Social Security and Well-Being of the Elderly:

The Case of France

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Abstract:

We use the 1982 and 1993 reforms of the French pension system in the private sector to study the relationship between Social Security benefits and the well-being of the elderly in France between the late 70's and the beginning of the new century. Affecting people in a different way, depending on the year of birth, gender or socio-economic status, these reforms provide some sources of identification to estimate the effect of benefits changes on the standard of living of the elderly families. To avoid spurious corelation or endogeneity problems in the determination of the impact of Social Security benefits on well-being indicators for the elderly we compute simulated social security payments and compare their evolution to various measures of well-being based on income, consumption, poverty, inequality or happiness for both elderly and non-elderly families. We then focus on the 1982 and 1993 reforms. Our estimations conclude to a general increase in income, consumption and subjective well-being. For income, a one euro increase in simulated benefit doesn't induce a 100 percent increase in after tax income (except at the top of the distribution), which shows some substitution between the different sources of income available for the elderly households. However, the effect of a change in the pension benefits remain significant. Estimation of difference in difference models to evaluate the impact on income and consumption of the 1982 and 1993 reforms underlines that it may exist asymmetry in the substitution effect between the different sources of income of the elderly depending on the sign of the change in generosity of the pension reforms.

Keywords: Retirement policies, Income, Poverty

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Introduction

With the imminent retirement of the large baby boom generations and the increase in the relative number of retirees in the population, the French Pension advisory committee estimated in 2006 that the cost of the Social Security program will have raised of 3 points by 2050 to reach 16 percent of GDP. To face the demographic transition, reforms in the existing Social Security programs have been implemented since the mid 90's. The major changes were for workers in the private sector in 1982 and 1993, and in a lesser extent in 2003. The trend in their pension system generosity changes in the mid 90's. After becoming more generous until 1982, the French private sector pension scheme became less generous from 1993. An important reform of the civil servant pension scheme has also been voted in august 2003, deacreasing the generosity of the system too.

As the decline of labor force participation of older workers is often seen as resulting from incentives inherent in the pension systems and their legislation, substantial attention has been devoted to the impact of these reforms on the activity of old age workers. The studies have concluded to a massive decrease in the labor market participation of workers older than 60 after 1982 (e.g. Blanchet and Pelé, 1999). The impact of the 1993 reform is more ambiguous. Even if the reform has had an impact on labor market participation (Bozio, 2007), the old age workers activity rate didn't increase again as much as could be expected.

Another key aspect of these reforms, which has been less studied, is how they have affected the well-being of retirees. The direct effect of an increase in the generosity of the pension system, by way of an increase in the benefits, must be an increase in the income of the retirees. Anyway, this result hold only when no substitution effect appear, i.e. if individuals do not adapt their behavior to the changes in the pension system. Indeed, they can either adapt their labor supply, increase or decrease their saving or see some changes in the level of transfers they get from other family members. If the changes in either of these componants or in the three of them are important, an increase in the system generosity can even lead to a reduction of the income of the elderly. At the reverse, a decrease in the system generosity could lead to an increase in old workers income. These phenomena would be very extrem but the question of the subsitution effects is a key point in view of changing demographics. Indeed, the forecast increases in the pension benefits expenditures have lead, in France, as in many other developed countries, to reforms that include cuts in benefits available to retirees. Depending on the variation of their other sources of income, the impact of a drop in the benefits on the standard living of the elderly can be very important and questionning if it induces an important decrease in their standard of living.

In this paper, we use the several reforms of the French pension system in the private sector to study the relationship between Social Security benefits and the well-being of the elderly in France between the late 70's and the beginning of the new century. Affecting people in a different way, depending on the year of birth, gender or socio-economic status, these reforms provide some sources of identification to estimate the effect of benefits changes on the standard of living of the elderly families. To estimate these effects, we regress the pension benefits on several indicators. However, care must be taken on potential reverse effects when studying the causal effect of Social Security programs on the standard of living. For exemple, if individuals become poorer and Social Security is redistributive, then observed benefits will increase. Empirical regressions will make it appear as if Social Security

programs were deteriorating living conditions even if there is no causal relationship. To avoid this reverse effect we compute simulated social security payments and compare their evolution to various measures of well-being based on income, consumption, poverty, inequality or happiness for both elderly and non-elderly families. We then focus on the 1982 and 1993 reforms.

The paper is organized as follows. Section 1 is devoted to a detailed presentation of the French Social Security system and its main reforms since the 50's. The French consumption survey, the well-being indicators and their evolutions since the late 70's are presented in section 2. Section 3 describes the empirical methodology and the construction of the simulated benefits. Results are presented in section 4 and 5 and the last section concludes.

