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International Comparisons of Income Poverty and Extreme Income Poverty

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Abstract

Using household income data from the Luxembourg Income Study, I study the sensitivity of crossnational income poverty comparisons to the method in which poverty is measured. Absolute poverty comparisons that keep the purchasing power at the poverty line constant across countries lead to conclusions that differ from relative poverty comparisons in which the real value of the poverty line varies with average income. The absolute poverty ranking of countries also varies as the real value of the poverty line is lowered, so that more usual poverty comparisons often differ from extreme poverty comparisons. A shift-share analysis of absolute poverty rate differences suggests that the demographic composition of the household population contributes only a small portion to poverty differences across countries.

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Consider two simplified characterizations of how economically-advanced countries approach problems associated with individuals with low incomes. One type of country provides limited income support to low-income individuals through government transfers, with virtually no support to able individuals judged to be appropriately self-sufficient. The second type of country provides income support to any individual with low income, and may consider one goal of government policy to reduce the inequality of incomes that may arise in the absence of government. The income support system of the United States is generally characterized as following along the lines of the first type of country (for example, see Ellwood and Summers, 1986). Many of the welfare states of Western Europe, such as Sweden and Germany, are thought of as following the second approach (see the discussion in Mitchell, 1991). One might expect the second type of country to exhibit lower levels of income poverty, since this is a stated goal of government policy in these countries. The authors of several recent crossnational studies of poverty have concluded that this is indeed the case (*e.g.*, see Buhmann, *et al.*, 1988; Smeeding, *et al.*, 1990; and Mitchell, 1991).

What does it mean for poverty to be higher in one country than in another? Despite considerable effort devoted by social scientists in constructing and defending various measures of poverty, no consensus has been reached on an appropriate metric for this concept. In fact, there is general disagreement over whether the state of being poor should be defined on the basis of some absolute needs standard, or on the basis of "needs" that change as the average level of well-being increases (see Atkinson, 1983; Blackburn, 1990). Given this lack of consensus, conclusions from comparisons of poverty in different countries can be quite fragile if there is insufficient

exploration of the sensitivity of comparisons to the way in which poverty is operationalized.[1]

These problems are compounded when attempting to measure the notion of "extreme poverty" using income data. Choosing the level of income below which an individual is considered poor is an arbitrary task, so assigning an income cutoff for extreme poverty is equally arbitrary. In this paper, I proceed by first establishing a set of standard poverty lines to use in measuring poverty, and then considering how the level of poverty would change if the poverty cutoffs were one-half the size of the standard poverty lines. As discussed in section II, this is similar to the type of poverty comparison suggested by Atkinson (1987). I also attempt to capture dimensions of extreme poverty by using an alternative measure to the usual headcount ratio, or percentage poor; in particular, I use the poverty index suggested by Foster, Greer, and Thorbecke (1984), as it is designed to be sensitive to the presence of very low incomes in the income distribution.

In what follows, I make comparisons of poverty in Australia, Canada, the United States, and several advanced economies in Western Europe. I use the household-level income data available in the database constructed by the Luxembourg Income Study (LIS), which provides income data from various years from 1979 to 1987. These data have been used in several recent comparisons of poverty across countries.[2] The bulk of previous research using the LIS data has used measures of relative poverty, in the sense that poverty lines are

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[1] Such problems arise in measuring poverty on the basis of incomes only (as I do in this paper). Additional concerns relate to the adequacy of using income as a measure of economic well-being, rather than wealth, consumption, self-perceptions of poverty status, *etc.* One alternative to studying income poverty is to use more direct measures of consumption and living conditions; Mayer (1992) makes crossnational comparisons using this approach.

[2] See the references cited in Mitchell (1991).

constructed as a given percentage of the median level of income. An important consideration that I consider is how poverty comparisons would differ if absolute poverty lines -- reflecting constant purchasing power across countries -- were used instead. This latter manner of setting poverty lines is similar to that used by the U.S. Census Bureau in its construction of poverty rates at different points in time in the United States. The results show that poverty comparisons can be very sensitive to whether a relative or absolute standard is used. Comparisons of absolute poverty are sensitive to where the poverty line is fixed, so that crossnational comparisons using standard poverty rates can lead to different conclusions that comparisons using extreme poverty rates. I also examine the sensitivity of poverty comparisons to changes in other characteristics of the poverty measure, such as equivalence scales, and methods of purchasing power adjustment, but find the comparisons to be much less sensitive to these other changes.

Measures of poverty would be expected to differ across countries if factors related to poverty also differed across countries. For example, families in the United States are more commonly headed by an unmarried female than families in other countries I study. Since female-headed families are more poverty-prone in all countries, this difference in female headship rates can potentially explain higher poverty in the United States relative to other countries. An additional concern of this paper is quantifying the importance of demographic (age and household type) and labor supply differences across countries to differences in measures of absolute poverty.

I. The LIS Data

The goal of the Luxembourg Income Study (LIS) is to gather and process

household-level income data for a wide range of countries. Each of the country files in the LIS dataset comprise basic data from income surveys performed by statistical agencies in each of the individual countries. Information from these surveys have been provided to researchers at the Center for Population, Poverty, and Policy Studies, and the International Networks for Studies in Technology, Environment, Alternatives, and Development, both in Luxembourg. There, the data have been made as comparable as possible across the countries, given what is available on each individual country's survey. The data are also organized in a common format for each of the countries, and have been made available to other interested researchers (via network access). A more detailed history of the construction of the data is provided in Smeeding and Schmaus (1990).

There are currently 33 different datasets that are part of LIS. Each dataset has information on annual household income for a particular country in a particular year. In this paper, I analyze the available data for 19 of those country/year datasets. For eight of the countries -- Australia, Canada, France, Germany, the Netherlands, Sweden, the United Kingdom, and the United States -- I am able to use data from two different years.[3] For each of these countries, there is data from one year in the 1979-83 period, and from one year in the 1984-87 period. The availability of observations from two different years allows a comparison of how poverty may have been changing differently across countries in the early 1980s. I also include three other countries -- Austria, Italy, and Luxembourg -- for which there is income information only for only one year. A listing of the parent surveys for each of the datasets is provided in appendix table 1.

[3]The German data are for West Germany only.

Crossnational comparisons of income distributions are more believable the more comparable the method of collecting data in the different countries. There are several differences in this method for the LIS datasets which LIS researchers are unable to correct. For one, the basic income-sharing unit is not the same in all countries. Some countries have income information available for samples of both families and households. (Families are generally defined as two or more related individuals living together, while households consist of all individuals living in the same house or apartment). However, a number of countries' datasets do not separately identify families within a household, which necessitates using the household as the basic income-sharing unit in the analysis.[4] There are two exceptions to this rule: one, the family unit only is available with the Canadian data for 1981; and, two, both Swedish datasets use the "tax unit," which treats all separate tax filers as an income unit.[5] One implication of the tax unit definition is that all unmarried adults (over the age 18) are treated as a separate unit, even if they reside with their parents.[6]

The percentage of the resident population covered by the surveys also differs across countries. The primary reason is that some of the countries -- Germany, Italy, and the United Kingdom -- exclude some or all households headed by foreign-born individuals. All of the countries exclude homeless or

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[4]The family unit is used by the U.S. Census Bureau in official calculations of poverty rates.

[5]Measured poverty rates for the 1987 Canadian data are very similar using either the household or the family as the basic unit of observation. This suggests that the restriction to families in the 1981 data does not seriously bias comparisons to results from other countries using the household unit.

[6]Income reports in the Swedish data are not taken from tax files, but rather are obtained as survey responses (as in the other countries used). The Norwegian data were excluded because the basic income source was tax reports, which may not be comparable to survey information.

institutionalized individuals. Population coverage is approximately 98 percent in most of the countries, though the 1981 German data covers only 92 percent of the population (Buhmann, *et al.*, 1988).

Information collected concerning factor income, transfer income, and taxes differs across the countries. In three of the countries, the only available information is "disposable income," *i.e.* after-tax, after-transfer income reported directly by respondents (in Austria, Italy, and Luxembourg). More detailed information on the components of disposable income are available for the other countries.[7] For these other countries, I also use a measure of factor income which is before taxes and transfers, and a measure of gross income defined as before taxes but including transfers. The measure of transfers for the United States includes imputed values for certain noncash transfers (food, housing, and medical benefits). Federal and state income taxes are imputed for both United States datasets. Payroll taxes are also simulated in many countries (including the United States). All of the datasets suffer from income underreporting, though a limited analysis suggests that this underreporting may be similar across countries (Smeeding and Schmaus, 1990).

The LIS researchers have devoted considerable effort to making the household and income information as comparable as possible across the countries in LIS. A full accounting of this effort is not appropriate here. In the following analysis, I assume that the income information in these data is sufficiently comparable that comparisons of income distributions across countries using these data are informative. At this point, it would seem that

[7]The German and U.K data are reports on monthly income, which have been extrapolated to an annual equivalent.

the Swedish data is least likely to be broadly comparable with other countries, given the income unit difference. Of course, to the extent that there are significant contributors to purchasing power that are differentially missed in the data, many of these comparisons may be biased.

II. Measuring Poverty

Constructing a measure of income poverty requires at least three choices: one, the definition of income for any given individual; two, the level of income below which an individual is considered poor; and, three, the index used to represent the level of poverty for the society as a whole. There have been several suggestions for the appropriate handling of these decisions; in this section I briefly discuss the issues and detail how I will proceed.[8]

A. Defining an Individual's Level of Income

Let Y_i be the annual income of the ith household (or other income sharing unit). Given that there is no information on how income is actually shared within the household, the conventional assumption is that the level of economic well-being (as reflected in annual income) is the same for all individuals in the household.

A given level of income is expected to represent a higher level of well-being the smaller is the number of individuals in the household. In the poverty measurement literature, this fact is generally referred to as the income "needs" being higher for larger households. A common method of handling these differences is to use a set of equivalence scales that reflect

[8] See Foster (1984) or Atkinson (1987) for more extensive discussions of these issues.

the extent to which income must increase as household size increases in order for well-being to remain constant. In constructing equivalence scales, we assume for each household a number E_i equal to the ratio of income for that household to income for some single-adult household, such that the level of well-being associated with these incomes is the same in both households.[9] E_i can be thought of as the household size expressed as its equivalent in numbers of single-adult households, so that Y_i/E_i represents income per equivalent adult (or "equivalent income").[10]

E_i could be allowed to depend on any of a number of characteristics of the household, but in this study I limit those characteristics to the number of adults (A_i) and the number of children (C_i). As in Cutler and Katz (1992), I use scales of the form

$$E(A_i,C_i) = (A_i+kC_i)^e \qquad (1)$$

The constant e represents the extent to which there are economies of scale in income sharing; the smaller is e, the greater the extent of these economies. The constant k allows the needs of children to differ from those of adults. Most researchers agree that e should be greater than zero but less than zero, but there is considerable disagreement over which part of that interval is

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[9] An implicit assumption is that this ratio E_i does not vary with the level of income for the single-adult household. Different types of single-adult households may be expected to receives different levels of well-being from a given amount of income, so that the reference household would have to be a particular type of single-adult household (*e.g.*, male, nonelderly).

[10] For example, suppose that the ith household consisted of three adults, whose income needs were two times that of a single-adult household (so that E_i=2). Then the ith household and the single-adult household are equally well off if Y_i is twice the income of the single-adult household. Alternatively, the ith household is equally well off if its equivalent income (in this case $Y_i/2$) is equal to the single adult's income.

most appropriate. Buhmann, *et al.* (1988) suggest that e≈.75 is typical of scales used by "expert analysts" wishing to count numbers of low-income individuals, and it is this choice (e=.75, along with k=1) that I primarily use in this paper. But this choice is quite arbitrary, so I will also explore the sensitivity of measurements to changes in this choice.

B. Setting the Poverty Lines

Given that each individual can be assigned a level of income (in their household) that can be expressed in equivalent terms as the income received by a single adult, it is necessary only to set a poverty line for a single adult. Suppose that for some given country, this poverty line is Z. Then all individuals in the ith household are poor if

$$Y_i/E_i \leq Z \quad . \qquad (2)$$

Otherwise, all individuals in the household are not poor. As noted above, I will consider the ith household as "extremely" poor if the condition also holds when Z/2 is used in place of Z in equation (2).

