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**Working Paper No. 137**

## The International Evidence on Income Distribution in Modern Economies: Where Do We Stand?

**Timothy Smeeding and Peter Gottschalk**

**March 1996 (revised)**

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**Luxembourg Income Study (LIS), asbl**

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# THE INTERNATIONAL EVIDENCE ON INCOME DISTRIBUTION IN MODERN ECONOMIES: WHERE DO WE STAND?

Timothy M. Smeeding
Syracuse University, USA

and

Peter Gottschalk
Boston College, USA

March 1996
[Revised]

# THE INTERNATIONAL EVIDENCE ON INCOME DISTRIBUTION IN MODERN ECONOMICS: WHERE DO WE STAND?

## 1. INTRODUCTION[1]

Interest in cross-national comparison of personal income distributions, low relative incomes, and income inequality in general has grown dramatically during the past five years. Interest in cross-national distribution research did not come about by accident; several factors helped propel this line of research in the 1980s and 1990s. First of all, income distributions in the United States, the United Kingdom, and in several other nations began to trend toward greater inequality in a systematic and secular pattern, and the inequality generating pressures of a rapidly internationalising highly technical economy were felt in several modern nations. Second, the former state socialist nations of Central and Eastern Europe (CEE) began a still continuing process of economic and social adjustment and transition to a new socio-economic order. While this transition is still underway, CEE nations have experienced large changes in both real income levels and in income distribution. Third, along with the rise in inequality, a growing interest in the question of "fairness" vis-a-vis "budget pressures" was present in the national political debates of the late 1980s and early 1990s, thus making "income distribution" a legitimate realm of political inquiry.

Finally, the emergence of comparable cross-national data on distribution allowed for comparisons of similarities and differences across countries and over time. Similarities and differences in experiences help us understand how market forces, demographic forces, and public policy affect the relative economic status of various groups in each nation.

This brief paper summarises and provides limited updates on a small part of what was learned in a large study undertaken for the OECD (Atkinson, Rainwater, and Smeeding, 1995), and a subsequent review article (Gottschalk and Smeeding, 1996). It also adds recent material for CEE nations (Torrey, Smeeding, and Bailey, 1996) and for Taiwan (Republic of China).

Lessons learned from international income comparisons are heavily dependent on the underlying quality and comparability of the income data on which they rest. While all estimates of "income" are subject to choice of data and measurement techniques, many of these choices lead to findings which, on closer examination, are found to be mere statistical artifacts rather than genuine economic regularities. The value of empirical contributions has more often been found in the theoretical processes used to explain them than in the empirical observation itself. It can be argued that the contribution of Kuznets' Presidential Address to the American Economic Association lay in his analytical framework of income distribution rather than in the much celebrated Kuznets curve indicating that inequality first rises and then falls as a country develops. While several recent writers claim to have evidence which contradicts the Kuznets curve (e.g., Milanovic, 1995), advances in the theory of income distribution have not moved much beyond Kuznets over the past 40 years (Atkinson, 1994).

This paper starts therefore from a position of caution as to what can be achieved by a summary of the empirical evidence. Not the least of the reasons for this caution are the difficulties in making choices about concepts of measurement. Due to space constraints, we are unable to document all of the limitations and footnotes that go into these datasets presented here. In particular, we have not been able to verify the quality of the CEE datasets by comparing them with

administrative records due mainly to the paucity of these records. However, the quality of LIS data for OECD nations can be more fully investigated in Atkinson, Rainwater, and Smeeding (1995, Chapters 2, 3, and Appendices). We begin with our choice of measures and a more general listing of cautions in Section 2. The second difficulty in writing a paper on "empirical facts" is that these have many dimensions. Here we have chosen to concentrate on the comparison of two dimensions: market and disposable income inequality across countries, and time. Section 2 covers the specific terms and definitions used to make these comparisons.[2]

Section 3 summarises for a range of nations, the extent of income inequality in the 1980s and early 1990s and its trend. One question to be asked is if one can identify distinct groupings of countries with different degrees of inequality? Section 4 briefly discusses the trend in inequality in recent years, and asks if there is a world wide trend toward greater inequality or whether a particular set of countries are different. Section 5 addresses some of the factors that seem to have affected inequality: differences in market incomes, demographic factors, and then government intervention (direct taxes and transfers). The final section (6) summarises the paper and offers suggestions for additional research.

## 2. CHOICES AND MEASURES

There are currently no international standards for income distribution which parallel the international standards used for systems of national income accounts.[3] Hence, researchers need to decide what they want to measure and how far they can measure it on a comparable basis. The Luxembourg Income Study (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 (1979-1993 for most nations, but 1968-1995 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 others have made to study longer term trends in income distribution are discussed in Gottschalk and Smeeding (1996).

## 2.1 Choices: Inequality of What among Whom on What Terms?

Our attention is focused primarily on the distribution of **disposable money income**, that is income after direct taxes and including transfer payments. Several points should be noted:

a. income rather than consumption is taken as the indicator of resources, although there may be both theoretical and empirical arguments favoring use of the latter;

b. the definition of income falls considerably short of the Haig-Simons comprehensive definition, typically excluding much of capital gains, imputed rents, home production, and most of income in-kind (with the exception of near-cash benefits);

c. No account is taken of indirect taxes or of the benefits from public spending (other than cash and near-cash transfers) such as health care, education, or most housing subsidies;

d. the period of income measurement is in general the calendar year with income measured on an annual basis (although the United Kingdom evidence relates to weekly or monthly income).

Thus, variables measured may be less than ideal and results may not be fully comparable across countries. For example, one country may help low-income families through money benefits (included in cash income), whereas another provides subsidised housing, child care, or education (which is not taken into account). While, a recent 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 here, there is no guarantee that these relationships hold for alternative countries or methods of accounting.[4] Still this study shows that countries which spend more for cash benefits tend to also spend more for noncash benefits. Because noncash benefits are more equally distributed than are cash benefits, levels of inequality within countries are lessened, but the same rank ordering of these countries with respect to inequality levels that is found here using cash alone, persists when noncash benefits are added in.

**Market income**, which includes earned income from wages and salaries and self-employment, cash property income (but not capital gains or losses) and other private cash income transfers (occupational pensions, alimony, and child support) is the primary source of disposable income for most non-elderly families. To reach disposable income, governments add public transfer payments (social retirement, family allowances, unemployment compensation, welfare benefits) and deduct personal income tax and social security contributions from market income. Near-cash benefits—those which are virtually equivalent to cash (food stamps in the United States and housing allowances in the United Kingdom and Sweden) are also included in the disposable income measure.[5] And differences between disposable and market income capture the net effects of income redistribution.