1 Background on the French Social Security System since 1950

General Structure

The French system is complex, but its structure can nevertheless be summed up quite simply in the following way. For a large part of the population (wage earners in the private sector), the pensions rely on two pillars:

- The basic general scheme (Social Security), which offers benefits corresponding to the share of gross wages below a Social Security ceiling[1]. The general scheme gathers more than 70% of the contributors and of the retirees.

- Complementary schemes, organized on an occupational basis. They consist in a large number of specific schemes which are federated in two main organisms ensuring inter-schemes demographic compensation: AGIRC for executive workers and only for the fraction of their wages over the Social Security ceiling and ARRCO for other workers and executives' wages below the ceiling. In 1972, contributing to a complementary scheme became compulsory. Today, complementary schemes provide about 40% of the retirement pensions for wage earners in the private sector.

The complexity of the French system is essentially due to the existence of a large number of exceptions to this general rule of organization. When Social Security was created, in 1945, civil servants or people employed in state-owned companies, who already benefited from more generous dispositions, refused to join the new system. They kept their own pension schemes[2]. Adding the private and public sector, the coverage rate is about 90%. The following analysis will thus deal with these two populations.

Before entering the details of the main rules of these pension schemes, let us make a few remarks on self-employed. When Social Security was created, self-employed decided to adopt cheaper systems offering lower protection. The idea was that a large part of their retirement needs were likely to be covered by other sources, such as income from their professional assets. Their pension schemes are on an occupational basis. The benefits are not calculated on a reference wage but on an indicator of the professional income. Beyond this

[1] € 681 per month in 1979, € 2,279 in 2001 and € 2,773 in 2008.

[2] Note that civil servants are not really covered by an autonomous pension system, since their pensions are directly paid on the state budget.

generality, each of these pension schemes has its specific rules. Their coverage rates being low, we will not make any particular presentation of their rules.

Wage earners in the private sector

General regime

The basic general scheme offers contributory benefits corresponding to the share of the wages below the Social Security ceiling. The pension depends on the length of the workers' career and on the earning profiles during this career. It is proportional to the number of quarters of contribution to the system (truncated to Nmax quarters), and to a reference wage. The reference wage is computed as the average of the annual wages on 10 to 25 years of the pensioners' career (detailed below). The past nominal wages are reevaluated at the time of the benefits claim according to a set of retrospective coefficients.

The general formula of the basic pension for private sector wage earners has remained unchanged since 1945 but the computation of each of the components of the pension has known major changes. The main trend is that the initial pension has become more generous until 1982 and less generous from 1993. More precisely, in this period, there have been three main reforms, one in 1971 (the Boulin Law), one in 1982 and finally one in 1993. The equation giving the pension level is:

$$Pension = \alpha \times \left[\frac{N\ of\ quarters,\ truncated\ to\ N_{\max}}{N_{\max}} \right] \times \left(reference\ wage \right) \qquad [1]$$

with α depending on the period.

Before 1971, the pension was granted from 60 with a proportionality coefficient α of 20%. This coefficient increased by 4% per year when people delayed retirement. The number of contribution quarters Nmax was 120, in link with the short contribution periods as the system only started in 1945. The reference wage was computed on the basis of the last 10 annual wages. Under 15 years of contribution, people received an annuity proportional to the contributions they had paid. If the benefits were too low or under 5 years of contribution, no benefits were granted. Social Security reimbursed the contribution amount.

In 1971, the Boulin Law made the system more generous but still with very strong incentives to wait until the age of 65. The proportionality coefficient α was set to 25% for people claiming their first benefit at 60 and increased by 5 percentage points for each year worked after this age. The number of contribution quarters Nmax was set to 150. Even if retirement was allowed from 60 years old, the incentives to delay retirement remained very strong. Whatever the number of contribution years, the proportionality coefficient α strongly increased with age of retirement. The reference wage was computed on the basis on the best 10 annual wages.

The 1982 reform made retirement at 60 really practicable as it lowered the disincentives to retire before 65[3]. A new formula was introduced for α, incorporating both the age and the total number of years of contribution to the pension scheme:

[3] This was already the case for the women who had contributed 150 quarters to the pension scheme since 1977.

$$\alpha = 50\% - 1.25 \times \min\left(4 \times (65 - A)\ ;\ \max\left(0;150 - \left(N\ of\ quarters\right)\right)\right) \qquad [2]$$

with A the retirement age and A<65. If A≥65 then α=50%.

The maximal value of α remains equal to 50%, reduced by 1.25 percentage point per missing quarter either to reach the age of 65 or to reach the target number of contributed quarters. The adjustment applied was the one which leads to the most favorable outcome for the pensioners. The target number of contributed quarters was set at 150 until 1993. That is to say that somebody retiring with 150 contributed quarters received the maximal proportionality coefficient (α=50%) whatever his/her retirement age.

