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POVERTY IN INDUSTRIAL NATIONS:
A COMPARATIVE PERSPECTIVE*

by

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A B S T R A C T

International comparisons of poverty are traditionally based on the head count and poverty gap ratios. Using the Luxembourg Income Study (LIS) microdata, the present paper extends the comparative measurement of poverty to utilize alternative measures which take account of the income distribution among the poor as well (i.e., Sen (1976), Kakwani (1980) and Foster et al. (1984)). It is found that given any poverty line these three measures yield a completely different ranking than the traditional head count and poverty gap ratios. Also, whereas the traditional two measures lead to contradicting rankings, the alternative measures register (with only few exceptions) the same ranking. In spite of the fact that the ranking of countries by all the poverty measures examined is not preserved under alternative poverty lines, considerably less rerankings occur with respect to the measures which incorporate all three poverty dimensions.

INTRODUCTION

The problem of measuring poverty at the national level has three different dimensions: identification of the individuals who should be considered poor, the quantification of their individual degree of poverty, and the aggregation of the individual measures of poverty to an overall measure for the economy. The identification and quantification problems are solved by selecting a poverty line. An individual is considered poor if his income falls below the poverty line, and the degree of poverty is measured by the gap between actual income and the poverty line. The aggregation problem has traditionally been solved either by simply counting the number of the poor and expressing it as a percentage of the total population or by summing up the shortfall of the income of all the poor from the poverty line. These aggregate poverty measures are called the 'head count ratio' and the 'poverty gap', respectively. The second measure is often normalized to obtain the average poverty gap per poor person reletive to the poverty line, and is called the 'poverty gap ratio'.

The literature on the measurement of poverty has, however, dealt widely with the weaknesses of the head count and the poverty gap measures (e.g., Sen (1976), Kakwani (1980), Foster et al. (1984)). The head count ratio does not reflect the size of the poverty gap. In contrast, the poverty gap does not reflect the size of the poor population. Neither is sensitive to the inequality in the income distribution among the poor. The aggregate poverty measures proposed by Sen (1976) and others incorporate three elements of overall poverty: (i) the size of the poor population (i.e., the 'width' of poverty); (ii) the size of the poverty gap (i.e., the 'depth' of poverty); (iii) the income distribution among the poor (i.e., the 'relative deprivation' of the poor). These measures differ in their sensitivities to each of the three elements and thus may register different magnitudes of

poverty and possibly even different directions for the change in poverty over time (See Achdut and Bigman (1991)).

The most commonly used measures of poverty in cross-national empirical research and especially in the Luxembourg Income Study (LIS) (e.g., Buhmann et al. (1988), Smeeding et al. (1990), Achdut and Tamir (1990), Rainwater (1992)), have nevertheless been the head count and poverty gap ratios. The purpose of the present paper is to extend the international comparison of poverty to include additional poverty measures. Of special interest is the question of whether the various countries investigated could be ranked unequivocally according to all poverty measures and whether the ranking is preserved under alternative poverty lines. The data source for this study is LIS database for eight countries: Canada, France, Germany, Israel, the Netherlands, Sweden, the United Kingdom and the United States. The investigation is carried out over two periods of time: the late 1970's and early 1980's (1979-1981) and the mid 1980's (1984-1987).

DESCRIPTION OF THE POVERTY MEASURES AND DATABASE

Poverty will be examined in this paper using five measures: the head count ratio (H), the poverty gap ratio (G), and the poverty measures proposed by Sen (PS), Kakwani (PK) and Foster et al. (PF). Each one of the poverty measures reflecting all the elements of overall poverty mentioned above, has the general form of the measure proposed by Sen (1976), namely, a normalized weighted sum of the poverty gaps of the poor individuals. The weights may be either the position of the poor individuals in the poverty ladder or the poverty gap itself, or both. Rank order weights are embodied in Sen's and Kakwani's poverty measures, whereas poverty gaps are adopted in Foster's measure. All these measures are special cases of the following general family of poverty measures

$$(Z, Y, \alpha, \beta) = A \sum_{i=1}^{q} [(g_i/Z)^{\alpha}(q+1-i)^{\beta}][g_i/Z], \tag{1}$$

where q = the number of the poor

    Z = the poverty line

    Y = the income vector of the poor $(Y_1,\ldots,Y_q)$,

    α = a parameter reflecting sensitivity to the poverty gap of the individual poor (≥ 0)

    β = a parameter reflecting sensitivity to the rank order of the individual poor (≥ 0)

    A = a normalization factor which varies from one poverty measure to another

    g_i = $Z-Y_i$ = the poverty gap of the i's individual $(i=1,..,q)$

PS is obtained when $\alpha=0$, $\beta=1$ and $A = 2/[(q+1)n]$, where n is the size of the total population; PK holds for $\alpha=0$ (regardless of the value of β) and $A = q/n\phi(\beta)$, where $\phi(\beta) = \Sigma_i i^{\beta}$ (notice that PK reduces to PS for $\beta=1$); PF is obtained for $\beta=0$ (regardless of the value of α) and $A = 1/n$. For the purpose of this study we chose $\beta=2$ for PK and $\alpha=1$ for PF.

In order to emphasize the differences among PS, PK and PF, we may write them in the following form, as shown by the respective authors

PS: $P(Z,Y,0,1) = H[G + (1-G)I_p]$

PK: $P(Z,Y,0,2) = H[G + (1-G)EI_p]$

PF: $P(Z,Y,1,0) = H[G^2 + (1-G)^2(CV_p)^2], \tag{2}$

where $H = q/n$ denotes the head count ratio, $G = (Z-Y_p)/Z$ denotes the poverty gap ratio (Y_p represents the average income of the poor), I_p and EI_p are the Gini and the extended Gini coefficients of income inequality among the poor,

respectively,[1] and CV_p is the coefficient of variation of income of the poor. The different income inequality measures implicit in the poverty measures reflect different sensitivities to income changes at different ranges of the income distribution.

