due to statutory changes in social security programs. In reality, however, there are two types of factor that may actually differ across cohorts and affect benefits.

- The first type comprises factors that are largely exogenous to social security programs, but are potentially important determinants of income, poverty, and health. Earnings profiles are the most important example of this type.
- The second type comprises factors that are likely to be endogenous to social security programs. Ages of persons initially claiming social security benefits belong to this type. To assess the impact of social security programs on the well-being of the elderly, we should hold the first type of factor constant.

A question is whether we should hold the second type constant, because those factors are part of the effect caused by legal changes. So, we consider two approaches: the "partial" simulation approach in which we hold only the first and type constant, and the "full" simulation approach in which we hold both the first and second types constant.

For the partial simulation approach, we take the cohort born in year c (that is, aged a in year $c+a$) as an example, and call this cohort c. Let Pr (R_{ac}) be the probability that cohort c initially claims social security benefits at age a (in year $c+a$), and denote the earnings profile of the base cohort as $\bar{y}$. In addition, assume that cohort c has the earnings profile $\bar{y}$ (same as base cohort), and denote the benefits this cohort can initially claim at age k as B_{kc} ($\bar{y}$). Then, the expected benefits cohort c receives at age a, which is denoted by B_{ac}^{PS}, is expressed as

$$B_{ac}^{PS} = \sum_{k=a_0}^{a} \Pr(R_{kc}) B_{kc}(\bar{y}),$$

where we assume that the cohort keeps receiving the same amount of benefits from the initial claim[9] and denote the first age at which the cohort can claim benefits as a_0. Because cohort c is aged a in year $c+a$, B_{ac}^{PS} can be easily put into an age-by-year cell and used as an explanatory variable instead of B_{ac}^{A}.

For the full simulation approach, we assume that the timing of retirement and income, poverty and health of the elderly are correlated. We use the earnings profile of the base cohort in the same way as the case of the partial simulation approach, but we use the retirement patterns of the base cohort when weighting the initially claimed benefits. That is, fully-simulated

[9] In practice, we have to consider the price indexation: the benefits are adjusted by CPI inflation from the age of the initial claim.

benefits, B_{ac}^{FS}, are given by

$$B_{ac}^{FS} = \sum_{k=a_0}^{a} \Pr(\overline{R}_k) B_{kc}(\overline{y}),$$

where $\Pr(\overline{R}_k)$ is the probability that the base cohort initially claims benefits at age k.

2. Calculating simulated benefits

To apply the basic empirical strategy described above to Japanese data, we have to consider two additional issues. The first is which cohort we should choose as the base cohort for simulations. While the actual cohort we use is not critical for simulations, we choose the 1926 cohort, which was aged 54 in 1980 (the first survey year) and aged 75 in 2001 (the last survey year). This cohort appears as the elderly during almost the entire period under study, and it faced the 1986 Pension Reform at the EPI eligibility age of 60. In addition to this base cohort, we focus on cohorts born from 1911 to 1946 for the regression analysis.

The second issue is how to construct the simulated benefits. The simulated benefits are constructed mainly from two factors: the first is the probability of retirement at each age for each cohort, and the second is the benefits to be claimed. The Annual Report of the Social Insurance Agency is the key data source for both factors. The Report shows the number of those who initially claimed benefits at different ages in each year for both EPI and NPI. In the case of EPI, the initial claim for benefits starts at age 55 and ends almost completely by age 74. By dividing the number of those who claim benefits at each age by the cumulative number of those up to age 74, we get the retirement pattern for each cohort (ignoring the mortality rate for simplicity). We apply the same method to the case of NPI, in which the age of the initial claim is limited to between 60 and 70[10].

Using these observed rates, we form a cohort-, gender-, and sector-specific set of probabilities for retirement that sum to one. Not surprisingly, the probability of retirement peaks at age 60 for EPI and 65 for NPI, both of which are the normal eligibility ages for public pension programs. For example, 44.3 percent of male EPI members retired at age 60, and 62.3 percent of male NPI members retired at age 65 in the 1926 cohort.

The next task is to estimate benefits received by a synthetic person who has the same

[10] In the case of the NPI, eligibility to claim the benefits is not equivalent to retirement, because the NPI members are self-employed workers, farmers, and other non-employed workers.

earnings history as the 1926 cohort, based only on legislative variations in the structure of benefits. In the case of EPI, a plausible method is to construct a mean earnings history for the 1926 cohort and calculate the benefits based on it with the benefits formula. Due to a lack of individual histories of wage earnings, however, we cannot directly apply this method. Instead, we use the following approach, which is indirect but is probably the most plausible approach given the limited information available from published data:

- First, we collect the mean value of initially claimed EPI benefits at each age from each year's Annual Report of the Social Insurance Agency. This reflects both the benefits formula that was effective in each year and the mean earnings histories of new beneficiaries.
- Second, we get the mean value of the career average monthly income (CAMI) of EPI beneficiaries who initially claim benefits from the Annual Report. It is reasonable to assume that the mean CAMI reflects the mean earnings histories of the initial beneficiaries. Unfortunately, the Report only gives the average value of the CAMI across initially claiming ages in each year. We assume for simplicity that the reported mean CAMI roughly corresponds to the mean earnings history of the cohort that was aged 60 in the survey year, because the timing of initially claimed benefits is heavily concentrated on that age in the EPI.[11]
- Third, for each cohort, we calculate the ratio of initially claimed benefits at each age to the mean CAMI (obtained in the second step), and interpret a set of these ratios as the EPI benefits law applied to that cohort.[12]
- Finally, we put the 1926 cohort in each single cohort and compute its simulated benefits at each age by multiplying the average CAMI of the 1926 cohort by the benefits/CAMI ratio of each single cohort. We can roughly interpret this procedure as applying the EPI benefits law, which was actually applied to each cohort to the 1926 cohort.

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[11] For example, if the average CAMI was 400,000 yen across ages of initial benefits claimed in 1990, we interpret this amount as the average CAMI for the 1930 cohort, which was aged 60 in that year. Of course, the CAMI differs at a different age of initial benefits claim even for the same cohort. But, we ignore it for simplicity and because of limited information about wage profiles.