The 1993 reform tended towards a diminution of the system generosity. It lowered the level of pensions by changing the computation method for the reference wage, which was progressively calculated on the 25 best annual wages instead of on the 10 best annual wages. The rule is the following. The calculation remains on the 10 best annual wages for generations born before 1934, the number of years is up 1 each generation for generations born between 1935 and 1948 and is set up to 25 for all generations born after 1948. Nmax remains set to 150 but the reform made it harder to obtain the maximal proportionality coefficient α=50%. Indeed, equation (2) became:

$$\alpha = 50\% - 1.25 \times \min\left(4 \times (65 - A);\ \max\left(0;\ N_T - \left(N\ of\ quarters\right)\right)\right) \qquad [3]$$

with A the retirement age and A<65. If A≥65 then α=50%.

N_T, the target number of contributed quarters, increases from 150 (for cohorts born before 1934) to reach 160 for generation 1943. The number of quarters is up 1 each generation. The maximal value of α is reduced by 1.25 percentage point per missing quarter either to reach the age of 65 (as before) or to reach the target number of contributed quarters.

Some additional observations must be added to this presentation. Equation (1) implies that pensions, at the time they are claimed, are computed in current French Francs or Euros. They are revalued each year on a discretionary basis. During the 1970s and early 1980s, the general policy was to over index these pensions (with respect to the average gross wage), in order to make up for the initial gap between the standards of living of workers and of pensioners. Since the mid 1980s, the practice has rather consisted in an indexation on prices. This practice has been confirmed by the 1993 reform.

When the pension benefit falls below a floor, it is raised to the level of that floor (about € 12,000 in 2000) for individuals who can claim a full rate pension. These provisions mainly concern women who had part-time jobs or whose careers were short, and whose annual earnings are thus very low. They involve an additional strong incentive to postpone retirement until the full rate.

Finally, basic survivor benefits are paid to survivor spouse of a deceased worker if the survivor fulfills three main conditions: being older than a threshold age, having been married at least two years or having a child, and an income condition. The threshold age was set at 65 years old in 1945 and then decreased to be fixed at 55 in 1972. Until 1975 the income condition was very strict. Survivor benefit could not be drawn simultaneously with pension benefit. After 1975, the basic survivor pension can be added to other personal basic pension of the survivor spouse for people receiving a total personal income lower than a fixed amount.

The basic survivor benefit amounts to 50% of the basic pension of the deceased spouse before 1984, 52% between 1985 and 1993 and 54% since. Survivor benefits have an upper bound and a lower bound depending of the period.

Complementary schemes[4]

These schemes are almost fully contributory and are organized on a DC basis (although they are not funded). Workers accumulate points during their careers which are the pension's basic unit of calculation:

- The points are accumulated during the workers' career in proportion to their contributions. The contribution rate is fixed, and 1 € contributed in year t is considered as equivalent to the formal buying of 1/PP(t) points, where PP(t) is the purchase price of one "point" (the official term for this purchase price is *salaire de référence*).

- The pension is then equal to the total number of points accumulated over the pensioner's career, multiplied by a coefficient V(t) (*valeur du point*), which is fixed each year.

For a pensioner who started working at time t_0 and stopped at time t_1, the pension level at time t can therefore be written as:

$$\text{pension}=V(t).\sum_{t'=t_0}^{t_1}\frac{\tau(t')w(t')}{PP(t')} \qquad [2]$$

where $\tau(t')$ and $w(t')$ are respectively the contribution rate and the worker's wage at time t'. Only a fraction of the wage is taken into account for computing contributions and points accumulated each year:

- For executives, contributions are collected by ARRCO for the part of the wage below the ceiling, and by AGIRC for the segment of the wage which is included between 1 and 8 ceilings.

- For non-executives, the wage is truncated to three times the social-security ceiling, and contributions are collected by ARRCO.

The ARRCO and AGIRC pension schemes were created after the general regime (1961 for ARRCO and 1947 for AGIRC) as the unification of numerous pre existing schemes. The acquisition of points before the unification is almost automatic and does not raise any particular question for the older generations. Concerning retirement age in these complementary schemes, normal retirement theoretically remains at age 65. For retirement below 65, a quasi actuarial adjustment is applied. Since the 1982 pension reform, this adjustment is not applied to people who fulfill the conditions for a full rate basic pension (more than 37.5 years of contribution).

The general formula has remained unchanged since ARRCO and AGIRC pension schemes creation but the computation of each of the components of the benefit has known changes.

[4] Most of the information on the ARRCO and AGIRC pension schemes is issued from Bajram-El Moudden (2000).