The data used in this paper came from the Luxembourg Income Study (LIS) database. The advantage of this database over other sources is that it is constructed on the basis of unified definitions of income and demographic variables which make income and households characteristics very comparable as possible across countries. The investigation unit in this research is the individual household. The measure of income used is the equivalent disposable household income defined as the post-tax and post-transfer income divided by the appropriate equivalence factor according to the equivalence scale suggested by LIS.[2] Only households with positive disposable incomes were considered.[3]

The poverty line in the present study is defined as a certain percentage of the median equivalent disposable income. Five poverty lines are examined: 40%, 50%, 60%, 80% and 100%. In the calculation of the median income, households are weighted equally but in the calculation of the poverty and income inequality measures, each household is weighted by its number of persons.

POVERTY CHANGES OVER TIME

Table 1 presents estimates of the five poverty measures at the mid 1980's for the eight countries selected. These computations take the poverty line as 50% of the equivalent median income. According to these measures poverty varies widely among countries. The lowest percentage of poor persons is observed in Sweden, the Netherlands and West Germany, ranging from 5.8% to 6.6%, whereas the highest percentage is

Table 1: Poverty Measures in Eight Selected Countries and Rank Order (in parentheses) - the Mid 1980's Period

	H	G	PS	PF	PK
Canada (1987)	12.4 (6)	29.1 (6)	0.0508 (6)	0.0162 (6)	0.0594 (6)
France (1984)	9.3 (5)	26.4 (3)	0.0364 (4)	0.0114 (4)	0.0435 (4)
Germany (1984)	6.6 (3)	22.1 (1)	0.0211 (1)	0.0053 (1)	0.0249 (1)
Israel (1986)	17.6 (7)	25.4 (2)	0.0619 (7)	0.0167 (7)	0.0715 (7)
Netherlands (1987)	6.1 (2)	26.6 (4)	0.0243 (2)	0.0079 (2)	0.0290 (2)
Sweden (1987)	5.8 (1)	35.2 (7)	0.0285 (3)	0.0108 (3)	0.0331 (3)
United Kingdom(1986)	9.1 (4)	28.8 (5)	0.0394 (5)	0.0143 (5)	0.0479 (5)
United States (1986)	19.8 (8)	36.7 (8)	0.0992 (8)	0.0375 (8)	0.1136 (8)

observed in the United States and Israel: 19.8% and 17.6%, respectively. The United Kingdom, France and Canada are ranked in the middle, with head count ratios between 9.1% and 12.4%.

The poverty gap ratio also differs considerably across these countries, ranging from 22.1% to 36.7%. However, the ranking of countries according to this measure is quite different from their ranking according to the head count ratio. Only Canada and the United States maintain the same rank according the these two measures. Countries with low poverty gap ratio (22.1% to 26.6%) are West Germany, Israel, France and the Netherlands. Of these four countries two have also a low head count ratio, whereas one (Israel) has a very high head count ratio. Canada and the United Kingdom form the second group with a poverty gap ratio of about 29%. Finally, Sweden and the United States, the former with a very low head count ratio and the latter with a very high one, experienced the highest poverty gap ratio (35.2% and 36.2%, respectively).

While the poverty rankings according to H and G differ, the poverty measures, PS, PF and PK provide identical rankings. We observe four groups of countries: West Germany, the Netherlands and Sweden with the lowest level of poverty; France and the United Kingdom with slightly higher poverty; Canada and Israel with much higher poverty than the first group; and finally the United States with the highest poverty. Also, the ranking of countries according to H is quite similar to their ranking according to PS, PK and PF. Of the eight countries investigated, four have the same rank according to all these measures. While the United Kingdom succeeds France in the PS, PK and PF rankings, it precedes France in the H ranking. However, the H values of these two countries are very close (9.1% and 9.3%, respectively). Also, although Germany and Sweden switch positions in their ranking with respect to. H and the PS, PK and PF measures, they are quite close to each other in their H values (6.6%

and 5.8%, respectively). Four countries have also the same rank according to G and the PS, PK and PF measures, yet the rankings of the other four is very different accross these measures.

Table 2 shows the poverty measures for the earlier reference period, again, under a poverty line of 50% of the equivalent median income. The main results for the second period cited above also apply for the first period. The rankings of the countries, according to H and G differ quite notably, where the most noteworthy difference between these mesures is in the relative position of Sweden and Israel. The rankings according to PS, PK and PF are again nearly identical, and quite similar to the ranking according to H.

Table 3 presents the changes over time in poverty in each country - as registered by the different poverty measures - whereas Table 4 shows the changes over time in income inequality among the poor according to the Gini and the extended Gini coefficients and to the coefficient of variation, which are implicit in the PS, PK and PF poverty measures, respectively.[4] In Canada and France poverty declined according to all measures and, with the exception of G, by almost the same extent. The decline in the PS, PK and PF measures was also the result of a reduction in income inequality among the poor in these countries. West Germany also experienced a decline in poverty by all measures, with the exception of a slight rise (6%) in the head count ratio. The decrease in income inequality among the poor in West Germany was at a much higher rate than in Canada and France.