[12] For example, assume that we find that the average CAMI was 375,000 yen in 1990 and that the average benefits initially claimed was 187,500 yen at 60 in 1990 and 191,250 yen at 61 in 1991 (in 2001 price). Then, we assume that the average CAMI for the 1930 cohort was 375,000 yen (as explained in the second stage), and we take 0.5 (=187,500/375,000) and 0.51 (=191,250/375,000) as the ratios to convert the CAMI to the benefits at age 60 and age 61, respectively, applied to the 1930 cohort by the EPI benefits law which was effective at that time.

In the case of the NPI, we can apply a simpler methodology, because the NPI benefits are flat and not related to earnings history. Hence, when we put the 1926 cohort in each single cohort, we roughly assume that that cohort would get the actual benefits (in 2001 price) reported by each single cohort. We believe that this is the most reliable method given the limited information available from the Annual Report, even though it ignores differences in the period of contributions across cohorts.

One problem regarding the basic approach described above is that it produces social security benefits for only the mean earner and ignores variation in benefits along the income distribution. We do not need to worry about the variation in NPI benefits, which are basically flat[13]. In the case of EPI benefits, we roughly estimate the benefits for those at the 10th, 50th (median) and 90th percentiles as follows.

- First, we collect the CAMI at each percentile in 1986—when the 1926 cohort started to receive benefits—and estimate the benefits using the formula, because the CAMI can be taken as a reliable proxy of lifetime wage income[14].
- Second, we calculate the ratio of the estimated benefits (which is estimated based on the CAMI and the benefit formula) to the CAMI at each percentile, and get the quotient of this ratio to that for the mean earner. This quotient is higher at a lower quintile due to a flat component of the benefits.
- Third, we multiply this quotient by the ratio of the CAMI at each percentile to the average CAMI to obtain the "adjustment factor" at each percentage. This adjustment factor roughly grasps the ratio of benefits at each percentile to those for the mean earner.
- Finally, we calculate the simulated benefits at each percentile by multiplying the simulated benefits for the mean earner by the adjustment factor, which is obtained in the third stage.

3. Additional sources of variations

We basically aim to identify the impact of social security programs on income, poverty, and health solely from variations across cohorts, by controlling for both age and year effects. This

[13] In fact, lower-income households tend to receive lower benefits due to shorter years of contributions. We neglect this due to lack of available data.

[14] Unfortunately, there are no CAMI distribution data available by age and gender. We assume for simplicity that the data are all for those aged 60 in each year and that males and females have the same CAMI distribution. This probably overestimates the CAMI of the female elderly.

age-year cell approach, however, is likely to fail to exploit of important variations in benefits across groups within age-year cells. These within age-year cell variations can help identify the effects of benefits changes, and there are at least two candidates for the sources of variations: that is, sector and gender. As discussed in the previous sections, benefits laws and retirement patterns differ for EPI/MAI and NPI beneficiaries. An EPI/MAI beneficiary used to be an employed worker, whereas an NPI beneficiary used to be a self-employed worker in most cases. Because the SIR asks the elderly about type of public pension benefit, we can identify the sector to which each household head belongs.

However, two things should be noted here. First, the SIR only distinguishes the beneficiaries of NPI and those of the pension programs for employees, therefore, it cannot distinguish EPI (for retired employees in the private sector) and MAI beneficiaries (for retired employees in the public sector). We treat all beneficiaries of the public pension programs for employees as EPI beneficiaries, because EPI and MAI benefits have many things in common. Second, some elderly receive both EPI and NPI benefits in the SIR dataset, and we categorize them into EPI beneficiaries for simplicity. As a result, in our empirical analysis EPI beneficiaries are those who receive any EPI benefits, whether or not they receive NPI benefits. And, NPI beneficiaries are those who receive NPI benefits only, meaning that they have no experience working as private or public sector employees[15].

Another source of variations to be considered is gender. Several factors make a difference between the benefits received by men and women. In the case of EPI, females tend to receive substantially smaller benefits than males due to a shorter period of coverage and lower wage earnings; in fact, the average benefits and CAMI was 44 percent and 45 percent lower, respectively, for women than for men in 2001. In addition, the eligibility age for female employees, which had been 55 (compared to 60 for male workers) until 1988, was gradually raised to 60 until 2001. Hence, younger females started to receive EPI at a later age. Moreover, the share of female beneficiaries is much higher in the NPI than in the EPI (73 percent versus 31 percent in 2001), largely because of women's limited opportunities to work as full-time employees. Reflecting a long-term uptrend of women's labor participation, however, there has

[15] Strictly, it is desirable to further control whether a spouse is alive or dead, because survivors' benefits differ substantially between the NPI and EPI/MAI beneficiaries (see Yamada and Casey (2002)). This effect seems to be reflected in the crossing terms of sector and gender (see below) dummies in our estimation equations.

been a shift among female beneficiaries from NPI to EPI over the past two decades[16].

4. Basic facts about benefits

In what follows, we collapse all of the micro-data into age-by-year-by-sector-by-gender cells taking their mean values in each cell, and then estimate models with sector and gender variations. The age of households head ranges from 55 to 75. Table 2 reports the basic statistics for well-being outcomes and social security benefits. We notice that there are substantial gaps in household income and poverty rates among gender-sector cohorts. Household income is highest for households whose heads are male EPI beneficiaries, while it is the lowest for households whose heads are female NPI beneficiaries. The share of households under the poverty line is highest for households whose heads are male NPI beneficiaries, followed by those whose heads are female NPI beneficiaries. In other words, EPI participants enjoy higher income with a lower share of the poor while NPI participants suffer from lower income with a higher portion of the poor. The gaps in social security benefits are even larger than household income levels.

