NATIONAL INSURANCE INSTITUTE
Bureau of Research and Planning

NATIONAL INSURANCE INSTITUTE

Bureau of Research and Planning

THE PERFORMANCE OF THE OLD AGE BENEFIT SCHEME IN ISRAEL

UNDER RAPID INFLATION: 1979 - 1984[*]

by

Lea Achdut and David Bigman[**]

THE PERFORMANCE OF THE OLD-AGE BENEFIT SCHEME IN· ISRAEL

UNDER RAPID INFLATION: 1979 - 1984

Introduction

The objective of this paper is to evaluate the performance of the Israeli National Insurance Institute benefit system to the elderly population and of the adjustments made in these benefits during the years of rapid inflation. As performance indicators we examine the changes from year-to-year in poverty and income inequality among the elderly population. In section I we outline the basic structure of the pension system in Israel and the methods designed to maintain the real value of the National Insurance Institute (N.I.I.) benefits during the years of high inflation. In section II we review briefly the economic theory of poverty measures and define the specific measures that will be used in this study. In section III we examine the main trends in poverty and inequality among the elderly population during the years 1979-1984.

I. Israel's pension system

Israel's system of pensions for elderly, survivors and disabled people consists of two principal tiers: the first is the state tier which is operated by the National Insurance Institute and its task is to ensure basic economic security for the elderly. The second tier — the occupational pension — is operated by means of public and

voluntary insurance arrangements, and it encompasses the Histadrut (General Labour Union) pension funds and the budgetary pension paid by law to public service employees.

Old-age and survivors insurance, much like other social insurance programs, incorporates income distribution and social welfare considerations - in addition to pure insurance considerations - such as reducing poverty and narrowing of social disparities. These considerations are reflected in the premiums paid by insurees, in the requirements of eligibility and in the universal basis of the pensions, which does not require (with some exceptions) any test of means for materializing entitlement. Every resident of Israel is insured under the Old-Age and Survivor's Insurance Law and has to pay premiums regardless of his participation in the labour market. The level of old-age and survivors pensions does not depend on the insuree's income at the time of employment and is only loosely related to the duration of the insurance. Instead, their level is determined by law at a uniform rate as a percentage of the average wage rate in the economy, according to the number of persons which depend on the elderly person for their livelihood.

Elderly people and survivors who are not insured under the National Insurance Law are guaranteed a special pension (at the basic level) which is financed by the state. Included in this category are

immigrants who reached the eligibility age before they came to Israel and elderly people who reached that age before the National Insurance Law was enacted. At the present, virtually all elderly people in Israel are entitled to a pension from the National Insurance Institute.

The supplementary occupational pension system of the Histadrut is, in contrast, basically quasi-voluntary and anchored in collective labour contracts. Self-employed, certain groups of employees and non-employee workers are not insured at all within Histadrut pension schemes. In the occupational pensions system the insurance element is, of course, dominant. The level of the pension depends on the numbers of working years and the income from work of the eligible elderly person during the period preceding his retirement. The maximum wage replacement rate in the occupational pension is 70 percent. The occupational pension scheme is relatively new in Israel, and a considerable proportion of the elderly population is not covered at all by this scheme. As a result, most elderly people in Israel do not have any source of income other than their National Insurance pension. Only 40 percent of the elderly people have any occupational pension, and only a small percentage of those have accumulated the maximum pension rate while most of them have accumulated relatively low rates.

The basic old-age or survivors benefit paid by National Insurance is rather low and cannot guarantee an acceptable standard of living. Originally, this benefit was intended to be only a supplement to the occupational pension. In practice, however, for a considerable proportion of the elderly population this benefit is the only or the major source of income. In 1965 it was therefore decided to introduce a selective scheme for elderly people - the supplementary benefit program - which would guarantee a minimum income to all of them. This program is financed by the government but implemented by the National Insurance Institute. In the early 1970s it became evident, however, that even the addition of the selective scheme was not sufficient to raise the incomes of the elderly people above the poverty line. To alleviate the state of the elderly, a minimum level of income was determined and every elderly person was entitled to a supplement to his income up to that level. In 1974 the program of guaranteed minimum income was implemented, first to elderly people and widows, and in 1975 it was extended to other population groups. In 1982 it was anchored in the Income Guarantee Law.

The level of the guaranteed minimum income was fixed as a percentage of the average wage as "defined by law":[1] 25 percent for an individual, 37.5 percent for a couple and additonal increments for each of the first two children. These minimum levels approximately correspond to the poverty line incomes. In 1975, almost 50 percent of

all elderly people or survivors (most of them old) pension recipients were entitled to income supplements. In 1985 that percentage had gradually declined to 40 percent, mainly as a result of the rise in the proportion of the elderly who receive occupational pension. This trend is likely to continue in future.

Table 1

Composition of Gross Income of Elderly by Income
Source and by Quintiles (in percentages)[*]

Income Source		Quintiles				
	All	1	2	3	4	5
Employment income	13.6	1.7	2.0	7.1	11.0	20.1
National Insurance transfers	32.0	89.1	83.8	49.5	28.3	10.6
Occupational pensions	21.0	3.4	6.4	23.3	29.3	22.0
Other income	33.4	5.8	7.8	20.1	30.4	47.3

[*] Average for the years 1979-1984.

