past 20 years of normalising microdata to a common definition, many of the cautions urged above have been learned from trying to assess inequality trends using LIS. Survey practices and data quality have changed in most of the countries found in Table 1. In some cases, a new survey replaces the old (Australia 1994). In others, panel data sets (Luxembourg and Germany), which provide the LIS cross-sections, have suffered from sample attrition and some have not added new immigrants to their original samples for LIS. Many nations provide income distribution trend data based on national definitions of income that include income items not included in LIS income, such as capital gains (Sweden) and imputed rent (the Netherlands), while several others typically exclude near-cash income, such as food stamps in the US. Finally, the weighted sum of aggregate incomes taken from the surveys in several countries may be substantially below somewhat comparable aggregate national incomes, suggesting that income under-reporting may be a serious issue (e.g., Italy, Spain; see Smeeding *et al* 2001). While the changes found in LIS may be reasonable, they should be compared to those from other sources, which are designed to produce more accurate trend data.

The data on trends in income inequality have grown dramatically in recent years. When the Atkinson *et al* (1995) report was published, there was evidence that among 16–18 countries observed during the 1970s and 1980s, the trend in inequality observed from comparable Gini coefficients could be separated into two eras (Table 3, first and second columns). From the mid 1970s to the mid 1980s, inequality increased in only the UK and the US, falling modestly in seven other nations and having no trend in nine others. These increases in the US and the UK were in marked contrast to the falling inequality in both nations from 1950–1970 (Gottschalk and Smeeding 2000). There were no suitable and accurate data in seven other nations for the 1970s or 1980s (see ‘na’ in first and second columns of Table 3).

By the time the 1980s were finished (second column, Table 3), inequality was falling significantly only in Italy, but was increasing in nine nations. Eight nations experienced no change, where a change between plus and minus 1 per cent in a given measure is taken as an insignificant change. Inequality in the UK increased by over 15 per cent over this period, while inequality in the US rose by about 12 per cent. Inequality either stopped declining or rose modestly in all of the other nations shown here during the 1980s.

Finally, a combination of results for 25 nations are shown in the last column of Table 3, using LIS, and similar summaries of other national trends based on data collected by the OECD (Forster 2000), by Atkinson (1999) and from recent national reports. Here we see that from the late 1980s to the mid to late 1990s inequality rose in almost every OECD nation, with Denmark being the only possible exception. Large increases were experienced by only two nations, and by the late 1990s inequality increases had become more tempered in the UK, and also in the US. These



**Table 3: Overall Trends in Income Distribution**  
Summary results from national and cross-national studies

	Early/mid 1970s to mid/late 1980s	OECD study 1980s	Mid/late 1980s to mid/late 1990s
<b>Australia</b>	<b>0</b>	+	+
Austria	0	0	++
Belgium	0	+	+
<b>Canada</b>	–	<b>0</b>	+
Czech Republic	na	na	+++
Denmark	na	na	–
Finland	–	0	+
<b>France</b>	–	<b>0</b>	+
<b>Germany</b>	–	+	+
Hungary	na	na	++
Ireland	–	0	++
Israel	0	0	++
<b>Italy</b>	--	–	++
<b>Japan</b>	<b>0</b>	+	++
<b>Mexico</b>	<b>na</b>	<b>na</b>	++
Netherlands	0	+	++
New Zealand	0	+	+++
Norway	0	0	++
Poland	na	na	++
<b>Russia</b>	<b>na</b>	<b>na</b>	++
Sweden	–	+	+
Switzerland	na	na	+
Taiwan	0	0	+
<b>United Kingdom</b>	++	+++	++
<b>United States</b>	++	++	++

+++ Significant rise in income inequality (more than 15 per cent increase)

++ Rise in income inequality (7 to 15 per cent increase)

+ Modest rise in income inequality (1 to 6 per cent increase)

0 No change (–1 to +1 per cent change)

– Modest decrease in income inequality (1 to 6 per cent decrease)

-- Decrease in income inequality (7 to 15 per cent decrease)

--- Significant decrease in income inequality (more than 15 per cent decrease)

na No consistent estimate available

Notes: The results are based on several income inequality indicators, mainly Gini coefficients, in most countries and reflect the general trends reported in national and comparative studies. However, trends are always sensitive to beginning and ending points as well as to other cautions mentioned in Atkinson *et al* (2001). G-20 countries are indicated in bold.