Evolution of the ARRCO pension scheme

The ARRCO pension scheme was created at the unification of numerous pre-existing schemes. We focus on the UNIRS scheme, which is the most important scheme in the ARRCO group. It was created in 1957. At that time, people could only contribute to the system between 21 and 65 years old, even if they began to work younger and stop older[5]. There was thus no incentive to delay retirement after 65. For retirement below 65, the number of points was reduced by 5 percentage point per missing year.

Rules change in 1965. New proportionality coefficients were settled. Since the 1982 pension reform, this adjustment is not applied to people with more than 37.5 years of contribution. When people have more than 32.5 years of contribution but do not have 37.5 years, their benefits is still reduced using proportionality coefficients depending either on their age or on the number of quarters missing to reach Nmax. The different proportionally coefficients are given in table 2.

Table 1: Value of the proportionality coefficient in the UNIRS scheme

Between 1965 and 1982					
Age	60	61	62	63	64
Proportionality coefficient	0.78	0.83	0.88	0.92	0.96
After 1982					
Age	60	61	62	63	64
Missing quarters	20	16	12	8	4
Proportionality coefficient	0.78	0.83	0.88	0.92	0.96

Since 1999, pension benefits can be claimed at 55. At that age, the number of points used to calculate the pension benefit is equal to 0.43% of the total number earned. This proportionality coefficient is increased by 0.0175 percentage point per quarter until 60.

The ARRCO complementary survivor benefit amounts to 60% of the deceased spouse complementary benefit, including the extras for children. There is no mean-tested condition to receive a complementary survivor pension. But an age condition remains: 55 for ARCCO.

Evolution of the AGIRC pension scheme

The AGIRC scheme was created in 1947 for executives. Until 1988, the contributions were collected by AGIRC for the segment of the wage which was between 1 and 3 ceilings. The threshold was then increased to 8 ceilings. Normal retirement age is 65. Between 1947 and 1955, the number of points earned by individuals was decreased by 5 percentage point a

[5] The minimum age was suppressed in 1971, the maximum age in 1983.

year if they claimed their benefits between 60 and 64 and multiplied by 1.05 to 1.25 from 66 to 70 or more.

The proportionality coefficients for retirement after 65 were suppressed in 1955 and the coefficients for early retirement changed in 1964. At 55, the number of points used to compute the pension benefit was equal to 0.43% of the total number earned. This proportionality coefficient increased by 0.0175 percentage point per quarter until 60, then by 0.0125 percentage point per quarter until 62 and by 0.01 percentage point per quarter until 65. Since the 1982 reform, the conditions to claim a pension are the same as in the ARRCO pension scheme.

Civil servants[6]

Civil servants have a unique pension scheme, directly financed from the state budget. The civil servant scheme offers contributory benefits corresponding to a share of the last gross wage[7]. The principle is that the pension is proportional to the number of quarters of contribution to the system (truncated to Nmax quarters), and to the last gross wage, excluding bonuses. The equation giving the initial pension level is therefore:

$$Pension = 0.75 \times \left[\frac{N.of\ quarters, truncated\ to\ N_{\max}}{N_{\max}} \right] \times \left(last\ gross\ wage, excluded\ bonuses \right) \quad [2]$$

As a general rule, pension claiming is feasible at age 60, if people have at least 15 years of services. A rather large minority can however leave at age 55: primary school teachers, policemen, prison officers… For women who have bread at least 3 children, the age condition is even completely relaxed.

The key variable is the number of years a civil servant worked. Each year entitles her to a 2% of the last gross wage annuity, the sum being truncated to 75%. Once this basic annuity is computed, some other periods may be taken into account: the most important provision is an additional year given to women for each child they bred. Each additional year yields an additional 2% annuity that may increase the basic annuity up to 80%.

The general formula of the basic pension and the computation of each of the components of the pension has remained unchanged between 1964 and 2003.

Survivor benefits are paid to surviving wife[8] of a deceased worker without any age or income conditions. The survivor benefits amounts to 50% of the deceased spouse complementary benefit.

2 Data description

The objective of this article is to study the link between some observable indicators characterizing the elderly and the evolution in the generosity of the pension scheme. In

[6] Most of the information on the Civil servants pension schemes are issued from Blanchet and Mahieu (2004).
[7] This gross wage excluded bonuses, which represent up to 50% of the total net income for some specific categories, the ones with the highest income. This bonuses remains however insignificant for most civil servants working for the Education Department, which is the largest employer.
[8] The law has been changed in 2003. The gender condition has been suppressed.

France, we do not have any comprehensive survey that provides simultaneously information on labor income, consumption, subjective well-being or on the number of contribution quarters to the pension schemes. Failing this, we rely on several databases to compute either the well-being indicators or the simulated pension benefits.