Neverthelesss, the benefits to the elderly paid by the National
Insurance Institute still constitute the single most important source
of income for a majority of the elderly population. As can be seen in
Table 1, the N.I.I. benefits constitute 90 percent of the gross income
of the lowest quintile of old-aged families and 84 percent of the
gross income of second quintile. Even in the third quintile, more than
50 percent of their gross income came from the N.I.I. benefits.
Furthermore, since as we shall see below, economic income is
distributed very unequally among the elderly, the vast majority of the
elderly of the lowest two quintiles depend almost entirely on the
N.I.I. benefits for their livelihood.

Changes in the level of the benefits paid by the National
Insurance Institute and their adjustment to developments in the
economy has started already in 1973. The policy that was gradually
formed, attempted to prevent erosion in the value of the benefits
relative to the average wage rate by means of an automatic updating of
the benefits that was anchored in the National Insurance Law, instead
of recurring amendments. Basic old-age and survivors benefits and the
income support benefit paid to other weak population groups were
linked to changes in the average wage. Linkage to the average wage was
intended to insure that with the rise in the standard of living of the
general population, the living standard of benefit recipients would
not lag behind.

The acceleration of inflation after 1977 often reduced, however, the ability of the automatic updating system to prevent the erosion of the benefits. One weakness of the system was definition of the average wage which served as the basis for updating wage-linked benefits, not as the actual average wage at the time of updating but rather an estimate, termed the "average wage as defined by law" (since the formula of its calculation appears in the National Insurance Laws), which is based on the wages three months earlier. At high rates of inflation, however, even the three months lag could cause a significant erosion in the beneftis. Furthermore, during the period between the two consecutive updatings, the benefits eroded at a precipitated rate as inflation accelerated.

To prevent the erosion of the National Insurance benefits, continous changes have been introduced since 1978 into the method of calculating and updating them. In order to illustrate the dynamics of the process of adjusting the benefits let us examine the changes introduced into the method of updating the level of the guaranteed minimum income. In 1975 and 1976 the guaranteed minimum income was updated once a year (in April) according to the changes in the (estimated) average wage. In addition, raises during the year were made according to the cost-of-living increments. From January of 1977 these benefits were updated twice a year according to changes in the average wage rate. In December 1978 an additional amendment was introduced which raised the minimum income each time that the

accumulated price increase since the last updating exceeded 10%. From April 1980, the frequency of updating further increased as benefits were adjusted each time that all wage-earners received a cost-of-living increment. In September 1980, as inflation accelerated to an annual rate of over 100 percent, current updatings based on the cost-of-living index were made each time that prices rose by 5% or more. As a result of this amendment, the guaranteed minimum income was updated almost every month in accordance with the rise in either wages or prices. This latter method of updating succeeded in preserving the value of benefits paid to low-income groups until 1984 when inflation reached such high levels (more than 25 percent monthly) that even this method could not maintain the real level of the benefits. At the end of the first quarter of 1984, the level of the guaranteed minimum income reached lowest level both in terms of its relative prices and vis-a-vis the average wage. In view of these developments the government decided on a temporal regulations of revising the method of updating of benefits. A floor level of income was determined for basic old-age and survivors pensions and the calculated "average wage - as defined by law" was adjusted to include all the cost of living and wage increments up to that date. On the other hand, from that date, the guaranteed minimum income was updated monthly according to the full rate of the price increase regardless of the change in wages. This method not only prevented an erosion in the purchasing power of the benefits, but also played a critical role in maintaining the benefits when real wages fell sharply as a result of the economic

policy that was introduced in July 1985. This method of updating continued until June 1986.

Reforms were introduced in the linkage methods of pensions in the occupational pension system too. Until 1979 the pensions of the Histadrut funds were linked to the pensioner's last wage grade. In 1979 most sectors of the economy introduced linkages to the consumer price index. In April 1984 the Histadrut gradually linked the pensions to the average wage in the economy in order to improve the situation of the pensioners in periods when real wages rise. Budgetary pension, in contrast still remained linked to the pensioner's previous wage.

II. The Economic Theory of Poverty Measures

The most common measure of overall poverty in empirical studies is the percentage of the poor in the total population. This measure is called in the economic literature the Head Count ratio. The main weakness of this index is that it does not reflect the depth of poverty, i.e., the size of the poverty gap, which indicates whether a person is just below the poverty line or very far from it. Another common measure is the Poverty Gap, which measures the aggregate shortfall of the poor's income from the poverty line, or, in relative terms, the percentage shortfall of the poor's average income from the poverty line. This latter measure is called the "income gap ratio". The Poverty Gap measure does not reflect, however, the "width" of

poverty, i.e., the size of the poor population, and therefore it can only supplement the Head Count ratio. Moreover, neither the Head Count nor the Poverty Gap give information on the inequality in the distribution of the poverty gap among the poor.