The question of distribution "among whom" is here given the simplest answer—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 choice of the household, rather than a narrower

unit such as the spending unit or the family, is open to debate. It captures the economies of scale extant in shared living arrangements, but it assumes a degree of income-sharing within the household that may not be realised. Moreover, the choice of unit may affect comparisons across countries in light of different household structures. For the most part, the household—all persons sharing the same housing unit regardless of familial relationship—is the common unit of analysis. However, for Sweden and Canada more restrictive nuclear family (Sweden) and economic family (Canada) definitions of the accounting unit are necessary (see Atkinson, Rainwater, Smeeding, 1995, Chapter 2, for additional details). These restrictions probably overstate the amount of household-based inequality in each of these two nations.[6]

## 2.2 Measurement Approach and Comparability

The approach adopted here, based in large part on data from the Luxembourg Income Study (LIS), overcomes some, but not all, of the problems of making comparisons across countries and across time that plagued earlier studies. Some problems, e.g., the use of data from different types of sources, still remains. But most of the data are now drawn from household income surveys, or their equivalent, and in no case is synthetic data used.[7] The main qualification concerns the French data, which come from tax records that have been augmented to reflect income transfer receipt.

One major advantage of LIS is the availability of micro-data. 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 micro-data 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.[8] The data all cover, at least in principle, the whole non-institutionalised population as well.

The aim of the LIS project is to increase the degree of cross-national comparability, but 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. It is left to the reader to decide if the level of comparability found in this study is acceptable. Moreover, many 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 OECD and in other forums. This painstaking two-year process helped improve the quality of the analysis while also testing the mettle of both the analysts and the reviewers. In some nations, we only update to OECD results to a later year using the same national database. Finally, our results for CEE nations have been reviewed by teams of country experts, but not by national authorities.

## 3. INCOME INEQUALITY IN 25 NATIONS

The LIS data sets have been used here to compare the distribution of disposable income in 25 nations over a five to ten year period.[9] The numbers presented are taken from the most recent LIS data and correspond generally to the results found in Atkinson, Rainwater, and Smeeding (1995), which use earlier years' LIS data in most cases. Figure 1 shows the percentiles of the distribution as percentages of the median, where $P_{10}$ is considered "low," $P_{90}$ "high". The ratio of high to low

(decile ratio) is also shown. For instance, the high to low ratio in Russia is 6.83, indicating that a person in a high income family at the 90th percentile enjoys almost seven times the income of a low income family of equivalent size at the 10th percentile.

Russia has the highest decile ratio at 6.83 followed by the United States (5.67) with the second largest value recorded in Figure 1, the next largest being Australia with a value of 4.26. The lower part of the distribution of disposable income as shown under the low column appears to be substantially different in Russia (35) and in the United States (37) with the closest other nations being Australia (45) and Canada (47). Low income units have living standards in excess of 50 percent for most other nations, up to 59 percent in Belgium, Luxembourg, and The Netherlands and 65/66 percent in the Czech and Slovak Republics. No doubt this difference owes in part to the relatively low values for $P_{10}$ for the United States earnings distribution, which is attributable to both low wages and to the weakness of the United States incomes package for families with children and the aged at this income level (Rainwater and Smeeding, 1995; Gottschalk and Smeeding, 1995; Smeeding, Rainwater, and Torrey, 1993). In Russia the basic safety net to the poor and the aged and nominally fixed state sector wages have been ravaged by inflation and the socio-economic upheaval.

The relative incomes of the rich are highest in Russia where a person at the 90th percentile has 2.39 times the median person's income and nearly seven times as much as a low income person. The value of United States relative income at the 90th percentile point is 2.07 times the median, while that found in Ireland is 2.09. Other nations with $P_{90}$ values nearly twice the median include Spain (1.98) and Taiwan (1.95). The distribution at the top is noticeably less unequal in the Czech

and Slovak Republic and in Scandinavia (Denmark, Finland, Norway, and Sweden), followed by Belgium and Germany.

While percentile ratios have some obvious appeal (e.g., insensitivity to top coding, ease of understanding), they have the disadvantage of focusing on only a few points in the distribution and lack a normative basis. Table 1 presents an alternative Lorenz-based summary measure of inequality, the Gini coefficient. with countries grouped according to type (OECD, CEE, Taiwan, Israel).[10]

Among the OECD nations, lowest Gini is found in Finland followed by most, but not all, Scandinavian nations. Austria's figures must be treated with caution because of their exclusion of self-employment income, but they and the smallest Benelux nations come next, followed by West Germany, Italy, and The Netherlands. There is then a gap of .015 points to Canada and France. The United Kingdom, Spain, and Australia are next, with another gap of .014 to Switzerland, Ireland, and finally the United States. As measured by these Ginis, the range of inequality across OECD nations runs from .223 (Finland) to .343 (United States) or by as much as 54 percent.

Turning to the CEE nations, income inequality for persons in the Czech and Slovak Republics is most similar to that found in the Scandinavian economies while Hungary and Poland are similar to France, Canada, Australia, and the United Kingdom. Russia had the highest Gini as well as the highest rich to poor ratio of all countries for which we have LIS data in the 1990s. This is partially the result of some very high incomes since the Gini changes by a large fraction when we impose a top code of ten times the median adjusted income in Russia, while other nations' estimates change little, if at all. Russia still has the highest Gini and the ranking of nations is unaffected.

Based on these data, it appears that there is a wider range of disposable income inequality in the five CEE transition countries, including Russia, than in the major and much richer OECD nations based on these preliminary results. Finally, the Republic of China and Israel have inequality levels near the middle of the OECD range, with Ginis very similar to that found in the United Kingdom.

### 3.1 Absolute Comparisons of Income Inequality

Since countries differ substantially in terms of real GDP per capita, most authors have made comparisons across nations in nominal or relative terms. Measures of real or absolute income differences across nations are much more difficult because they require comparisons of purchasing power of currencies across nations. One problem is that the purchasing power parities used to compare real levels of GDP per capita or total consumption (including government spending on health, education, transportation) across nations are not designed for adjusting measures of disposable personal income such as those examined here. Nonetheless, such comparisons are at least implicitly made by analysts from rich nations who argue that the higher the average standard of living in a particular nation, the better off are its citizens. For example, because the United States real GDP per capita in 1993 was $24, 750 as compared to say $17,750 in the United Kingdom, $15,230 in Finland, $18,050 in the Netherlands, and $18,070 in Italy, the United States is, "on average," better off than these nations (World Bank 1995). What is interesting to ask how far that average advantage carries when one takes account of the wider dispersion in overall distribution in the United States. What has been implicitly assumed by analysts is that the higher United States average standard of living extends to all levels of the income distribution.

