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**INCOME INEQUALITY AND POVERTY UNDER TRANSITION
FROM RAPID INFLATION TO STABILITY:
ISRAEL 1979-1990***

by

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A B S T R A C T

The paper examines the trends in income distribution
and poverty in Israel during 1979-1990, placing a
special emphasize on the transition from a period of
inflation (1979-1984) to a period of price
stabilization (1985-1990). Various income inequality
and poverty measures are applied. A distinction is
made between changes in the factor and the net income
distributions, so as to examine the role played by
transfers and taxes in reducing income disparities
and poverty. The Annual Income Surveys conducted by
the Central Bureau of Statistics serve as a data
source for the analysis.

I. INTRODUCTION

The implementation of the stabilization policy in July 1985 was a turning point in the Israeli economy. During the period from 1979 to June 1985, Israel experienced extremely high rates of inflation which peaked at more than 450% annually in the first half of 1985. The inflationary wave progressed in three phases: in the 5-year period until mid-1979, inflation was relatively low and rather steady at an annual rate of 35-45%. In mid-1979 inflation rose rather sharply to an annual rate of 130% and remained at that average level until the end of 1983. During all of 1984 and until June 1985 inflation accelerated to a level of 450% per annum and even more. In July 1985 the government introduced a sweeping package of measures which rolled the inflationary tide back to an annual level of less than 20% during the years 1986-1990. The price stabilization policy, however, contributed to an additional expansion in unemployment, which emerged gradually since 1979.

High and unanticipated inflation, so the argument goes, has negative distributional effects and potential devastating consequences for the poor; failure to properly adjust the tax structure drives nominal incomes into higher tax brackets and thus raises the real tax burden and further erodes real inocmes; lags in the adjustment of the various social security benefits exposes the more vulnerable sections of society to poverty and tends to expand income disparities between the poor and the rich. However, the distributional cost of inflation and its negative effects on the weak population are somewhat moderated when, as is the case in Israel, the government takes steps to index various kinds of income. As early as 1977, the government of Israel introduced a widespread system of indexation that embraced wages, financial assets, the income tax structure and the social security benefits. When inflation accelerated to higher levels, the government elaborated the updating mechanisms by raising the degree and frequency of indexation. However, these adjustments were not carried out immediately after the inflationary tides in 1980 and 1984, since it took time for the policy makers and the labor union

to fully recognize the adverse impact of inflation and to complete the necessary administrative and legal arrangements. When inflation declined in 1985, it had an immediate favorable effect: The very transition from a 20% monthly rate of inflation to less than 2% led to a one time real increase in the income tax brackets and in the social security benefits. With the stabilization of prices, the income tax and social security systems stabilized as well.

The purpose of this paper is to examine, against this background, the trends in income inequality and poverty in Israel during the period from 1979 to 1990. The findings indicate that over this entire period, there have been relatively small changes in the extent of income inequality and poverty. The measure of inequality of net income rose by a mere 3% - 5% according to most indices, the Head Count ratio rose by 11% and the Poverty Gap rose by 15%. Also during the inflation period 1979-1984, there were surprisingly small changes: the income inequality (measured by the Gini Coefficient) rose by 3%, the Head Count ratio by 4% and the Poverty Gap ratio by 10%. A careful analysis of the year-to-year changes show, however, very large differences between the developments in the years 1980 and 1984, the developments in the years 1981 - 1983 and 1985, and the developments in the years 1987 - 1990. In the years 1981 - 1983, when inflation was high but relatively steady, income inequality and poverty declined, but they increased in 1984, as inflation had accelerated to a higher level. In 1985 the trend reversed again; following the drastic curb in inflation, income inequality and poverty declined. In the years 1987 - 1990, as a result of the expanding unemployment, the net income inequality rose, but only slightly, whereas poverty increased significantly.

II. THE FUNCTIONAL FORM OF AGGREGATE POVERTY MEASURES

In analyzing the basic trends and year to year changes in poverty, we will examine the three factors that determine the level of overall poverty: (i) the percentage of the poor in the total population; (ii) the size of the income gap of the poor; and (iii) the distribution of income among the poor. Different poverty measures represent, however, different sensitivities to each of these factors and thus may register different magnitudes of poverty, and possibly even different directions for the change in poverty over time.

Six poverty indices will be examined: the Head Count ratio (denoted by H), the Poverty Gap ratio (G), and the four poverty measures proposed by Sen (1976) (denoted by PS), by Kakwani (1980) (denoted by PK), by Foster et al. (1984) (denoted by PF) and by Bigman (1986) (denoted by PB). The two indices H and G are the common measures of poverty in empirical studies, although their weaknesses have widely been discussed in the literature. The Head Count ratio does not reflect the size of the poverty gap, and the Poverty Gap does not reflect the size of the poor population, nor is it sensitive to the inequality in the distribution of income among the poor. The other four indices - PS, PK, PF and PB - reflect all three components of overall poverty. Each of these measures has the general form of the poverty index that has been proposed by Sen (1976), i.e. a normalized weighted sum of the poverty gaps of all the poor individuals. The weights may be either the position of the poor individual in the poverty ladder or the poverty gap itself, or both. Rank order weights have been applied in Sen's and in Kakwani's poverty measures, poverty gap weights have been applied in Foster's measure, and the Bigman measure is based on both weighting schemes. All the above measures are special cases of the following general family of poverty measures:

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

where q is the number of the poor, Z is the poverty line, g_i is the individual poverty gap and A is a normalization factor (which varies from one poverty measure to another).

In order to emphasize the differences among the various indices examined, we can write them in the following form:

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

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

Foster et al. $P(Z,Y,1,0) = H[G^2 + (1-G)^2(CV_p)^2]$

Bigman: $P(Z,Y,1,1) = H[G^{*2} + (1-G^*)^2(ECV_p)^2]$ (2)

where I_p and EI_p are the Gini and the Extended Gini coefficients of income inequality among the poor, respectively, CV_p is the ordinary (coefficient of variation of income of the poor and ECV_p is the extended rank weighted coefficient of variation'. Each of these indices attaches different weights to each of the three components of overall poverty, i.e. the 'width', the 'depth' and the degree of inequality or 'relative deprivation' among the poor.