Sources: Atkinson *et al* (1995); Gottschalk and Smeeding (1997, 2000); Atkinson (1999); Forster (2000); Atkinson and Brandolini (2001); Fukui (2001); LIS (<<http://www.lisproject.org/keyfigures/>>); Statistics Canada (2002)

trends may, in time, be shown to have been a result of the strong labour markets and low unemployment in these nations during the latter half of the 1990s.

But inequality has begun to increase in Canada, France, and Germany in the 1990s, where before this time it had not risen. Russian and Czech inequality began to rise in the 1990s, as one might expect given the suppression of market earnings distributions under the institutions of the former Soviet regime. However, these changes have been accompanied by very different starting and ending points in these two nations (see Figure 1 where Czech inequality is 0.259 in 1996, and Russian inequality is 0.447 in 1995). New Zealand's inequality continued to rise as well. Thus, the patterns change considerably as we move from period to period.

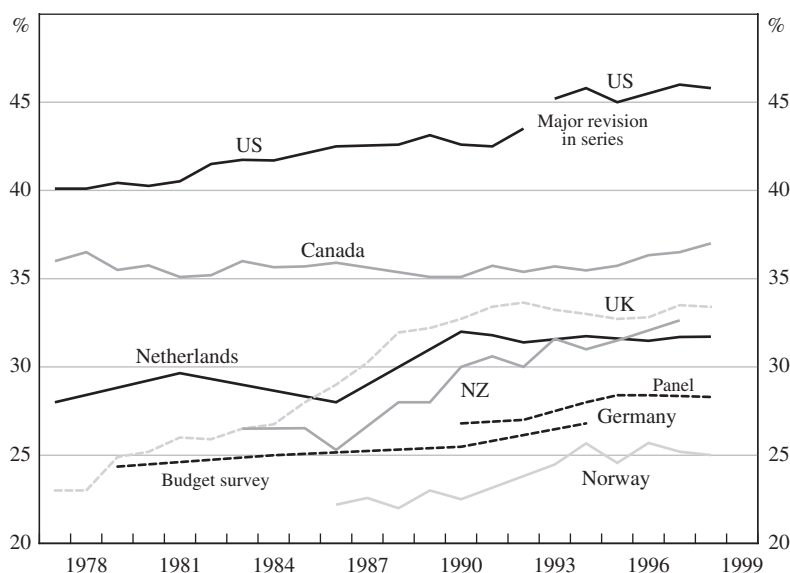
Because pictures are often easier to fathom than are strings of '++' and '-', Figure 4 provides a snapshot of inequality trends in seven nations. The basic diagram is taken from Atkinson (1999) with later year data adjustments by the present author from the same sources, where available. The data confirm the patterns seen in Table 3, and also suggest a slowing, but not a reversal, of rising inequality in several nations at the end of the 1990s. However, they also show a rise in Canadian inequality as the 1990s draw to a close.

The following summary impressions can be gleaned from Table 3 and Figure 4.

The OECD study (Forster 2000) focused on the 1980s, a period of transition from one period (flat or declining inequality) to another period (rising inequality) in most

**Figure 4: Changes in Income Inequality**

Gini coefficient, per cent



Sources: Atkinson (1999); Forster (2000); Hauser and Becker (2000); Hauser and Wagner (2002); Canada – Statistics Canada (2002); United States – US Department of Commerce (2002, Tables B-3, B-6)

nations. As Gottschalk and Smeeding (2000) argue, this best describes a ‘U’-shaped change in the distributions of income in most nations with inequality falling in the 1960s (few comparable observations) and early 1970s, but then rising from the late 1970s and 1980s into the 1990s. The turning points (bottom of the ‘U’) differ across nations. Many (e.g., the Scandinavian nations) did not experience a rise in inequality until the 1990s. And in many nations (e.g., Germany, France and Canada) these increases have so far been very modest (see Gottschalk and Smeeding (2000) for more on the ‘U’ shape).

While inequality rose rapidly in the UK and the US during the 1980s and early 1990s, the trend seems to have flattened out in both countries by the end of the decade. To the extent that the UK income distribution source (Family Expenditure Survey) and US source (Current Population Survey) do not accurately capture or measure incomes in high-income households (due to topcoding, non-response, etc), this conclusion may be unwarranted (e.g., see CBO (2001) for the US 1979–1997; and Jencks (2002)). However, the rate of increase in inequality has still slowed markedly in these two nations in the late 1990s.