We investigate this question by converting the median incomes of a set of rich nations on which the percentile points in Figure 1 are based, into real United States 1991 dollars using the Penn World Tables' purchasing power parities (Summers and Heston, 1991) (Figure 2). We then recompute median, high, and low incomes as a fraction of the U.S. median. We show both the real U.S. dollar gap (Panel A) and the resulting comparisons across countries at several percentile points with the United States set at 100 (Figure 2, Panel B).[11]

The real dollar gaps in Panel A are much closer at the bottom end of the scale than are those in Figure 1, because almost all of the nations shown in Figure 1 and Figure 2 are "poorer" than the United States in terms of real GDP per person. Stated differently, both low and high disposable incomes fall as a percent of the U.S. median income. Of course, the rates of high to low income stay the same with both ends of the distribution being converted to United States dollars using the same scale. As is often claimed, the United States has the highest median ("average") standard of living of the countries compared here (Panel B, middle column). The rankings of nations at the 50th percentile are therefore similar to those found when using GDP per capita (e.g., World Bank, 1995). However, the wider distribution of United States incomes means that "low -income" persons living in households at the P10 level in the United States had lower living standards than did similarly situated persons in each of the 10 other nations in the early 1990s. Despite the fact that the median American enjoyed a standard of living far above the median Finn (whose income per equivalent adult was only 77 percent as high), Dutch (78 percent as high), or Italian (75 percent as high), low-income Americans—at P10—had living standards that were 22 percent below that of low-income Finns, 24 percent below low-income Dutch, and 15 percent below the average income of the bottom

quintile Italian. Only the Australians had incomes that were near those of the Americans at low income levels.

Real income comparisons move in both directions, however. At the other end of the scale, "high income" Americans enjoyed real living standards far above those experienced in other nations. At the P90 level, the real income of Americans was 50 percent more than the average incomes of the rich in the other nations studied. At the very top of the distribution the rich (P95 level) these differences remained the same or were further magnified.

Although we would argue that economic well-being in the most developed countries is most crucially a function of the individual's relative position in the distribution of income, real levels of living are also important in comparing income and well-being. Such comparisons allow one to balance off differences in income distribution with differences in real overall spendable income. The claim that "America enjoys the highest standard of living in the world" must be evaluated alongside the equally valid claim that America enjoys the greatest level of real income inequality in the post-industrialised world—with their rich far better off than rich in other nations and their poor not so well off as are the poor in other nations.

In closing, we must reiterate a point made in passing above. Because countries differ in the way that they finance goods, such as health care and education, and because they differ in the extent to which specific types of consumption are tax subsidised, e.g., owned versus rented housing, these PPP's are less than ideal for adjusting disposable income for total control over resources—standard of living—across countries. The "real income" measures above should therefore be seen as measures of net spendable income rather than measures of total consumption, the largest difference

between the two concepts being goods and services such as health care, child care, and education which are provided at different prices and under different financing schemes in different nations.

Finally, we stress that we have not overcome any of the problems associated with purchasing power parity comparisons. All that we have done is to apply the PPP methodology to median disposable incomes and to different points in the income distribution.

## 4. THE COMPARATIVE TREND IN INCOME INEQUALITY

In this section we lay out the facts of how income inequality has changed over the past 15 to 25 years in major modern nations. The empirical evidence concerning recent trends in income inequality in different nations is summarised in Table 2.[12] While the various studies surveyed use different income and inequality measures and cover different periods, they are sufficiently robust to paint a picture of overall changes in inequality during the 1980s and into the early 1990s in a large number of nations.[13] These series give a reasonable span of years and the data themselves are internally over time. They, therefore, give an indication of the relative trends in different countries. We summarise these changes in Table 2 using a simple summary score based on the Gini coefficients that are used in all studies reviewed here. Countries are listed in order of change in disposable income inequality from largest to least change. Where they are available from the same studies, we also present data on the trend in market income inequality in each nation.

Both the United Kingdom and the United States experienced a substantial rise in inequality during the 1980s, with the increase in the United Kingdom being much greater over this time period. Whereas trends in earnings inequality were similar in the United States and the United Kingdom,

the time paths for changes in the distribution of family income were markedly different. In the United Kingdom income inequality fell through the mid-1970s but the Gini coefficient rose by more than 30 percent between 1978 and 1991. This is almost double the increase over two decades in the United States, and more than double the decline in the United Kingdom from 1949 to 1976.

While starting from a much lower level of inequality, Sweden experienced a pattern of change in inequality similar to that in the United Kingdom, downward until 1981, then upward in the 1980s, with the sharpest increases in the early 1990s. The Swedish Gini increased by about 20 percent from 1980 to 1992, though the Swedish income distribution remained considerably more equal than either the United States or the United Kingdom, in spite of these changes.[14]

The Czech Republic experienced a somewhat larger 25 percent rise in inequality more than that found in Sweden and the United States over exactly the same period. While "market" income inequality in the Czech Republic was unmeasurable in 1980 because of the absence of a true labour market, this change in disposable income inequality over this period is less than that found in the United Kingdom (Torrey, Smeeding, and Bailey 1995). The changes experienced by Hungary and Poland—28 and 12 percent, respectively, over a shorter period, (three and five years, respectively)—are closer to our expectations. While the Hungarian change is very large, the change found in Poland is not much different from that found in the United Kingdom over the 1981-1986 period or in Sweden from 1988 to 1992.[15]

In Australia, Denmark, and Japan, (and in Poland, though over a shorter period), the upward trend over the 1980s is slightly less than that experienced in the United States and Sweden. The same is true in New Zealand, though all of the increases here came during the late 1980s (Saunders,

1994). In Belgium, the Netherlands, the Slovak Republic, and Norway, the overall increase in inequality was just about 5 percent from 1980-1990. In many nations: Canada, Ireland, Israel, Portugal, Taiwan, Finland, and France, there was little or no change in the 1980s and early 1990s. And income inequality actually declined slightly in Italy during the 1980s.

Our overall assessment is that any 1970s trend toward greater equality has ended in virtually all of the nations studied here with the single exception of Italy. And there is a tendency for those nations with the most recent data to show rising disposable income inequality. Certainly market income trends show this type of change in most nations observed here. It may well be that the nations which have so far shown resistance to rising disposable income inequality may soon exhibit such trends.

It is also noteworthy that there appears to be no apparent relation between the *trend* over the 1980s and the *overall level* of inequality at the start of the period. Inequality has increased both in the United States, with a very high level of inequality even before the increase, and in Sweden, which started from a much lower level of inequality. Inequality has fallen in Italy, but risen in the United Kingdom, both occupying intermediate inequality positions in the mid-1980s (Figure 1).