In analyzing the trends in income distribution we examined five indices of income inequality: The Gini coefficient, the extended Gini coefficient (for K = 3), the coefficient of variation, the extended rank weighted coefficient of variation and the Atkinson's measure. These different income inequality measures reflect different sensitivities to income changes at different ranges of the income distribution. The Gini coefficient, for instance, is relatively more sensitive to income changes at the middle range; the coefficient of variation gives equal weights to income changes at the upper and at the lower tails of the income distribution, whereas the extended coefficient of variation gives higher weights to variations at the lower tail. By giving higher weights to deviation from the means at the lower tail of the income distribution, the latter index ensures that Dalton's principle of transfers (which requires that progressive income transfers has to decrease the measure of inequality) is satisfied.

Data sources are the Annual Income Surveys, which the Central Bureau of Statistics has conducted since 1965[2]. The investigation unit in these surveys is the individual household, and the population includes all the households in urban localities[3] whose head was either an employee or did not work. The income surveys distinguish between three definitions of income: (1) economic (or market) income - all current incomes from wages, rent, dividends etc., prior to any deduction and without including transfer payments; (ii) gross income - economic income plus all cash transfer payments; (iii) net income - gross income after the deduction of obligatory payments (mainly income tax and the National Insurance contributions paid by the employees).

The definition of poverty in our analysis is the same as that of the National Insurance Institute, i.e. 50% of the median equivalent net income. The equivalent income is calculated by dividing the total income of the household by the number of 'standard adults', using the Israeli equivalence scale[4]. All poverty and income inequality measures were calculated on the basis of the household's equivalent income, when each household is weighted by its number of persons.

III. TRENDS OF INCOME INEQUALITY

As a background to the analysis of the trends in income inequality and poverty, Table 1 and Table 2 summarize, by means of selected key indicators, the main economic developments from 1979 to 1990. Table 2 also represents selected indicators for the developments in the income tax and social security systems. Most notable in these tables is the extreme instability of the economy and the sharp changes from one year to the next that most indicators reflect during that period. Even after the prices had stabilized changes in wages and private consumption continued to fluctuate, as a result of a deliberated government policy or due to the growing unemployment. These developments will be referred to in detail upon discussing the trends in poverty and income inequality.

Table 1:   Indicators of Main Economic Developments in Israel: 1979 - 1990*

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Real Annual Change in: (%)												
GDP	4.7	3.5	3.2	0.8	2.0	1.7	3.9	3.6	5.4	2.7	1.7	5.4
Private Consumption	7.9	-2.8	1.2	7.3	8.0	-7.3	-0.5	14.2	9.0	4.2	0.0	5.3
Gross Average Wage	9.5	-3.3	11.0	-1.0	4.9	-0.4	-9.0	7.8	7.9	6.0	-1.3	-1.0
Minimum Wage	-0.7	-15.8	44.9	6.4	7.1	-3.7	-17.2	0.2	28.8	16.0	3.6	0.1
Minimum Wage as % of												
Average Wage	31.0	26.3	36.0	36.8	37.6	36.5	31.8	31.5	36.8	40.1	41.3	42.9
Rate of Inflation (%)	111	133	101	132	191	445	185	19.6	16.1	16.4	20.7	17.6
Rate of Unemployment (%)	2.9	4.8	5.1	5.0	4.5	5.9	6.7	7.1	6.1	6.4	8.9	9.6

*   Calculated for a calendar year, which is not identical to the period of the survey.

Table 2: Indicators of Main Developments in Social Security and Income Tax Systems: 1979 - 1990*

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1. Real change in tax threshold(%)	0.2	-12.2	7.7	3.5	- 3.3	- 9.0	25.3	38.2	2.15	0.1	1.1	8.7
2. Tax threshold as % of average wage	40.7	36.0	36.6	36.5	33.6	31.2	39.8	55.0	50.3	47.3	47.6	53.7
3. Tax threshold as % of minimum wage	131.3	136.9	102.0	99.2	89.4	85.5	124.7	174.0	136.5	117.7	115.3	125.2
4. Real change in basic old-age pension (%)	-0.7	+1.4	+17.0	+10.0	+1.7	-1.1	2.0	-0.1	10.8	9.5	1.4	-0.1
5. Basic old-age and survivors pension as % of average wage	12.1	12.4	13.7	14.5	14.0	14.0	15.1	14.7	14.8	15.3	15.4	15.9
6. Real change in minimum guaranteed income (%)	-0.6	+10.8	+9.5	+10.4	+1.0	-2.8	+10.3	+6.5	-6.1	+9.0	+0.6	-3.3
7. Minimim guaranteed income as % of average wage	20.5	22.9	23.7	25.1	24.2	23.7	27.5	28.9	24.6	25.2	25.2	25.4
8. Real change in child allowance point (%)	-8.3	-12.0	-6.7	-3.5	-2.7	-14.4	+10.2	+37.0	0	+0.6	+2.0	0
9. Child allowance point as % of average wage	3.2	2.8	2.8	2.8	2.6	2.2	2.5	3.4	3.1	2.9	2.9	3.0

*Calculated to fit the period of survey

Despite the large-scale changes in inflation rates, wages, unemployment rates and the social security system which characterized the Israeli economy, there were surprisingly small changes in income inequality during the entire 12 year period from 1979 to 1990. The inequality in the distribution of economic incomes increased slightly by 3%-7% - depending on the index. The measure of inequality of net incomes rose by 3% - 5% according to most indices, and the CV measure even declined by 2%.

However, a careful analysis of the year-to-year changes shows relatively large differences in the extent of income inequality between the inflation period 1979-1984 and the price-stabilization period 1985-1990, as well as within each period. To emphasize the trends in income inequality registered by different indices, we have normalized their values in the various years by their value in 1979. The normalized values of the indices for net incomes, which indicate the precentage changes vis-a-vis that base year, are presented in Figures 1a and 1b. They show that the various indices follow identical trends in their direction (excluding 1990), however of different magnitude. In general, the Gini and the extended Gini coefficients and the extended CV show similar yearly rates of change. The CV and the Atkinson measures also exhibit, more or less, the same rates of change but of a higher magnitude.