LIS data for Mexico and Russia show much more volatility than do the other data sets. Inequality in Mexico was lower in the late 1980s than in 1990s, but inequality was much higher in both 1994 (Gini of 0.496) and 1998 (0.494) than in 1996 (0.477), perhaps due to cyclical volatility. And several studies (e.g., Hölscher (2001)) based on LIS and other data argue for rapidly rising inequality in Russia in the 1990s.<sup>8</sup> Other world pictures are somewhat more mixed. For instance, Sala-i-Martin (2002)<sup>9</sup> suggests that inequality rose in China and Indonesia, but not in India, Brazil, or Pakistan over the 1970–1997 period. The refinement of these analyses must await better data and methods (e.g., Deininger and Squire (2002)).

## 4.2 What changed and why?

The estimates in Table 3 and Figure 4 provide an overall picture of changing inequality, but one that needs to be carefully interpreted. For instance, suppose that one weights changes in inequality at the bottom of the distribution more than changes at the top. If so, one would be happy to learn that overall changes in relative poverty (e.g., the per cent with incomes less than 40 or 50 per cent of the adjusted (for family size) median) were far less frequent and of lesser magnitude than were increases in overall inequality in rich OECD nations (Smeeding *et al* 2001). That is, in most of the European countries studied here and in the UK and the US, relative poverty did not increase by much, if at all, during the 1990s. Thus, the phenomenon of increasing inequality is predominately a consequence of changes in the top of the distribution, rather than in the bottom (Forster 2000).

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8. However, because the Mexican and Russian surveys are taken over a period of several months when inflation can be rapid, the estimates of annual inequality for each nation may be sensitive to the treatment of changes in domestic prices over this period.

9. Appendix figures, taken from the World Bank data compiled by Deininger and Squire (1996).

The data say nothing about trade-offs between economic growth and inequality in rich nations. Though much has been written on this topic in recent years, there is no compelling case for one being systematically related to the other in OECD nations (e.g., see Arjona, Pearson and Ladaïque (2001) for a concise summary of studies in OECD nations). In fact, in some rapidly growing nations, such as Ireland, a modest increase in inequality can be seen as a small price to pay for rapid economic growth in real incomes and falling poverty at all levels of the income distribution (Nolan 2001). Similarly, modest increases in inequality may be the price that needs to be paid by countries such as Canada, France, Germany and Australia, as they adjust to greater trade and the increased capital and labour mobility that accompanies globalising economies.

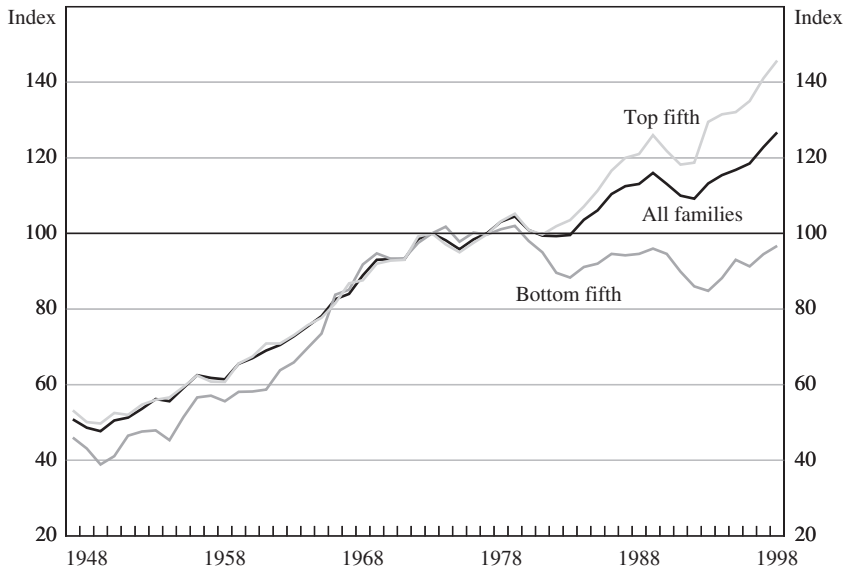
Finally, the question is raised whether increases in inequality were accompanied by widespread or selective changes in real economic well-being within each nation. The question of whether all the boats rose or only some, while others sank, is clearly a critical one for most nations. As in Ireland, rising inequalities are much more acceptable when living standards are rising across all segments of the population than when they are concentrated among the rich alone. While we are trying to compile these data for a number of countries, the experience of the US is one which other countries might choose not to emulate in this regard.<sup>10</sup> Figure 5 suggests that the US experienced several distinctly different periods of income inequality change during the past 50 years: first, one of falling inequality and widespread real income gains, largely in concert for all families from roughly 1950s through the mid 1970s; second, one where real income growth was increasingly different depending on where one lies in the income distribution from the 1970s onward. And within this latter period we note two different epochs. While average family incomes grew during the 1980s, and especially the period from 1993 onward (albeit reflecting the cyclical changes of the 1991–1993 recession), higher incomes grew by much more than did lower incomes throughout the period. Lower incomes fell from 1979 until 1993 before rising markedly in the later 1990s. Still, by the end of the 1990s, the average income for families in the bottom-fifth of the distribution had barely reached the real standard of living experienced at the end of the 1970s, despite the real income gains for all during the latter 1990s.