Figure 6 depicts partially and fully simulated social security benefits measures, along with the actual benefits for those aged 65 in each survey year. For the simulated benefits, we first calculate values (in 2001 prices) for EPI and NPI, and males and females at each age, based on the median earnings history of the 1926 cohort, and then get their weighted average in each calendar year. As can be seen from this chart, they showed a steady increase during the 1980s and leveled off thereafter. This probably reflects a slowdown in the increasing generosity of the benefits formula in EPI; in fact, along with a rise in the average period of contributions, the MHLW lowered the actuarial rate for earnings-related benefits to hold down the growth of total benefits. In addition, both types of simulated benefits have been moving almost in parallel to actual benefits, while they was higher than the latter until the mid-1990s, probably because our base cohort is relatively young among the cohorts that appear in the survey and its higher wage profile makes the simulated benefits higher.

Figure 7 shows the time series evolution of the social security benefits initially claimed at

[16] Another aspect of gender variation is that a dependent wife is eligible for NPI benefits at age 65 without any contribution.

ages 60, 62, and 65 by year of birth for the 1926 cohort median male earnings history[17]. The top three curves are for the EPI, while the bottom three are for the NPI. In the case of the EPI, benefits growth has been decelerating, and even turned negative for the younger generations, reflecting less generosity incorporated into recent pension reforms. In comparison, there were some small jumps in NPI benefits, which were caused by increases in flat benefits in recent pension reforms. In addition, this figure demonstrates a wide gap in benefits levels between EPI and NPI, making the sector one of key sources of variations.

5. Regression strategy

Based on these data described above, we apply two regression strategies to estimate the unbiased impact of social security benefits on well-being income. The first strategy is the *pseudo* IV estimation, which consists of three stages: we first regress (partially and fully) simulated benefits on actual social security benefits, and second regress well-being outcomes on simulated benefits, and then divide the two estimated coefficients to obtain the implied IV effects. The second strategy is the direct IV estimation, in which we regress well-being outcomes on the estimated actual benefits, instrumented by simulated benefits.

In each regression model we consider seven models for treating control variables: age, year, sector, and gender.

- Model I includes just dummies for each level of age and year.
- Model II-a includes just dummies for each level of age, year, gender and sector.
- Model II-b includes just dummies for each level of age, year and gender.
- Model II-c includes just dummies for each level of age, year and sector.
- Model III-a controls also second-level interactions of age*gender, age*sector, year*gender, year*gender and gender*sector.
- Model III-b controls also second-level interactions of age*gender and year*gender.
- Model III-c controls also second-level interactions of age*sector and year* sector.

As a benchmark model, Model I controls just first level fixed effects of age and year. Models II put gender and/or sector dummies as additional sources of variation into Model I. Models III

[17] We can also present the female's version of Figure 7, which shows almost the same pattern of evolution as seen in the case of men.

conclude both first and second level fixed effects of age, year, and one or two of gender and sector—but not age*year, which is too demanding on the data.

We apply those regression models for not only the average earner but also an earner at the 10th, 50th (median) and 90th percentiles of the distribution. For 10th regressions, we compute the average social security benefits among households with household income between the 5th and 15th percentiles. In the same way, for 50th and 90th regressions, we compute the average benefits among households with household income between the 45th and 55th percentiles and between the 85th and 95th percentiles, respectively. In addition, for poverty regressions, we use the data to compute the average benefits among households living below poverty.

V. Regression results

In this section we present regression results, the core of our empirical analysis. We estimate the impact of social security benefits on seven variables of well-being outcomes: mean income, 10th, 50th, and 90th percentile income, absolute and relative income poverty rates, and health care benefits.

Tables 3- 9 summarize and compare our regression results for Models I to III-c based on the same format. The variables in the leftmost column indicate dependent variables: those in the upper part are actual social security benefits used to analyze the impact on well-being variables, which are listed in the lower part. The upper part in each table reports the coefficients on the actual benefits in the first stage of the pseudo IV estimation. If the first stage yields significant and right-signed effects, we can confirm that we are using a sensible dimension of variation. The lower part in each table reports the coefficients on the well-being variables, using the actual benefits as a regressor along with control variables, comparing the results of the second stage of the pseudo IV estimation and those of the direct IV one. For the purpose of exposition, the parameter estimates associated with the other explanatory variables (age, year, sector, gender, and sector dummies) are not shown in the tables.

Three things should be mentioned from these tables. First, we find that only three models—that is, Models I (Table 3), II-b (Table 5), and III-b (Table 8)—out of seven are sensible, judging by the coefficients on the actual benefits in the first stage of the pseudo IV estimations reported in the upper part (as well as those on the simulated benefits in the direct IV estimations). Model I uses only age and year variation with no second-level interaction. Model II-b uses gender as additional variation to age and gender with no second-level interactions. Finally, Model III-b also uses gender as additional variation but with second-level interactions.

These results suggest that we should not include sector as an additional variation, probably reflecting some multicolinearity between benefits and sector dummies. In fact, the EPI has both flat and earning-related components, whereas the NPI has only the flat component, making the levels of the two benefits quite different as already illustrated in Table 2. Meanwhile, gender can be considered as an appropriate additional variation, making Models II-b and III-c more relevant than Model I. Hence, let us concentrate on the former two models in what follows.

Second, we confirm significant and positive effects of social security benefits on household income in both Models II-b and III-b (as well as Model I). This confirms that the development of benefits generosity actually led to increased disposable income for the retired population. It should be noted, however, social security benefits are not fully translated into total income. In the pseudo IV estimations, 100 euros of extra benefits adds to household income by only 22-26 euros. To correctly assess this coefficient, we have to normalize it by the effects of simulated benefits on actual benefit. By calculating the ratio between these two effects, we find that 49-56 percent of additional social security benefits are translated into total income. These degrees of transformation correspond to the levels of the coefficients on the simulated benefits in the direct IV estimations.

Two interpretations of these results are possible. First is that the social security benefits partly offset an increase in income of other sources. This crowding-out effect is consistent with the results of preceding empirical studies, including Yashiro and Oshio (1999), Oshio and Oishi (2004), which show a negative impact of the social security benefits on the incentives of the elderly to work. Second is that higher social security benefits have some negative impact on household-size-adjusted income through residential decisions. As implied by Ohtake (1991) and Iwamoto and Fukui (2002), higher social security benefits are more likely to make the elderly live separately with their adult children. This co-residence effect appears at least to partly offset the direct impact of the social security benefits on the disposable income of the elderly.