During the five-year inflation period there were differences between the developments in the years 1980 and 1984 in which the rate of inflation jumped to higher levels, and the developments in the years 1981-1983 in which the rate of inflation was high but relatively steady. According to all indices, after a 2% rise in the net income inequality in 1980, the years 1981-1983 witnessed a continuous decline: the Gini coefficient declined by 6.8% and the extended Gini coefficient and the extended CV - by 5%-5.5%. The CV and the Atkinson measure declined even more - by 13.3% and 15.4%, respectively. In 1984 net income inequality rose again by 7% - 9% according to the first three indices, by 13% according to CV and by 19% according to the Atkinson measure. These
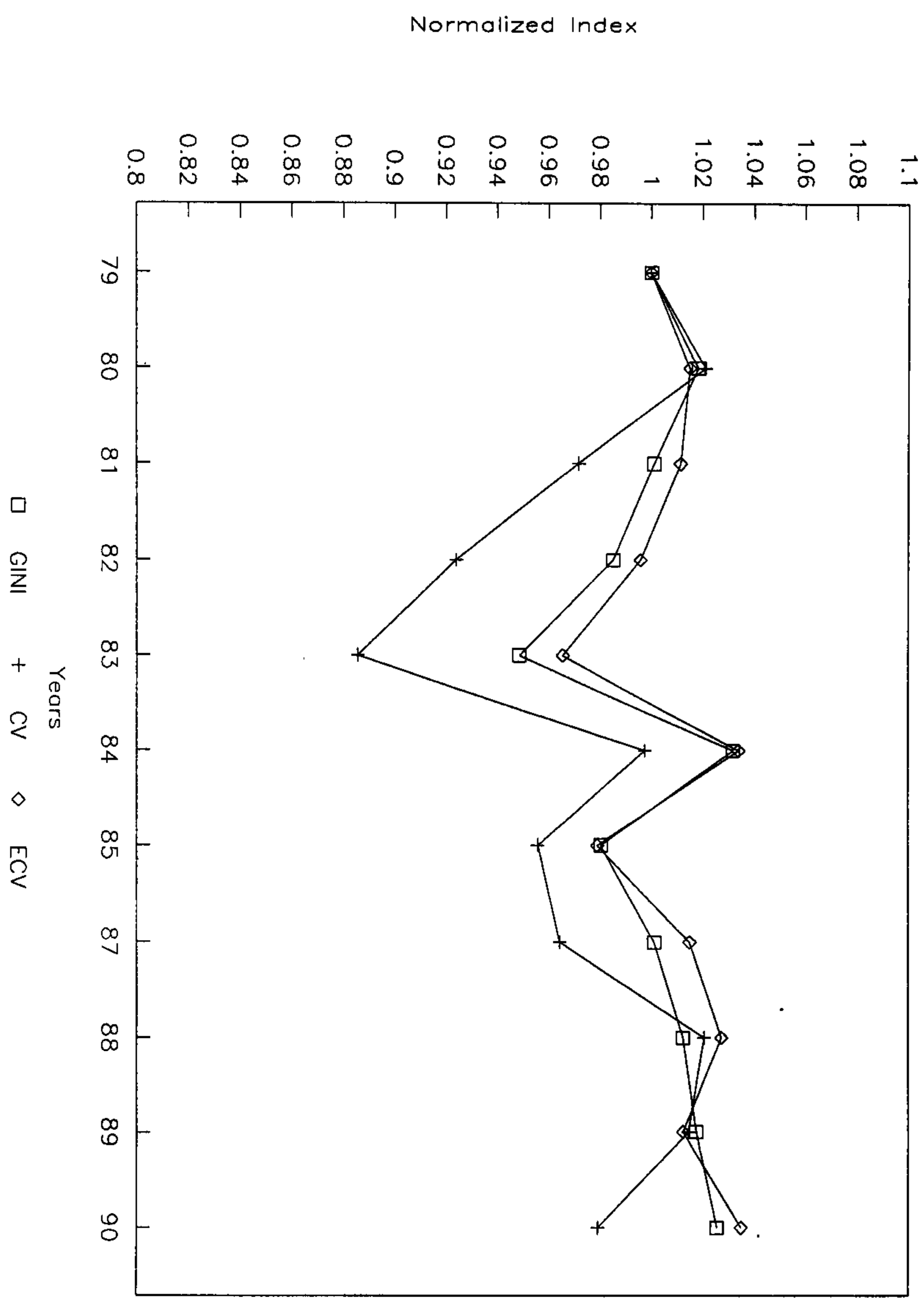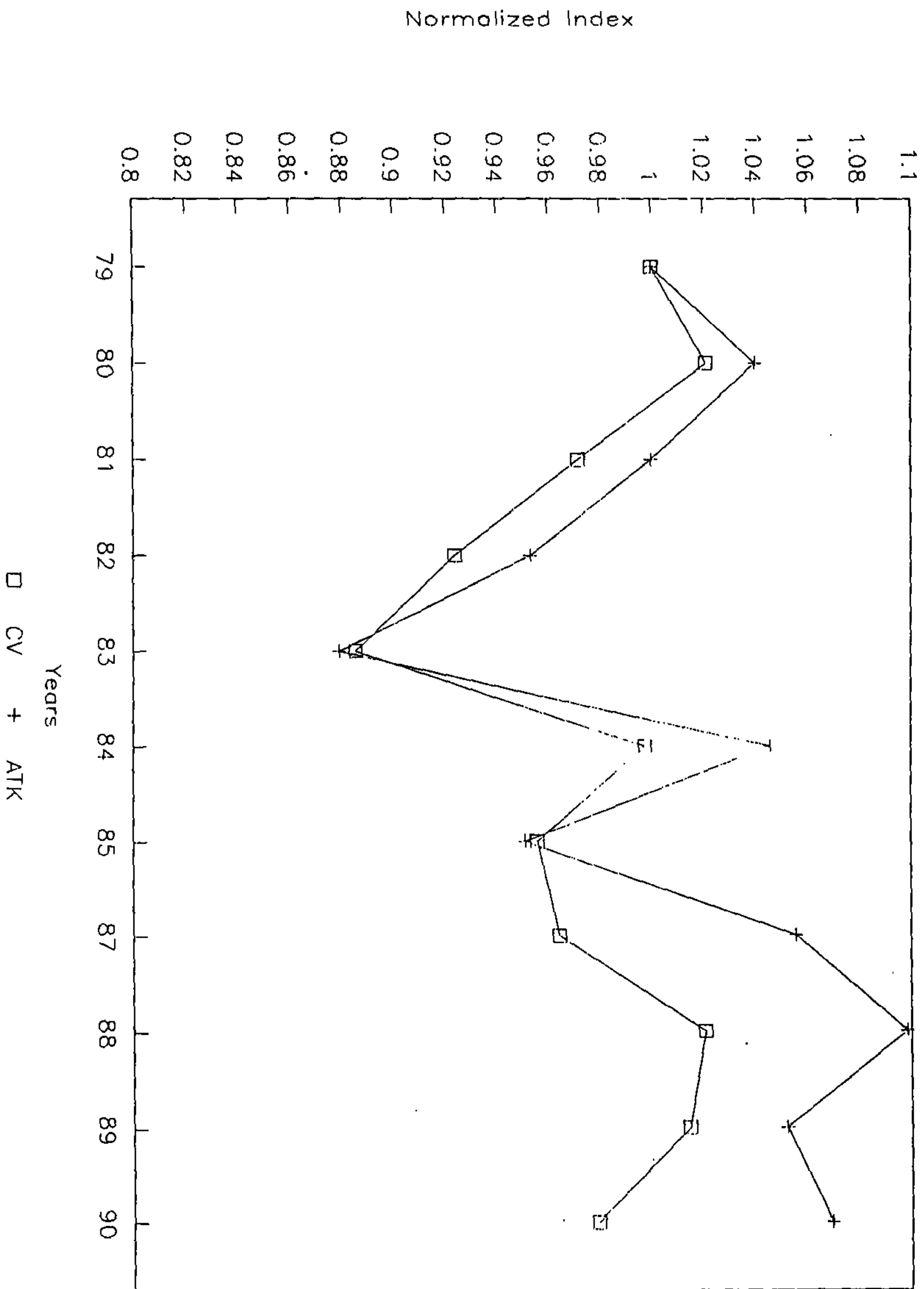
Figure 1a: Measures of Inequality (net income)