Nor is there a consistent "group country" story. Among the Scandinavian nations, Sweden experienced a rapid rise in inequality in the early 1990s, while Finland did not. In Europe we find large secular increases in inequality in the United Kingdom, small increases in Belgium and in the Netherlands, but stasis in Germany, Denmark, Portugal, Ireland, and France, with secular decreases in Italy and Denmark. Canada experienced only mild increases in inequality of family income while the United States experienced much larger increases despite similar market forces affecting market

incomes in both countries (Hanratty and Blank, 1993). And finally, if there is a regional pattern, it is to be found among the CEE nations, with inequality rising in Poland, Slovakia, and the Czech Republic at the upper end of the range found in Western nations over similar periods, while Hungarian inequality appears to have risen more rapidly than in these other nations.

## 5. EXPLORING DIFFERENCES IN LEVELS AND TRENDS

The story of why we observe these differences in levels and trends in inequality is necessarily incomplete because of the confluence of market, demographic, institutional, and policy changes. The inclusion of multiple income sources received by multiple individuals thwarts attempts to identify the causal links that lead to variations across countries and over time in the distribution of total post-tax and transfer family income. There is ample evidence that family members take account of all sources of income available to the family in deciding not only how much each member might work in a market setting, but also how to structure living arrangements. Moreover, governments themselves react differently to market income changes via changes in redistribution (tax and transfer) policy, and via other policies (e.g., macroeconomic policy or micro-policies such as government employment). This leads to decision making processes that are much too complex to be treated in a unified causal framework at this time. We therefore limit ourselves to a simple descriptive exercise that focuses on the difference in inequality before and after government redistribution.

### 5.1 Differences in the Level of Inequality of Market Income and Disposable Income

Table 3 and Figure 3 shows the Gini coefficient for market income (pre-tax and transfer) and for disposable income (post-tax and transfer). The difference between these two Gini's represents both the behavioral effect of taxes and transfers as well the direct effects of redistribution.

First of all, we note that the disposable income Gini (DPI) is not closely related to the level of inequality of market income (MI) both of which vary substantially across nations. Countries are ranked according to the DPI Ginis in Table 3, which also indicates the MI Gini, and differences between MI and DPI. This difference reflects the net effects of direct taxation (income taxes and employee social security taxes) and government transfer benefits and runs from .023 (Taiwan) to .245 (Sweden). The relationship between DPI and MI can be more clearly seen in Figure 3. For example, Finland, Italy, and Taiwan all have some of the lowest levels of inequality of market income (around 0.33), but they differ substantially in inequality of disposable income, with Finland achieving the lowest level (.233) followed by Italy (.255) and finally, Taiwan with a DPI inequality measure of .302 not much different from the MI measure of .325. The lack of any clear pattern between inequality of market and disposable income is apparent in the low correlation between these two series (multiple correlation coefficient of .282). Similarly, Hungary, France, Poland, and Canada all have DPI Ginis in the .285 - .295 range, but MI Ginis that run from .415 to .470.

These data suggests that there is a wide variety of experiences which underlies between inequality of market and disposable income inequality. Some of these differences may reflect differences in the willingness of governments to alter the pre-fisc distribution of income. While differences may also reflect different behavioral responses to redistributive policies, our priors are

that much of the pattern reflects policy differences, which explicitly and implicitly offset both MI and especially DPIs, though this would have to be shown.

### 5.2 Changes in Inequality Over Time

Changes in earned income inequality appear to be the prime force behind changes in market income inequality during the 1980s in the nations studied here.[16] With earnings at or above roughly 70 percent of market income in most modern nations, this is to be expected. Other market forces (such as capital income) and nonmarket forces, both demographic and social, also affected market income inequality, though to a lesser degree.

But market income changes do not tell the whole story. By the mid 1980s, more than 25 percent of all households in major OECD nations depended on something other than earnings as the primary source of their incomes. In nations such as the United Kingdom, the Netherlands, and Sweden, this figure reached 30 percent of income (Atkinson, Rainwater, and Smeeding, 1995a, Table 8). The redistributive effects of government are therefore important in explaining trends in inequality as well as the level of inequality at any point in time.

The crude evidence in Table 2 indicates that the trends in market income inequality mirror the trends in disposable income inequality in most nations. In some countries, especially Finland, but also in Israel, Spain, Ireland, Canada, and Germany, government redistribution appears to have muted the trend in market income inequality. In other nations, notably the United Kingdom, New Zealand, and Japan, the trend in disposable income inequality is more pronounced than is the trend in market income inequality.

Our reading of the limited cross-national information on changes in tax and transfer structures is that changes in taxes paid and transfers received were largely offsetting to the changes in the distribution of pre-tax and transfer incomes. This would occur automatically in countries with progressive tax and transfer systems. How much of these changes came from explicit policy changes as compared to changes in the economic behavior of households is an important question that remains to be answered. The link between changes in tax and transfer policy and changes in the distribution of disposable income is certainly not well understood at this stage in the literature.

## 6. SUMMARY AND RESEARCH IMPLICATIONS

We find a wide range of levels of income inequality across the twenty-five nations studied here. The range of inequality among OECD nations is very large, and the range among CEE nations appears to be even larger still. Comparisons of real income differences across countries are also instructive and can add a great deal in cases where one wishes to compare nations with similar overall levels of production and economic output (per capita GDP) to one another. Government redistribution has a measurable effect on overall income inequality, reducing market income based measures compared to disposable income measures in every nation. However, countries with very similar disposable income inequality often have very different inequality of market income and vice versa. These differences are yet to be explained.

Trends in overall income inequality diverge across nations in interesting ways. One finds large increases in inequality among very different nations: two Anglo-Saxon nations (the United Kingdom, the United States), one Scandinavian nation (Sweden), and three CEE nations (Czech

Republic, Hungary, Poland) exhibit the largest increases in measured income inequality from roughly 1980 to 1992. In contrast, other Anglo-Saxon (e.g., Canada), European, and Scandinavian (e.g., Finland) nations have experienced a much lesser change in inequality. And many nations have shown no measurable change in inequality during the 1980s.

Additional research is needed to further investigate the patterns found here to provide a better overall theory of income distribution, and to build better structural models of income distribution and redistribution that can be applied across and within nations. Atkinson's (1994) self-characterisation of his review of the economic theory of income distribution is "a prospectus for a yet-unwritten book rather than a self-contained essay," a statement that we heartily endorse.

## Notes

1. We would like to thank, without implication, colleagues who have contributed to our work in this area: Anthony B. Atkinson, Lee Rainwater, Barbara Torrey, and Debra Bailey. We would also like to thank Ann Wicks, Rick Joy, Inge O'Connor, and Debra Bailey for assistance in preparing this manuscript. Smeeding is grateful for financial support provided by the Russell Sage Foundation and by the National Science Foundation under #SBR-9022192, and #SBR-9511521. We retain responsibility for all errors of omission or commission.