Explanations for why income inequality changed in rich nations are many and, as seen in the data for the US, can be very complicated as well. Many of these comparisons are based on LIS data (Gustafsson and Johansson 1997; Acemoglu 2002; Rehme 2002a, 2002b). Others are based on series of national datasets (Arjona *et al* 2001; Forster 2000). Still others concentrate on earnings changes alone and are not based

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10. Figure 5 is based on the US Census Bureau's income series for families of two or more persons (thus omitting unrelated individuals), unadjusted for taxes paid, but gross of transfers received. It is therefore a less complete income concept and population group than the one studied by LIS. However, restricting ourselves to this definition buys a more or less consistent 50-year series of incomes and income inequality. We are currently trying to develop a series that is both consistent with LIS and with national survey practices, measures of price change, etc, for several countries.

**Figure 5: Trend in US Real Average Family Income, by Rank in the US Income Distribution 1947–1998, 1973 = 100**



Note: Incomes are for families only, before tax, and are deflated by the CPI-UX1 price index.

Source: Burtless and Smeeding (2001)

on changes in overall incomes, after taxes and transfers (Beaudry and Green 2000; Card and DiNardo 2002).

First, it is important to establish what these studies do not show, i.e., that increasing levels of international trade can be tied to growth in inequality. To quote Friedman (2000), patterns of change in wages and earnings are not determined in Beijing, but are a product of a complex set of interactions within and across nations. More likely, the effect of international trade on the economy is proportionate to the size of the trade sector in each nation (Richardson 1995). Studies that have tried to establish this connection using LIS data have concluded that greater levels of trade do not lead to increased poverty or inequality (e.g., Gustafsson and Johansson (1997); Osberg (2000); Osberg and Sharpe (2000)).

There is, however, evidence that both the changing supply and demand for labour of different skills can explain some of the changes in earned incomes across rich nations, and possibly among middle-income ones as well. The rising demand for skills led to higher (lower) wages in countries that had smaller (larger) responses in their education (supply) sectors. Thus, Canada and the Netherlands experienced much smaller increases in high wages than did the US or the UK (Gottschalk and Joyce 1997). Institutional mechanisms have also slowed the rewards to higher skills in many European nations, at least early into the 1990s (Katz and Autor 2000). And there is new evidence that the demand for skills increased faster than the supply in

middle-income nations as well (Berman and Machin 2001), and in Mexico (Legovoni, Bouillon and Lustig 2002), thus exacerbating earned income inequality.

It is more difficult to tie these explanations to 'skill-biased technological change' or to 'demand-side effects', as various sectors of the economy have experienced different levels of technological change in each country as well as across countries. Different practices of management, different national climates and institutions for promoting entrepreneurship, the differential availability of venture capital, and diffusion of technological progress are also apparent throughout the OECD world (e.g., Forster (2000); OECD (2001a)). Better identification of demand-side effects is certainly needed. For instance, an interesting new paper by Acemoglu (2002) argues that wage compression in Europe might have led to a more rapid adoption of technology that benefited low-skill workers than in other countries.

Moreover, no one has yet documented the effects of increased changes in product quality or the effect of falling international prices for traded goods due to greater international competition amongst the rich nations. Our textbooks tell us that trade and comparative advantage bring a better standard of living (more real income) to each nation, but the research that we have so far reviewed has not addressed the size of these gains as of this writing.

### 4.3 Summary of trend analyses

It appears that the amount of good quality and consistent information on income distribution trends is on the rise. Recent work by Atkinson (1999), Forster (2000), Atkinson and Brandolini (2001) and the Canberra Group (2001) in conjunction with LIS, has made some headway into the issue, but much needs to be done to produce more consistent and comparable measures of income inequality in most of the middle-income countries and in some of the rich ones. To the extent that these data emerge, we will be in a better position to model the determinants of changes in inequality and to understand its evolution on a worldwide scale.