Normalized Index

Years

□ GINI + CV ◇ ECV

Figure 1b: Measures of inequality (net income)

Normalized Index

Years

□ CV   + ATK

differences indicate that the incomes at the upper tail of the distribution, to which the CV and the Atkinson measure are more sensitive, rose (or declined) at higher rates than did the lower incomes.

The striking differences between the devleopments in 1980, 1984 and in 1981-1983, were due mainly to the effects of inflation on the government welfare programs and on the income tax system as well as to the rise in the unemployment rate. When the different categories of income are compared (Table 3) one finds that the inequality in the net income distribution declined in 1981 -1983, in spite of a 3% increase in the inequality of economic incomes. This was due to the improvement in the benefit level (mainly to low income families) following the adjustment of the indexation mechanisms to the inflation rates. Even stronger was the influence of the rise in the progressivity of the income tax system - as nominal incomes rose to higher tax brackets. The erosion in the tax threshold and brackets in real terms and relative to the average wage increased the tax rate - especially in the middle and high-income ranges - therefore further increasing the progressivity of the income tax system. The increase in the income tax contribution to the reduction of the net income inequality in 1981 - 1983 is reflected in the decrease of the gross income inequality by only 2%, and of the net income inequality by even higher rates. Comparing the gross and net inequality indices, Table 3 shows that the income tax system reduced the Gini index for net income to a level which is lower by 12.2% than the level of the gross income index. This reduction increased to 16.7% in 1983 and to 18% in 1984 - despite the frequent adjustments in the tax structure so as to take account of inflation. The same trend was observed also by comparing the extended Gini coefficient and the extended CV for gross and net incomes. However, they are further accentuated by comparing the CV measures, since the CV is more sensitive than the other measures to changes at the higher range of the distribution.

TABLE 3: INDICATORS FOR THE EFFECT OF BENEFIT AND INCOME TAX SYSTEMS ON INCOME DISTRIBUTION: SELECTED YEARS

		1979	1980	1983	1984	1985	1987	1988	1989	1990
Gini Coefficient										
1.	Economic income	0.433	0.434	0.443	0.475	0.468	0.459	0.457	0.474	0.480
2.	Gross income	0.366	0.369	0.362	0.400	0.373	0.370	0.370	0.377	0.376
3.	Net income	0.318	0.324	0.302	0.328	0.312	0.319	0.322	0.324	0.326
4.	(3)-(1) as % of (1)	26.6	25.4	31.8	31.0	33.3	30.5	29.6	31.7	32.0
5.	(3)-(2) as % of (2)	13.1	12.2	16.7	17.9	16.5	13.9	12.9	14.0	13.0
Extended Gini Coefficient (K=3)										
6.	Economic income	0.693	0.695	0.708	0.741	0.736	0.727	0.729	0.743	0.755
7.	Gross income	0.570	0.576	0.564	0.610	0.570	0.574	0.577	0.575	0.579
8.	Net income	0.506	0.515	0.487	0.523	0.496	0.514	0.520	0.513	0.524
9.	(8)-(6) as % of (6)	27.0	26.0	31.2	29.4	32.7	29.3	28.6	30.9	30.7
10.	(8)-(7) as % of (7)	11.2	10.7	12.7	14.3	13.1	10.6	9.8	10.8	9.6
Coefficient of variation										
11.	Economic income	0.840	0.824	0.847	0.953	0.926	0.907	0.888	0.952	0.942
12.	Gross income	0.731	0.720	0.708	0.822	0.766	0.752	0.754	0.790	0.758
13.	Net income	0.640	0.653	0.566	0.638	0.611	0.617	0.653	0.649	0.626
14.	(13)-(11) as % of (11)	23.8	20.8	33.2	33.0	34.0	32.0	26.5	31.8	33.5
15.	(13)-(12) as % of (12)	12.5	9.3	20.0	22.4	20.0	18.0	13.5	17.8	17.4

According to the CV measures, the income tax reduced the gross income inequality by 9.3% in 1980. This percentage rose continuously to 20% in 1983 and to 22.34% in 1984.

In spite of the growing progressivity of the income tax in 1984, the inequality of net income increased. This was due mainly to the renewed erosion in the social security benefits caused by the inflationary tides, and, in part, also to the rise in unemployment. The comparison between the economic and gross income according to the various indices shows that the low income families were those who suffered from the eroded benefits.

In 1985, the year in which the stabilization policy was implemented, the trend reversed again and net income inequality decreased by 4%-5% according to most of the indices. The decrease emanated from the rise in the benefit level resulting not only from the introduction of special indexation arrangements to coping with the soaring inflation in 1984, but also from the drastic curb in inflation in the second half of 1985. The real increase in the income tax brackets after the annual inflation was reduced to 20%, along with the 1987 reform, which abolished the two highest marginal tax rates, reduced the progressivity of the income tax system, and therefore its contribution to income equality. The difference between the Gini index for net and gross incomes declined from 18% in 1984 to 13% in 1990, and according to the CV from 22.4% in 1984 to 17.9% in 1990. The net income inequality in 1987-1988 rose by 3%-5% according to most indices despite a slight decrease in the economic and gross income inequality, as a result of a significant rise in the minimum wage level, following a new law. In 1989-1990, with the growing scope of unemployment, the economic income inequality rose by about 4% according to most indices, and was followed by only a very small increase in the net income inequality. The CV and the Atkinson measure even show a small decrease in the net income inequality.