Third, we find that the impact of social security benefits differs substantially by income class. For those at the 10th percentile of income distribution, 84-88 percent of social security benefits are translated into total income in Models II-b and III-b. For those of higher household income, the degree of transformation is lower: 52-58 percent for those at the 50th percentile and 25-33 percent for those at the 90th percentile. And the coefficients on the benefits tend to be less significant for the 90th percentile households.

This probably reflects on the difference in retirement behaviors among income classes. Lower-income households consist mainly of the self-employed, who have no official retirement age and whose incentives to work are not much affected by social security benefits. The heads of higher-income households, on the contrary, have been employed workers in most cases and experienced official retirement (mainly at age 60) and tend to choose to keep working in the secondary market or to retire from labor force. Accordingly, social security benefits are more likely to work as a disincentive to work for higher-income households than for the lower-income ones.

Forth, we examine the impact on poverty rates. We find that social security benefits lower both relative and absolute poverty rates of the elderly. Our estimates suggest that each 1,000 euros of simulated benefits among households below poverty—keeping the average benefits among all households unchanged—leads to a decline in the relative and absolute poverty rates of 6.6-7.0 and 5.4-5.6 percent, respectively, based on the direct IV estimation. During 1980 and 2001, average benefits among households below absolute and relative poverty rose by 3,366 euros and 3,131 euros, respectively, which could have reduced poverty rates if other things were equal. However, average benefits for all households rose by 4,701 euros, more than for those below poverty, over the period. Hence, relative income poverty rate *rose* from 10.4 percent to 16.4 percent (or 6 percentage points) for the elderly. Also, the absolute income poverty rate only slightly declined from 10.4 percent to 9.9 percent (or 0.6 percentage point) for the elderly. This implies that there are some inequality-widening factors that offset a reduction in inequality caused by an increase in social security benefits. Altogether, the time-series evolution of social security benefits has failed to reduce poverty rates significantly over the past two decades.

Finally, we explore the impact on the health care benefits, which we take as a proxy of health status due to limited information from the SIR. Unfortunately, we find little consistent pattern of the social security benefits on the health care benefits. This implies that the health care benefits cannot tell precisely about health status of the elderly, since the health care benefits depends heavily on health care policies as well as demographic factors. Moreover, the social security benefits have two opposing effects on health care benefits; on the one hand, higher benefits may improve the elderly's health status and thus reduce their dependence on health care, and on the other hand, the income effect may raise their spending on it.

VII. Conclusion

We have investigated the impacts of social security benefits on the elderly well-being in Japan during the past two decades, based on cross-sectional data from Surveys on Income Redistribution and the methodology that avoids simultaneous estimation bias. Among others, the following four facts should be note in evaluating Japan's social security programs.

First, social security benefits have significantly improved the well-being of the elderly, at least in terms of household income and poverty. About a half of additional benefits are translated into total income on average. The fact that benefits are not fully translated into total household income for the elderly is consistent with the results of preceding empirical analyses that show that public pension benefits tend to reduce the incentive of the elderly to work and/or to live with their adult children.

Second, the impact of social security benefits differs substantially by income class. A larger potion of additional social security benefits will be crowded out for higher-income households, probably because they tend to choose to keep working in the secondary market or to retire after their retirement at age around 60. In contrast, social security benefits do not affect incentives to work for lower-income households, a large part of whom are self-employed and flat-rate NRI beneficiaries. This result implies that a reduction in benefits, if needed due to demographic pressures, should be weighted on higher-income households.

Third, social security benefits have failed to reduce poverty rates significantly over the past two decades. An increase in benefits for households below poverty could have reduced poverty rates if other things were equal, but average benefits increased more for all households and other factors than benefits widened income inequality.

Fourth, our tentative results regarding the impact on health health-care spending, even if not an approximate proxy of health status, imply that the impact of social security programs is so complicated that it should be analyzed in from as many aspects viewpoints as possible. To assess the impact of social security on the well-being of the elderly more precisely, we need more evidence on of the effects on well-being measures—consumption, consumption poverty, health status, and subjective assessment of happiness—which are not available in our dataset.

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Table 1. Measures of well-being and the data source

Measure	Data Source Name	Years Available	Ages Available	Sample Size for Elderly	Variable Description
Total income	Survey on Income Distribution	1980, 83, 86, 89, 92, 95, 98, 2001	All	666	Mean household income
Relative income poverty	Survey on Income Distribution	1980, 83, 86, 89, 92, 95, 98, 2001	All	666	% elderly below 40 of non-elderly median
Absolute income poverty	Survey on Income Distribution	1980, 83, 86, 89, 92, 95, 98, 2001	All	666	% elderly below 40 of non-elderly median
Health care benefits	Survey on Income Distribution	1980, 83, 86, 89, 92, 95, 98, 2001	All	666	Mean household health care benefits