Well-being indicators

The data are issued from the "Budget des Familles" survey (Insee). The "Budget des Familles" survey (Insee) is the best household survey that we have in France to answer the question of the well-being of the elderly. It has been conducted every five years since 1979. We therefore use five waves: 1979, 1984, 1989, 1994 and 2001. Between 9,000 and 15,000 households were interviewed at each wave[9]. The survey is specifically dedicated to the study of consumption, which makes it extremely rich as far as consumption is concerned. It also gives a special attention to income. It provides precise information on wages and pensions. Eventually, the survey also includes a subjective measure of well-being.

The fact that the “Budget des familles” survey is a household survey is an important but frequent drawback in a study of the well-being of the elderly. Indeed, the persons living in specific institutions like nursing homes are not interviewed, which is the case of a large proportion of the eldest of elder persons in France. The basic unit is the group of persons living in the same household. However, the survey also provides some crucial information at the individual level. It is thus possible to compute the variables of interest at the family level, defined as the group composed by an individual, his spouse and the children living with them, but this step requires to make some strong assumptions on the repartition of some amounts (for instance taxes) within the household. It seems thus more reliable to work at the household level. However, this matter is not crucial at all as a large proportion of the households (88% in 1979) are made up of one family. Moreover, elder people living with their children are quite few in France.

To compare elderly well-being in income, consumption and happiness with the well-being of younger individuals, we define ‘non-elderly’ households as households in which nobody is older than 64 and ‘elderly’ households as households in which there is at least one member older than 64. Income and consumption data are normalized by an equivalence scale to account for the size of the household. The scale is the OECD equivalence scale in which the first adult is counted as one, each subsequent adult as 0.7 and each child under 18 as 0.5. To take into account that some households can be composed of more than one elderly, we weight the elderly households by the number of members older than 64.

The analysis encompasses three aspects of elderly well-being: income, consumption and happiness. For a household, net income is defined as the sum of income from all sources (wages, pensions, real estate income, subsidies) minus all taxes (income tax, housing taxes). We use these data to make four income-based measures of well-being for elderly households: Social Security income, total household income, absolute and relative income poverty. Relative poverty is defined as follows. An elderly household is defined as poor, in a given year, if its income is below forty percent of the median non-elderly income in that year. For absolute poverty, we use the standard indicator with a threshold equal to one half of the median income of a base year (1979), adjusted for price inflation.

[9] 14,250 households in 1979; 11,977 in 1984; 9,038 in 1989; 12,960 in 1994 and 10,305 in 2001.

Consumption is defined as the total household consumption. We use these data to make three consumption based measures of well-being for elderly households: total household consumption and absolute and relative consumption poverty. The definitions for absolute and relative poverty in consumption are the same as the ones used for income.

Finally, each 'Budget des familles' survey includes a question about how the households assess their financial situation. The question is exactly the same for the last four surveys but is a little different in 1979, where the question was more on the budget than on the financial situation. We will make the assumption that this survey change affects all the age categories in the same way, which is a fairly weak assumption. We can thus group the answers into three groups: comfortable financial situation, acceptable financial situation, difficult financial situation. These last indicators will be used thereafter as subjective well-being measures. We have to keep in mind in the following that it is not a general measure of happiness or life satisfaction but a subjective indicator of the felling of households towards their financial means.

Table 5 gives a summary of the availability of the well-being data.

Pension benefits

No comprehensive survey providing information on past labor income, number of contribution quarters and labor Force participation since the 70's do exit in France. We rely thus on four databases to simulate the private sector pension benefits: the annual declarations of social data for the wage history (DADS, INSEE); the wage files of civil servant, the *échantillon interrégime de retraités* (DREES) for the number of quarters and retirement age profiles; the French Labor Force Survey for the activity rate of the elderly (*enquête Emploi*, INSEE).

The DADS is an administrative database collected by the French Statistical Institute (INSEE). The data are based upon mandatory employer reports of the gross earnings of each employee subject to the French payroll taxes. Each worker in the private sector is concerned. The French Statistic Institute prepares an extract of the data covering all individuals employed in French enterprises who were born in October of even-numbered years. For each observation, we have information on the individual gender, occupation and the annualized gross nominal earnings. A panel has been specially made[10] to study earnings profiles between 1967 and 2000 for several cohorts born between 1908 and 1980.

The *échantillon interrégime de retraités* (hereafter referred to as the EIR) matches administrative data collected from all pension schemes that exist in France. For the first run, in 1988, four cohorts of pensioners were selected (those born in 1906, 1912, 1918 and 1922) and their national identification number were transmitted to all existing pension scheme (more than 120 basic schemes and about 180 complementary schemes). All these pension schemes then had to search for these individuals in their records and return the information to a central organization that carried out the matching if they were in. The operation was renewed in 1993 and 1997 for several news cohorts: cohort 1926 in 1993, cohorts 1930, 1932, 1934, 1936, 1938, 1940 and 1942 in 1997. We have thus accurate information on the mean number of quarters for men and women for a large range of cohorts.