IV. TRENDS IN POVERTY

The trends in poverty observed during the period 1979-1990 were more or less similar to those found in the analysis of income distribution although, as expected, the year-to-year changes in poverty were larger. The percentage of the population with net income below the poverty line ranged from 13% to 16.9%, and the poverty gap was between 24% and 32% of the poverty line. On average, poverty dimensions were slightly higher in the years 1987-1990 than in 1979-1985, due to the dominant effect of the growing unemployment.

Figures 2a and 2b illustrate the trends in poverty as indicated by the six poverty indices, calculated for net income and normalized by their values in 1979. All indices exhibit the same trends: in the period 1979-1984 there were differences in the dimensions of poverty between the three-year period, 1981-1983, in which inflation was high but rather steady and the two single years 1980 and 1984, in which inflation surged to higher levels. In the 1981-1983 period, the percentage of population with net income below the poverty line declined gradually by 19%, and the poverty gap narrowed by 10%. In 1983 the lowest poverty dimensions were observed according to almost all indices. The percentage of the poor population, which rose to 16.7% in 1980, declined to 13.6% in 1983, and the poverty gap declined from 27% of the poverty line in 1980 to 24% in 1983. The four poverty indices, PS, PF, PK and PB that combine (and weigh) all three dimensions of poverty showed even a greater decrease in poverty, by 28% (according to PS and PK) and by 38% (according to PF and PB). In contrast, in 1980, the Head Count ratio rose by 10%, and the Poverty Gap ratio rose by 6%. Similarly, in 1984, as a result of the upsurge of inflation, the Head Count and the Poverty Gap ratios increased by 16%. Only in 1984, the poverty measures PS and PK rose by about 28% while the PF and PB measures rose by 35% and more.

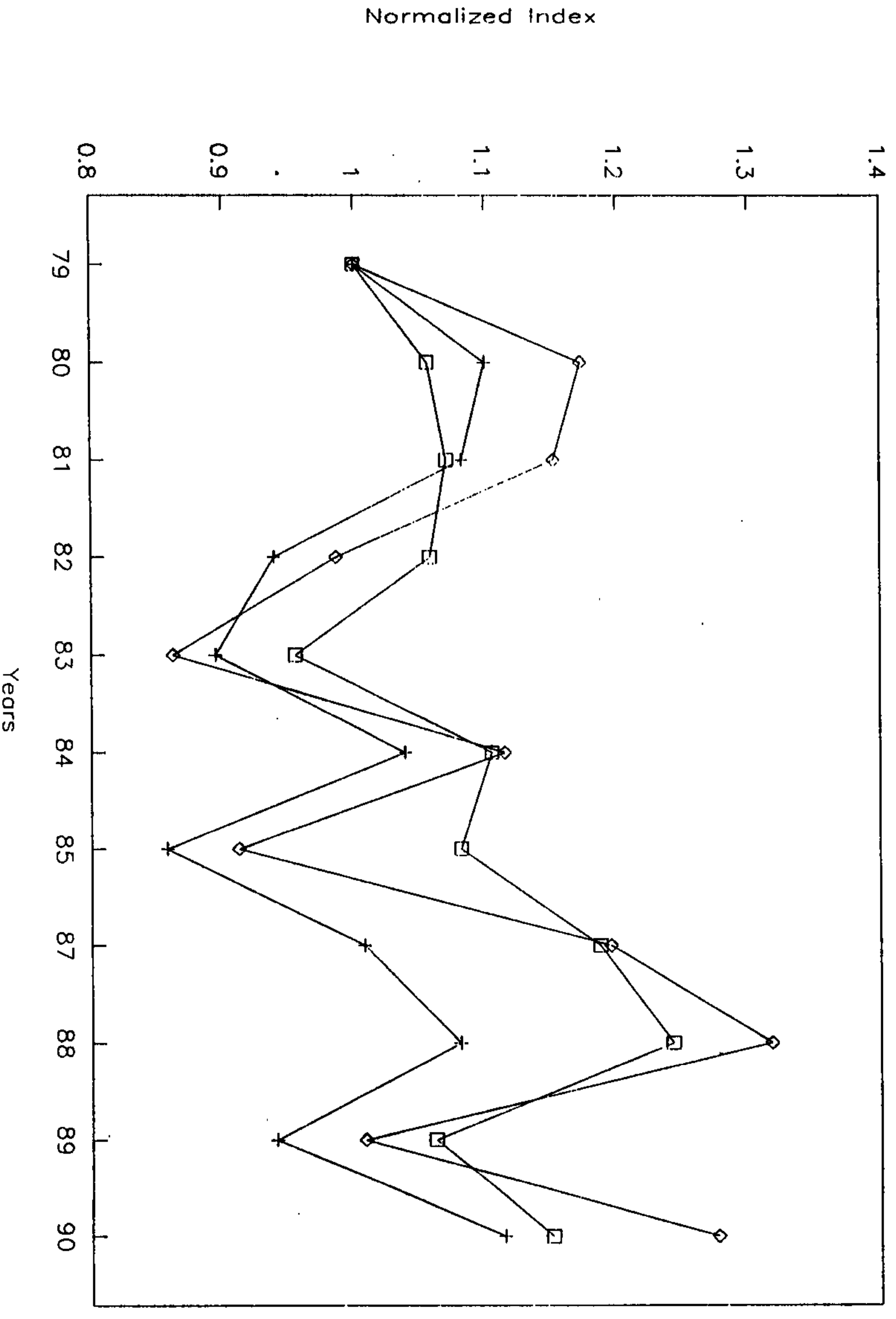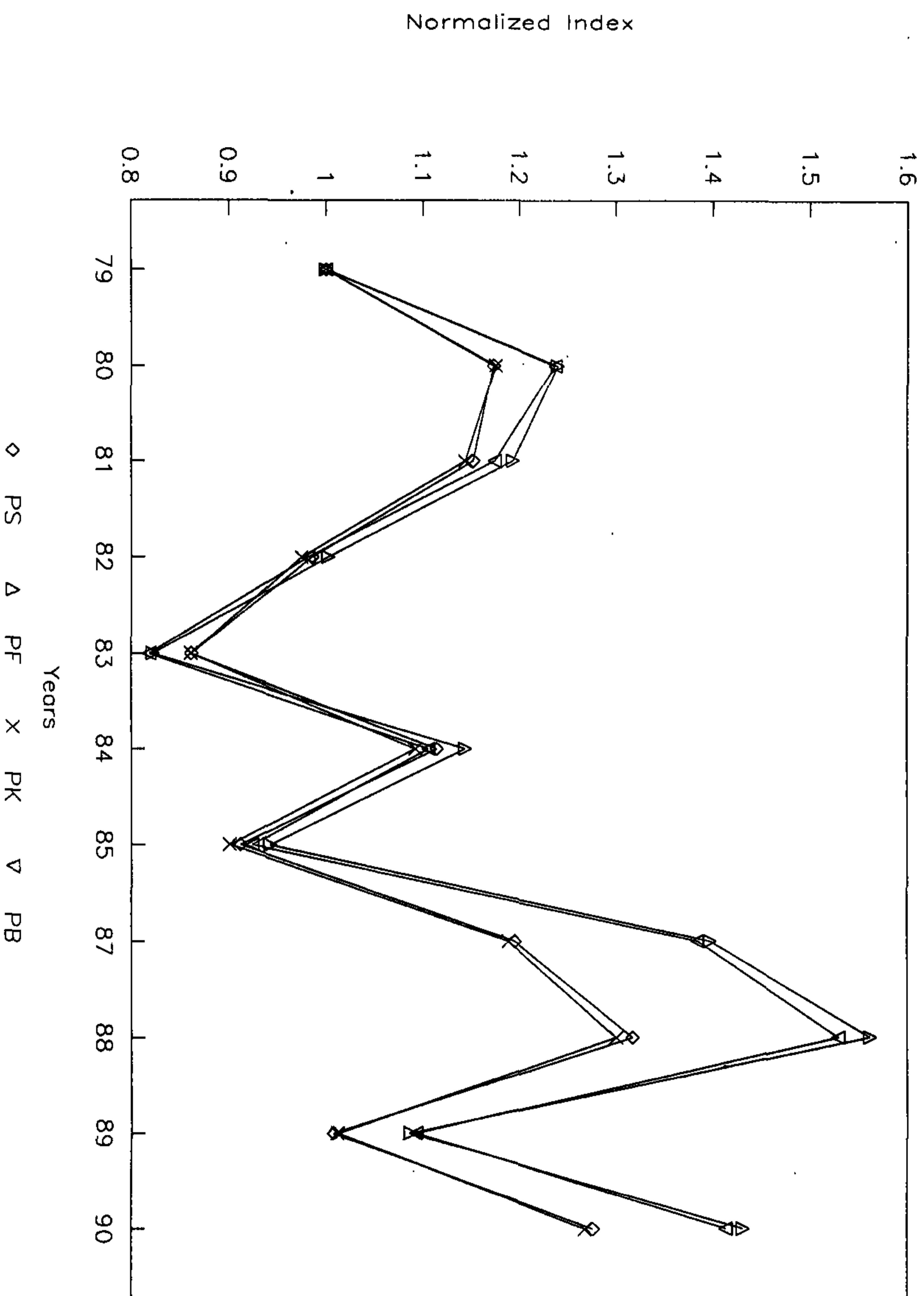Figure 2a: Poverty Measures (net income)