In contrast, the other countries - Israel, the Netherlands, Sweden, the United Kingdom and The United States - experienced a rise in poverty by all measures, except for Israel in which the head count ratio remained unchanged between the mid and early 1980's. The United Kingdom witnessed the largest rise in poverty according to all

**Table 2: Poverty Measures in Eight Selected Countries and Rank Order
(in parentheses) - the Early 1980's Period**

	H	G	PS	PF	PK
Canada (1981)	13.2 (6)	29.8 (6)	0.0558 (7)	0.0185 (7)	0.0655 (7)
France (1979)	9.8 (5)	28.4 (5)	0.0406 (5)	0.0133 (5)	0.0483 (5)
Germany (1981)	6.2 (3)	23.7 (2)	0.0222 (3)	0.0064 (2)	0.0264 (3)
Israel (1979)	17.8 (8)	22.6 (1)	0.0557 (6)	0.0134 (6)	0.0642 (6)
Netherlands (1983)	5.0 (2)	26.3 (4)	0.0198 (1)	0.0063 (1)	0.0237 (1)
Sweden (1981)	4.8 (1)	31.8 (7)	0.0214 (2)	0.0074 (3)	0.0249 (2)
United Kingdom(1979)	7.3 (4)	24.4 (3)	0.0265 (4)	0.0081 (4)	0.0320 (4)
United States (1979)	17.4 (7)	34.2 (8)	0.0829 (8)	0.0304 (8)	0.0965 (8)

Table 3: Percentage Change in Poverty Measures Between the Mid and Early 1980's Periods

	H	G	PS	PF	PK
Canada	-6.2	-2.5	-9.0	-12.4	-9.3
France	-4.6	-7.0	-10.3	-14.3	-9.0
Germany	6.0	-6.8	-5.0	-17.2	-5.7
Israel	-0.7	12.0	11.1	24.6	11.4
Netherlands	20.0	1.2	22.7	25.4	22.4
Sweden	20.0	10.8	33.2	45.9	32.9
United Kingdom	25.1	18.2	48.7	76.5	49.7
United States	14.0	7.3	19.7	23.4	17.7

Table 4: Percentage Change of income Inequality Measures between the Mid and Early 1980's Periods.

Country	Inequality Measure		
	CV_P	I_P	EI_P
Canada	-11.7	-5.3	-5.7
France	-10.4	-6.4	-6.4
Germany	-35.0	-18.2	-18.1
Israel	34.7	15.2	16.4
Netherlands	7.9	3.7	3.3
Sweden	32.4	16.5	16.5
United Kingdom	61.1	28.7	29.1
United States	1.8	3.1	0.7

measures; the head count ratio rose by 25%, the poverty gap ratio by 18.2% , the PS and PK measures by 33% and the PF measure by 76.5%. This might be explained in part by the high rise in the unemployment rate - from 4.7% in 1979 to 11.8% in 1986. In these countries the income disparities among the poor widened according to all income inequality measures, in particular in the United Kingdom, Israel and Sweden, whereas in the United States, in which poverty rose less than in the European countries, income inequality increased only slightly.

The differences in the magnitude of change in poverty as regisrered by the different poverty measures reflect the sensitivities of each measure to the changes in the various dimensions of overall poverty. Of the three poverty measures which incorporate the three dimensions of poverty, PS and PK exhibit the same rate of change since the Gini and the extended Gini coefficients changed by the same rate (which means that the relative position of the poorest families remained more or less unchanged). The coefficient of variation - implicit in the PF measure - changed at a higher rate than did the other two measures of income inequality. This and the fact that PF is more sensitive to changes in income inequality among the poor than are PS and PK led to a greater rate of change in the former than in the latter measure.

To estimate the relative 'contribution' of each one of the three dimensions that jointly determine the level of poverty to the overall change in poverty, we make use of the logarithmic time differentials of PS, PK and PF, so as to express the percentage change in overall poverty as a 'weighted average' of the percentage change in the head count ratio, the poverty gap ratio and the extent of income inequality among the poor. For the PS measure we obtain

$$PS = H + G \left[\frac{G(1-I_P)}{G(1-I_P) + G} \right] + I_P \left[\frac{I_P(1-G)}{G(1-I_P) + G} \right], \qquad (3)$$

where $\hat{}$ denotes percentage change.[5] For PK we obtain the same as above, only EI_P replaces I_P, whereas the decomposition for PF yields

$$PF = H + G \left[\frac{2G^2 - 2(1-G)GCV_P^2}{G^2 + (1-G)^2CV_P^2} \right] + CV_P \left[\frac{2(1-G)^2CV_P^2}{G^2 + (1-G)^2CV_P^2} \right]. (4)$$

Table 5 presents the estimates of the relative contribution of each dimension of poverty to the change in overall poverty as measured by PS and PF.[5] The findings reveal that in the Netherlands almost all the rise in poverty can be explained by the increase in the relative size of the poor population (90% and 80% as indicated by PS and PF, respectively), whereas the contributions of the slight rise in the poverty gap and in income inequality were negligible. The increase in the percentage of the poor populatuion in the United States was also the main contributor to the rise in the overall poverty (70% and 65% by PS and PF, respectively), while the income inequality remained almost the same in the two surveyed periods. In contrast, in Israel, which experienced a slight decrease in the relative size of the poor population, the rise in the overall poverty was caused mainly by the rise in the poverty gap (about 70% and 60% of the rise in the PS and PF, respectively). In France and in the United Kingdom, the three components contributed to the change in the overall poverty more equally than in other countries. It should be noted that across all countries, with the exception of the United States, the contribution of the change in income inequality to the change in poverty as measured by PF was greater than that measured by PS. The PS measure is more sensitive to changes in the relative size of the poor population, while the PF measure is more sensitive to changes

Table 5: The Relative Contribution of H, G and Income Inequality to the Change in the Overall Poverty