[10] Cf. Koubi (2004).

The French Labor Force Survey has been conducted by the French National Statistical Institute (INSEE) since 1950. The households included in the Labor Force Survey sample are interviewed in March of three consecutive years with one-third of the households replaced each year. The survey samples are representative of the French population aged 15 and up. Education and labor market status are completed for each interview. We use the 1968-2001 waves of the French LFS to compute the probability to retire by age and cohort.

3 Empirical Strategy and simulated benefits

Methodology

A main point has to be considered when studying the causal effect of Social Security programs on the standard of living of the elderly. At the individual level, the observed pension benefit depends on three main components: the rules of the pension system; the wage profile and the length of the career. The last two may be endogenous. For example, if individuals become poorer and social security is redistributive, then observed social security benefits will increase to compensate individual's poverty. Empirical regression will make it appears as if Social Security programs were deteriorating living conditions even if there is no causal relationship. The relation between Social Security benefits and well-being indicators may also be due to spurious correlation if the observed retirement incomes and the well-being measures are codetermined by the same factors, for instance economic growth, without any causal effect. Finally, retirement paths can be endogenous to Social Security rules, i.e. individuals can decide to claim their pension earlier, even with a reduction, if the system became more generous. In that case, the pension benefit level may be lower than with a less generous system and the conclusion of a standard regression model could be a negative effect of the generosity of the pension scheme on the financial well-being indicators of the elderly.

To circumvent this problem, we simulate Social Security benefits which are primarily functions of the pension schemes rules and not of the differences in individual's characteristics. We work at the birth cohort level. The idea is to abstract from differences in characteristics of recipients, which may be endogenous, and focus solely on the variations in benefits that arise from pension schemes. Identification is provided by legislation variations. We can thus use instrumental variables methods and regress the outcome variables on Social Security income, instrumented by simulated benefits. To comparison purpose we will bring both standard and instrumental variables regressions into play in the sequel.

For a given cohort c in year y we define B_{ay} as the actual benefits, SB_{ay} as the simulated benefits and WB_{ay} as the outcome or well-being indicators of interest. The empirical methodology will be the following.

1) The regression of simulated benefits on actual benefits in order to test the correlation between both. Year dummies, age dummies and individuals characteristics, denoted X_{ay} hereafter, are included in the regression:

$$SB_{ay} = \alpha B_{ay} + \beta X_{ay} + \varepsilon$$

2) The estimation of a reduced form model, i.e. regression of the well-being indicators on the observed benefits. We have thus:

$$WB_{ay} = \gamma B_{ay} + \delta X_{ay} + \varepsilon$$

3) The estimation of the instrumental variables model, with simulated benefits.

$$WB_{ay} = \gamma SB_{ay} + \delta X_{ay} + \varepsilon$$

Simulation

The benefits are simulated for workers of the private sector and civil servants. They are simulated by generation, gender, age, sector and in the private sector, for executive and non-executive workers. To control for differences in characteristics of recipients, we simulate pensions holding the earnings history and the number of contribution quarters constant. Simulation of the benefits are based on a given earnings history for some fixed cohort of workers.

For workers in the private sector, we use the DADS wage data for cohorts 1936 and 1938[11]. These birth cohorts fulfill a main condition. Individuals have to be observed at least 25 years before retirement to simulate the basic scheme pension benefits. Under the assumption that the last earnings are the better, we need wages from 30 to 55 for early retirement and to 65 for normal retirement age. Our dataset provides this information by gender and by qualification. The main drawback is however that we don't have any information on the wage history for this cohort before 29 years old and this information is needed to simulate pension benefits for private sector complementary schemes. Wage history is completed using the wage growth rate of the 1948 generation between 18 and 29 years old[12]. The graph of the wage curves between 18 and 35 by birth cohorts do indeed shows that the trends are quite similar, even if the level are different. At last, few individuals are retiring after 65. To simulate their pension, we complete the career history assuming that the wage curve, in reel terms, is flat at the end of one's career, i.e. after 55, and we index last wages on price inflation. We use the French consumption price indices to adjust the earnings profile for inflation for earlier and later cohorts. All birth cohorts have thus the same real earning career. We distinguish three workers groups: low wage earner whose career is always at the minimum wage; median earner; and high wage earner who earn the mean wage of executives.

Things are easier for civil servant. We need only the last wage to compute the simulated benefit. To be coherent with the private sector, we build three career histories for the 1937 cohort corresponding to the same criteria: low wage earner whose career is always at the minimum wage; median earner; and high wage earner who earn the mean wage of executives.