In this study, a poverty line must be chosen for each country/year dataset. One of two strategies are generally used in connecting the poverty lines over time or across countries. The first is to use a relative poverty standard, so that the poverty line for a given country in a given year depends on the average level of well-being in that country or that year. For example, the poverty line might be set at 50 percent of the median level of equivalent income in that country and year.[11] Relative poverty comparisons imply that a country or a year with a higher average income would also require a higher income in order not to be considered poor. With relative poverty, an increase

[11]This method of choosing the poverty line was suggested by Fuchs (1967).

in incomes by the same proportion for all households does not change the classification of any individuals as poor or not poor. However, a decrease in the dispersion of incomes would tend to lower the number of individuals classified as poor.

The other strategy is to set poverty lines that have the same purchasing power in each country and year. This absolute poverty standard is commonly used in studying changes in poverty over time in a given country, where the poverty line is changed over time to reflect changes in some price index. In the present study, the situation is complicated by the need to compare the purchasing power of incomes in different countries' currencies. I use the OECD purchasing power parities for private consumption in constructing these absolute poverty lines. In particular, Z_t^c, the poverty line in country c and year t, is calculated as

$$Z_t^c = Z_{85}^{US} \left(Z_{85}^c / Z_{85}^{US}\right)\left(Z_t^c / Z_{85}^c\right) \quad , \qquad (3)$$

where the latter two ratios are of poverty lines with the same purchasing ability. The first term in parentheses represents the purchasing power parity of country c's currency in U.S. dollars in 1985, while the second term in parentheses reflects average price level changes over time within country c.[12]

The set of absolute poverty lines are defined once Z_{85}^{US} is specified. For most of my calculations I will use the same poverty line, for a single-person household, as is used by the U.S. Census Bureau.[13] This is $5479 in U.S.

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[12]Consumer price indices reported in International Monetary Fund (1991) are used in this adjustment. The adjustment factors for the combination of inflation and currency change are reported in the OECD column of appendix table 2.

[13]The poverty lines I use for households of other sizes will differ from those of the Census Bureau, since different equivalence scales are used.

dollars for 1985. Atkinson (1987) has suggested exploring the sensitivity of poverty assignments to this choice by allowing poverty lines to vary over a range of possible values. In effect, I am doing this by also considering poverty lines that are half the size of the "standard" poverty lines. To further study this sensitivity, I also measure poverty using poverty lines that are 75 percent, or 25 percent, of the standard lines.

C. Poverty Index

A poverty index uses the information on the equivalent incomes of all households to construct a scalar measure of poverty. The most commonly used measure is the headcount ratio, an estimate of the proportion of individuals who are poor. Letting $m_i=A_i+C_i$ be the number of individuals in the household, and d_i a dummy variable equal to one if the household is poor (*i.e.*, if equation [2] is true), the headcount ratio is

$$\hat{p} = \frac{\sum_{i=1}^{n} m_i d_i}{\sum_{i=1}^{n} m_i} .$$

This measure has been criticized for being insensitive to the extent to which poor households' incomes fall below the poverty line. Examining the headcount ratio at the various proportions of the standard poverty lines mutes this criticism to some extent, but leads to the possibility of ambiguous poverty comparisons between country/year datasets.[14] One alternative is to use a

[14] Atkinson (1989) points out that comparing calculations of the headcount ratio at all possible values of the poverty line is a first-order stochastic dominance comparison of the two income distributions (at least among lower levels of income in that distribution).

scalar measure that is sensitive to the distribution of incomes among the poor; I use the index suggested by Foster, Greer, and Thorbecke (1984), estimated as

$$\hat{F} = \frac{\sum_{i=1}^{n} m_i d_i \left(1 - \frac{Y_i}{E_i Z}\right)^2}{\sum_{i=1}^{n} m_i}$$

An argument in favor of this index is that is an increasing function of: (1) $\hat{p}$; (2) the income gap (one minus the ratio of average equivalent income to Z); and (3) the coefficient of variation of incomes among the poor. $\hat{p}$ is an increasing function only of $\hat{p}$.

III. Poverty Comparisons

Before discussing measures of poverty derived from the LIS data, I present some descriptive statistics characterizing the income distributions in the countries studied.

Average income among individuals in each of the nineteen country/year datasets is reported in table 1. The income for each individual is the equivalent income of that individual's household. All averages are adjusted (using OECD purchasing power parities) so as to be expressed in U.S. dollars in 1985. Three separate income measures are used: pre-tax, pre-transfer income (factor income); pre-tax, post-transfer income (gross income); and post-tax, post-transfer income (disposable income).[15] The results suggest that average income is considerably higher in Canada and the United States than in

[15]The primary taxes subtracted are income and payroll taxes.

Table 1
Means and Coefficients of Variation for Adjusted Family Income[1]

Country	Year	Mean[2] FY	Mean[2] GY	Mean[2] DY	Coeff. of Variation FY	Coeff. of Variation GY	Coeff. of Variation DY
1979-83							
Australia	1981-2	8769	9635	7559	.79	.67	.55
Canada	1981	11660	12780	10836	.74	.64	.58
France	1979	6223	7786	7105	1.60	1.26	.81
Germany	1981	8070	9722	7409	.78	.56	.51
Netherlands	1983	7565	9408	6236	.92	.68	.59
Sweden	1981	6496	9019	6338	.83	.52	.48
Un. Kingdom	1979	6977	8332	6708	.77	.58	.53
Un. States	1979	12366	13476	10649	.82	.73	.60
1984-87							
Australia	1985-6	9107	10000	7703	.93	.79	.75
Austria	1987			7452			.42
Canada	1987	12357	13778	11199	.77	.65	.57
France	1984	6361	8247	7538	1.28	.97	.76
Germany	1984	8014	9672	7375	.90	.66	.62
Italy	1986			6473			.71
Luxembourg	1985			9114			.47
Netherlands	1987	8170	10073	6350	.90	.66	.55
Sweden	1987	7121	9961	6692	.90	.57	.53
Un. Kingdom	1986	7368	9150	7157	.97	.71	.64
Un. States	1986	13485	14686	11555	.90	.80	.68

[1]Adjusted household income is income per equivalent adult in the household. Household incomes are weighted by the number of persons in the household, and by any household weight variables available on the parent survey. For countries without household designations, the averages are across either families or tax units (see appendix table 1).

[2]The income abbreviations are:

FY: factor income (wages and salaries plus property income)
GY: gross income (factor income plus cash and some noncash transfers)
DY: disposable income (gross income minus income and payroll taxes)

All means are in expressed in 1985 US dollars, using OECD purchasing power parities in 1985 and consumer price indices in the various countries to perform the conversion.

Australia, or in the European countries included in the sample. Among these latter countries, average income is highest in Luxembourg, while average disposable income is roughly the same in the remainder of the countries.[16] For countries with two different years of data, the sample average disposable income increased from the 1979-83 period to the 1984-87 period in every country except Germany.

An index of dispersion for the three sources of income is also reported in table 1. The statistics reported are coefficients of variation, a standard index of inequality. One advantage of the coefficient of variation over other indices is that it can be calculated when the sample includes incomes equal to zero for households with no factor income. The results suggest that factor income inequality is much higher in France than in the other countries, and appears to be lowest in Canada (among those countries with sufficient information to calculate factor income). The coefficients of variation for factor income in the United States do not appear to be much different from the European countries (other than France). The reduction in inequality from including transfers in income tends to be much larger in the European countries than in the United States, Canada, or Australia. The dispersion in disposable income appears to be highest in France, but the United States, Italy, and Australia appear to have higher levels of disposable income inequality than the other countries studied.

From 1979-83 to 1984-87, increases in the sample coefficients of variation for disposable income occurred in Australia, Germany, Sweden, the

[16]These patterns across countries are essentially replicated in the per capita private consumption expenditure series provided in OECD (1989). The final two columns of appendix table 2 present this series, along with calculations of per capita disposable income from LIS. The correlation coefficient between the two series is 0.88.

United Kingdom, and the United States, but not in Canada, France, and the Netherlands.[17]

A. Absolute Poverty Comparisons

Headcount ratios for each of the three income definitions are reported in table 2. The poverty lines use $5479 (in $US in 1985) as the poverty line for a single-person household. The purchasing power of this cutoff is held constant across the dataset, and the equivalence scales are calculated using k=1 and e=.75 (in equation [1]). I will refer to these as the "standard" poverty lines.

Sample sizes do vary across the country/year datasets, and in some case are smaller than is usual for calculations of poverty rates in the United States (see appendix table 1). Many of the datasets are random samples of their parent survey; for example, the LIS data for the United States include roughly one fifth of the sample available from the Current Population Survey. To gauge the extent to which sampling variation may contribute to crossnational differences in measured poverty, I also calculate standard errors for the poverty rates, treating both poverty status and household size as random variables.[18]

Standard poverty rates constructed using factor income show Canada and the United States to be the least poor among the countries studied; France is the most poor using this income definition. The other European countries (and

[17]Part of the reason for these differences may be different changes in the state of the macroeconomy. The change in the coefficient of variation is positively correlated with changes in the country's unemployment rate, but this correlation (for only eight countries) is not statistically significant.

[18]The headcount ratios are calculated using any household weights that are available. See the appendix for details on how the standard errors are calculated.

Australia) exhibit poverty rates that tend to be at least 50 percent higher than those in Canada and the United States. Standard errors for these poverty rates are fairly small; for a comparison of poverty rates in any two countries, a difference of 3 percentage points or more is statistically significant (at the 5 percent level).[19] The poverty rates in Germany, the Netherlands, and Sweden are much smaller if gross income is used instead of factor income; these countries' gross-income poverty rates are close in magnitude to those of the United States.

The preferred measure of income in calculating poverty rates is disposable income. Adding taxes back to the income measure increases poverty rates in all countries, but the increase is most substantial in Germany, the Netherlands, and Sweden. The increase is particularly large in Netherlands, where roughly 50 percent of the population has disposable income that is lower than the income at the 20th percentile in the United States. Disposable income poverty is substantially higher in all of the European countries (and Australia) when compared to the United States, the primary exception being Luxembourg (which in 1987 had a lower poverty rate than the United States in 1986).[20] Measured poverty appears to be lower in Canada than in any of the other countries.

Poverty rates using various proportions of the standard poverty lines are

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[19]The standard error for the difference in poverty rates between Germany 1981 and Germany 1984 is .015. The standard error for all other comparisons would be less than .015.

[20]As noted earlier, these comparisons may be less persuasive when they involve Sweden, since the income-sharing unit is defined differently in the Swedish data. However, Swedish poverty rates still tend to be higher than in Canada, Luxembourg, and the United States when attention is focused on groups whose measured poverty is not likely to be affected by the difference in income units (*e.g.*, married couples with no children); these results are presented in section IV of the paper.

Table 2
Poverty Rates, With Various Definitions of Income[1]

Country	Year	Proportion Below Poverty Line:[2] Factor Income	Gross Income	Disposable Income
1979-83				
Australia	1981-2	.329 (.005)	.274 (.004)	.366 (.005)
Canada	1981	.228 (.004)	.140 (.004)	.156 (.004)
France	1979	.550 (.006)	.407 (.007)	.425 (.007)
Germany	1981	.347 (.011)	.180 (.008)	.335 (.011)
Netherlands	1983	.405 (.008)	.232 (.007)	.521 (.009)
Sweden	1981	.452 (.007)	.174 (.006)	.390 (.007)
Un. Kingdom	1979	.427 (.007)	.314 (.006)	.432 (.007)
Un. States	1979	.250 (.005)	.175 (.004)	.201 (.004)
1984-87				
Australia	1985-6	.340 (.006)	.282 (.006)	.384 (.007)
Austria	1987			.273 (.006)
Canada	1987	.226 (.005)	.118 (.005)	.136 (.005)
France	1984	.538 (.006)	.359 (.006)	.371 (.006)
Germany	1984	.376 (.010)	.220 (.010)	.344 (.010)
Italy	1986			.492 (.008)
Luxembourg	1985			.180 (.011)
Netherlands	1987	.381 (.009)	.193 (.008)	.500 (.010)
Sweden	1987	.425 (.007)	.142 (.005)	.340 (.006)
Un. Kingdom	1986	.451 (.007)	.312 (.006)	.411 (.007)
Un. States	1986	.254 (.005)	.178 (.005)	.208 (.005)

[1]The reported statistics are the proportion of individuals with equivalent household income less than $5479 (in 1985 US dollars).