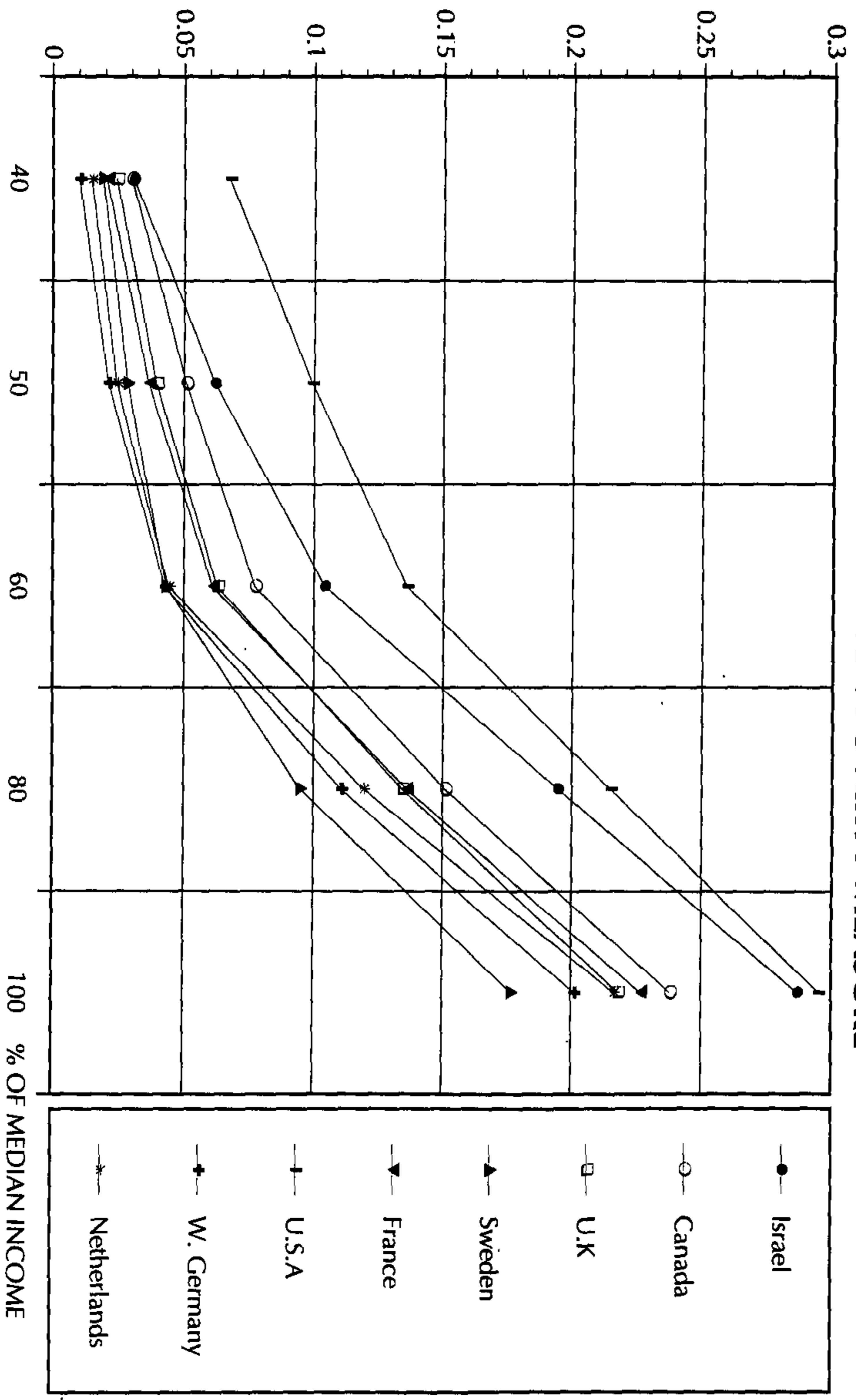| Country	Poverty Measure	Percentage Change	'Widening'	'Deepening'	'Relative Deprivation'	Total
Canada 1981/1987	PS	-9.0	67	16	17	100
	PF	-12.4	48	19	33	100
France 1979/1984	PS	-10.3	44	37	19	100
	PF	-14.3	31	40	29	100
Israel 1979/1986	PS	11.1	-6	68	38	100
	PF	24.6	-3	57	46	100
Netherlands 1983/1987	PS	22.7	91	3	6	100
	PF	25.4	82	4	14	100
Sweden 1981/1987	PS	33.2	65	20	15	100
	PF	46.0	48	25	27	100
United Kingdom 1979/1986	PS	48.7	56	23	21	100
	PF	76.5	37	20	43	100
United States 1979/1986	PS	19.7	73	22	5	100
	PF	23.4	64	33	3	100

in the poverty gap and in the income distribution of the poor.[6]