The number of quarter, depending on the length of the career, is provided by the EIR data for cohort 1934[13]. Knowing all these components, we can calculate the benefit for each year of birth at each possible retirement age, for each category of workers. To take into account the potential endogeneity of the retirement paths we carry two sets of estimation to test the robustness of the results. First, we use the observed retirement paths in the French Labor Force Survey to compute a weighted average. This set of simulations is referred hereafter as "partially simulated" or "mixed" simulation . Second, we carry out a set of

[11] In the database, earnings profiles are always made for two cohorts, in order to increase the sample size.
[12] For executive workers, we complete the carrer only between 22 and 29 years old because they begin to work later.
[13] The last wave of the EIR being 2001, choosing cohorts 1936 or 1938, we wouldn't have the number of contribution quarter for the eldest in the youngest cohorts (i.e. for individuals older than 64).

simulation with the retirement path of the 1935 generation for all the cohorts[14]. It is hereafter referred "fully simulated" or "pure" simulation. Pension by age and year are thus obtained by weighting simulated pension obtained at the desegregated level by the share of the different groups in the total population. The coefficients are provided by the Labor Force survey for each generation. Finally, survivor benefits are simulated as 50 percentage point of the mean pension.

Observed and simulated benefits

The increase in *observed* benefits has been really significant in France from the late 70s to the late 90s both in level and relatively to the average worker income. This can be explained by several factors. First, workers have better past labor income when they arrive at the retirement age and claim for their pension. Second, more women have personal pension benefits, possibly added to survival benefits. Third, the change in the pension schemes rules have tended towards an increase in the system generosity at the beginning of the period, among other with a high indexation coefficient for the basic pension. The 1993 reform has tended towards a diminution of the system generosity. We can see an inflexion in figure 1 with a decrease in the level of observed benefits and in their ratio to the average worker income which may be a first effect of this reform[15].

Average *simulated* benefits are given in figure 2. The main change between the pure and mixed simulation approaches is the difference in the retirement path of the individuals. Benefit levels predicted for the mixed simulation approach are higher than the ones predicted for the fully simulated approach. This means that, should people from other generations have had the retirement path of the 1935 generation, they would have had lower benefits levels. This suggests an optimal adjustment of the age of retirement of the worker to the pension benefits scheme rules. A comparison between the two specifications and observed benefits shows that simulated benefits are always a bit higher than observed benefits. This can be explained by an under-estimate of the income tax in the simulations.

The differences between observed and simulated benefits are higher at the end of the period. The change in the pension rules combined with changes in the labor market can explain this. Benefits are simulated holding constant the earnings history and the number of contribution quarters. They correspond to a typical career of someone born in the mean 30s, with no unemployment or part-time spell during her working history. Or, after the crisis at the beginning of the 70s, the more and more people have suffered non-employment spells. The 1993 reform requiring an increase in the length of contribution to the pension scheme and a greater number of wages for the computation of the pension benefits, the impact of the assumptions made on the individuals working life is higher at the end than at the beginning of the period.

For the simulations, we have distinguished three groups of workers: low wage earner whose career is always at the minimum wage; median earner; and high wage earner who earn the mean wage of executives. Low wages and incomplete careers being often correlated, we have simulated low wage earners benefits with the 10^{th} percentile of the number of contribution quarter per cohort. Mean number of contribution quarter has been used in the

[14] The last wave of the Labor Force survey being 2002, choosing cohorts 1936 or 1938, we wouldn't have the retirement path for the eldest in the youngest cohorts.

[15] The decrease of the mean pension benefit is lower when pensions are normalized by an equivalence scale to account for the size of the household, what is done thereafter.

other cases. Comparison between low-, mean- and high-earner simulated benefits and the 10th, 50th and 90th percentiles of Social Security Income are given in Figure 3. Simulated and observed benefits exhibits a good match.

Figures 4 and 5 compare simulated benefits for birth cohorts affected differently by the 1982 reform. The change in the normal retirement age from 65 to 60 was decided in 1982. The pension rules were thus different for generations 1914 or 1919 and generations 1924 or 1929. These differences appear in the figures. We can indeed observe that benefits at 61 are much higher for generations 1924 or 1929 than for the older generations. More attention will be devoted to these cohorts in section 5.

Differences in pension benefit by age in figures 6 and 7 are more complex to interpret. They mix changes in pension rules and pension upgrade after retirement.

4 Results

Time Series Evidence

Time series evidence for the measures of well-being data are given in figures 8 to 18. The shape of benefits in figure 8 exhibits some differences with observed benefits in figure 1. The difference between the two figures is explained by the differences in definition of the benefit indicator. In figure 1, benefits are calculated at the individual level. In figure 8, mean pension benefits are calculated at the household level and normalized by an equivalence scale to account for the size of the households. The decrease of the mean pension benefit is lower in the second case.