2. In order to realise the full range of choices and their potential applications, the larger studies need to be consulted (Atkinson, Rainwater, and Smeeding, 1995, Chapters 2, 3; Appendices 2 through 6, and Gottschalk and Smeeding, 1995).

3. For a discussion of the problems of comparability across countries, see, among others, Atkinson, Rainwater, and Smeeding (1995); Buhmann et al. (1988). The issue of international standards for income distribution studies is also being addressed by the Luxembourg Income Study Project.

4. Smeeding et al. (1993) covers Australia, Canada, West Germany, United Kingdom, the Netherlands, and United States around 1980.

5. In many of the CEE nations, we have the option of adding production for own consumption (mainly among rural farm families), the value of goods produced and bartered, and in-kind transfers (food, appliances, etc.) received from outside the household. However, these amounts are not included here.

6. Our comparisons of income distribution, and of the effect of taxes and transfers on inequality, use equivalence scales to adjust families for differences in economic need as reflected by family size. These scales have been found to systematically affect the level of overall inequality, but not its pattern. See Atkinson, Rainwater, Smeeding (1995), Chapter 4. See also Buhmann et al. (1988).

7. Synthetic data may well give a more accurate picture of the distribution; they are not, however, typically available as micro-data. It should also be noted that Australian, Canadian, and United States LIS-based estimates are based, respectively, on 33, 25, and 20 percent subsamples of the original surveys.

8. For example, the after-tax data for Australia, New Zealand, the United States, and other nations used below are obtained using a tax imputation model at the level of the individual household to estimate direct taxes. In France, LIS uses INSEE computations of transfer receipt to the tax records.

9. We compare incomes by considering household disposable income (or market income) per equivalent adult, using an "intermediate" equivalence scale of household size raised to the power of a half (or $S^E$ where E = .5). Thus, adjusted income equals unadjusted income divided by $S^E$. Many recent cross-national studies of inequality and poverty have used this value for E (e.g., Atkinson, Rainwater, Smeeding, 1995; Hagenaars et al., 1994).

10. Two sets of figures are presented, each bottom coded at 1 percent of median disposable income; the other top coded at ten times median income.

11. Such comparisons can clearly not be made by all countries shown n Figure 1. For instance, real GDP per capita in Poland and Hungary and Slovakia were only 25 percent of U.S. GDP per capita in 1993 (World Bank 1995). In future analyses, we intend to add more countries to this comparison. Atkinson (1995) makes a similar comparison for European nations.

12. These trends are drawn from numerous primary studies which are summarised in Gottschalk and Smeeding (1995).

13. It should be emphasised that these figures are not comparable across countries. One can draw no conclusions from these estimates about the relative degree of inequality in different countries. In each case, the estimates are drawn from national studies of income inequality which are not designed for purposes of international comparison, and they are not necessarily based on the same concepts of income or method of calculation. While we have used the LIS data for inequality comparisons across a subset of these nations, where other national studies were not available, the LIS data are less complete in terms of years studied than are those from the other national studies cited here. Where LIS trend data is available, however, it supports the findings shown in Table 2.

14. Were we to show not percentage change, but percentage point change in inequality, Sweden may fare a bit better than shown here. A 15 percentage point change in the Swedish 1991 Gini of .229 or .034, is less than a 10 percent change in the U.S. 1991 Gini of .343.

15. While the Polish data are consistent from 1987 thru 1992, it is not entirely clear that the Polish household budget survey has adequately captured changes in entrepreneurial incomes since 1990. Thus, the Polish results must be cautiously interpreted.

16. This conclusion draws heavily on Gottschalk and Smeeding (1995), who in turn base their conclusions on material from Gottschalk, Gustafsson, and Palmer (1995), OECD (1994), Gardiner (1993), Ploug and Kvist (1994), Messere (1994) and Commission of the European Community (1993, 1993a).

## References


Atkinson, A.B. (1994) "Explaining the Distribution of Income," mimeo prepared for the J. Rowntree Inquiry Into Income and Wealth (Cambridge, England: University of Cambridge).

_____. (1995) "Income Distribution in Europe and the United States," LIS Working Paper #133. October 1995.

Atkinson, A.B., L. Rainwater, and T. Smeeding. (1995) *Income Distribution in OECD Countries: Evidence from the Luxembourg Income Study (LIS)* (Paris: OECD).

Buhmann, B., L. Rainwater, G. Schmaus, and T. Smeeding. (1988) "Equivalence Scales, Well-Being, Inequality and Poverty: Sensitivity Estimates Across Ten Countries Using the Luxembourg Income Study (LIS) Database," *Review of Income and Wealth*, vol. 34, pp. 115-142.

Commission of the European Communities. (1993) *Social Protection in Europe, 1993* (Brussells, Belgium: Directorate General for Employment, Industrial Relations and Social Affairs).

_____ (1993) 'Recent Reforms in Social Protection Systems in the Community,' in *Social Protection in Europe*, Chapter 2 (Brussels, Belgium: Directorate General for Employment, Industrial Relations and Social Affairs), pp. 31-40.

Gardiner, K. (1993) "A Survey of Income Inequality Over the Last Twenty Years—How Does the United Kingdom Compare?" Welfare State Programme Discussion Paper WSP/100 (London: London School of Economics).

Gottschalk, P. and T. Smeeding. (1995) "Cross-National Comparisons of Levels and Trends in Inequality," mimeo, Boston College and Center for Advanced Study, May. Also Luxembourg Income Study Working Paper #126. March 1996 (revised).

Gottschalk, P., B. Gustaffson, and E. Palmer (eds.). (1995) *The Distribution of Economic Well-Being in the 1980s* (Oxford: Cambridge University Press), forthcoming.

Hagenaars, A., K. deVos, and A. Zaidi. (1994) "Patterns of Poverty in Europe," mimeo (Netherlands: University of Leiden).

Hanratty, M. and R. Blank. (1993) "Down and Out in North America: Recent Trends in Poverty Rates in the U.S. and Canada," *Quarterly Journal of Economics*, vol. 10, pp. 233-257.

Messere, K.C. (1994) *Tax Policy in OECD Countries: Choices and Conflicts* (Amsterdam, Netherlands: Publications BV).

Milanovic, B. (1995) 'Determinants of Cross-Country Income Inequality: An Augmented Kuznets' Hypothesis.' In *Income Distribution During the Transition*, Research Project Paper #5 (Washington, DC: The World Bank).

Organisation for Economic Co-operation and Development (OECD). (1994) "New Orientations for Social Policy," Social Policy Studies No. 12 (Paris: OECD).