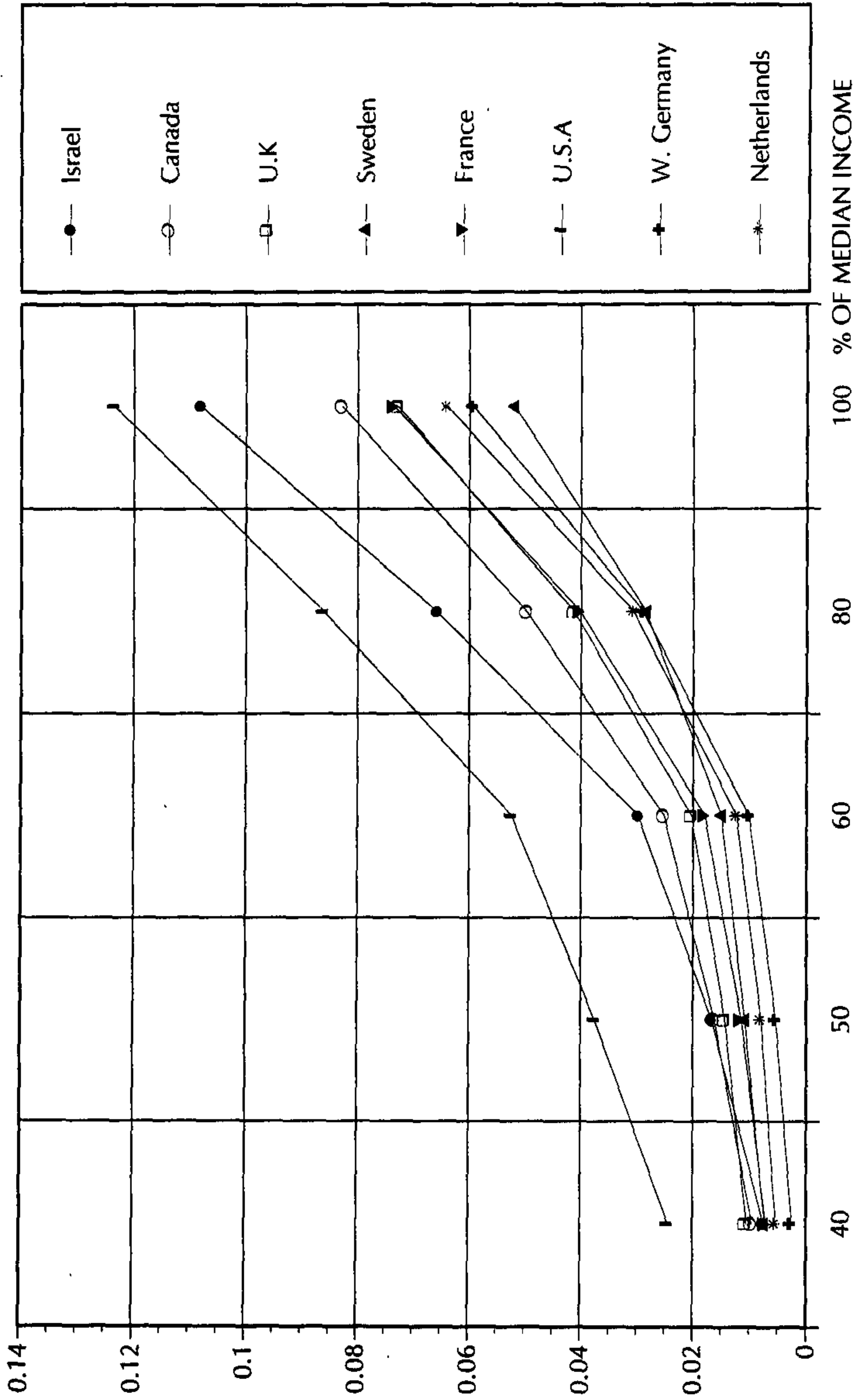## POVERTY RANKINGS UNDER ALTERNATIVE POVERTY LINES

The literature on aggregate poverty measures does not offer any guidelines for selecting the poverty line. The choice of any particular poverty line - which is usually arbitrary - will affect the magnitude of poverty according to all measures and may well reverse the poverty rankings by country.

Figures 1-5 addresses this issue. They present, for the mid 1980's period, the values of the PS, PF, PK, H and G poverty measures, respectively, obtained under poverty lines set at 40%, 50%, 60%, 80% and 100% of the equivalent median income. The most striking finding arising from the first three figures is the formation of two groups: Israel and the United States on the one hand and the other countries on the other hand. The former group exhibits considerably higher poverty values at any poverty line, with just one minor exception. Among the other six countries Canada has the highest values of PS and PK and, with the exception of the 40% poverty line, of PF as well. The other countries in this group cross each other at various poverty lines: for example, according to the PS and PK measures West Germany has lower poverty rates than Sweden at poverty lines of 40%, 50% and 60% of the median income but higher rates at the 80% and 100% poverty lines. It is interesting to note that almost all the crossings occur in the range of the 40%-60% poverty lines and that thereafter the ranking is nonambiguous. In spite of the fact that France and the United Kingdom cross each other they have very similar poverty rates at all poverty lines. The picture painted by the head count ratio[6] and especially by the poverty gap ratio is more complicated. What immediately meets the eye is the large number of crossings for both measures

FIGURE 1 – SEN POVERTY MEASURE

Legend:
- ● Israel
- ○ Canada
- ⊡ U.K
- ▲ Sweden
- ▼ France
- ┼ U.S.A
- ✚ W. Germany
- ✳ Netherlands

X-axis: % OF MEDIAN INCOME (40, 50, 60, 80, 100)

Y-axis: 0, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3

FIGURE 2 – FOSTER POVERTY MEASURE

Legend:
- ● Israel
- ○ Canada
- □ U.K
- ▲ Sweden
- ▼ France
- — U.S.A
- + W. Germany
- * Netherlands

% OF MEDIAN INCOME

FIGURE 3 – KAKWANI POVERTY MEASURE

Legend:
- ● Israel
- ○ Canada
- ▫ U.K
- ◀ Sweden
- ▼ France
- + U.S.A
- ✚ W. Germany
- ✳ Netherlands