[2]The numbers in parentheses are standard errors for the country's poverty rate estimate.

reported in table 3. Simply reducing the poverty lines by 25 percent (to 75 percent of the standard lines) leads to much lower poverty rates in most of the European countries. Compared to the United States, measured poverty is higher in Australia, France, Italy, the Netherlands, and the United Kingdom, but about the same in Austria, Germany, and Sweden. Only Italy clearly has a higher level of poverty than the United States if the "extreme poverty" lines are used (the 50 percent column), while several countries (including Germany) may have lower poverty rates. The standard and extreme poverty rate pairs are plotted in Figure 1. The plot suggests a positive, though not precise, relation between the two rates. The two U.S points suggest relatively high extreme poverty rates given the level of the standard rates. The index $\hat{F}$ also reflects the tendency for the poor in the United States to be more likely to be extremely poor; the index is much lower in Austria, Germany, and Luxembourg than in the United States, although none of these countries have clearly lower standard poverty rates. If the poverty lines are set at 25 percent of the standard lines, calculated poverty is negligible in all of the countries.

For most countries, there is little evidence of a change in poverty in the early 1980s. Only France and Sweden have standard poverty rates that are statistically significantly lower in the later period, while the increase in the United Kingdom is the only instance of a change in sample extreme poverty rates by more than one percentage point.

These absolute poverty comparisons are clearly sensitive to where the poverty lines are anchored. An easy way to see this is by plotting the cumulative distribution functions for the two countries being compared. As an example, I plot in figure 2 the gross income and disposable income

Table 3
Poverty Rates At Different Proportions of the Standard Poverty Lines[1]

Income Measure: Disposable Income

Country	Year	Percent of Standard Poverty Line 100%	75%	50%	25%	FGT Measure[2]
1979-83						
Australia	1981-2	.37	.18	.06	.02	.049
Canada	1981	.16	.08	.03	.01	.031
France	1979	.43	.22	.06	.02	.066
Germany	1981	.33	.13	.02	.00	.027
Netherlands	1983	.52	.26	.07	.04	.083
Sweden	1981	.39	.14	.04	.01	.162
Un. Kingdom	1979	.43	.22	.05	.01	.052
Un. States	1979	.20	.12	.05	.02	.042
1984-87						
Australia	1985-6	.38	.20	.07	.03	.130
Austria	1987	.27	.10	.02	.00	.019
Canada	1987	.14	.07	.03	.01	.024
France	1984	.37	.18	.05	.02	.068
Germany	1984	.33	.14	.03	.00	.028
Italy	1986	.49	.30	.11	.02	.074
Luxembourg	1985	.18	.05	.01	.00	.011
Netherlands	1987	.50	.24	.06	.02	.065
Sweden	1987	.34	.13	.05	.01	.065
Un. Kingdom	1986	.41	.22	.07	.03	.084
Un. States	1986	.21	.13	.06	.02	.046

[1]The "standard" poverty line is that used in constructing the poverty rates in Table 2. The reported poverty rates are calculated using the designated proportion of the standard poverty line.

[2]This is the poverty measure suggested by Foster, Greer, and Thorbecke (1984).

Figure 1
Standard and Extreme Poverty Rates

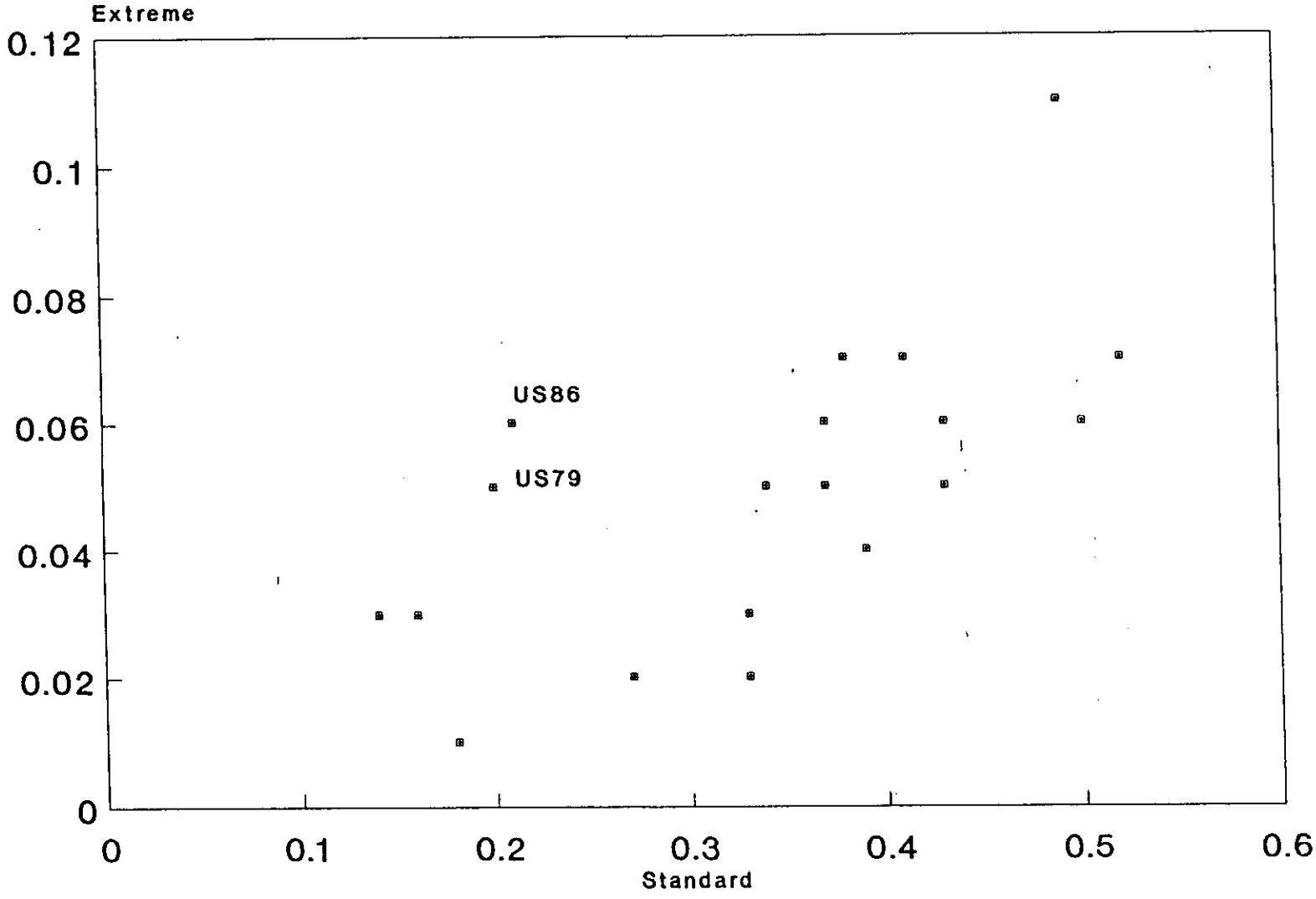


Figure 2A
Distribution Functions:
Equivalent Gross Income

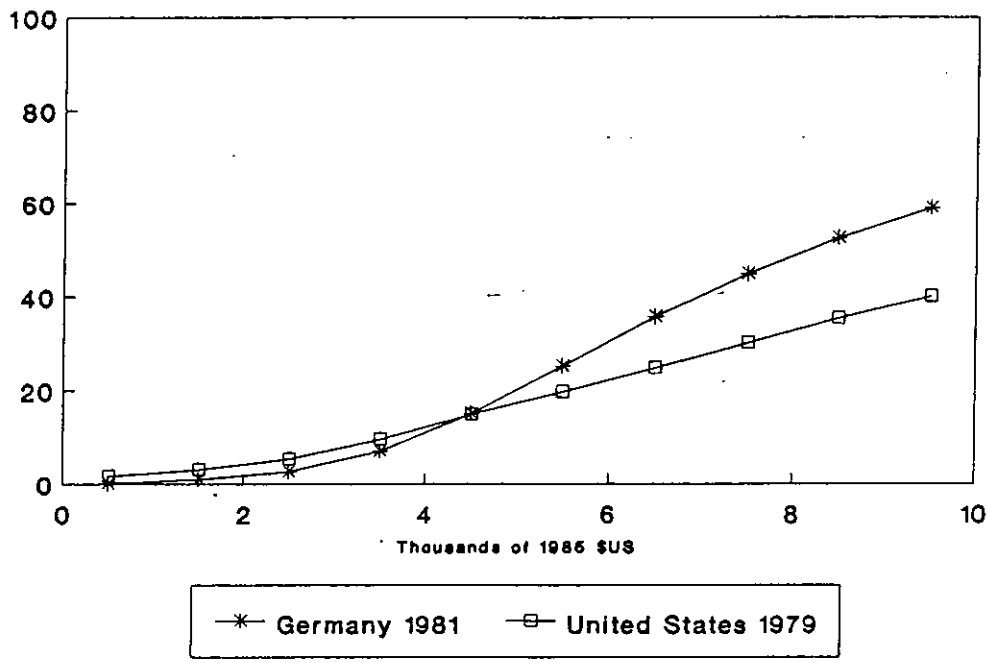
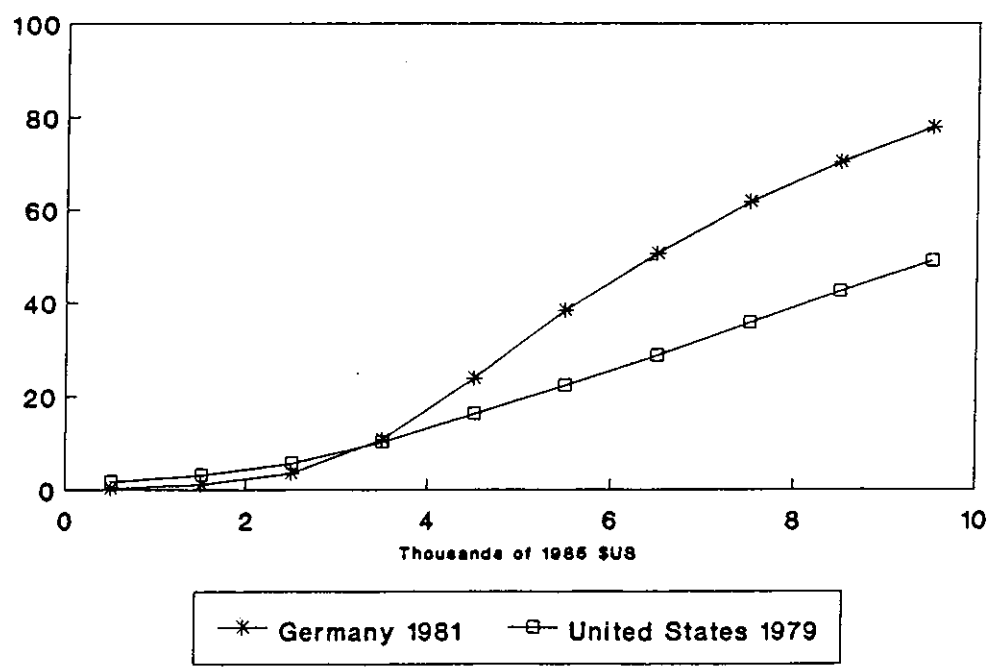


Figure 2B
Distribution Functions:
Equivalent Disposable Income



distribution functions for Germany in 1981 and the United States in 1979.[21] At very low levels of income, the distribution function for the United States lies above that of Germany, while the reverse is true at higher levels of income (including around the standard poverty line of $5439).