Ploug, N. and J. Kvist (eds.). (1994) *Recent Trends in Cash Benefits in Europe* (Copenhagen: Danish National Institute of Social Research).

Smeeding, T., P. Saunders, J. Coder, S. Jenkins, J. Fritzell, A. Hagenaars, R. Hauser, and M. Wolfson. (1993) "Poverty, Inequality and Family Living Standard Impacts across Seven Nations: The Effect of Noncash Subsidies," *Review of Income and Wealth*, vol. 39, no. 3, pp. 229-256.

Summers, R. and A. Heston. (1991) "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1989," *Quarterly Journal of Economics*, May, pp. 327-368.

Torrey, B., T. Smeeding and D. Bailey. (1996) "Rowing Between Scylla and Charybdis? Income Transitions in Central European Households," Luxembourg Income Study Working Paper #132, February (revised).

World Bank. (1995) *The World Bank Atlas 1995* (Washington, DC: The World Bank).

**Table 1. Measures of Inequality in OECD Countries, in Transition Economies, in Taiwan and Israel**

| Country | Year | Gini (1)[a] | Gini (2)[b] |
|---|---|---|---|
| **A. OECD Countries** | | | |
| Finland | 1991 | .223 | .223 |
| Austria[c] | 1987 | .227 | .227 |
| Sweden | 1992 | .229 | .229 |
| Belgium | 1992 | .230 | .230 |
| Norway | 1991 | .233 | .233 |
| Luxembourg | 1985 | .238 | .238 |
| Denmark | 1992 | .240 | .239 |
| Germany (West) | 1984 | .250 | .249 |
| Italy | 1991 | .255 | .255 |
| The Netherlands | 1991 | .271 | .268 |
| Canada | 1991 | .286 | .285 |
| France | 1984 | .295 | .294 |
| United Kingdom | 1986 | .304 | .303 |
| Spain | 1990 | .308 | .306 |
| Australia | 1989 | .309 | .308 |
| Switzerland | 1982 | .323 | .311 |
| Ireland | 1987 | .330 | .328 |
| United States | 1991 | .343 | .343 |
| **B. CEE Transition Countries** | | | |
| Slovak Republic | 1992 | .189 | .189 |
| Czech Republic | 1992 | .208 | .207 |
| Hungary | 1991 | .289 | .289 |
| Poland | 1992 | .291 | .290 |
| Russia | 1992 | .437 | .393 |
| **C. Taiwan and Israel** | | | |
| Republic of China/Taiwan | 1991 | .302 | .300 |
| Israel | 1992 | .305 | .305 |

[a]Gini (1) = Gini coefficient for equivalent disposable income (EI) where $EI = DPI/S^E$. S = family size, E = .5, person weighted, bottom coded at 1 percent mean DPI.

[b]Gini (2) = Gini (1) top coded at 10 times median disposable income.

[c]Austria excludes the self-employed.

Source: Authors' tabulation of data in the Luxembourg Income Study.

**Table 2. Changes in Market and Disposable Income Inequality[a]**

| Country[b] | Years Change | Market Income Inequality[c] | Disposable Income Inequality |
|---|---|---|---|
| United Kingdom | 1981-1991 | +++ | ++++ |
| United States | 1980-1993 | +++ | +++ |
| Sweden | 1980-1992 | +++ | +++ |
| Czech Republic | 1980-1992 | na | +++ |
| Hungary | 1989-1992 | na | +++ |
| Poland | 1987-1992 | na | ++ |
| Australia | 1980/81-1989/90 | ++ | ++ |
| Denmark | 1981-1990 | ++ | ++ |
| New Zealand | 1981-1989 | + | ++ |
| Japan | 1981-1990 | + | ++ |
| Slovak Republic | 1980-1992 | na | + |
| The Netherlands | 1981-1989 | + | + |
| Norway | 1982-1989 | + | + |
| Belgium | 1985-1992 | + | + |
| Finland | 1981-1992 | +++ | 0 |
| Canada | 1980-1992 | + | 0 |
| Israel | 1979-1992 | + | 0 |
| Ireland | 1980-1987 | + | 0 |
| West Germany | 1983-1990 | + | 0 |
| France | 1979-1989 | 0 | 0 |
| Republic of China | 1981-1991 | 0 | 0 |
| Portugal | 1980-1990 | 0 | 0 |
| Spain | 1980-1990 | n/a | 0 |
| Italy | 1976-1991 | -- | -- |

[a]Degree of change is based on Table A-1 and is coded as follows:

| Designation | Interpretation | Range of Change in Gini |
|---|---|---|
| -- | small decline | -5 percent or more |
| 0 | zero | -4 to +4 percent |
| + | small increase | 5 to 10 percent |
| ++ | moderate increase | 10 to 15 percent |
| +++ | large increase | 16 to 29 percent |
| ++++ | extremely large increase | 30 percent or more |

[b]For a complete listing of coutnry sources, see Gottschalk and Smeeding (1996), Tables 4 and B-1.

[c]Most studies show changes in market income inequality, while still others do not discuss market income changes at all. The latter are marked "na."