In a seminal paper Amartya Sen (1976) has proposed three basic axioms that poverty measures should satisfy. These are:

(F) *The Focus Axiom: Poverty is measured on the basis of the incomes of the poor only.*

(M) *Monotonicity Axiom: Given other things, a reduction in the income of any poor individual must strictly raise the measure of aggregate poverty.*

(T) *Transfer Axiom: Given other things, a transfer of income from a poor individual to any one who is richer must strictly raise the measure of aggregate poverty.*[2]

It is easy to see that the Head Count measure violates the monotonicity and the transfer axioms, except for the case in which the raise of income allows the recipient to cross the poverty line. The Poverty Gap measure satisfies the monotonicity axiom but violates the transfer axiom, except for the above mentioned case.

Sen proposed a general structure for aggregate poverty measures as a weighted sum of the individuals poverty; the individual poverty

itself was measured by the income gap up to the (predetermined) poverty line, and the weights of the aggregate measure were determined so that the measure will satisfy the three basic axioms. The weighting scheme that Sen has proposed is based on a person's relative rank in the income distribution, so that the poorest of the poor has the highest weight. The weight attached to a person i's poverty gap, R(i), is (q+1-i) where q is the number of the poor. According to this weighting scheme the poverty measure has the following form:

$$P(Z,Y) = A \sum_{i=1}^{q} R(i) \frac{(Z - Yi)}{Z}$$

where A is a constant, Z is the poverty line and the poor person i's poverty gap is given by Z-Yi. Sen determined A in such a way that if all the poor have the same income, then P(Z,Y) = HG. Sen then showed that this poverty measure can also be written as:

$$P(Z,Y) = H\left[G + (1-G)I^p\right]$$

where I^p is the Gini coefficient of income inequality among the poor. This form shows that Sen's measure reflects the three components of the overall poverty; namely, the "width", the "depth" and the degree of inequality among the poor or the "relative deprivation".

The literature on poverty measures that followed the work of Sen has generally taken his basic approach. A considerable number of

alternative poverty measures have consequently been proposed which satisfy Sen's three axioms, but differ in their functional form (see e.g., Kakwani 1980, Thom 1979, Anad 1977, Foster, Grear and Thorbeck 1984).

In this paper we limit ourselves to three poverty indices: the Head Count, denoted by H, the Poverty Gap ratio (G), and the poverty measure proposed by Sen, denoted by PS. We also examine the trends of inequality among the general elderly population and among the poor population.

Data sources are the annual income surveys, which the Central Bureau of Statistics has conducted since 1965. The investigation unit in these surveys is the individual household in urban localities. The poverty and the inequality measures were calculated according to three income definitions: (1) Economic income which includes all current income prior to deductions and transfer payments (mainly, income from employment, property income and occupational pensions). (2) Gross income which equals economic income plus cash transfer payments, and (3) net income which deducts from the gross income all the obligatory payments (income tax and social security). The definition of the poverty line in our analysis is the same as that of the National

Insurance Institute. The poverty line per "standard adult" is set at 40% of the median "equivalent" gross income.[3]

III Trends of Poverty and Inequality Among the Elderly

Table 2 presents the levels and year-to-year changes in poverty among the elderly population in 1979 through 1984. In 1979 the erosion of the National Insurance benefits paid to elders and survivors was the highest and, as a consequence, the level of poverty was unusually high. Improvements in the benefits in 1980-1982 brought to a sharp decline in poverty, mainly in 1982. The inflationary shock in 1984 eroded the benefits despite all the improvements in the adjustments, to the extent that poverty rose back to its 1979 level.

The year-to-year changes in the benefits' real and relative value are shown in Table 3. In 1979 36 percent of the elderly population[4] had net income below poverty line, and, on average, their net income fell short of the poverty line income by 20 percent. In 1980 through 1982 that percentage of the elderly poor declined to less than 14 percent and the poverty gap declined to 16.7 percent of the poverty line. In 1983 through 1984 the Head Count ratio more than doubled, and the poverty gap rose by 35 percent. Sen's measure indicates a much sharper increase of poverty only in 1984, at a rate of 50 percent, whereas the head count rose by 21 percent and the poverty gap by 29 percent.

Table 2
Poverty Measures of the Elderly Population
(Net Income)

		Y e a r s					
		1979	1980	1981	1982	1983	1984
Poverty	Index	0.208	0.187	0.169	0.168	0.175	0.226
Gap	(Rate of change)	--	(-10.29)	(- 9.33)	(- 1.11)	(4.37)	(29.04)
Head	Index	0.359	0.267	0.259	0.135	0.252	0.306
Count	(Rate of change)	--	(-25.90)	(- 2.95)	(-47.89)	(86.82)	(21.43)
Sen's	Index	0.099	0.075	0.065	0.036	0.065	0.098
Measure	(Rate of change)	--	(-25.24)	(-12.21)	(-45.63)	(82.30)	(51.12)

Table 3
Indicators for Changes in Social Security
Benefits for the Elderly*

Indicators	1979	1980	1981	1982	1983	1984
1. Real change in the basic old age benefit*(%)	-0.7	1.4	17.0	10.0	1.7	-1.1
2. Basic old age benefit** as percent of the average wage	12.1	12.4	13.7	14.5	14.0	14.0
3. Real change in the minimum guaranteed income*(%)	-0.6	10.8	9.5	10.4	1.0	-2.8
4. Minimum guaranteed income**as percent of the average wage (%)	20.5	22.9	23.7	25.1	24.2	23.7

* The average benefit and its real changes were calculated to fit the income
** survey's period, which were different from the calendar year.
For a single person.