The point where the two distributions cross in figure 2 is at a lower level of income for the disposable income distribution than for the gross income distribution. This illustrates a second important result of the poverty comparisons: income taxes start to play an important role in reducing gross income at a much lower level of gross income in many European countries than in the United States and Canada. Figure 3 rearranges the distribution functions for gross and disposable income presented in figure 2 so that both distributions for the same country appear in one plot; the horizontal difference between the two curves is roughly taxes paid at that percentile in the income distribution.[22] In both countries the two distributions are virtually indistinguishable at very low incomes. But the distributions start to diverge to a much greater extent in Germany than in the United States, when gross income reaches $5000. Many individuals are in households that European tax systems treat as able to pay substantial taxes, while households with similar purchasing power pay lower taxes in the United States and Canada.

B. Relative Poverty Comparisons

Most studies of crossnational differences in poverty have used a relative definition of poverty status. This is in particular true of the literature

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[21] Percentages of individuals with equivalent income within $1000 intervals were calculated, and plotted at the midpoint of that interval.

[22] This would be an exact geographic representation of taxes paid by households as a function of their gross income, if the tax system did not change the income ranking of households.

Figure 3A
Distribution Functions:
Germany, 1981

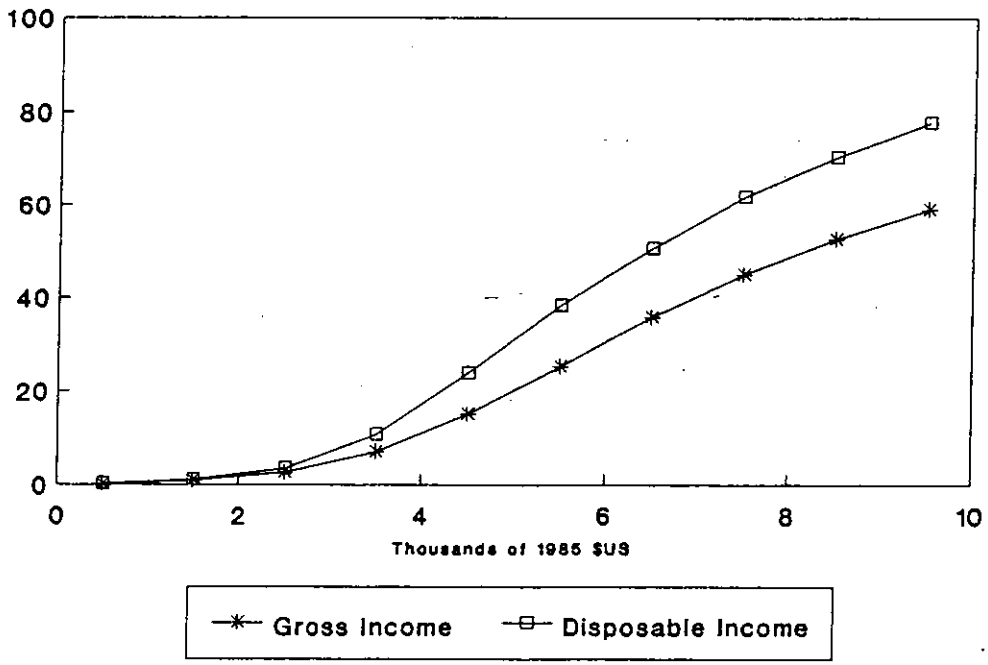
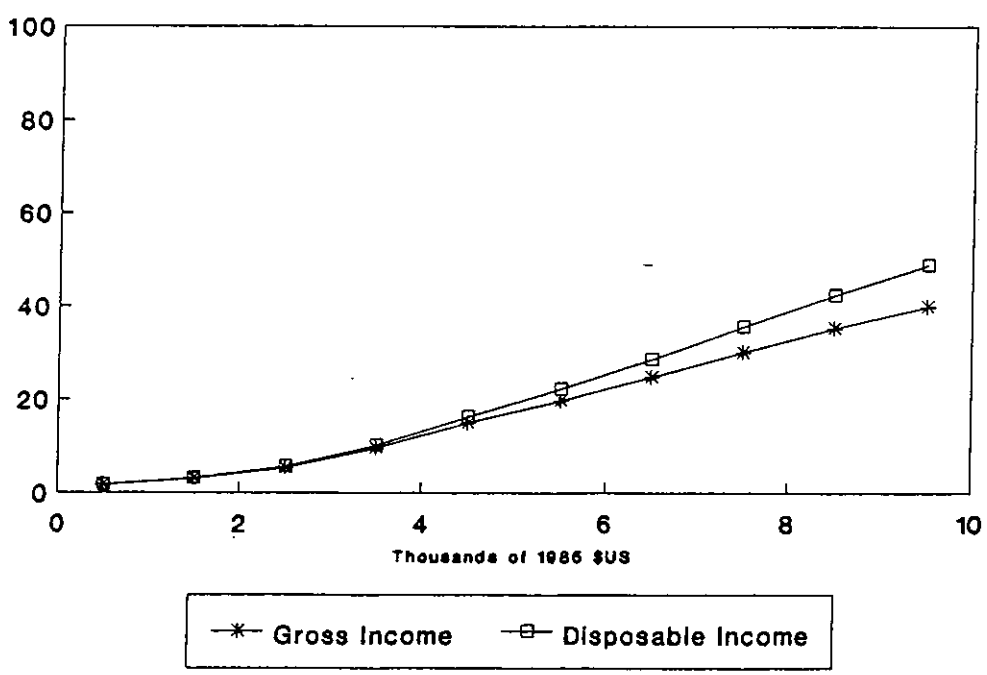


Figure 3B
Distribution Functions:
United States, 1979



that has made use of the LIS data.[23] This research has tended to conclude that poverty in the United States is relatively high. My absolute poverty comparisons suggest, if anything, the opposite conclusion. Given this difference, I believe it important to repeat the kind of relative poverty comparisons made by earlier researchers.

The general approach in measuring relative poverty has been to assign poverty lines as a certain percentage of median income. I follow this procedure, first using 50 percent, and then 25 percent, of median equivalent income in setting the poverty lines.[24] A clear advantage of studying relative poverty is that purchasing power parities and price indices are unnecessary. Table 4 reports these poverty rates for each of the three income definitions.[25]

All of the countries have fairly similar factor income poverty rates when the poverty lines are set at 50 percent of the median. At 25 percent of the median, factor income poverty tends to be higher in Germany, the Netherlands, Sweden, and the United Kingdom (in 1986) than in other other countries. This is at least partially due to the higher percentage of households with no earners in those countries (see section IV). With gross income, poverty rates tend to be higher in the United Kingdom and its former colonies (at 50 percent of the median), and highest in the United States. This pattern holds when using disposable income, although now Italy's poverty rate is quite high among

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[23] For example, Mitchell (1991) considers relative poverty measures only. One exception is Smeeding and Torrey (1988), although their focus is on children only. Hanratty and Blank (1990) make absolute poverty comparisons of the United States and Canada.

[24] The median equivalent income is among individuals in all households. It is used to set the single-person poverty line in each country; other poverty line are obtained through the equivalence scales in equation (1) with k=1 and e=.75.

[25] The poverty lines vary with the income definition, since the median income varies.

Table 4
Relative Poverty Rates[1]

Poverty Line:[2]		50% of Median			25% of Median		
Country	Year	FY	GY	DY	FY	GY	DY
1979-83							
Australia	1981-2	.23	.15	.10	.16	.03	.02
Canada	1981	.21	.15	.12	.12	.03	.02
France	1979	.25	.09	.08	.16	.02	.02
Germany	1981	.22	.07	.05	.17	.01	.01
Netherlands	1983	.27	.09	.07	.22	.05	.04
Sweden	1981	.28	.06	.05	.20	.02	.01
Un. Kingdom	1979	.24	.12	.07	.17	.01	.01
Un. States	1979	.24	.19	.16	.14	.05	.04
1984-87							
Australia	1985-6	.24	.16	.11	.17	.03	.03
Austria	1987			.04			.00
Canada	1987	.22	.14	.11	.13	.03	.02
France	1984	.26	.09	.09	.17	.02	.02
Germany	1984	.26	.09	.06	.20	.01	.01
Italy	1986			.11			.02
Luxembourg	1985			.05			.01
Netherlands	1987	.25	.07	.06	.21	.02	.02
Sweden	1987	.30	.08	.06	.22	.02	.02
Un. Kingdom	1986	.31	.14	.10	.24	.03	.03
Un. States	1986	.25	.20	.18	.16	.07	.05

[1]Poverty lines are set as a percentage of a country's median equivalent income. Income abbreviations are the same as in Table 1.

[2]Separate medians are used for each of the three income types.

European countries. Poverty rates for gross income and disposable income tend to be very low if the poverty lines is set at 25 percent of the median; the primary outliers are the higher poverty rates in the United States, and the Netherlands in 1983.

These calculations support the conclusions of earlier researchers that the United States exhibits high levels of poverty relative to advanced European economies, when relative poverty comparisons are made. They are also support the contention that the choice between relative and absolute poverty concepts is important to how one views poverty differences across countries. This importance is illustrated by plotting the absolute and relative poverty rates from the nineteen country/year datasets (see figure 4).[26] If anything, there appears to be a negative relationship between these two measures among these countries (or no relationship, if the two points for the United States are ignored).

C. Income Distributions and Poverty Rates

A poverty rate is by definition a function of the underlying income distribution. I next examine the connection between crossnational differences in income distributions and measured poverty. In particular, I will focus on the relative importance to poverty rates of differences in the location and dispersion of the income distribution.

With knowledge of each country's distribution function for income, it would be possible to study how differences in the parameters of those distributions contribute to crossnational differences in poverty rates.[27]

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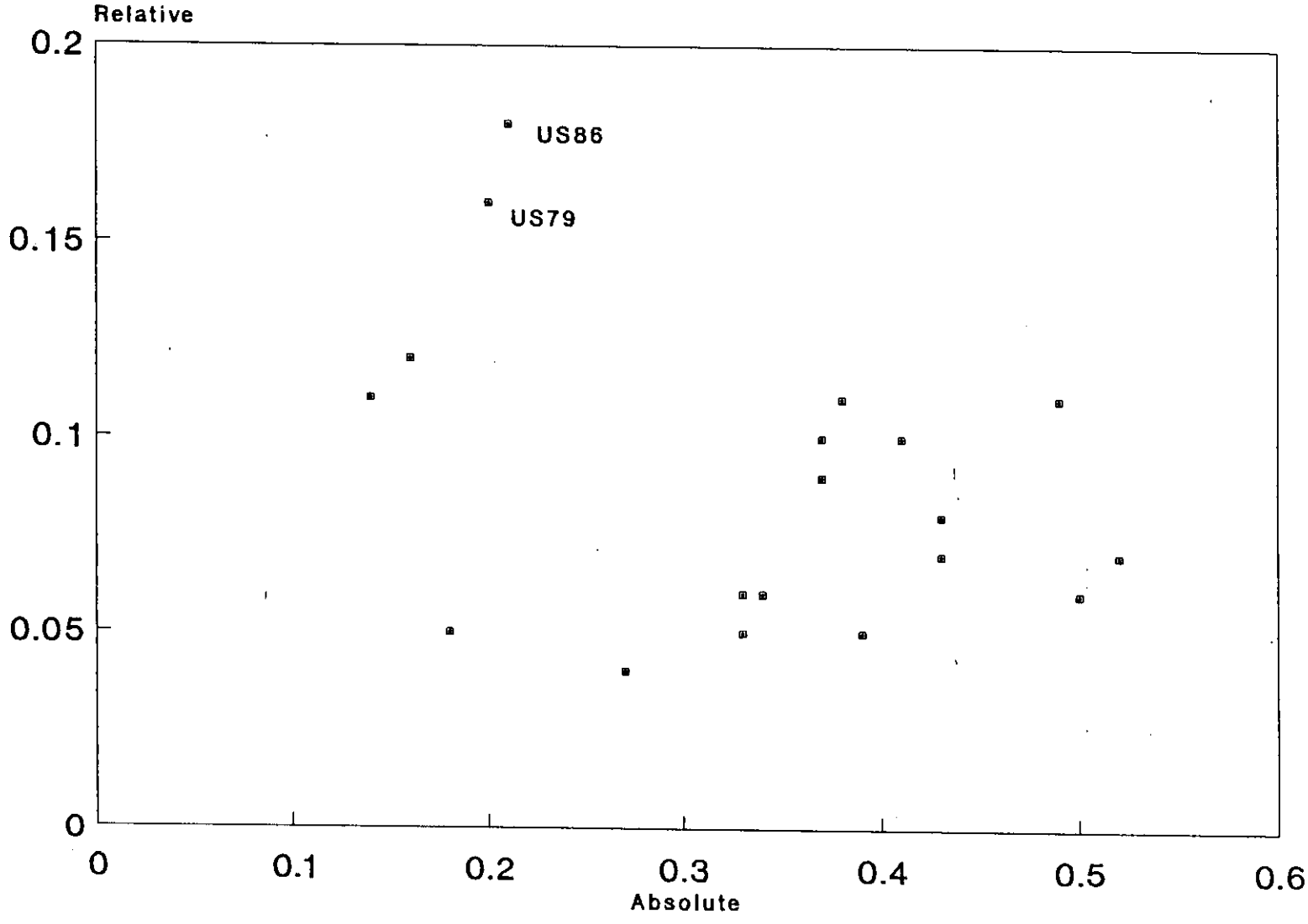
[26]These are the standard poverty rates for disposable income from Table 3, and the disposable income poverty rates at 50 percent of median income from Table 4.