**Table 3. Inequality in Disposable and Market Income**
**Income Redistribution in 24 Nations**

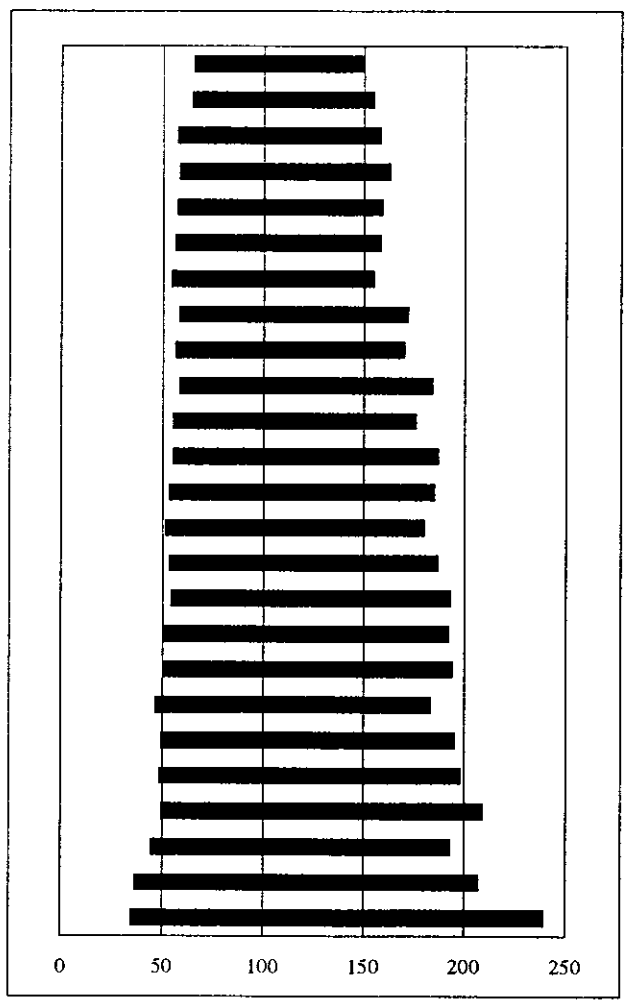
| Country[a] | Year | Abbreviation | DPI Gini | MI Gini | Difference | Income Redistribution[b] |
|---|---|---|---|---|---|---|
| Slovak Republic | 1992 | SR92 | 0.189 | 0.404 | 0.215 | 53.1 |
| Czech Republic | 1992 | CZ92 | 0.208 | 0.413 | 0.206 | 49.8 |
| Finland | 1991 | FI91 | 0.223 | 0.337 | 0.114 | 33.9 |
| Sweden | 1992 | SW92 | 0.229 | 0.474 | 0.245 | 51.6 |
| Belgium | 1992 | BE92 | 0.230 | 0.456 | 0.226 | 49.6 |
| Norway | 1991 | NO91 | 0.233 | 0.378 | 0.145 | 38.4 |
| Luxembourg | 1985 | LX85 | 0.238 | 0.380 | 0.142 | 37.4 |
| Denmark | 1992 | DK92 | 0.240 | 0.436 | 0.196 | 45.0 |
| Germany | 1984 | GE84 | 0.250 | 0.428 | 0.178 | 41.6 |
| Italy | 1991 | IT91 | 0.255 | 0.330 | 0.075 | 22.8 |
| The Netherlands | 1991 | NL91 | 0.270 | 0.414 | 0.143 | 34.5 |
| Canada | 1991 | CN91 | 0.286 | 0.415 | 0.129 | 31.1 |
| Hungary | 1991 | HU91 | 0.289 | 0.493 | 0.204 | 41.4 |
| Poland | 1992 | PL92 | 0.291 | 0.446 | 0.156 | 34.9 |
| France | 1984 | FR84 | 0.295 | 0.470 | 0.175 | 37.2 |
| Taiwan | 1991 | RC91 | 0.302 | 0.325 | 0.023 | 7.0 |
| United Kingdom | 1986 | UK86 | 0.304 | 0.488 | 0.185 | 37.8 |
| Israel | 1992 | IS92 | 0.305 | 0.453 | 0.147 | 32.6 |
| Spain | 1990 | SP90 | 0.308 | 0.429 | 0.121 | 28.1 |
| Australia | 1990 | AS90 | 0.309 | 0.437 | 0.128 | 29.3 |
| Switzerland | 1982 | CH82 | 0.323 | 0.406 | 0.083 | 20.4 |
| Ireland | 1987 | IR87 | 0.330 | 0.503 | 0.174 | 34.5 |
| United States | 1991 | US91 | 0.343 | 0.449 | 0.107 | 23.7 |
| Russia RLMS | 1992 | RL92 | 0.440 | 0.549 | 0.110 | 20.0 |

[a]Austria is omitted.

[b]Income Redistribution is measured by the percentage reduction from MI Gini to DPI Gini (i.e., [(MI - DPI)/MI]*100.

Source: Luxembourg Income Study.

**Figure 1:** **The Gap Between Low and High Income Individuals Numbers Given as Percent of Median in Each Nation**




| Country | Low[1] | High[2] | Ratio of High to Low[3] |
|---|---|---|---|
| Slovak Republic 1992 | 66 | 149 | 2.25 |
| Czech Republic 1992 | 65 | 155 | 2.36 |
| Finland 1991 | 58 | 158 | 2.71 |
| Belgium 1992 | 59 | 163 | 2.76 |
| Sweden 1992 | 58 | 159 | 2.77 |
| Norway 1991 | 57 | 158 | 2.79 |
| Denmark 1992 | 55 | 155 | 2.84 |
| The Netherlands 1991 | 59 | 172 | 2.94 |
| Germany 1984 | 57 | 170 | 2.98 |
| Luxembourg 1985 | 59 | 184 | 3.12 |
| Italy 1991 | 56 | 176 | 3.14 |
| Austria 1987 | 56 | 187 | 3.34 |
| Switzerland 1982 | 54 | 185 | 3.43 |
| Hungary 1991 | 52 | 180 | 3.46 |
| New Zealand 1987/88 | 54 | 187 | 3.46 |
| France 1984 | 55 | 193 | 3.51 |
| Poland 1992 | 51 | 192 | 3.76 |
| United Kingdom 1986 | 51 | 194 | 3.80 |
| Canada 1991 | 47 | 183 | 3.86 |
| Republic of China/Taiwan 1991 | 50 | 195 | 3.90 |
| Spain 1990 | 49 | 198 | 4.04 |
| Ireland 1987 | 50 | 209 | 4.18 |
| Australia 1989 | 45 | 193 | 4.26 |
| United States 1991 | 37 | 207 | 5.67 |
| Russia 1992 | 35 | 239 | 6.84 |
| AVERAGE[4] | 53 | 182 | 3.53 |

Source: Author's tabulation of data in the Luxembourg Income Study

[1]Relative income for individuals who are lower than 90 percent of the individuals in the country and higher than 10 percent of the individuals, as percent of national median.

[2]Relative income for individuals who are higher than 90 percent of the individuals in the country and lower than 10 percent of the individuals, as percent of national median.

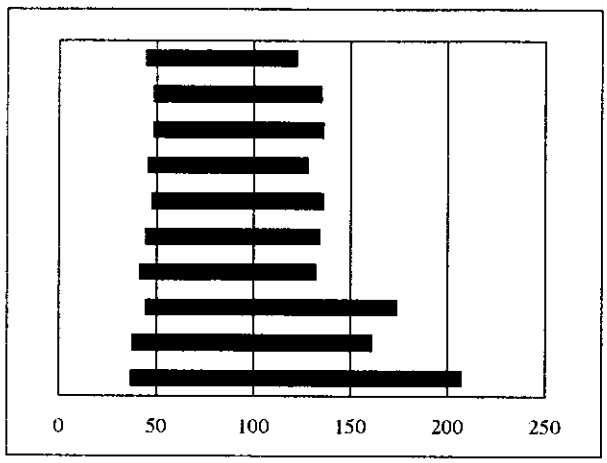
[3]Ratio of 90th to 10th percentiles, or decile ratio.

[4]Simple average, excluding United States.