Figure 1. After-tax household income

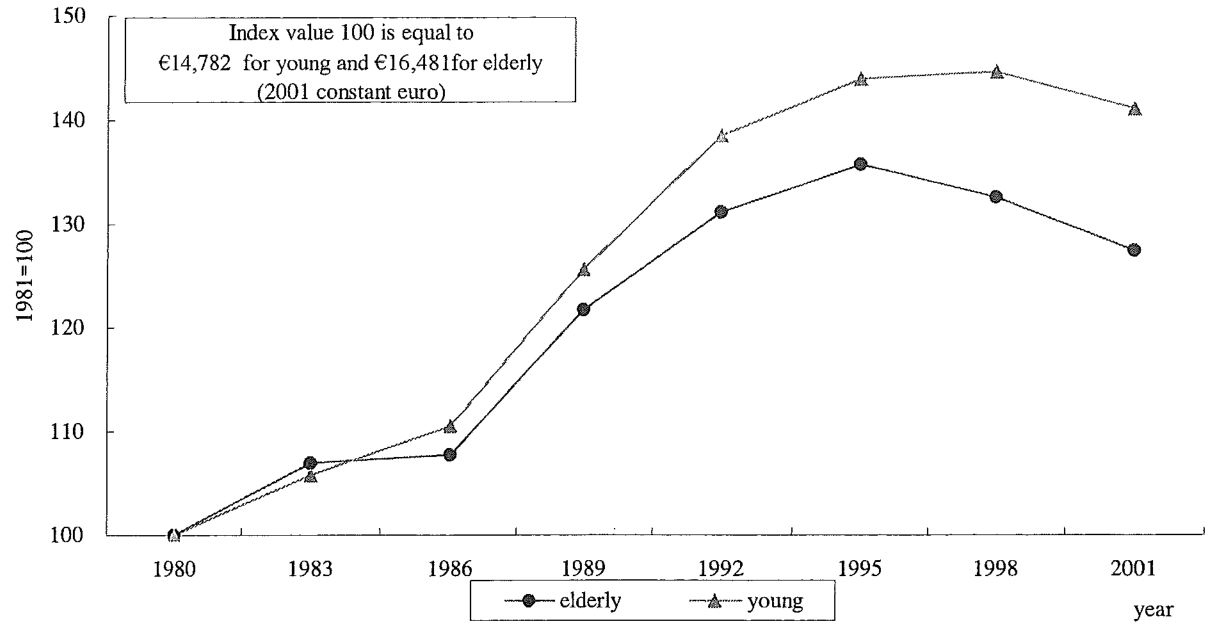

Figure 2. Relative income poverty

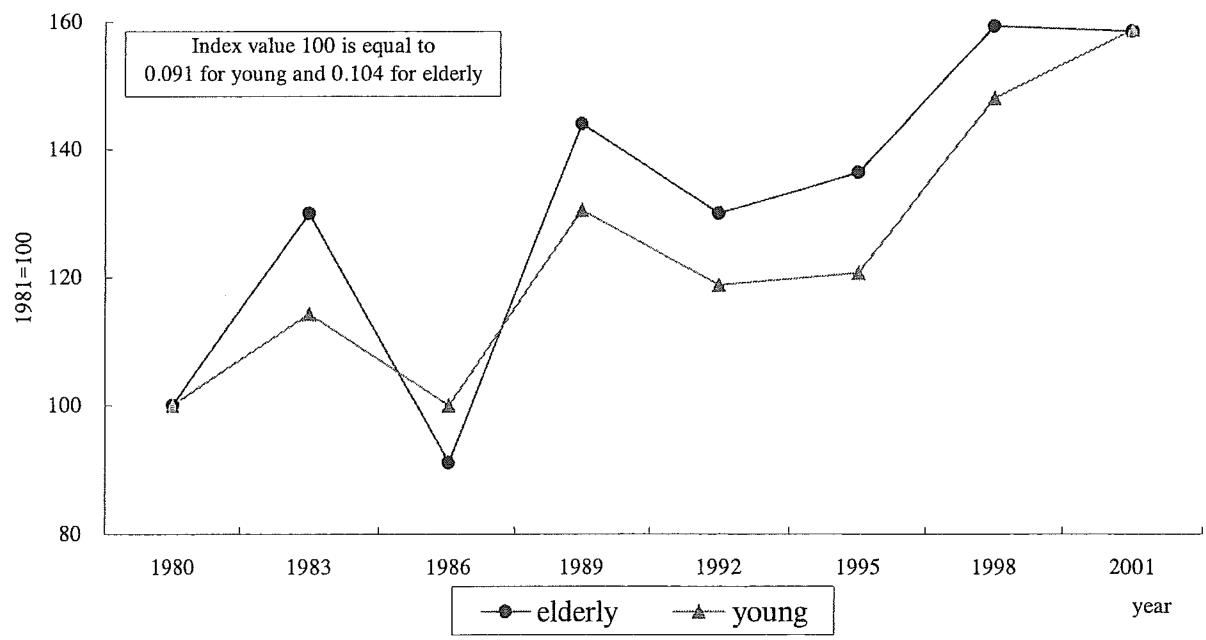

Figure 3. Absolute income poverty

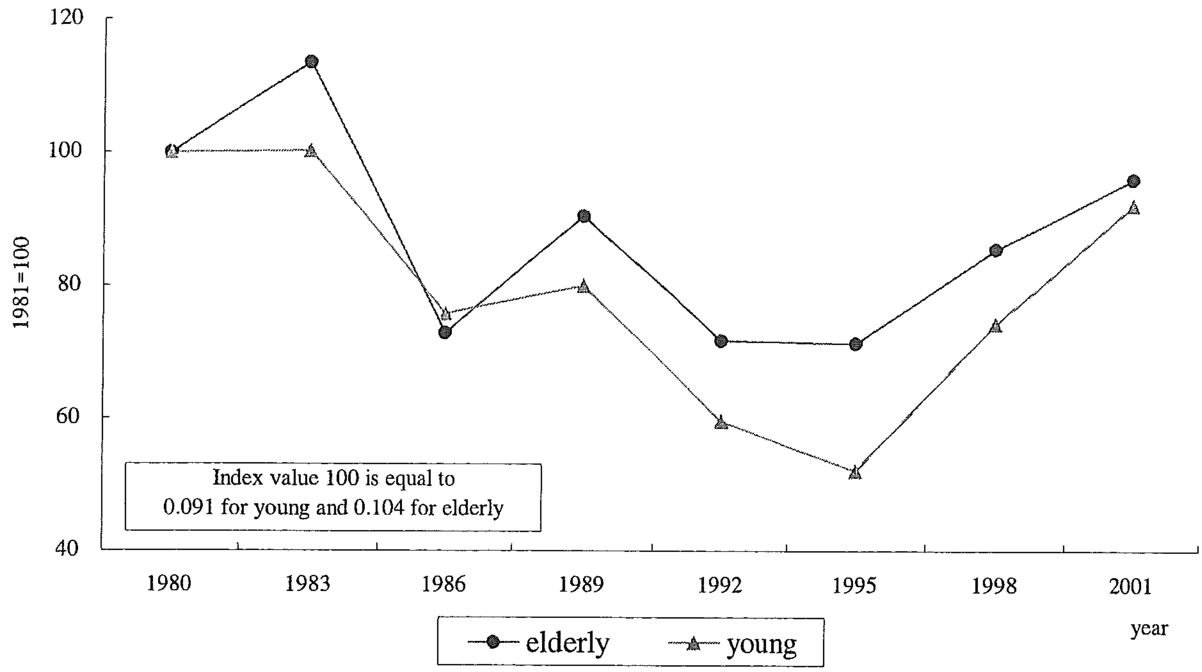