[27]This assumes that the distribution function can be represented as of the same

Figure 4
Absolute and Relative Poverty Rates



Unfortunately, not only do the parameters need to be estimated, but there is also considerable certainty about the appropriate functional form to use for the income distribution.[28] Instead, I settle for estimating an approximate relationship between the poverty rates and measures of the location and dispersion of the distribution. In particular, I assume that the poverty rate follows a logistic distribution that depends upon the location and dispersion of the underlying income distribution, and estimate the relationship by regress the log odds of the poverty rate on the mean and coefficient of variation statistics reported in table 1.

The top panel of table 5 reports these estimates for the absolute poverty rates at the standard and extreme poverty lines. Coefficient estimates and implied elasticities (around the mean of the variable and the poverty rate) are reported. Both coefficient estimates are statistically significant (at conventional levels) in the standard rate equation; increases in average income tend to decrease the poverty rate while increases in the coefficient of variation tend to increase it. Changes in average income appear to have a much larger impact on standard poverty rates, while changes in the coefficient of variation have a stronger impact on extreme poverty. T-tests of the difference in elasticities in the standard and extreme rate equations support this conclusion.[29] The bottom panel of table 1 adds the year of the sample as

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functional form for all countries.

[28] I used the disposable income statistics in table 1 to generate method of moments estimators for the lognormal distribution for each country, and then generated estimated poverty rates from these distributions. This method provided good estimates of both absolute and relative poverty rates using the standard poverty lines (when compared to the tables 3 and 4 estimates), but performed much more poorly in estimating the extreme poverty rates.

[29] The t-tests treat $\hat{p}$ and $\bar{X}_j$ as nonstochastic. A covariance between the $\hat{\beta}_j$'s from the two equations is generated by estimating the two equations as a

Table 5
Regressions of Absolute Poverty Rates[1]
on Average Income and Income Inequality

Dependent Variable:[2]	Standard Rates		50% of Stand. Rates		Difference in Elas.
Indep. Var.	Coeff.	Elas.[3]	Coeff.	Elas.	(p-value)[4]
Average Income (in 1000s of $)	-.29 (.03)	-1.53	-.10 (.06)	-.78	.036
Coefficient of Variation	1.60 (.46)	.63	3.57 (1.00)	2.03	.004
R^2	.89		.49		
% of Variation Explained by:					
Average Income	82%		10%		
Coeff. of Var.	9%		41%		
Covariance	-2%		-2%		

Dependent Variable:	Standard Rates		50% of Stand. Rates	
Indep. Var.	(1)	(2)	(1)	(2)
Average Income (in 1000s of $)		-.29 (.03)		-.10 (.06)
Coefficient of Variation		1.58 (.47)		3.59 (1.04)
Year	-.01 (.05)	-.01 (.02)	-.00 (.05)	.01 (.04)
R^2	.00	.89	.00	.49

[1]The sample consists of the 19 country/year observations listed in Table 1. All regressions also include a constant term.

[2]The dependent variable is the logistic transformation of the relevant poverty rate.

[3]The elasticities are calculated using $\epsilon_{p,x_j} = \hat{\beta}_j(1-\hat{p})\bar{X}_j$, where $\hat{p}$ is the sample average for the relevant poverty rate.

[4]The p-value corresponds to a t-test of the null hypothesis that the elasticities (at $\hat{p}$ and $\bar{X}_j$) are the same.

an additional control; there is no evidence of any world-wide trend in absolute poverty (with or without the distributional controls).

The estimated equations can be used to decompose the sample variation in the log odds of the poverty rates into components due to variation in average income, the coefficient of variation, and the covariance of these two statistics (which is positive).[30] Differences in average income can explain 82 percent of the differences across countries in standard poverty rates, but only 10 percent of the extreme rate differences. The coefficient of variation explains almost half of the extreme rate variation, but less than 10 percent of the standard rate variation. These regressions suggest that a high-average, high-variance country could be expected to have relatively low standard poverty but not low extreme poverty -- which is what we observe for the United States.

Table 6 reports results for a similar exercise using the relative poverty rates from table 4. In theory, relative poverty should be sensitive to changes in the dispersion of income, but there is little reason to expect it to be sensitive to changes in average income.[31] The coefficient estimates clearly suggest that increases in the coefficient of variation tend to

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system.

[30] Let L be the log odds, where $L=\beta_0+\beta_1 Y+\beta_2 C+\epsilon$, where Y is average income, C is the coefficient of variation, and ϵ is white noise. Then

$$V(L) = \beta_1^2 V(Y) + \beta_2^2 V(C) + 2\beta_1\beta_2 COV(Y,C) + V(\epsilon)$$

Of course, this is an accounting for variation in the log odds, not the poverty rates. However, a similar analysis using linear probability estimates provides very similar results for this decomposition.

[31] For example, a proportional increase in all individuals' incomes would increase the average income but not change the dispersion of the distribution; it would also not affect the level of relative poverty.

Table 6
Regressions of Relative Poverty Rates
on Average Income and Income Inequality*

Dependent Variable:	Standard Rates		50% of Stand. Rates		Difference in Elas.
Indep. Var.	Coeff.	Elas.	Coeff.	Elas.	(p-value)
Average Income (in 1000s of $)	.16 (.03)	1.15	.12 (.08)	.90	.610
Coefficient of Variation	2.44 (.58)	1.33	3.89 (1.44)	2.27	.131
R^2	.72		.37		
% of Variation Explained by:					
Average Income	38%		7%		
Coeff. of Var.	31%		29%		
Covariance	3%		1%		

Dependent Variable:	Standard Rates		50% of Stand. Rates	
Indep. Var.	(1)	(2)	(1)	(2)
Average Income (in 1000s of $)		.16 (.03)		.12 (.09)
Coefficient of Variation		2.42 (.59)		3.86 (1.48)
Year	-.02 (.04)	-.01 (.02)	-.02 (.06)	-.01 (.05)
R^2	.01	.72	.01	.38

*See notes to Table 5. Relative poverty rates (using 50 percent of equivalent median income as the country's standard poverty line) are used to form the dependent variables.

increase relative poverty. But there is also evidence that increases in average income tend to increase relative poverty. In fact, more of the variation across countries in the log odds of the standard relative poverty rates can be accounted for by average income differences than by coefficient of variation differences. These peculiar results may have something to do with the coefficient of variation being an imperfect measure of dispersion, understating the amount of dispersion the higher the average level of income.

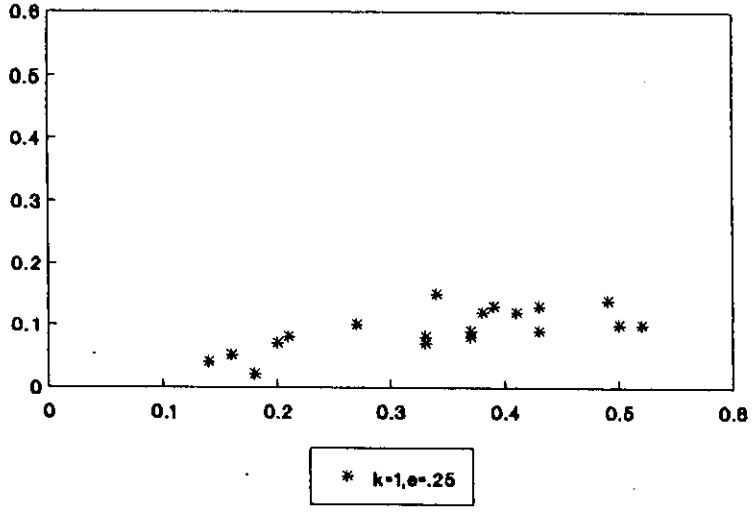
D. Sensitivity of Results

How sensitive are the estimated poverty rates to changes in how poverty is measured? The basic conclusions of the analysis of absolute poverty are not particularly sensitive to changes in equivalence scales or purchasing power parities, though some of the country rankings are changed when these changes are made.

In figure 5, I plot the standard poverty rates from table 3 against standard poverty rates using alternative choices for the equivalence scale parameters in equation (1). Two alternative are considered: one, k=1, e=.25, which assumes much greater economies of scale within the household; and, two, k=.4,e=.5, assuming an intermediate degree of economies, and that children require less than adults.[32] Figures 5a and 5b maintain the poverty line for a single-person household at the same value as in earlier calculations. This does tend to lower the value of the poverty line considerably for larger households, especially when e=.25, so I also changed the equivalence scales keeping the poverty line for a more average household size (three persons) constant (see figures 5c and 5d). The poverty rates using these alternative

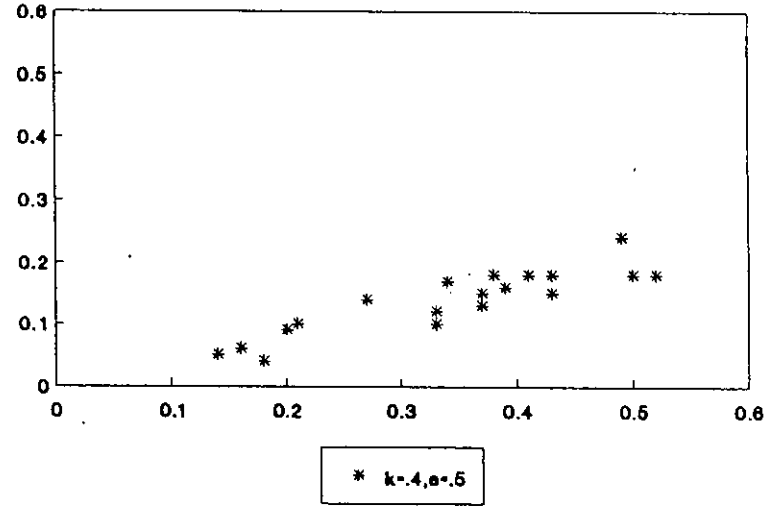
[32]This latter set of scales was used in Cutler and Katz (1992).