% OF MEDIAN INCOME
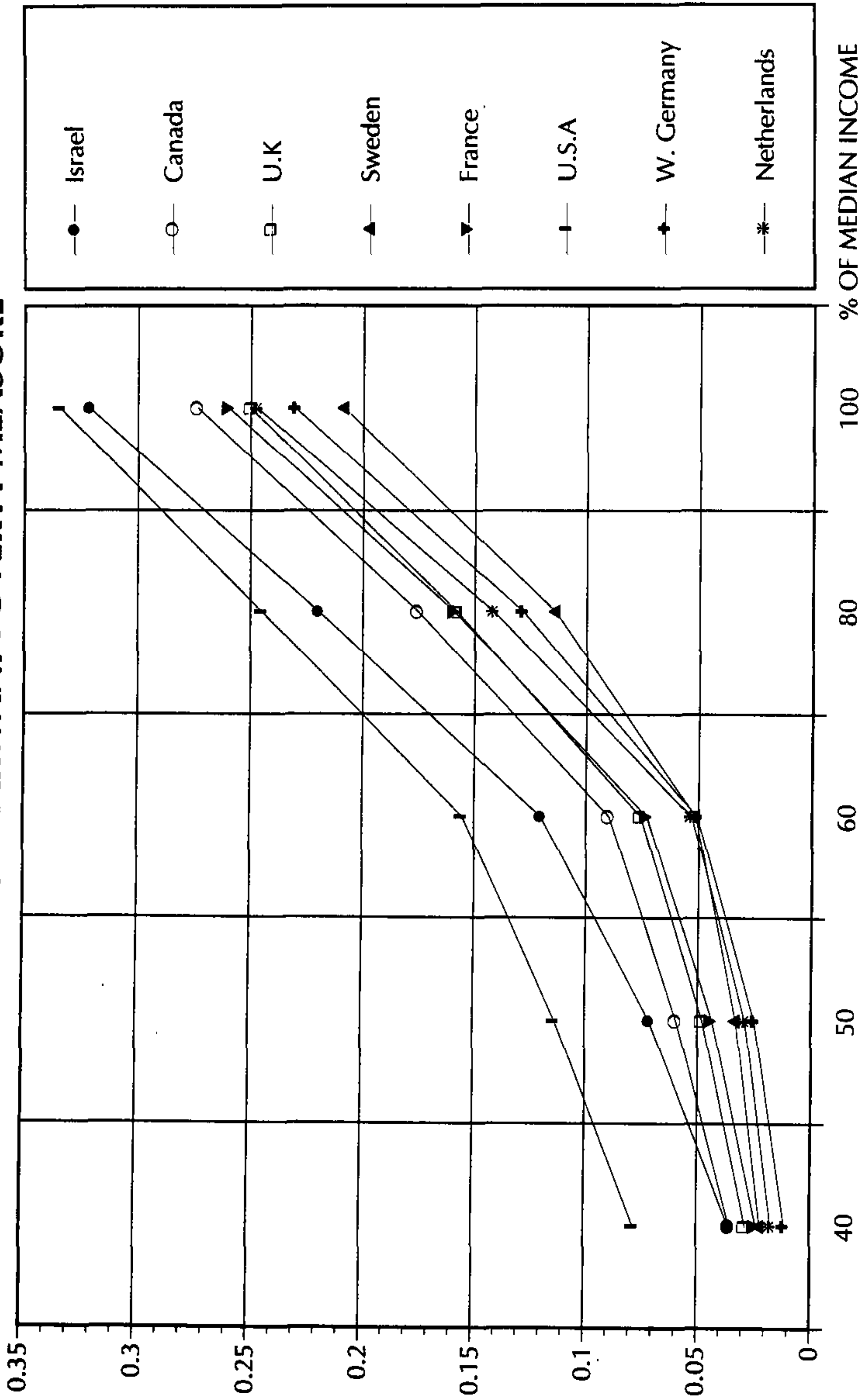
FIGURE 4 – HEAD-COUNT RATIO

% OF MEDIAN INCOME

Israel
Canada
U.K
Sweden
France
U.S.A
W. Germany
Netherlands
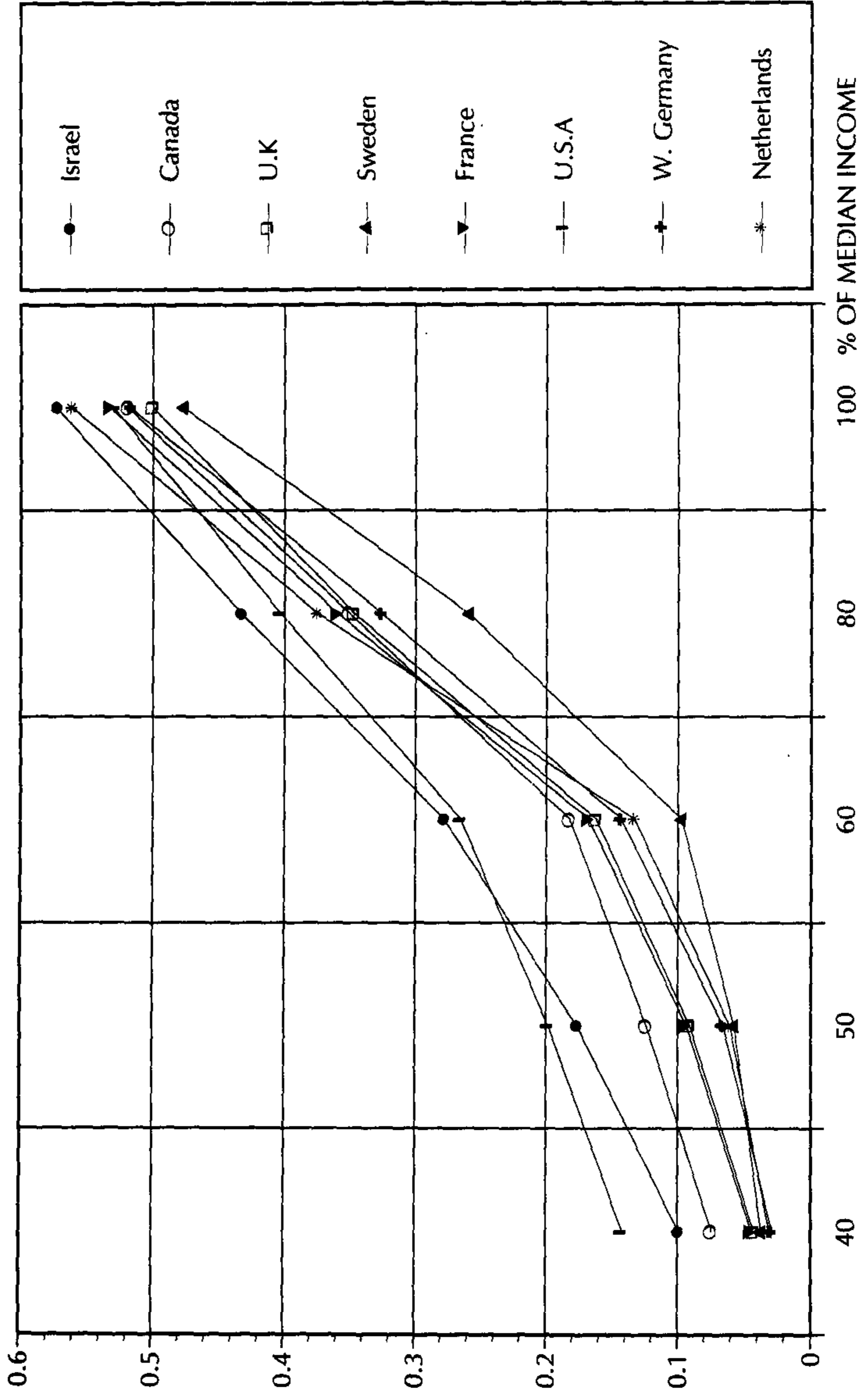
FIGURE 5 – INCOME GAP RATIO