FIGURE 1:
POVERTY MEASURES
NET INCOME
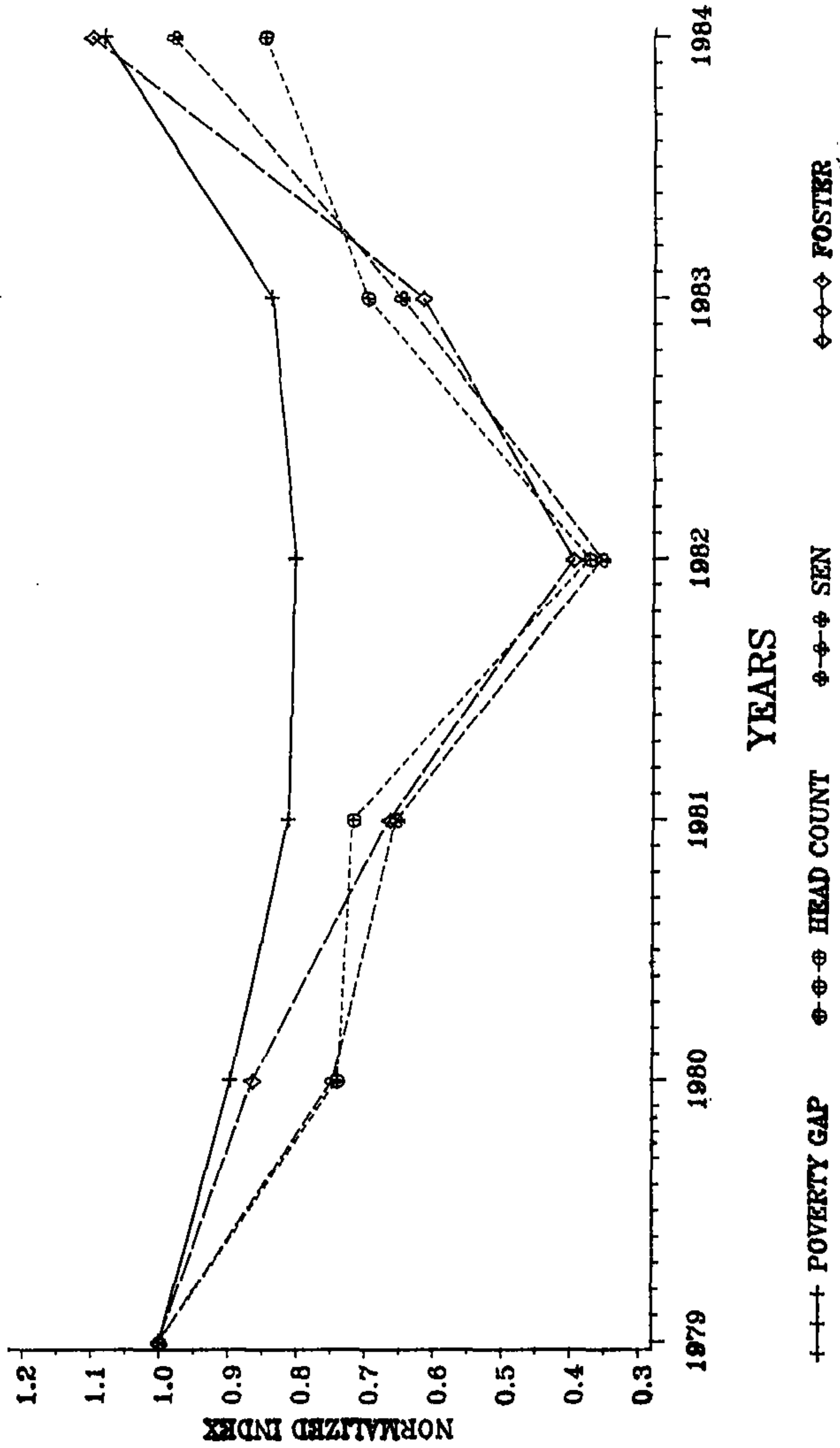
To further emphasize the different trends registered by the different indices, we have normalized their value in the various years by their values in 1979. The normalized poverty indices, which manifest the percentage changes from that base year, are presented in Figure 1.

Table 4

Poverty Incidence Among the Elderly

	1979	1980	1981	1982	1983	1984
Percentage of the elderly people* in total population	12.6	12.1	12.4	12.6	12.6	12.9
Percentage of elderly poor of the total poor population	28.0	18.1	19.3	10.6	19.2	18.8
Percentage of poor elderly families in the population of poor families	52.3	40.2	40.4	22.8	40.4	40.7

* People living in families whose head is elderly.