Figure 4. 10th, 50th and 90th percentiles of elderly income

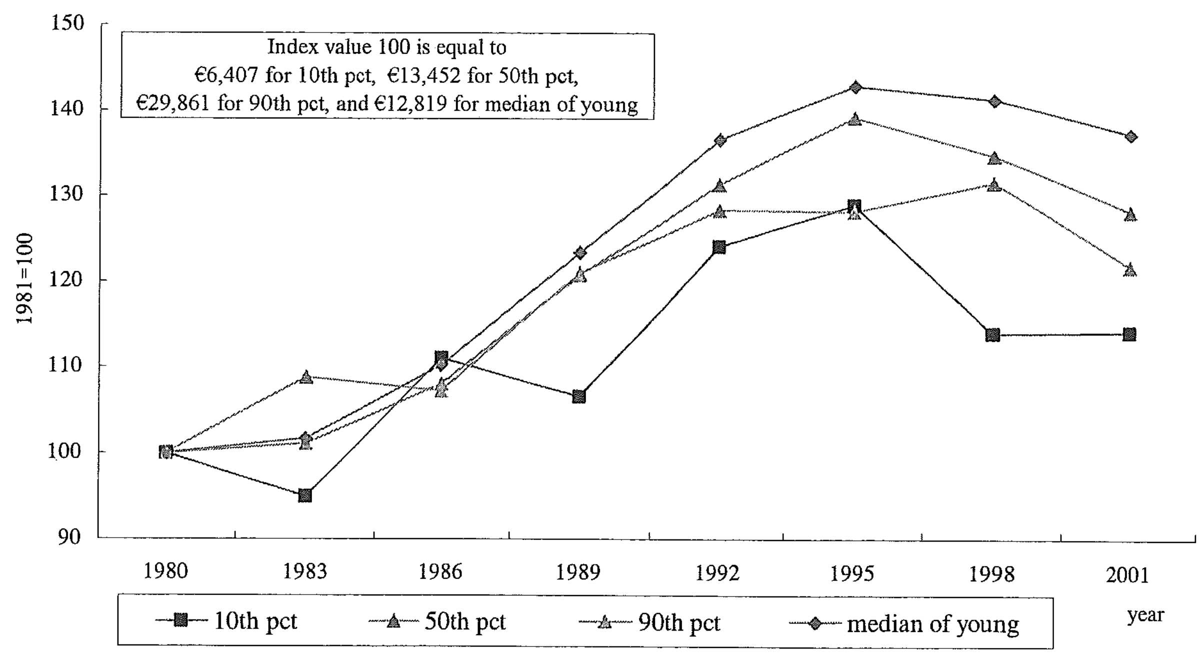

Figure 5. Health care benefits

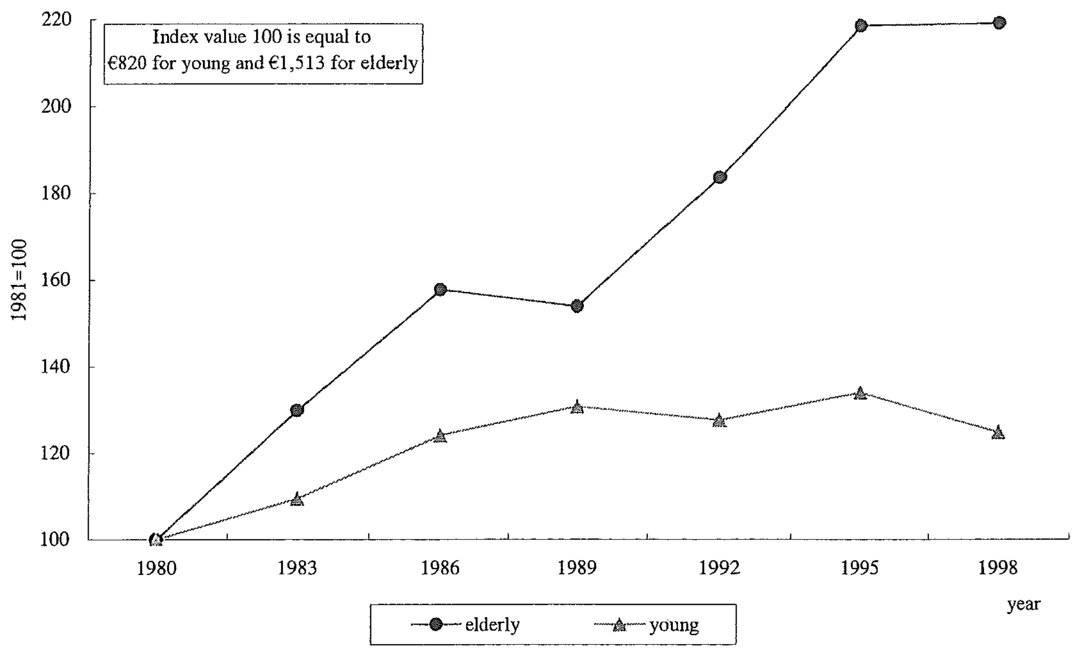

Table 2: Basic statistics for well-being outcomes and social security benefits: 1980-2001

(2001 euros)