## Figure 2: Real Income Distribution Comparisons (all figures in 1991 United States dollars)

### A: The Real Dollar Gap Between High and Low Income Individuals (United States median = 100)

| Country | Low Disposable Income[1] | Length of bars represents the gap between high and low income individuals | High Disposable Income[2] | Ratio of High to Low Incomes |
|---|---|---|---|---|
| Finland 1991 | 45 | | 122 | 2.74 |
| Belgium 1992 | 49 | | 135 | 2.76 |
| Sweden 1992 | 49 | | 136 | 2.77 |
| Norway 1991 | 46 | | 128 | 2.79 |
| Denmark 1992 | 48 | | 136 | 2.84 |
| The Netherlands 1991 | 45 | | 134 | 2.94 |
| Italy 1991 | 42 | | 132 | 3.14 |
| Canada 1991 | 45 | | 174 | 3.86 |
| Australia 1989 | 38 | | 161 | 4.26 |
| United States 1991 | 37 | | 207 | 5.67 |
| AVERAGE[5] | 45 | | 146 | 3.12 |




### B: Ratio of Real Income to United States Real Income (United States = 100 at each point)

| Country | Low Disposable Income (P10) | Incomes at the Median[3] (P50) | High Disposable Income[2] (P90) | Income of the Rich (P95) |
|---|---|---|---|---|
| Finland 1991 | 122 | 77 | 59 | 57 |
| Belgium 1992 | 133 | 83 | 65 | 62 |
| Sweden 1992 | 134 | 85 | 65 | 63 |
| Norway 1991 | 125 | 81 | 62 | 59 |
| Denmark 1992 | 131 | 88 | 66 | 62 |
| The Netherlands 1991 | 124 | 78 | 64 | 64 |
| Italy 1991 | 115 | 75 | 64 | 63 |
| Canada 1991 | 123 | 95 | 84 | 82 |
| Australia 1989 | 103 | 83 | 78 | 77 |
| United States 1991 | 100 | 100 | 100 | 100 |
| | 123 | 83 | 67 | 65 |

Source: Author's tabulation of data in the Luxembourg Income Study

[1]Relative income for individuals who are below 90 percent of the individuals in the country and more affluent than 10 percent of the individuals in the country. Numbers give real income (1991 United States dollars) as a percent of the United States median.

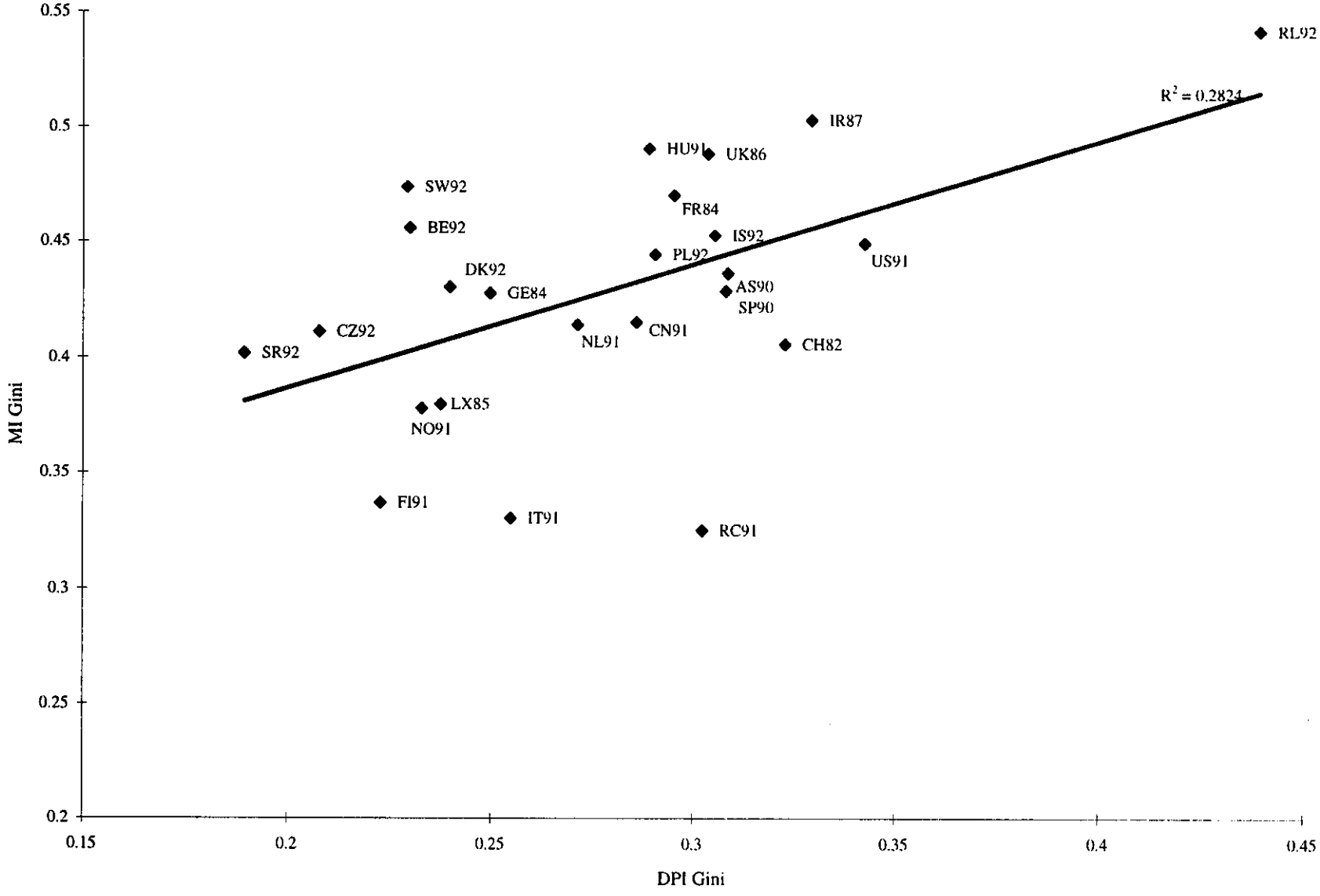
[2]Relative income for individuals who are more affluent than 90 percent of the individuals in the country and below 10 percent of the individuals in the country. Numbers give real income (1991 United States dollars) as a percent of the United States median.

[3]Numbers give real income (1991 United States dollars) of the median individual in each country as a percent of the United States median.

[4]Numbers give real income (1991 United States dollars) at the 95th percentile (individuals are more affluent than 95 percent of the population as a percent of the United States 95th percentile.

[5]Simple average, excluding United States.

## Figure 3:
## Market Income and Disposable Income Inequality




Source: Author's tabulations of Luxembourg Income Study