Figure 5A
Standard Poverty, Alternative
Equivalence Scales



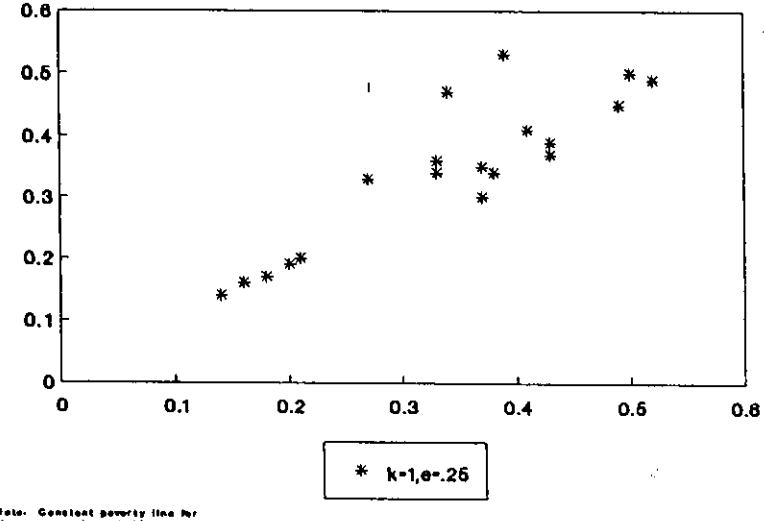
Note: Constant poverty line for single-person household

Figure 5B
Standard Poverty, Alternative
Equivalence Scales



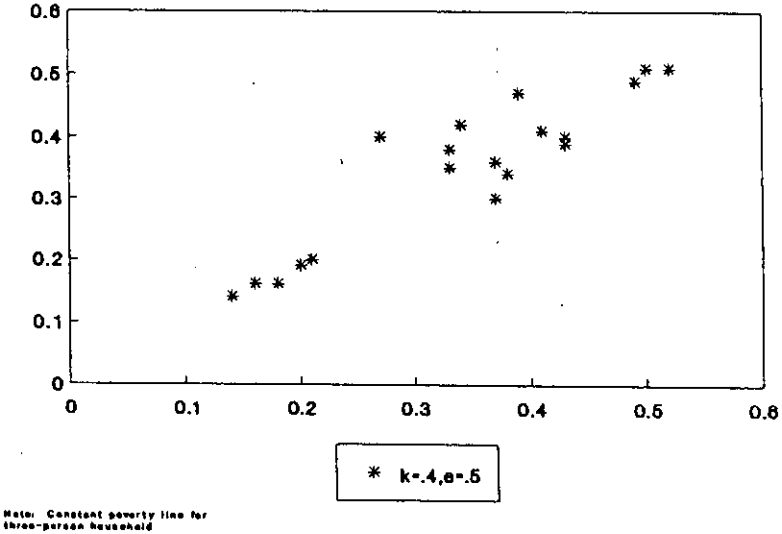
Note: Constant poverty line for single-person household

Figure 5C
Standard Poverty, Alternative
Equivalence Scales



Note: Constant poverty line for three-person household

Figure 5D
Standard Poverty, Alternative
Equivalence Scales



Note: Constant poverty line for three-person household

equivalence scales are clearly positively correlated with the table 3 poverty rates, although this correlation is weaker when the change in equivalence scale reduces the average poverty line (as in figures 5a and 5b). This is not surprising, since many of the countries with high standard poverty lines have substantial declines in measured poverty as the value of the poverty lines are reduced (see table 3). Similar results are obtained when the equivalence scales for the extreme poverty rates are changed (see figure 6), although the correlations with the table 3 rates are smaller than in figure 5.

I also explored the sensitivity of the absolute poverty rates to changes in the purchasing power parities (PPP's) used to change countries' 1985 currency value to 1985 U.S. dollars. As an alternative to the OECD PPP's, I use the 1985 purchasing power parities for consumption provided by Summers and Heston (1991). I keep the real value of the poverty line constant at $5439 (in 1985 US$) but change other countries nominal poverty lines to reflect the Summers and Heston PPP's. These alternative exchange factors, reported in appendix table 2, tend to be close to the OECD factors.[33] The standard and extreme poverty rates using the two sets of PPP's are plotted in figure 7.[34] The estimated poverty rates are also very similar using either set of purchasing power parities, although Australia's poverty rates are somewhat lower when the Summers-Heston PPP's are used. In general, the conclusions seem robust to changes in the PPP's and the equivalence scales.

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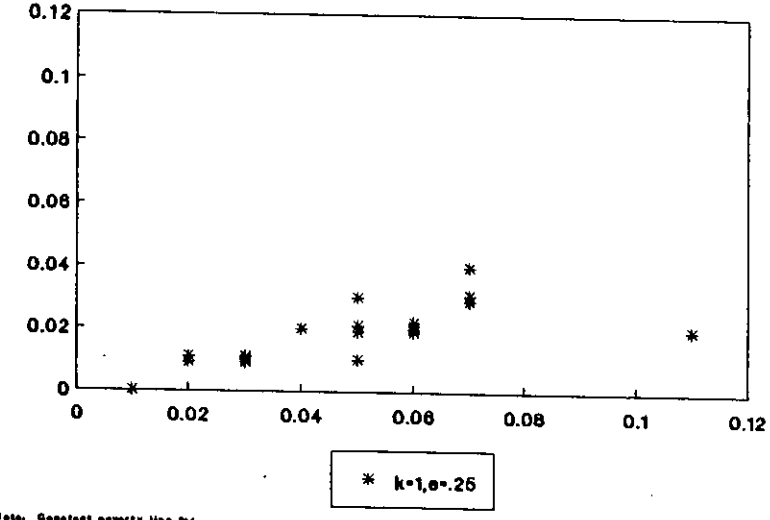
[33]The two sets of PPP's appear to be based on the same price data (from the United Nations International Comparison Program), although they involve different methods of aggregating this data into price index. The actual Summers-Heston PPP's that I use are from the supplementary tables (for the Penn World Table Mark 5) to the Summers and Heston article.

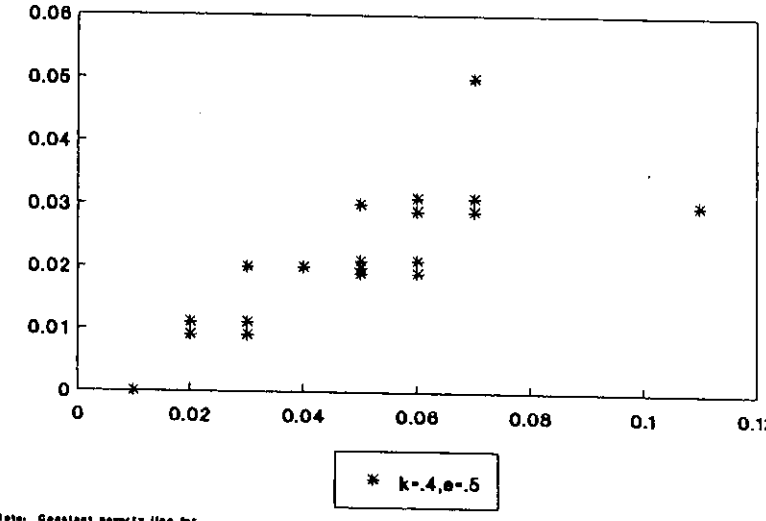
[34]The equivalence scales have k=1, e=.75.

Figure 6A
Extreme Poverty, Alternative Equivalence Scales



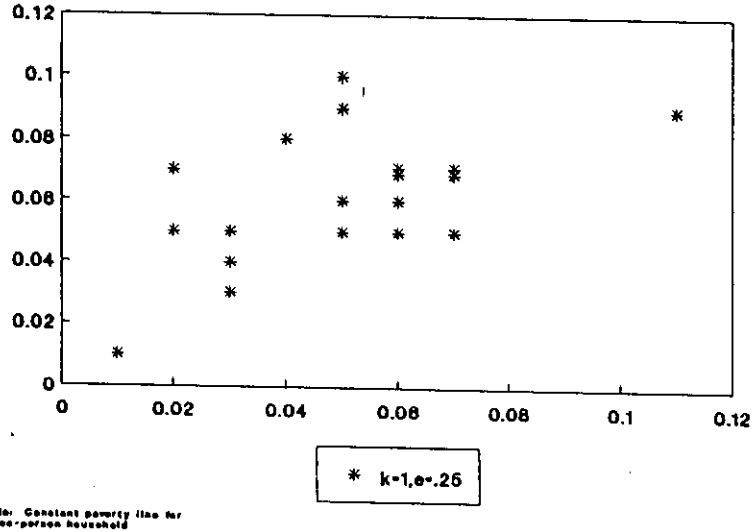
Note: Constant poverty line for single-person household

Figure 6B
Extreme Poverty, Alternative Equivalence Scales



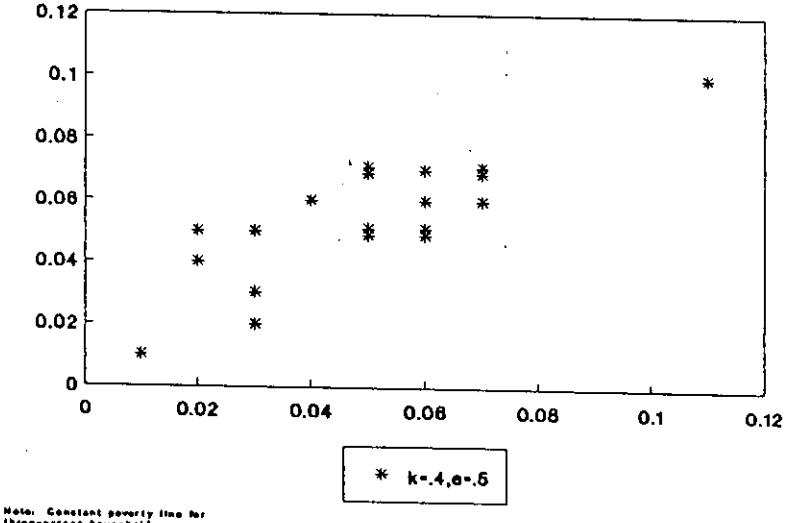
Note: Constant poverty line for single-person household

Figure 6C
Extreme Poverty, Alternative Equivalence Scales



Note: Constant poverty line for three-person household

Figure 6D
Standard Poverty, Alternative Equivalence Scales



Note: Constant poverty line for three-person household

Figure 7A
Standard Poverty Rates
Using Different PPP's

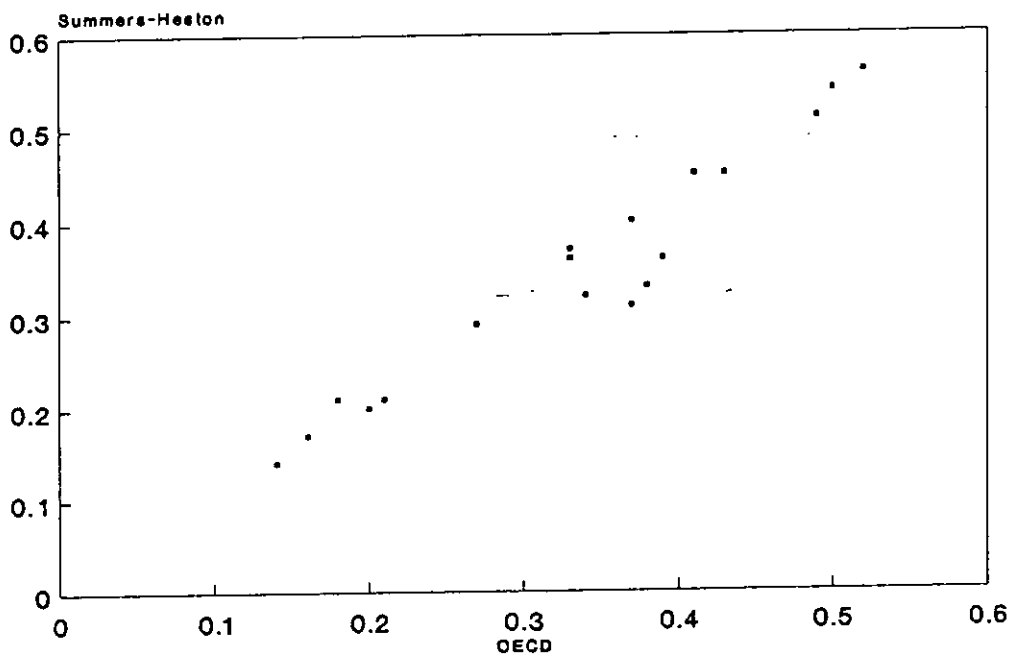
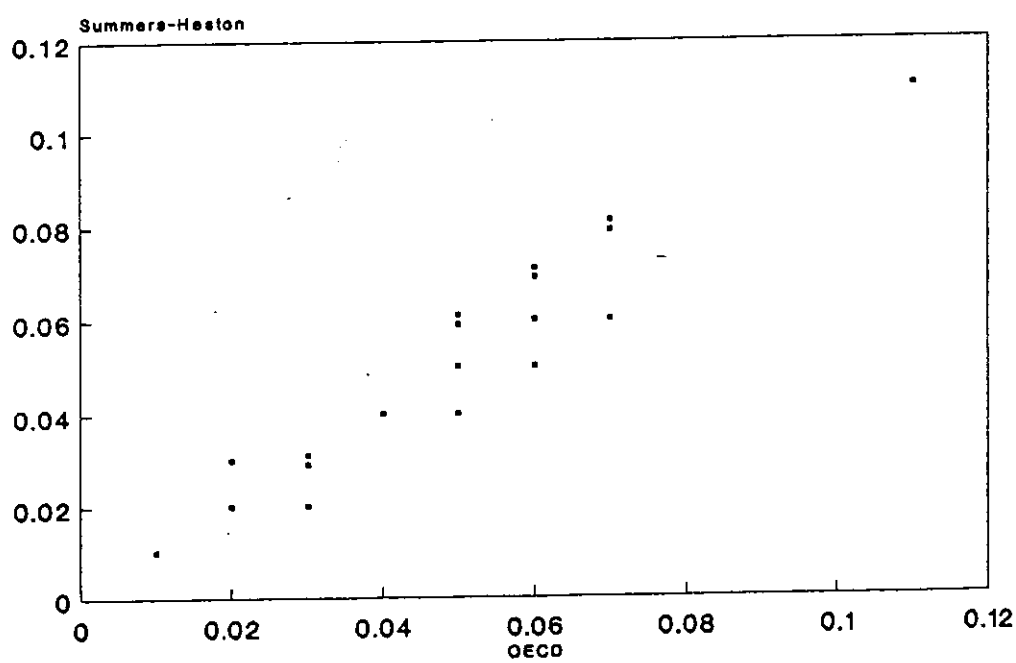