Figure 2b: Poverty Measures (net income)

◇ PS   △ PF   × PK   ▽ PB

Normalized Index

Years

In 1985, the trend reversed again, the percentage of the population with net income below the poverty line fell from 15.8% in 1984 to 13%, that is, a decline of 17%, but the poverty gap declined by only 2% and remained at the level of 28% of the poverty line. The other poverty measures also fell by 17% .

During the years 1987-1990, the period of low and stable inflation, poverty dimensions continued to fluctuate: increasing in 1987 and 1988, decreasing in 1989 and increasing again in 1990. The percentage of the poor population rose from 13.0% in 1985 to 16.4% in 1988, declined to 14.3% in 1989 and rose again to 16.9%. The Poverty Gap rose from 27.6% of the poverty line in 1985 to 31.8% in 1988 and after declining to 27.1% of the poverty line in 1989 it rose again to 29.4% in 1990. Over the entire period, 1985-1990, the Head Count Ratio rose by 30%, and the Poverty Gap by only 6.5%. The other poverty measures increased even more: for instance, the PS measure showed an increase of 40%, and the PF measure an increase of 52%.

The changes in poverty during the period under survey were affected mainly by the changing level of the social security benefits. The growth in the unemployment rate appeared to have an impact only during the second half of this period. In the years 1979-1983 the economic income poverty measures remained almost unchanged, despite the rise in the rate of employment (from 3% in 1979 to 5% in the years 1980-1983), apparently because of the increase in the minimum wage rate that followed a new minimum wage agreement. In contrast, the expanding unemployment since 1984 (up to 9.4% in 1990) contributed, undoubtedly, to a rise of 25% in the economic income Head Count measure in that period.

Table 4 presents a number of indicators for assessing the overall effect of social security benefits and the income tax system on the poor population (See also Table 2). These indicators clearly demonstrate that the frequent adjustments in the benefits were more than successful in offsetting the negative effects of the inflationary tides in 1980 and 1984, and was the single most

TABLE 4 — THE EFFECT OF THE PUBLIC TRANSFERS AND INCOME TAX ON POVERTY: SELECTED INDICATORS

	1979	1980	1983	1984	1985	1987	1988	1989	1990
Head Count – Families (%)									
1. Economic income	27.8	28.1	29.8	31.0	31.3	32.6	32.6	33.0	34.3
2. Net income	17.7	15.7	12.6	14.8	11.4	13.8	14.2.	12.8	14.3
3. (2)-(1) as % of (1)	36.3	44.0	57.7	52.3	63.6	57.8	56.4	61.2	58.3
Head Count – Persons (%)									
1. Economic income	23.8	24.2	24.3	25.9	26.3	27.3	28.0	28.0	30.4
2. Net income	15.2	16.7	13.6	15.8	13.0	15.3	16.4	14.3	16.9
3. (2)-(1) as % of (1)	36.1	31.0	44.0	39.0	50.6	44.0	41.5	49.0	44.4
Poverty Gap (%)									
1. Economic income	58.4	58.6	61.4	62.6	66.5	63.2	63.7	64.6	66.4
2. Net income	25.6	27.0	24.4	28.2	27.6	30.4	31.8	27.1	29.4
3. (2)-(1) as % of (1)	56.2	53.9	60.6	55.0	54.3	51.9	50.2	58.0	55.7
PS									
1. Economic income	0.188	0.191	0.198	0.213	0.227	0.228	0.235	0.238	2.262
2. Net income	0.056	0.066	0.049	0.063	0.051	0.067	0.074	0.057	0.072
3. (2)-(1) as % of (1)	70.2	65.4	75.2	70.4	77.5	70.6	68.3	76.1	72.5
PF									
1. Economic income	0.113	0.115	0.124	0.133	0.151	0.146	0.151	0.156	0.175
2. Net income	0.017	0.021	0.014	0.024	0.016	0.024	0.027	0.019	0.025
3. (2)-(1) as % of (1)	85.0	81.7	88.7	82.0	89.0	83.6	82.2	88.0	86.0