Legend: Israel, Canada, U.K, Sweden, France, U.S.A, W. Germany, Netherlands

% OF MEDIAN INCOME
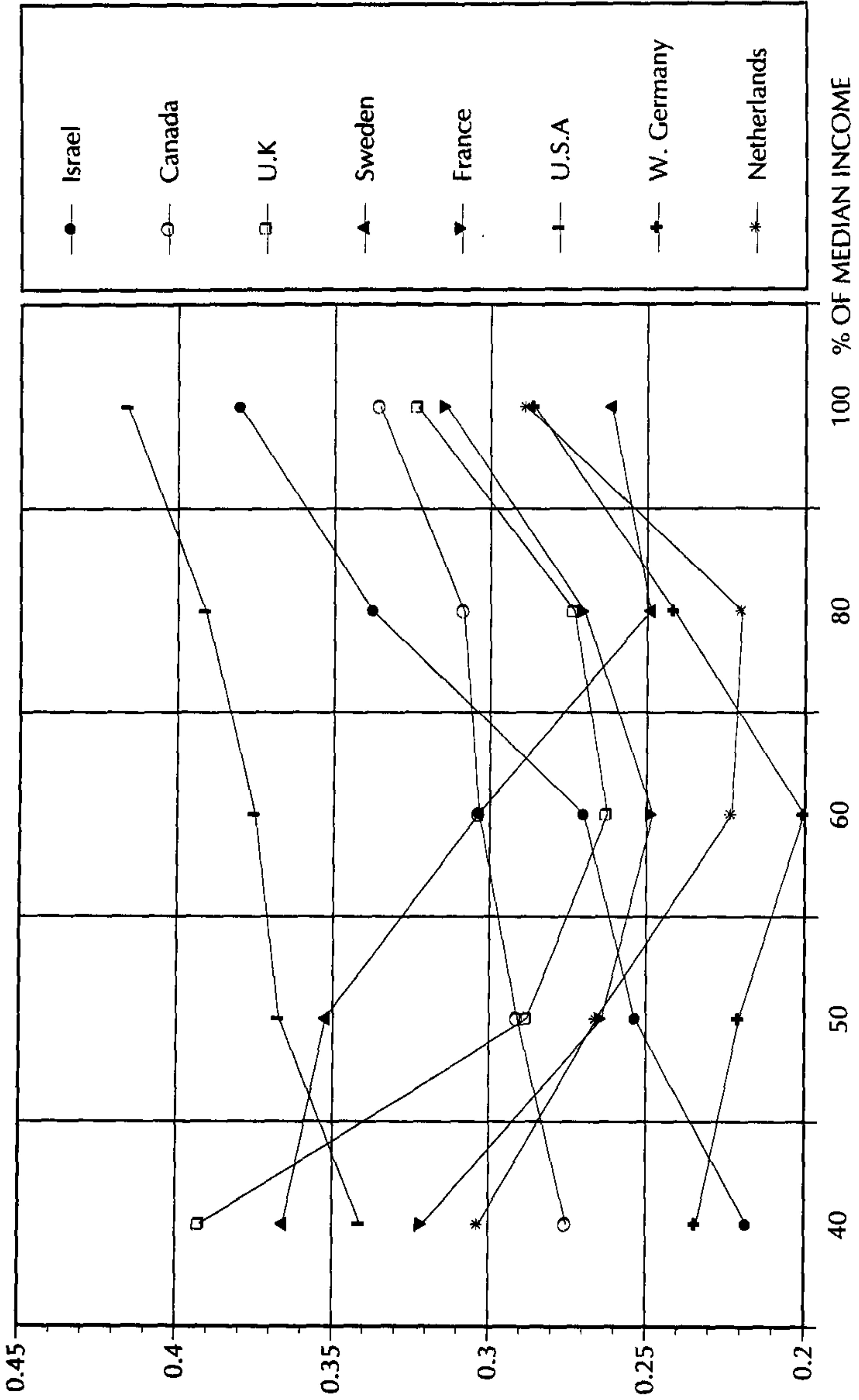
and the absence of any trend for the poverty gap ratio. Consequently, it is impossible to unequivocally rank the countries with respect to the alternative poverty lines.

Since a complete ordering of all eight countries under all poverty lines is impossible, we restrict ourselves to making pairwise comparisons. Given a poverty measure P and two distributions x and y, we will say that x has unambiguously less poverty than y if $P(x, Z) \leq P(y, Z)$ for all positive Z, with strict inequality for some Z. This criterion provides the basis for the results presented in Tables 6 and 7. A "+" means that a country in a row has less poverty than a country in a column, according to all poverty lines. A "-" denotes that a country in a row has more poverty than a country in a column, according to all poverty lines. A "x" means that we cannot say unequivocally that a country in a row has more (less) poverty than a country in a column. For each pairwise comparison, the three results appearing in Table 6 relate to PS, PK and PF, respectively, and in Table 7 to H and G, respectively.

Table 6 shows, for example, that the United States has more poverty than all the other countries and that West Germany is less poor than the other countries except Sweden with which the comparison is inconclusive. The Netherlands has more poverty than West Germany but less poverty than the other countries, and again except Sweden with which the comparison is inconclusive. It is apparant that the PS and PK measures yield the same results (i.e., more poverty, less poverty or inconclusive) with respect to the pairwise comparison. The PF measure yields the same results as the other two measures, with the exception of the comparisons relating to Israel, Canada and the United Kingdom. Out of 25 pairwise comparisons, PS and PK yield 25 conclusive results whereas PF yields 22. Table 7 reveals that H yields even less, only 18, while G yields 18 <u>inconclusive</u> results.