Figure 7B
Extreme Poverty Rates
Using Different PPP's



IV. Household Characteristics and Crossnational Differences

Some types of individuals of the population are more prone to be poor than other types. For example, in the United States households headed by an unmarried women with children are more likely to have incomes below the United States poverty line than households headed by a married couple (*e.g.*, see Garfinkel and McLanahan, 1986. Changes in such characteristics of the population have been studied for the extent to which they can account for movements over time in poverty rates in the United States.[35] In this section, I consider the extent to which crossnational differences in household characteristics can account for observed differences in standard and extreme poverty.

Table 7 reports percentages of the population in various demographic/earner categories in each of the country/year datasets. In all of the countries, the most prevalent household type is married couple, with more individuals in married couples with children households than in married couples without children. At least 79 percent of individuals live in married couple households in all countries except the United States (74 percent), Austria (70 percent), and Sweden (67 percent), though Sweden's low percentage is at least partly due to the income-tax unit definition.[36] The percentage of individuals in households with children and an unmarried female is 5 percent or less in most countries, but is 10 percent in the United States.

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[35] I perform an analysis of this type in Blackburn (1990).

[36] The income-tax unit counts all adults living with their parents as not living in a married couple household, while they would be counted as living in a married couple household in all other countries. However, it would appear that Sweden would have a low married couple percentage even if the household were the unit of analysis, since only 8 to 10 percent of individuals in Sweden live in households with a head under age 25 (assuming most adults living with their parents are under the age of 25).

Table 7
Household Characteristics of Individuals in the LIS Samples[1]

Country	Year	Percentage In: Married Couple w/Kids	Married Couple No Kids	Fem. Head w/Kids	No Earns.[2]	Head's Age <25	Head's Age >64
1979-83							
Australia	1981-2	.57	.24	.05	.26	.06	.11
Canada	1981	.54	.25	.06	.11	.06	.11
France	1979	.57	.28	.03	.15	.06	.15
Germany	1981	.50	.29	.02	.19	.06	.18
Netherlands	1983	.55	.30	.03	.24	.06	.12
Sweden	1981	.41	.26	.05	.17	.08	.19
Un. Kingdom	1979	.55	.26	.05	.18	.04	.16
Un. States	1979	.50	.24	.10	.12	.07	.13
1984-87							
Australia	1985-6	.52	.26	.04	.18	.04	.12
Austria	1987	.70			.27	.04	.20
Canada	1987	.50	.28	.05	.12	.04	.12
France	1984	.54	.29	.03	.23	.03	.13
Germany	1984	.43	.37	.02	.24	.02	.18
Italy	1986	.53	.34	.02	.17	.01	.16
Luxembourg	1985	.52	.31	.03	.18	.03	.13
Netherlands	1987	.50	.30	.04	.26	.04	.13
Sweden	1987	.39	.28	.06	.17	.10	.20
Un. Kingdom	1986	.48	.30	.06	.28	.04	.16
Un. States	1986	.47	.27	.10	.14	.04	.14

[1]The reported statistics are (weighted) percentages of individuals living in households with the corresponding characteristic.

[2]Households in which no member received earnings over the relevant income period.

There is considerable variation across countries in the percentage of individuals in households with no earners. This percentage is on average over 20 percent in Australia, Austria, Germany, the Netherlands, and the United Kingdom, and is lowest in Canada and the United States (12-13 percent). There is less variation in the percentage of individuals in households with very young heads (though, as expected, Sweden is an outlier here). A few countries tend to have larger elderly-head components of the population -- Austria, Germany, and Sweden are all around 20 percent -- but most countries have around 12 percent of the population in elderly-headed households.

Tables 8 reports percentages of individuals in various types of households that fall below the standard poverty lines. Countries with the lowest overall standard poverty rates differ from other countries mostly in their low poverty rates for married-couple households, and in particular married couples with children. Poverty rates for female-headed households are high in all countries, as are poverty rates for households with no earners. Poverty rates for the elderly are substantially higher than overall poverty in some countries -- Australia, Austria, Sweden, and the United Kingdom -- but in other countries there is little difference.

Extreme poverty rates within types of households are reported in table 9. As would be expected, extreme poverty rates are much lower than standard poverty rates in all household types. This is particularly true for female headed households, where extreme poverty rates are on average about 40 percentage points lower than standard rates; however, this type of household continues to have fairly high extreme poverty rates in Australia and the United States. Extreme poverty rates for households with no earners are also

Table 8
Poverty Rates for Different Household Types:
Standard Poverty Lines

Country	Year	Percentage Poor In: Married Couple w/Kids	Married Couple No Kids	Fem. Head w/Kids	No Earns.[2]	Head's Age <25	Head's Age >64
1979-83							
Australia	1981-2	.40	.24	.69	.65	.31	.58
Canada	1981	.15	.06	.50	.41	.24	.16
France	1979	.49	.29	.69	.51	.43	.42
Germany	1981	.42	.21	.42	.46	.23	.36
Netherlands	1983	.65	.34	.75	.62	.58	.46
Sweden	1981	.46	.28	.64	.56	.40	.52
Un. Kingdom	1979	.46	.31	.67	.84	.48	.67
Un. States	1979	.17	.09	.60	.49	.28	.24
1984-87							
Australia	1985-6	.40	.31	.76	.83	.34	.64
Austria	1987		.22		.44	.33	.40
Canada	1987	.15	.05	.47	.30	.26	.07
France	1984	.44	.26	.68	.48	.42	.32
Germany	1984	.43	.19	.76	.43	.49	.34
Italy	1986	.56	.39	.61	.68	.75	.53
Luxembourg	1985	.24	.10	.35	.26	.25	.19
Netherlands	1987	.64	.28	.91	.63	.58	.45
Sweden	1987	.34	.21	.60	.56	.50	.50
Un. Kingdom	1986	.47	.28	.78	.71	.48	.50
Un. States	1986	.20	.08	.61	.45	.37	.20

Table 9
Poverty Rates for Different Household Types:
50% of Standard Poverty Lines

Country	Year	Percentage Poor In: Married Couple w/Kids	Married Couple No Kids	Fem. Head w/Kids	No Earns.[2]	Head's Age <25	Head's Age >64
1979-83							
Australia	1981-2	.06	.02	.30	.17	.07	.03
Canada	1981	.03	.01	.13	.10	.08	.01
France	1979	.07	.05	.21	.08	.09	.03
Germany	1981	.02	.03	.02	.07	.03	.05
Netherlands	1983	.07	.05	.08	.09	.21	.03
Sweden	1981	.04	.01	.08	.05	.14	.00
Un. Kingdom	1979	.07	.01	.16	.16	.11	.01
Un. States	1979	.04	.02	.23	.19	.07	.04
1984-87							
Australia	1985-6	.08	.04	.33	.20	.13	.04
Austria	1987	.00			.04	.06	.02
Canada	1987	.02	.01	.10	.07	.07	.01
France	1984	.05	.04	.15	.13	.07	.01
Germany	1984	.02	.02	.19	.06	.12	.03
Italy	1986	.13	.07	.18	.18	.26	.11
Luxembourg	1985	.01	.01	.01	.02	.06	.00
Netherlands	1987	.06	.02	.10	.10	.24	.00
Sweden	1987	.03	.01	.04	.03	.20	.01
Un. Kingdom	1986	.10	.03	.11	.14	.10	.01
Un. States	1986	.05	.02	.27	.18	.15	.03

much smaller than the standard rates, though again this is less true for Australia and the United States. Since both of these types of households tend to rely heavily on government transfers, it would appear that there are universal transfer benefit programs for most countries that provide transfers that are generally above the extreme poverty lines but below the standard poverty lines. In Australia and the United States, these programs would appear to be either less universal, or to have greater variation in the benefit levels within the country.[37] Extreme poverty rates for the elderly are equal to or less than overall extreme poverty rates in all countries.

To what extent can crossnational differences in household characteristics account for differences in poverty rates? I use a simple shift-share analysis to get some idea of the answer to this question for the LIS countries. Since the headcount ratio is simply a mean, it can be decomposed as the weighted sum of headcount ratios within groups of the population, *i.e.*, if all individuals are sorted into one and only one of G different groups, then

$$\hat{p} = \sum_{g=1}^{G} w_g \hat{p}_g \quad ,$$

where $\hat{p}_g$ is the headcount ratio in group g, and w_g is the percentage of the population in group g. I estimate the contribution of differing household characteristics by allowing the percentages within groups (the w_g's) to vary across countries while holding the percentages poor (the $\hat{p}_g$'s) constant. As a point of reference, I use the United States results from 1979.[38]

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[37] For example, there is much cross-state variation in the level of AFDC and unemployment compensation benefits in the United States, while the unemployment compensation program does not cover all low-income unemployed.

[38] The population weights can be estimated for all groups in all countries, but the percentage poor can be estimated only if the sample for the cell is nonempty. One advantage to using the United States as the reference countries

I first separate the sample of each country into one of 72 groups, defined on the interactions of the age of the household head, head's marital status and sex, presence of children under 18, and number of earners.[39] In table 10, I report the actual difference between the poverty rate of the country and the poverty rate for the United States in 1979 ($\hat{p}^{t}_{j}-\hat{p}^{79}_{US}$), and the difference that would hold if that country's population weights were applied to the United States within-group poverty rates ($\tilde{p}^{t}_{j}-\hat{p}^{79}_{US}$). These contributions are estimated for both the standard poverty lines and the extreme poverty lines. In some cases, the difference in population characteristics can explain part of a positive difference between that country's poverty rates and the poverty rate in the United States in 1979; this is most notable in the Netherlands, Australia (in 1981-2) and United Kingdom (in 1986), the four countries with the highest percentage of households with no earners. In the case of Canada, roughly half of the negative difference with the United States 1979 standard poverty rates is accounted for by population characteristics. However, for most of the country/year datasets little of the difference in standard poverty rates is accounted for by population characteristics, and even less of the difference in extreme poverty rates is explained.

Crossnational differences in the number of earners within households play a very important role in the estimation of the effect of population characteristics on differences in poverty for many countries. This is

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is that the $\hat{p}_{g}$'s can be estimated for all (but one) demographic/earner group, while other countries have several empty cells, due to smaller sample sizes and lower percentages of single-parent households.

[39] The shift-share analysis is not performed for the Austrian data, since there is insufficient demographic information to identify the appropriate group for each household. Education is not used as one of the characteristics in defining groups, because many countries do not collect this information in the surveys provided to LIS.