Table 4 shows that the elderly poor constituted almost one fifth of the entire poor population although their share varied widely from year to year. This percentage was almost double the share of the elderly population in the general population. In terms of families, the share of the poor elderly was on average more than 40 percent of the total number of families in the population.

The most striking finding of the yearly poverty trends is the very large variations in the percentage of the elderly whose income fell below the poverty line, whereas the changes in the poverty gap measure in most years were rather small. The reason is the very high concentration of the incomes of the elderly population around the poverty line. Since the National Insurance benefits are the primary source of income of some 60 percent of the elderly population, and since these benefits are supplemented by the guaranteed minimum income up to a level approximately equal to the poverty line, almost 40 percent of the entire elderly population had net incomes of little more or little less than the poverty line. On average some 20 percent of the entire elderly population had net incomes less than 95 percent of the poverty line and another 20 percent had net incomes ranging from 95 percent to 115 percent of the poverty line. Therefore, even the small changes in the National Insurance benefits (mainly the supplementary benefits) relative to the average wage have led to large changes in the Head Count ratio. In 1982, for example, a small decline

of about 1 percent in the poverty gap, as an effect of the rise in the N.I.I. benefits, was followed by a decline of 50 percent in the percentage of the elderly poor. In 1983 an increase of 4.4 percent in the poverty gap was followed by an increase of as much as 87 percent in the Head Count ratio. Most of the elderly whose income in 1982 exceeded the poverty line or fell just short of it in 1983, remained, however, around the poverty line. For the elderly family there is only a minute difference in its economic situation whether its income rises from 95 percent of the poverty line to say 105 percent. The Head Count ratio may then indicate, however, a dramatic change, thus suggesting a very large improvement in the performance of the N.I.I. system. These changes would reflect, however, mostly the problem inherent in an arbitrary determination of the poverty line, on the basis of which the performance of the system is gauged.

As mentioned, the net income of some two-thirds of the elderly population is dominated by the social security benefits. Table 5 shows that on average some 60 percent of the elderly population had economic incomes lower than the poverty line and their incomes accounted to only 20 percent of the poverty line incomes. The social security benefits provided more than half of those with net incomes higher than the poverty line[5], and brought the average income of those who remained poor to some 80 percent of the poverty line, thus reducing the poverty gap by about 75 percent.

Table 5
Poverty Measures of the Elderly Population
(Economic Income)

| | | Years | | | | | |
		1979	1980	1981	1982	1983	1984
Poverty Gap	Index (Rate of change	0.767 —	0.805 (5.04)	0.815 (1.15)	0.804 (- 1.29)	0.778 (-3.23)	0.783 (0.63)
Head Count	Index (Rate of change	0.549 —	0.535 (- 2.72)	0.579 (8.30)	0.587 (1.28)	0.608 (3.62)	0.63 (4.69)
Sen's Measure	Index (Rate of change)	0.513 —	0.509 (- 0.70)	0.554 (8.81)	0.559 (0.82)	0.570 (2.05)	0.595 (4.43)

Table 6
Indicators for the Effects of Social Security Benefits

| Indicator	1979	1980	1981	1982	1983	1984
1. Ratio H $-\dfrac{\text{Economic Income}}{\text{Net Income}}$	34.5	50.1	55.3	77.0	58.5	51.9
2. Ratio G $-\dfrac{\text{Economic Income}}{\text{Net Income}}$	72.8	76.8	79.1	79.1	77.5	71.1
3. Ratio Sen $-\dfrac{\text{Economic Income}}{\text{Net Income}}$	80.5	85.3	88.1	93.6	88.6	83.5
4. Ratio $I_g^{p*}-\dfrac{\text{Economic Income}}{\text{Net Income}}$	87.7	84.8	86.8	84.6	86.0	82.5
5. Ratio I_g $-\dfrac{\text{Economic Income}}{\text{Net Income}}$	40.6	42.1	45.0	50.8	51.3	48.8

* I_g^p and I_g are the Gini Coefficients of the income distribution of the poor and the general elderly population, respectively.

Table 7

Inequality Measures of the Total Elderly Population

		Years					
		1979	1980	1981	1982	1983	1984
		Economic Income					
Gini	Index	0.646	0.653	0.678	0.666	0.647	0.696
	(Rate of change)	--	(0.99)	(3.95)	(- 1.82)	(-2.90)	(7.66)
C.V.	Index	1.417	1.443	1.550	1.438	1.343	1.691
	(Rate of change)	--	(1.83)	(7.45)	(- 7.21)	(-6.64)	(25.94)
Extended C.V.	Index	1.679	1.723	1.896	1.848	1.761	1.954
	(Rate of change)	--	(2.63)	(10.01)	(- 2.49)	(-4.70)	(10.96)
		Net Income					
Gini	Index	0.384	0.377	0.373	0.327	0.315	0.356
	(Rate of change)	--	(-1.65)	(- 1.14)	(-12.25)	(-3.79)	(13.20)
C.V.	Index	0.846	0.855	0.851	0.695	0.641	0.796
	(Rate of change)	--	(0.99)	(- 0.42)	(-18.28)	(-7.83)	(24.14)
Extended C.V.	Index	0.580	0.566	0.544	0.463	0.458	0.515
	(Rate of change)	--	(- 2.38)	(- 3.93)	(-14.93)	(-0.95)	(12.38)