		Male NPI	Male EPI	Female NPI	Female EPI
Total Household Income	mean	18,329	22,083	14,028	17,624
	s.d.	5,277	5,865	5,043	7,977
Relative income poverty (%)	mean	20.2	6.0	30.6	14.5
	s.d.	12.1	4.5	17.8	16.0
Absolute income poverty (%)	mean	13.3	3.4	22.4	8.0
	s.d.	7.6	3.2	14.3	13.1
Actual social security benefits	mean	2,262	9,104	3,779	9,588
	s.d.	1,651	2,613	2,174	3,308
Partially-simulatied social security benefits	mean	2,144	14,685	1,919	7,407
	s.d.	1,763	9,031	1,513	3,938
Fully-simulatied social security benefits	mean	2,280	14,581	2,042	7,421
	s.d.	1,983	9,180	1,696	4,275
Health care benefits	mean	24	31	28	31
	s.d.	18	21	26	32

Figure 6. Actual and simulated social security benefits at age 60

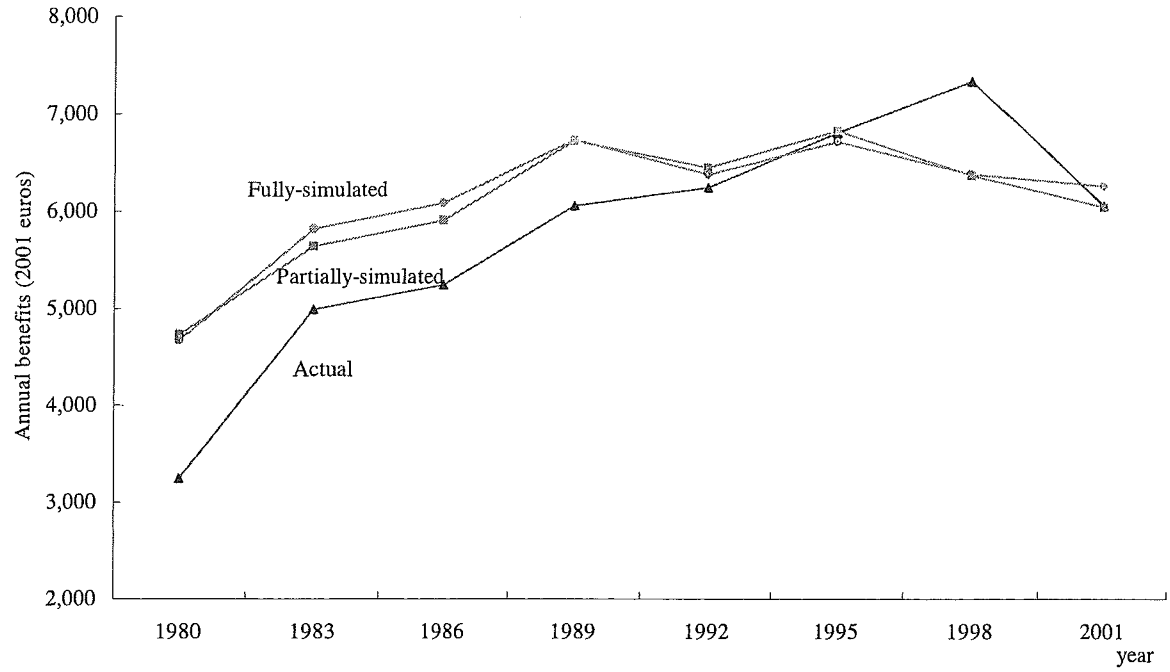

Figure 7. Average social security benefit initially claimed at different ages by year of birth for the 1926 cohort median male earnings history

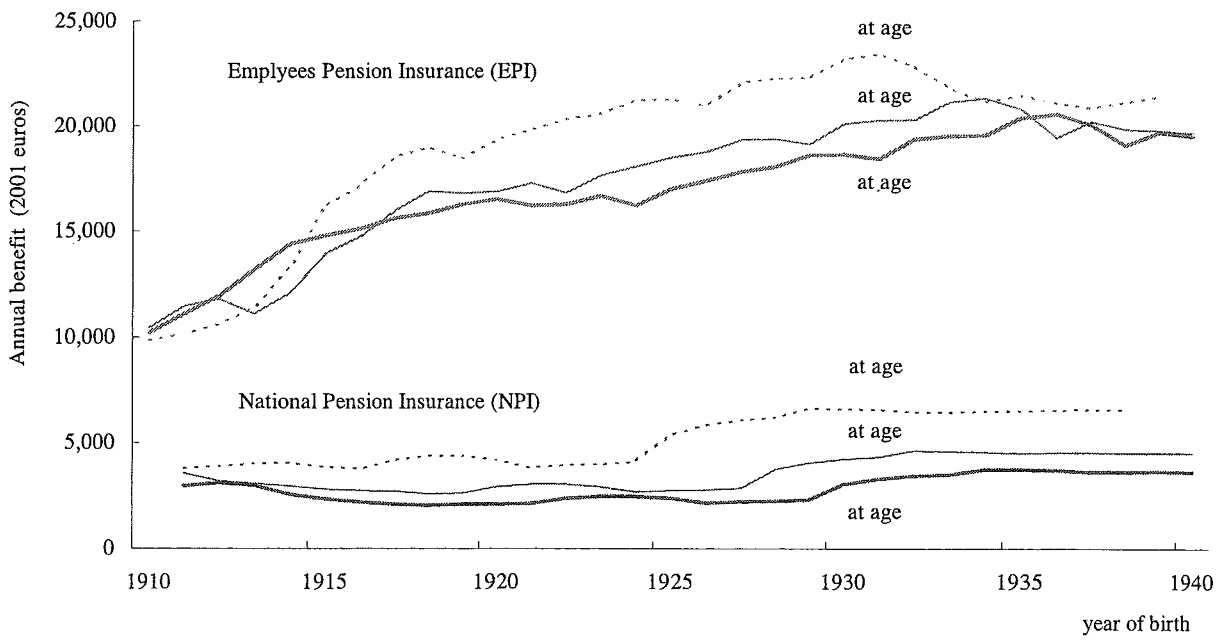

Table 3. Regression results: Model I (age/year)