Table 10
Contribution of Family-Type/Earner Status [1]
to Intercountry Differences in Poverty Rates

		Standard Poverty Lines [2]			50% of Standard Lines		
Country	Year	$\hat{P}_j^t - \hat{P}_{US}^{79}$	$\tilde{P}_j^t - \hat{P}_{US}^{79}$	% Expl.	$\hat{P}_j^t - \hat{P}_{US}^{79}$	$\tilde{P}_j^t - \hat{P}_{US}^{79}$	% Expl.
Australia	1981-2	.17	.08	47%	.01	.05	500%
Australia	1985-6	.18	0	0	.02	.01	50
Canada	1981	-.04	-.02	50	-.02	0	0
Canada	1987	-.06	-.03	50	-.03	-.01	33
France	1979	.23	0	0	.01	0	0
France	1984	.17	.02	12	0	.02	--
Germany	1981	.13	0	0	-.03	0	0
Germany	1984	.13	.01	8	-.02	.01	-50
Netherlands	1983	.32	.05	16	.02	.03	150
Netherlands	1987	.30	.06	20	.01	.03	300
Sweden	1981	.19	-.02	-11	-.01	0	0
Sweden	1987	.14	-.03	-21	0	-.01	--
Un. Kingdom	1979	.23	.01	4	0	.01	--
Un. Kingdom	1986	.21	.06	29	.02	.04	200
Italy	1986	.29	0	0	.05	0	0
Luxembourg	1985	-.02	.01	-50	-.04	.01	-25
Un. States	1986	.01	.02	200	.01	.01	100

[1] All households are separated into one of 72 categories, based on four age groupings (<25,25-44,45-64,>65), three headship classes (single male, single female, married couple), presence of children under 18, and three categories representing number of earners (0,1,>1).

[2] $\hat{P}_j^t - \hat{P}_{US}^{79}$ is the actual difference between the jth country's poverty rate in year t, and the United States poverty rate in 1979. $\tilde{P}_j^t - \hat{P}_{US}^{79}$ isthe difference that would result if within-group poverty rates were at the 1979 US level, but the percentages of individuals within groups were from the particular country/year.

demonstrated in table 11, in which the number of earners is removed as one of the characteristics that defines the population groups. With this grouping, virtually all of the countries have negative predicted differences between their poverty rates and the United States poverty rate in 1979, largely due to the lower percentage of female-headed households in these other countries. Of course, these differences only help explain standard poverty rate differences in the two countries that have lower measured poverty rates -- Canada and Luxembourg.

The difference in poverty rates for female-headed households and other households tends to be higher in the United States than in other countries. The same is true for households with no earners. Since United States poverty rates were used as the basis for measuring the effects of differences in population characteristic, we would expect to find smaller estimated effects if most other countries' poverty rates were used instead. In summary, it appears that only a small proportion of the often large difference in standard poverty rates between the United States and other countries can be accounted for by differing population characteristics. The primary contributor to crossnational differences in poverty rates would appear to be the lower poverty rates in the United States within groups of the population.

V. Concluding Remarks

Any study of poverty is hampered by the lack of agreement over an appropriate definition and method for measurement of the degree of poverty in a society. Even with the assumption that annual income is an appropriate gauge of economic well-being, there remain several issues associated with deciding who is poor, and how the poverty status of all individuals can be

Table 11
Contribution of Family Types
to Intercountry Differences in Poverty Rates[1]

Country	Year	Standard Poverty Lines[2] $\hat{P}_j^t - \hat{P}_{US}^{79}$	Standard Poverty Lines[2] $\tilde{P}_j^t - \hat{P}_{US}^{79}$	Standard Poverty Lines[2] % Expl.	50% of Standard Lines $\hat{P}_j^t - \hat{P}_{US}^{79}$	50% of Standard Lines $\tilde{P}_j^t - \hat{P}_{US}^{79}$	50% of Standard Lines % Expl.
Australia	1981-2	.17	-.03	-18%	.01	-.01	-100%
Australia	1985-6	.18	-.02	-11	.02	-.01	-50
Canada	1981	-.04	-.02	50	-.02	0	0
Canada	1987	-.06	-.03	50	-.03	-.01	33
France	1979	.23	-.03	-13	.01	-.01	-100
France	1984	.17	-.04	-24	0	-.01	--
Germany	1981	.13	-.03	-23	-.03	-.01	33
Germany	1984	.13	-.04	-31	-.02	-.01	50
Netherlands	1983	.32	-.04	-13	.02	-.01	-50
Netherlands	1987	.30	-.04	-13	.01	-.01	-100
Sweden	1981	.19	-.02	-11	-.01	-.01	100
Sweden	1987	.14	-.03	-21	0	-.01	--
Un. Kingdom	1979	.23	-.02	-9	0	-.01	--
Un. Kingdom	1986	.21	-.02	-10	.02	-.01	-50
Italy	1986	.29	-.04	-14	.05	-.01	-20
Luxembourg	1985	-.02	-.04	200	-.04	-.01	25
Un. States	1986	.01	-.01	-100	.01	0	0

[1]All households are separated into one of 24 categories, based on four age groupings (<25,25-44,45-64,>65), three headship classes (single male, single female, married couple), and the presence of children under 18

[2]See note 2 to Table 10.

represented in a simple form that can be compared across countries. Using data from the Luxembourg Income Study, I have found that crossnational comparisons of income poverty among developed economies can be quite sensitive to the precise manner in which poverty is measured.

In my analysis, the most significant definitional decision in measuring poverty turns out the be the choice between using a relative or absolute sense of poverty. Countries that have higher levels of inequality, such as Australia, Canada, Italy, and the United States, also tend to have high levels of relative poverty. However, some high-inequality countries (*e.g.*, Canada and the United States) also tend to have high average incomes, and these countries tend to have low absolute poverty rates. Although average income and the level of inequality are not correlated in my sample of countries,[40] high-average, high-inequality countries tend to have low absolute poverty because the variation of average income across countries is more important to the absolute poverty level than variation in inequality.

Absolute poverty comparisons are also sensitive to proportional changes in the real value of the poverty lines. Canada, Luxembourg, and the United States have considerably lower poverty rates than the other countries when the poverty lines are such that about 20 percent of the United States population is counted as poor. But if these poverty lines were cut in half (leaving about 5 percent of the United States population poor), almost all countries have absolute poverty rates that are close to, or lower than, the United States poverty rate. The presence of extreme poverty measured in this way is much more related to the dispersion of the income distribution than poverty

[40]The correlation coefficient between average income and the coefficient of variation (for disposable income per equivalent adult) is only 0.04.

comparisons at more usual magnitudes for the poverty lines.

Is absolute poverty or relative poverty a more appropriate concept for international comparisons? Measures based on these two concepts are measuring different things. Relative poverty is basically a manifestation of the level of inequality of incomes, where attention is concentrated on the low end of the distribution. An absolute poverty measure can be argued to incorporate a social welfare comparison across countries, related to but not solely dependent upon the level of inequality. To say that one country has a higher level of relative poverty than another does not tell the complete story about well-being comparisons of individuals at the low end of the distribution.

There are several criticisms that could be made of the poverty comparisons in this paper. I have attempted to be careful that the basic conclusions are not sensitive to certain measurement choices, namely the equivalence scales and the purchasing power parities. However, there are other potential problems that I am unable to address. This study assumes that the LIS disposable income series is internationally comparable. Much work has gone into constructing the LIS database so as to make it truly comparable, and I am unaware of any other data source that would be better for the type of analysis of this paper. However, there may be certain intangibles that are not easily incorporated into a quantitative measure of poverty: government benefits that are neither cash nor near-cash benefits; or conditions among low-income communities, such as crime, violence, or cleanliness, that more severely affect the poor in some countries. A crossnational comparison of poverty that includes these intangibles requires a more imaginative accounting than is customarily used in studies of poverty.

Appendix

In this appendix, I extend the work of Cowell (1990) to provide standard error formulas for estimates of poverty rates. These formulas treat both poverty status of the household and the household weight as random variables.

A weighted poverty rate is calculated using the formula

$$\hat{p} = \sum_{i=1}^{n} v_i m_i d_i \Big/ \sum_{i=1}^{n} v_i m_i = \sum_{i=1}^{n} w_i d_i \Big/ \sum_{i=1}^{n} w_i = \overline{wd} / \bar{w} \quad ,$$

where m_i is the number of persons in the household, v_i is the population weight for that household, d_i is a dummy variable equal to one if the household is poor, $w_i = v_i m_i$, and $\overline{wd}$ is the sample mean of the product of w and d. This can be thought of as a method of moments estimator of the population quantity

$$P = E(wd)/E(w) \quad ,$$

involving the moments of w and d. A first-order approximation for the variance of $\hat{p}$ is

$$AV(\hat{p}) = V(\overline{wd})/\bar{w}^2 + \overline{wd}^2 V(\bar{w})/\bar{w}^4 - 2\overline{wd}\,COV(\overline{wd},\bar{w})/\bar{w}^3 \quad .$$

Assuming independent and identically distributed observations, $\hat{p}$ will have be asymptotically normal with variance $AV(\hat{p})$ (*e.g.*, see Greene, 1993). This asymptotic variance can be estimated using the usual sample formulas for $V(\overline{wd})$ and $V(\bar{w})$; $COV(\overline{wd},\bar{w}) = COV(wd,w)/n$ under the i.i.d. assumption, which can be estimated using the sample analog to COV(wd,w).

Appendix Table 1
Country Database Names and Characteristics

Country	Income Year	Survey	Sample Size	Unit of Analysis
1979-83				
Australia*	1981-2	Income and Housing Survey	14,755	household
Canada	1981	Survey of Consumer Finances	15,136	family
France	1979	Survey of Individual Income Tax Returns	11,044	household
Germany	1981	German Transfer Survey	2,717	household
Netherlands	1983	Survey of Income and Program Users	4,833	household
Sweden	1981	Swedish Income Distribution Survey	9,625	tax unit
Un. Kingdom	1979	Family Expenditure Survey	6,777	household
Un. States	1979	Current Population Survey	14,361	household
1984-87				
Australia*	1985-6	Income and Housing Survey	7,560	household
Austria	1987	Austrian Microcensus	11,147	household
Canada	1987	Survey of Consumer Finances	10,999	household
France	1984	French Income Survey of Taxes	12,693	household
Germany	1984	German Panel Survey: Wave 2	3,968	household
Italy	1986	Bank of Italy Income Survey	8,022	household
Luxembourg	1985	Luxembourg Household Panel Study	2,012	household
Netherlands	1987	Survey of Income and Program Users	4,190	household
Sweden	1987	Swedish Income Distribution Survey	9,530	tax unit
Un. Kingdom	1986	Family Expenditure Survey	7,178	household
Un. States	1986	Current Population Survey	11,614	household

*The Australian data report income over an annual period that spans more than one calendar year.

Appendix Table 2
Purchasing Power Parities and Alternative Income Measures

Country	Year	PPP/Inflation Factors[1] OECD	S-H	Per Capita Averages[2] LIS DY	Priv. Cons.
1979-83					
Australia	1981-2	1.034	1.128	5737	6565
Canada	1981	1.034	1.009	8378	7977
France	1979	.238	.229	5447	6785
Germany	1981	.443	.431	5856	6597
Netherlands	1983	.418	.401	4841	6617
Sweden	1981	.155	.158	5302	6149
Un. Kingdom	1979	2.825	2.771	5136	6533
Un. States	1979	1.482	1.482	8204	10238
1984-87					
Australia	1985-6	.772	.842	5934	6972
Austria	1987	.055	.053	5949	6190
Canada	1987	.748	.730	8621	9528
France	1984	.141	.135	5837	7087
Germany	1984	.399	.387	5767	6824
Italy	1986	.702	.682	4835	6938
Luxembourg	1985	.023	.022	7019	8062
Netherlands	1987	.399	.382	5055	7067
Sweden	1987	.104	.106	5596	6889
Un. Kingdom	1986	1.636	1.541	5588	7096
Un. States	1986	.981	.981	8999	11330

[1]The factors are multiplied by incomes in the listed country/year's currency to obtain incomes in $US in 1985. "OECD" uses the purchasing power parities for private final consumption in 1985 (SNA classification), provided by OECD (1989). "S-H" uses the purchasing power parities for consumption expenditures in 1985 suggested by Summers and Heston (1991). Within-country price level changes are measured using the consumer price indices reported in the International Monetary Fund (1991).

[2]"LIS-DY" is per capita disposable income from the LIS. "Priv. Cons." is private final consumption per head as reported in OECD (1989), corrected for price changes using the U.S. Consumer Price Index.

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