important factor in the continuous decline in poverty in 1981-1983, and in 1985. However, the frequency of updating the *income tax brackets remained unchanged with rising inflation* rates, and during the years 1980-1983 the level of the income (relative to wages) threshold did not increase, and eroded even more in 1984, as inflation surged to a higher level. Therefore, the negative impact of the income tax on poverty during these years was relatively strong: in 1983, the benefits raised the income of 54% of the poor population to above the poverty line, compared with 44% in 1980. But, after taking account of tax payments, the reduction rate in the Head Count measure fell to 44% in 1983 (compared with 31% in 1980). In 1984, the overall efficiency of transfers and income tax in reducing poverty decreased, and only 39% of the poor persons were raised above the poverty level. The erosion in social security benefits and in the income tax threshold - much more than the erosion in real wages - accounted for the rise in net income poverty.

When it became clear that even the frequent adjustments of the benefit values could not keep pace with inflation, the government introduced temporarily special updating arrangements, especially for benefits given to low income families. This, along with the drastic curb in inflation after the implementation of the stabilization policy in July 1985, contributed to a significant, but temporary, improvement in benefits and income tax threshold levels. In 1985, the benefits raised 54% of the poor population to above the poverty line, and the income tax payments reduced this rate to 51% only. In this year, the decline in the net income poverty, most of which was due to the decrease in the size of the poor population, took place in spite of the rise in the economic income poverty. However, when prices were stabilized in 1987-1990 and after the validity of the special regulations for updating the benefits expired, the level of the benefits decreased in 1987 but remained stable in 1988-1990. This, together with rising economic income poverty, diminished the overall efficiency of benefits and income tax in reducing poverty in the years 1987-1988 and in 1990. In these years the benefits raised the

income of 42%-44% of the poor population to above the poverty line. 1989 is an exception; the observed decline in poverty and the observed increase in the contribution of the benefits to the reduction of poverty are difficult to explain, since in 1989 the level of benefits did not change. One possible explanation is the decline of the poverty line itself (as a result of a real decline in the median income), whereas the average net income of the poor increased slightly.

Table 5 shows the contribution of the changes in each of the three components that determine the poverty level to the overall change in the net income poverty. These components are the 'width' of poverty as measured by the Head Count ratio; the 'depth' as measured by the Poverty Gap ratio and the 'relative deprivation' as measured by income inequality among the poor. These contributions were taken from the logarithmic differential of the poverty indices PS and PF[5].

The table shows that during the period 1979/1990 the rise in overall poverty - as indicated by PS and PF - was caused, more or less equally, by the rise in each one of the three factors. In contrast, during the period 1985 - 1990, the poverty gap and income inequality contributed only marginally to the rise in total poverty, and most of the rise was due to the increase in the size of the poor population.

In the years 1980-1983, during which poverty declined, almost 70% of the decline in the overall poverty was contributed by the decrease in the size of the poor population; that is, the increase in the benefit levels sufficed only to raise the income of those poor whose income was close to the poverty line, but was insufficient to generate a substantial decrease in the poverty gap or to narrow significantly the disparities in the net income among the poor. This conclusion is even more prominent in 1985. The decline in overall poverty in 1985 was due, almost entirely, to the increase in the number of the poor; the poverty gap remained

Table 5:   Analysis of the Changes in Overall Poverty

| Period | Poverty Measure | % of Change | Contribution to the Changes in Overall Poverty | | | |
			'Widening'	'Deepening'	'Relative Deprivation'	Total
1979/1990	PS	+28	43	33	24	100
	PF	+43	28	33	39	100
1985/1990	PS	+40	79	10	11	100
	PF	+52	63	13	24	100
1980/1983	PS	-26	67	19	14	100
	PF	-34	51	22	27	100
1983/1984	PS	+29	58	33	9	100
	PF	+39	46	39	15	100
1984/1985	PS	-18	95	7	-2	100
	PF	-18	98	12	-10	100

almost unchanged and the income inequality among the poor even rose slightly.

V. **POVERTY AMONG THE ELDERLY AND LARGE FAMILIES**

The economic status of the elderly and of large families (with 4 children or more) has always been of particular concern to the policy makers in Israel. On average, 60-65% of the elderly population had in 1979-1990 an economic income lower than the poverty line, and their own economic income accounted for only 20% of the poverty line income. Among large families almost half were poor and their economic income fell short of the poverty line by as much as 50% in 1979-1984 and 60% in 1985-1990. These two groups thus depend for their livelihood on the social security system and they are highly vulnerable to any adverse changes in their benefits. The social policy that was implemented during the high inflation years was more favorable, however, towards the elderly population, whereas large families suffered from almost continuous erosion of their child allowances. The National Insurance Institute has made continuous efforts to maintain the purchasing power of the benefits to the elderly as well as of their value relative to the average wage in the economy, and adapted a policy of automatic and increasingly more frequent adjustments of the benefits to cope with the inflation tides. In contrast, during the entire period of inflation, the child allowance updating mechanism was changed only once (1981). Furthermore, the partial compensation given to large families in 1983-84 by raising their child allowances did not succeed in maintaining the real value of the allowance as inflation went up in 1984. In that year the real and relative value of the child allowances reached its lowest point. Only after the stabilization policy had been implemented, was a sharp real increase noted in the value of the child allowance - at an accumulated rate of 45% in 1985-86 - due only to the drastic decline in the inflation rates.

Table 6 presents selected indicators of the changes in poverty among the elderly and in their social security benefits (the basic old age pension and the minimum guaranteed income). It shows that the critical dependence of the elderly poor on these benefits (which amount to almost 90% of their gross income) made them extremely vulnerable to any change in the benefit value - that may have come either as a result of policy changes or due to the inflationary erosion of benefits.