Table 6: Pairwise Comparisons: PS, PK and PF Poverty Measures

	CANADA	FRANCE	GERMANY	ISRAEL	NETHERLANDS	SWEDEN	UNITED KINGDOM	UNITED STATES
CANADA	*							
FRANCE	+ + +	*						
GERMANY	+ + +	+ + +	*					
ISRAEL	- - ×	- - -	- - -	*				
NETHERLANDS	+ + +	+ + +	- - -	+ + +	*			
SWEDEN	+ + +	+ + +	× × ×	+ + +	× × ×	*		
UNITED KINGDOM	+ + ×	× × ×	- - -	+ + ×	- - -	- - -	*	
UNITED STATES	- - -	- - -	- - -	- - -	- - -	- - -	- - -	*

Table 7: Pairwise Comparisons: H and G Poverty Measures

	CANADA	FRANCE	GERMANY	ISRAEL	NETHERLANDS	SWEDEN	UNITED KINGDOM	UNITED STATES
CANADA	*							
FRANCE	× ×	*						
GERMANY	+ +	+ +	*					
ISRAEL	- ×	- ×	- ×	*				
NETHERLANDS	× ×	× ×	× ×	+ ×	*			
SWEDEN	+ ×	+ ×	× ×	+ ×	× ×	*		
UNITED KINGDOM	+ ×	+ -	× -	+ ×	× -	- ×	*	
UNITED STATES	- -	- -	- -	× -	× -	- ×	- ×	*

CONCLUSIONS

This paper extends the literature on poverty comparisons based on the Luxembourg Income Study (LIS) microdata to take account of the poverty measures suggested by Sen (1976), Kakwani (1980) and Foster et al. (1984), which reflect all three dimensions of poverty. It finds that given any poverty line the traditional head count and poverty gap ratios lead to inconsistent rankings, whereas the newer measures register the same ranking, with only few exceptions. Also, the rankings according to the newer measures were quite close to the head count ranking. In spite of the fact that the ranking of countries by all the poverty measures examined is not preserved under alternative poverty lines, considerably less rerankings occur with respect to the measures which all three three poverty dimensions.

The newer poverty measures clearly have their advantages. However, there is also a disadvantage involved: while the traditional head count and poverty gap measures have a tangible meaning (i.e., the number of the poor and the amount of transfers needed to eliminate poverty, respectively), the numerical value of the other measures is hardly interpretable. Still, this disadvantage, which characterizes also the Gini coefficient and other income inequality indices, has not prevented them from becoming an accepted and frequently applied welfare indicators. Like most inequality indices, the newer poverty measures obtain values between zero and one, and the higher their value the higher the level of poverty. In particular, an annual series of each measure will unambiguously help determining whether poverty is rising or falling over time as well as whether one country is more or less poor than the other.

Poor Population: Inequality Measures (Disposable Income)

	Gini Coefficient		Extended Gini		CV^2	
Canada (1987)	0.1685	(3)	0.2669	(3)	0.0922	(3)
France (1984)	0.1715	(4)	0.2741	(4)	0.0967	(4)
Germany (1984)	0.1299	(1)	0.2032	(1)	0.0527	(1)
Israel (1986)	0.1306	(2)	0.2037	(2)	0.0547	(2)
Netherlands (1987)	0.1844	(5)	0.2909	(5)	0.1112	(5)
Sweden (1987)	0.2194	(8)	0.3447	(8)	0.1517	(8)
United Kingdom (1986)	0.2055	(6)	0.3365	(7)	0.1471	(7)
United States (1986)	0.2103	(7)	0.3250	(6)	0.1355	(6)
Canada (1981)	0.1779	(5)	0.2831	(5)	0.1044	(5)
France (1979)	0.1832	(6)	0.2927	(6)	0.1079	(6)
Germany (1981)	0.1588	(2)	0.2480	(2)	0.0811	(2)
Israel (1979)	0.1134	(1)	0.1750	(1)	0.0406	(1)
Netherlands (1983)	0.1778	(4)	0.2816	(4)	0.1031	(4)
Sweden (1981)	0.1883	(7)	0.2958	(7)	0.1146	(7)
United Kingdom (1979)	0.1597	(3)	0.2607	(3)	0.0913	(3)
United States (1979)	0.2039	(8)	0.3229	(8)	0.1331	(8)

FOOTNOTES

[1]The rank order (attached to each individual) embodied in the extended Gini coefficient (EI_p) is raised to the power of 2, as required for PK when ß=2.

[2]The equivalence scale used in this study allocates a weight of 0.5 to the first individual in any household, a value of 0.25 for each additional individual from the second to the ninth (so that a nine-person household has an equivalwence factor of 2.5), and a weight of 3.0 to households with ten or more persons.

[3]The percentage of households with negative or zero incomes in the mid 1980's surveys ranges from 0% (Germany and Israel) to 2.3% (in the Netherlands).

[4]The values of the various income inequality measures are presented in the Appendix.

[5]The relative contribution of each poverty dimension was calculated as the ratio of each one of the three terms of the decomposition formulas (equations (3) and (4)) to the change in overall poverty. The decomposition of the change in PK (for ß=2) yields the same results as that of PS.

[6]West Germany is not included in Table 5 since the logarithmic approximation explains only 75% of the change in overall poverty (whereas in all other countries the explanation rate was above 90%).

[7]Notice that at the equivalent median income (100% poverty line) the Head Count ratio is not unique (50% of the population) across countries. The reason is that in the calculation of the equivalent median income we have attached an equal weight to each household whereas in the calculation

of the poverty measures we used the size of the household as a weight.

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