As Atkinson (1999) concludes, rising economic inequality is not inevitable – Denmark seems to present at least one exception to the rule. However, rising income inequality is predominant in most nations, even the most egalitarian, advanced welfare state nations of the world. And while inequality has increased, our reading of the LIS data, and to a lesser extent the international trend data, suggests that there have been different patterns in the timing and extent of the increase in inequality in most nations. Moreover, national changes in inequality may have different welfare implications depending on whose incomes are changing. In Sweden, Germany, Norway and Finland, most of the higher inequality in the 1990s seems to be coming from movements at the top of the distribution (from changes in  $P_{90}$ 's), not from changes in the bottom (i.e., from the  $P_{10}$ 's; see Gottschalk and Smeeding (2000)). And most rich countries have been able to protect the least skilled from the negative effects of rapidly changing industrial and employment effects brought about by increased trade and technological change. At least in theory, the winners from the globalisation game should be able to compensate the losers to the benefit of all. And

the strong welfare states of Europe and Scandinavia seem to have been able to protect their least-skilled and least-well-off citizens better than many others during this period.

That said, only a few authors have begun to sort out the sources of differences in inequality trends across the rich countries, and even fewer in the middle-income and poorer nations. Much additional work is needed here.

## **5. Summary and Conclusions**

This brief paper has perhaps asked more questions than it has given answers. This is how the paper was meant to be written. Understandings and explanations of changes in the broad structures of economic inequality within and across nations depend heavily on the quality of the data that we have at our disposal. For social scientists interested in this topic, economic inequality data are equivalent to the astronomer's Hubble telescope or the geneticist's Human Genome project. Without accurate indicators, model building and hypothesis testing cannot adequately proceed. Cross-national data on income distribution will never be perfect. But the ratio of signal to noise in these data can still be improved, as the LIS project has demonstrated. And there is room for the non-LIS G-20 nations to create similar data sets to illustrate changing economic inequality in their nations as well.

The evidence that we do have suggests that globalisation is one force among many which accounts for widening income inequalities in the rich countries of the OECD. The relationship between economic inequality and growth has not been sorted out, even in the rich nations, and we have yet to determine the effect of very high levels of inequality on civic engagement, or on support for policies which enhance opportunity for all citizens. Still, globalisation in rich nations appears to act more by raising incomes at the top of the income distribution than by lowering them at the bottom. Notwithstanding this influence, however, domestic policies – labour market institutions, welfare policies, etc – can act as a powerful countervailing force to market-driven inequality. Even in a globalised world, the overall distribution of income in a country remains very much a consequence of the domestic political, institutional and economic choices made by those individual countries – both rich and middle-income ones.

## Appendix A: Data and Sources for Figures 2 and 3

Country	P10/P50 Ratios	Rank	Non-elderly and cash and near-cash social expenditure level <sup>(a)</sup>		Full-time workers earning less than 65 per cent of median earnings	
			% of GDP	Rank	%	Rank
US	38	17	3.7	15	25.0	1
Italy	42	16	7.0	12	na	na
Australia	45	15	6.2	14	13.8	5
Japan	46	12	1.9	16	15.7	4
Canada	46	12	8.0	11	23.2	2
UK	46	12	9.4	9	19.6	3
Spain	50	11	6.8	13	na	na
Netherlands	55	4	14.1	2	11.9	8
Sweden	60	1	13.8	3	5.2	13
Germany	55	4	8.4	10	13.3	6
Switzerland	52	9	na	na	na	na
Denmark	51	10	12.4	4	na	na
France	54	7	10.7	6	13.3	6
Norway	55	4	10.1	8	7.8	9
Finland	59	2	15.3	1	5.9	12
Belgium	53	8	12.1	5	7.2	10
Luxembourg	59	2	10.4	7	6.0	11
Mexico	28	19	1.8	18	na	na
Russia	30	18	1.9	17	na	na
<b>Overall average</b>	<b>48.6</b>	<b>na</b>	<b>8.6</b>	<b>na</b>	<b>12.9</b>	<b>na</b>

(a) Cash and non-cash social expenditures exclude health, education, and social services, but include all forms of cash benefits and near-cash housing subsidies, active labour market program subsidies and other contingent cash and other near-cash benefits.

Sources: OECD, *OECD Economic Outlook*, vol 59 and 60, 1996 (per cent of full-time workers earning less than 65 per cent of median earnings); OECD (2001b) (non-elderly and cash and near-cash social expenditure level); author's tabulations of the LIS data files



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