In 1979 the erosion of the benefits was the deepest and the level of poverty among the elderly was the highest: 35% had net income below the poverty line and their average net income - after all the transfer payments were included - fell short of the poverty line by more than 20%. Improvements in the benefits in 1980-82 led to a gradual decline in poverty, and in 1982 only 10% of the elderly were poor. However, the inflationary jump in 1984 eroded once again the relative value of the benefits despite all the adjustments, and the percentage of the elderly population with net income below the poverty line rose to 21% in 1984. At that point the government decided to introduce additional improvements in the updating mechanisms, which came into effect in 1985. As a result, the benefit level rose and poverty declined. In 1985, 13% of the elderly were poor. In 1987-1990, the benefit level was maintained and the percentage of the poor elderly even declined to 12% in 1990. The share of the poor elderly in the total poor population declined from 29% in 1979 to 8.5% in 1990. The most noteworthy finding from Table 6 is the very large variations in the percentage of the poor elderly, whereas the changes in the poverty gap were rather small. The reason is that the minimum income guaranteed to the elderly is set very close to the poverty line (especially for a single and couple), and therefore even small changes in that level led to relatively large changes in the Head Count Ratio.

The trends in poverty among large families were markedly different as can be seen in Table 7. The percentage of these families with net income below the poverty line rose from 26% in 1979 to 36% in

Table 6:   Indicators of Changes in the Social Security Benefits[a] and of Poverty Incidence among the Elderly

Indicator	1979	1980	1981	1982	1983	1984	1985	1987	1988	1989	1990
1. Head Count (%) (Net Income)	34.8 ·	25.3	25.8	10.3	18.9	20.6	13.1	14.0	13.2	10.5	11.8
2. The elderly poor as percent of the poor population (%)											
– Families	53.6	39.1	40.7	18.4	37.5	36.5	23.7	21.1	21.0	18.4	17.9
– Persons	29.0	18.3	19.5	9.2	17.6	16.8	11.9	10.9	9.7	8.8	8.4
3. Proverty Gap (%) (Net Income)	19.7	18.9	16.7	19.6	17.2	22.0	22.7	20.4	19.4	17.9	20.2
4. The reduction in the Head Count by Social Security Benfits (%)	42.4	57.4	58.9	83.8	71.3	69.0	80.6	78.0	79.3	83.3	81.3
5. Percentage change in PS index among the elderly (Net Income)	--	-22.3	-9.6	-51.0	+55.0	+30.2	-37.6	+4.4	-9.0	-24.7	+18.4
6. Real changes in the basic old-age benefit	-0.7	+1.4	+17.0	+10.0	+1.7	-1.1	2.0	10.8	9.5	1.4	-0.1
7. Basic old-age benefit as percent of the average wage[b]	12.1	12.4	13.7	14.5	14.0	14.0	15.1	14.8	15.3	15.4	15.9
8. Real change in the minimum guaranteed income (%)	-0.6	+10.8	+9.5	+10.4	+1.0	-2.8	+10.3	-6.1	+9.0	+0.6	-3.3
9. Minimum guaranteed income as percent of the average wage[b]	20.5	22.9	23.7	25.1	24.2	23.7	27.5[c]	24.6	25.2	25.2	25.3

[a] Calculated to fit the income survey's periods which was different from the calander year.

[b] For a single person.

[c] During 1986 the minimum guranteed income peaked up to 29% of the average wage.

Table 7: Indicators of Poverty Incidence among Large Families[1] and of their Social Security Benefits

Indicator	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1. Percentage of the population with large families having net incomes below the poverty line	26.4	36.2	36.4	35.4	31.0	34.4	31.2	--	26.6	36.4	28.0	35.3
2. Percentage of poor large families in the total poor families	11.4	17.2	13.9	23.8	16.4	15.9	16.8	--	14.7	17.2	14.5	17.3
3. Percentage of poor in large families in the total poor population	30.5	37.8	32.1	41.5	37.0	36.3	34.5	--	29.6	34.4	29.2	34.3
4. Average shortfall of their net income from the poverty line (%)	24.7	29.8	30.4	26.9	24.0	30.6	29.1	--	26.1	27.6	26.1	25.3
5. Real change in child allowances for families with 4 children (%)	-7.5	-10.6	+2.1	+3.3	+3.7	-3.8	+13.5	+36.0	0	+0.7	+2.6	0
6. Child allowances as percent of the average wage	20.3	18.3	17.6	17.5	17.3	16.8	19.6	26.3	23.8	22.5	23.0	23.4
7. Percentage change in the poverty measure PS among large families (net income)		+58.7	-0.1	-12.6	-19.3	+30.9	-9.3		-23.3	+41.0	-27.2	+25.9

[1] Families with 4 children or more

[2] Calculated to fit the Income Survey's period which was different from the calender year.

[3] Includes also Family Allownace for Veterans. Only some 60% of all large families receive Family Allowance for Veterans.

1980, and remained high, though rather steady, in 1981-1982 (except for a slight decrease in 1983). Only after a sharp increase in the value of the child allowances and in the level of the tax threshold - as a result of the drastic decline in inflation - the percentage of the poor among large families declined gradually to 27% in 1987. But, this percentage increased again to 35% in 1988 and 1990. During the entire period, poor large families constituted 30% - 40% out of the total number of poor families.

1) The extended rank weighted coefficient of variation implicit in Bigman's measure is given by:

$$ECV^2 = A \sum_{i=1}^{q} R_i \frac{(Y_i - \bar{Y})^2}{\bar{Y}^2}$$

where $\bar{y}$ is the _weighted_ average income and $R_i = q+1-i$. Similarly, G^* is the rank weighted poverty gap ratio.

2) With the exception of 1986.

3) The sample therefore does not include the population in rural areas, especially in Moshavim and Kibbutzim, nor does it include households in urban areas whose head was self-employed. Data for latter households were found to be incomplete.

4) No. of

Persons	1	2	3	4	5	6	7	8
No. of Standard Adults	1.25	2	2.65	3.20	3.75	4.25	4.75	5.20

and the weight of each additional person is D.40.

5) Thus for example the percentage change in Sen's poverty measure is (approximately) given by:

$$\hat{PS} = \hat{H} + \hat{G} \left[\frac{G(1-I_p)}{G(1-I_p) + G} \right] + \hat{I_p} \left[\frac{I_p(1-G)}{G(1-I_p) + G} \right]$$

where the sign $\hat{}$ over a variable denotes its logarithmic time differential.

R E F E R E N C E S

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