FIGURE 2:
MEASURES OF INEQUALITY OF TOTAL POPULATION
NET INCOME
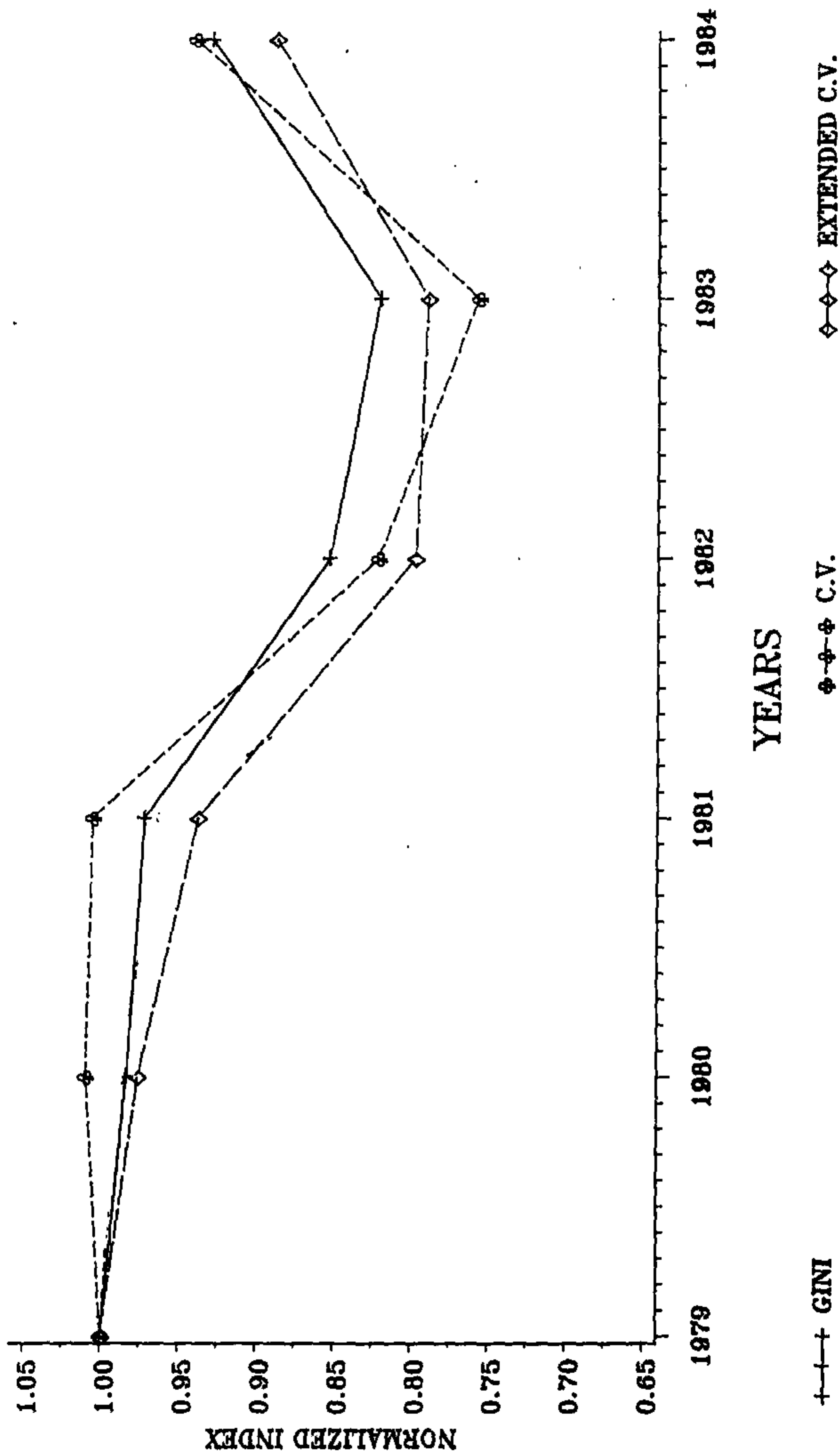
The incomes of the 40 percent of the elderly population whose economic incomes exceeded the poverty line were spread over the entire range of the general income distribution. As a result, income inequality among the elderly population was much higher than among the general population, as shown in Table 7. Changes in income inequality from year-to-year were influenced to a considerable extent by the changes in the social security benefits and were somewhat less influenced by the economic events. Only in 1984 the adjustments in the benefits could not keep pace with inflation, resulting in a steep rise in poverty and inequality. This is illustrated in Figures 1 and 2. This can also be observed by comparing the Gini coefficient of economic income to that of net income. In 1979 and 1980 the benefits have reduced the income inequality by 40 to 42 percent – as indicated by the ratio of the corresponding Gini coefficients in Table 6. In 1981 through 1983 this ratio gradually rose to 51 percent, largely as a result of the rise in the N.I.I. benefits.