Variable	Mean	# of Ob	First stage		Reduced form		IV	
	2001 euros		Partially simulated	Fully simulated	Partially simulated	Fully simulated	Partially simulated	Fully simulated
First stage								
Mean SS Income	6,153	666	0.3669 **	0.3728 **				
10th Pct SS Income	4,352	666	0.5221 **	0.5406 **				
50th Pct SS Income	6,386	666	0.4297 **	0.4365 **				
90th Pct SS Income	7,512	666	0.3502 **	0.3550 **				
Rel Pov SS Income	3,581	577	0.2725 **	0.2770 **				
Abs Pov SS Income	2,959	524	0.2314 **	0.2392 **				
Reduced form and IV								
Mean Income	18,019	666			0.3141 **	0.3159 **	0.8559 **	0.8472 **
10th Pct Income	6,747	666			0.5107 **	0.5246 **	0.9782 **	0.9704 **
50th Pct Income	14,856	666			0.3127 **	0.3144 **	0.7275 **	0.7204 **
90th Pct Income	32,793	666			0.2227 **	0.2191 **	0.6360 **	0.6172 **
Rel Inc Pov (*1,000)	0.179	666			-0.0264 **	-0.0276 **	-0.0947 **	-0.0976 **
Abs Inc Pov (*1,000)	0.118	666			-0.0196 **	-0.0205 **	-0.0800 **	-0.0813 **
Health care benefits	28	666			0.0000	0.0000	-0.0001	0.0000

(Note) *: significant at 5% and **: significant at 1%.

Table 4. Regression results: Model II-a (age/year/gender/sector)

Variable	Mean	# of Ob	First stage		Reduced form		IV	
	2001 euros		Partially simulated	Fully simulated	Partially simulated	Fully simulated	Partially simulated	Fully simulated
			First stage					
Mean SS Income	6,153	666	0.0375 *	0.0347				
10th Pct SS Income	4,352	666	0.0312	0.0270				
50th Pct SS Income	6,386	666	0.1191 **	0.1162 **				
90th Pct SS Income	7,512	666	0.0541	0.0545				
Abs Pov SS Income	3,581	577	-0.0135	-0.0185				
Rel Pov SS Income	2,959	524	-0.0185	-0.0276				
			Reduced form and IV					
Mean Income	18,019	666			-0.0582	-0.0738	-1.5521	-2.1284
10th Pct Income	6,747	666			-0.0056	-0.0567	-0.4988	-1.3931
50th Pct Income	14,856	666			-0.0142	-0.0255	-0.0863	-0.2154
90th Pct Income	32,793	666			-0.3989 **	-0.2962 **	-6.5162	-6.9802
Abs Inc Pov (*1,000)	0.179	666			-0.0025 *	-0.0049 *	0.5223	0.3618
Rel Inc Pov (*1,000)	0.118	666			-0.0049 **	-0.0090 **	0.3166	0.1940
Health care benefits	28	666			-0.0005	-0.0004	-0.0135	-0.0139

(Note) *: significant at 5% and **: significant at 1%.

Table 5. Regression results: Model II-b (age/year/gender)

Variable	Mean	# of Ob	First stage		Reduced form		IV	
	2001 euros		Partially simulated	Fully simulated	Partially simulated	Fully simulated	Partially simulated	Fully simulated
			First stage					
Mean SS Income	6,153	666	0.4347 **	0.4425 **				
10th Pct SS Income	4,352	666	0.5759 **	0.5991 **				
50th Pct SS Income	6,386	666	0.4994 **	0.5079 **				
90th Pct SS Income	7,512	666	0.4075 **	0.4129 **				
Rel Pov SS Income	3,581	577	0.3304 **	0.3381 **				
Abs Pov SS Income	2,959	524	0.2618 **	0.2713 **				
			Reduced form and IV					
Mean Income	18,019	666			0.2199 **	0.2187 **	0.5059 **	0.4943 **
10th Pct Income	6,747	666			0.4883 **	0.5011 **	0.8479 **	0.8364 **
50th Pct Income	14,856	666			0.2647 **	0.2649 **	0.5300 **	0.5214 **
90th Pct Income	32,793	666			0.1089 +	0.1031 +	0.2673 +	0.2496 +
Rel Inc Pov (*1,000)	0.179	666			-0.0239 **	-0.0249 **	-0.0663 **	-0.0680 **
Abs Inc Pov (*1,000)	0.118	666			-0.0179 **	-0.0187 **	-0.0552 **	-0.0561 **
Health care benefits	28	666			0.0001	0.0001	0.0001	0.0002

(Note) +: significant at 10%, *: significant at 5% and **: significant at 1%.

Table 6. Regression results: Model II-c (age/year/sector)

Variable	Mean	# of Ob	First stage		Reduced form		IV	
	2001 euros		Partially simulated	Fully simulated	Partially simulated	Fully simulated	Partially simulated	Fully simulated
			First stage					
Mean SS Income	6,153	666	-0.0228	-0.0264				
10th Pct SS Income	4,352	666	0.0302	0.0206				
50th Pct SS Income	6,386	666	0.0364	0.0317				
90th Pct SS Income	7,512	666	-0.0183	-0.0186				
Rel Pov SS Income	3,581	577	-0.0990 **	-0.1246 **				
Abs Pov SS Income	2,959	524	-0.0424	-0.0536				
			Reduced form and IV					
Mean Income	18,019	666			0.1982 **	0.1921 **	-8.6815	-7.2642
10th Pct Income	6,747	666			0.1210 *	0.1069	4.0109	5.1873
50th Pct Income	14,856	666			0.1491 **	0.1412 **	4.0944	4.4559
90th Pct Income	32,793	666			0.0527	0.0379	-2.8725	-2.0352
Rel Inc Pov (*1,000)	0.179	666			-0.0171 **	-0.0181 **	0.2306 **	0.1949 **
Abs Inc Pov (*1,000)	0.118	666			-0.0110 **	-0.0117 **	0.4874	0.4161
Health care benefits	28	666			-0.0005 *	-0.0005 *	0.0189	0.0159

(Note) *: significant at 5% and **: significant at 1%.