The inequality of economic income among the elderly poor population was even higher than that among the total elderly population, suggesting that a very high percentage of the elderly population had virtually no economic income. The social security benefits tended to equalize the incomes of the poor and the inequality indices of net incomes of the elderly poor population are markedly small. This is summarized in Table 8.

Table 8

Inequality Measures of the Poor Elderly Population

		Years					
		1979	1980	1981	1982	1983	1984
Economic Income							
Gini P	Index	0.711	0.753	0.765	0.756	0.719	0.702
	(Rate of change)	--	(5.90)	(1.56)	(- 1.20)	(-4.79)	(-2.39)
C.V.P	Index	1.445	1.615	1.669	1.634	1.477	1.409
	(Rate of change)	--	(11.75)	(3.33)	(- 2.07)	(-9.60)	(-4.28)
Extended C.V.P	Index	2.738	3.238	3.390	3.370	2.843	2.567
	(Rate of change)	--	(18.26)	(4.68)	(- 0.57)	(-15.63)	(-9.71)
Net Income							
Gini P	Index	0.087	0.114	0.101	0.116	0.100	0.122
	(Rate of change)	--	(31.15)	(-11.86)	(15.09)	(-13.47)	(22.26)
C.V.P	Index	0.171	0.237	0.203	0.233	0.188	0.220
	(Rate of change)	--	(38.61)	(-14.27)	(14.50)	(-19.30)	(17.38)
Extended C.V.P	Index	0.201	0.307	0.255	0.296	0.218	0.245
	(Rate of change)	--	(52.51)	(-17.04)	(15.97)	(-26.37)	(12.54)

FIGURE 3:
MEASURES OF INEQUALITY OF POOR POPULATION
NET INCOME

+-+-+ GINI(P)   ⊕-⊕-⊕ C.V(P)   ⊕-⊕-⊕ EXTENDED C.V(P)

YEARS

NORMALIZED INDEX
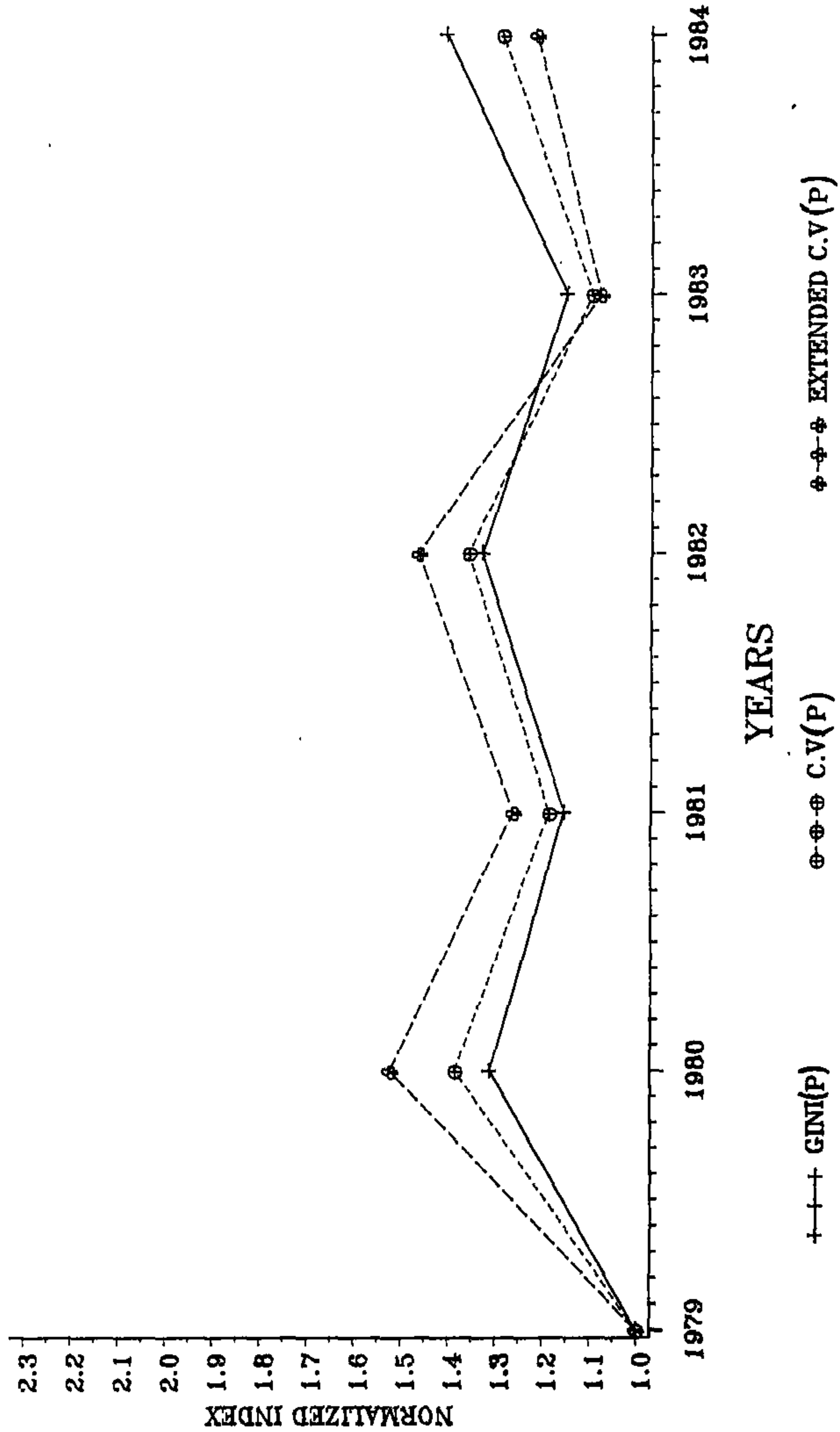
Summary and Conclusions

Almost 60 percent of the elderly population has economic income lower than the poverty line. These people depend for their very livelihood on the social security benefits. For the lower two quintiles, almost 90 percent of their gross incomes come from these benefits. They are highly vulnerable therefore to adverse changes in these benefits, that can come as a result of the erosion in their purchasing power.

The National Insurance Institute made very large efforts to prevent an erosion in these benefits during the high inflation years and adopted a policy of automatic and increasingly more frequent adjustments to guarantee an acceptable level income to this population. Even these adjustments could not keep pace, however, with the inflationary waves, especially in 1984.

The main problem we see in the N.I.I. benefits to the elderly is that they are very narrowly directed to supplement the income of the needy population up to a reference income - at a level of 25 percent of the average income for a single person - which is very close to the poverty line. This income is guaranteed to the elderly without taking into account their special needs. Thus, for instance, adjusting the benefits on the basis of the consumer price index may leave the needy

elders with less than the adequate income if their special basket of commodities have risen in price by more than the average basket. The high percentage of the elderly whose income is more or less equal to the poverty line makes it necessary to study their special needs. This study should also take into account the benefits in kind and the public services given to the elderly by the welfare system.

Another important finding that comes out of our study is the presence of a significant percentage of the elderly population whose incomes fall by 20 percent or more below the poverty line. Since the entire benefit system was targeted on a reference income approximately equal to the poverty line, we therefore conclude that this population has not received all the benefits to which they were entitled. This population constitutes the hard core of the poverty problem, and the question it raises is how to design the system so that this population can be reached.

In the long run the financial burden of the old-age benefits is likely to increase with the rise in the average age of the population. Budgetary constraints on these benefits require that attention should be focused on the lowest two-thirds of the elderly population. The financial burden can be checked in a number of ways that may require a change in the basic philosophy underlying the present system. One approach would be to substitute the present system of universal basic

old-age benefits by a more progressive system thereby taking into account the current economic incomes of the elderly while determining the level of the benefits. Another approach would be to integrate the N.I.I. system with the occupational pension funds by means of a state pension law. This combination will guarantee a pension to every retiree. The system with its two components will be more progressive because the basic universal benefit paid by the N.I.I. will be higher while the maximum replacement rates will be lower.

F O O T N O T E·S

1 As we shall see later on, this definition of the average wage rate may be different from the actual average wage.

2 Later, Sen (1979) replaces the Transfer Axiom by a weaker version, viz. Weak Transfer Axiom (WT): Given other things, a transfer of income from a poor individual to a more afluent but still poor individual must (strictly) raise the measure of aggregate poverty, provided that the recipient remains poor after the transfer.

3 The average per capita income is "standardized" to take account of economies of scale in consumption.

4 In this and all our subsequent discussions the Head Count ratio measures the number of persons living in families whose head is elderly.

5 But only one-third in 1979 and as much as three-quarters in 1982.

R E F E R E N C E S

Achdut, L., Bigman, D., 1987, <u>The Anatomy of Changes in Poverty and Income Inequality Under Rapid Inflation: Israel 1979-1984</u>, Bureau of Research and Planning, the National Insurance Institute, Discussion Paper No. 38.

Bigman, D., 1986, "Aggregate Poverty Measures and the Aggregation of Individual Poverty: A Reconsideration of Sen's Axiomatic Approach", - unpublished.

_____ 1987, "On the Measurement of Poverty and Deprivation", - unpublished.

Foster, J.E., 1984, "On Economic Poverty: A Survey of Aggregate Measures" in <u>Advances in Econometrics</u>. 3:215-51.

Foster, J.E., J. Gree and E. Thorbecke, 1984, "A Class of Decomposable Poverty Measures", <u>Econometrica</u> 52: 761-66.

Kakwani, N.C., "On a Class of Poverty Measures" <u>Econometrica</u>, 48: 437-46.

Sen, A., 1976, "Poverty: An Ordinal Approach to Measurement", <u>Econometrica</u>, 44: 219-31.

_____ 1979, "Issues in the Measurement of Poverty" <u>Scandinavian Journal of Economics</u>, 285-302.

_____ 1981, <u>Poverty and Famines: An Essay on Entitlement and Deprivation</u>, Oxford: Claredeon Press.