Each figure from 9 to 18 shows two lines representing respectively the elderly and non elderly well-being measures. The latter group is included to capture economic trend. The series are rescaled to fit on the same graph and well-being measures are in real terms, data representing for each wave the amount per person in 2001 euros.

The means, 10th, 50th and 90th percentiles of total household income, normalized by the OECD equivalence scale, have increased in France from the late 70s to the late 90s. The increase in the mean has been higher for the elderly. Although the difference was of nearly 2500€ at the beginning of the period, the two means were equal in 2001. The decrease in the difference between elderly and working age households is mostly due to the increase in the benefits level underlined previously. The increase in the income level of the elderly has been higher at the bottom of the distribution, reducing inequalities.

At the same time, the relative poverty has decreased in France from the late 70s to the mid 90s. Since that period, the relative poverty rate is more or less steady[16]. The trends have been very different for young and elder households. The poverty rate has been higher for the elderly at the beginning of the period. With the increases of the benefits until the mid 90s, the relative poverty rate of the elderly decreased below the poverty rate for younger households. For the working age households, the poverty rate has been more or less steady at the beginning of the period, even if the mean income has increased. With the higher rate of unemployment and part time work since the beginning of the 90s, their poverty rate has increased. We note a slight decline at the end in the late 90s with the improvement in the economic situation observed in France at that time. Trends are the same for absolute poverty.

[16] Cf. Hourriez and al. 2001.

As for income, the means and the 10^{th}, 50^{th} and 90^{th} percentiles of total household consumption, normalized by the OECD equivalence scale, have increased in France from the late 70s to the late 90s. The trends in the means are the same as the trends observed for mean total household income: the levels are lower for the elderly but the growth rates higher. The consumption poverty rate is always higher for the elderly (the trend was reversed during the period for the income poverty rate), even if it decreases at a higher rate than for the working age household.

Concerning the measure of subjective well-being, happiness increases and unhappiness decreases during the period. We can note on graphs 10 and 11 a peak in 1984, just after the change in the French government economic policy in 1983. After a period of reflation, the government moved to a politic of financial stringency.

Regressions results

Three sets of results are available in tables 3 and 4. The first set of regressions corresponds to the regressions of the observed benefits on the simulated pensions; the second is issued from the reduced form regressions of the indicators of well-being on the simulated pensions and the third is obtained performing instrumental variables regressions. In that case, the indicators of well-being are regress on observed benefits, using simulated pensions as instruments. Regressions on means of income or consumption are made using either the mean observed benefits or the median earner simulations. For the poverty rates or percentiles regressions, we do not measure actual benefits on average for the full population but as an average for the relevant sub-population. For example, for poverty, the average social security benefits are computed among families living below the poverty line; for the 10^{th} percentile among families with family income between the 5^{th} and the 15^{th} percentiles and so on. Low wage earner simulated benefits are used for the poverty and the 10^{th} percentiles regressions, median earner simulated benefits for the mean and 50^{th} percentiles regressions and high earner simulated benefits for the 90^{th} percentiles regressions. For the subjective well-being indicators, regressions are made using successively the three levels of simulated pension benefits for low, mean and high wage earners.

The columns 4 and 5 in tables 3 and 4 corresponds to the regressions of the observed benefits on the simulated pensions. Controls are gender, education and marital status. High wage earner being defined as individuals who earn the mean wage of executives, education has been dropped in the percentiles regressions. The regression coefficients of observed pension benefits on simulated benefits are highly significant and quite analogous between regressions on fully or partially simulated benefits. An interesting thing to note is that the coefficients are the highest for the 10^{th} percentile of benefits and low wage earner simulations, being equal to 0.863 for the partially simulated benefits and to 0.884 for fully simulated benefits. Simulations fit better the data at this level because there is less heterogeneity in the workers career at the bottom of the distribution than at the mean or top level. The lowest coefficients are for the median level where the correlation between observed and simulated benefits is between 0.3 and 0.4. In that case, the simulations are issued from observations on the mean income and the dependant variable is the median.

The results of the reduced form regressions of the indicators of well-being on the simulated pensions are given in the columns 6 and 7 of tables 3 and 4. The last set of results, columns 8 and 9, is obtained performing instrumental variables regressions. Results are quite similar for fully and partially simulated benefits and are analogous between reduced form or instrumental variables regressions analysis. The coefficients are higher in the second case.

The impact of an increase in the pension level on the mean income is only significant for fully simulated benefits. The difference between fully and partially simulated benefits is due to differences in the retirement path of the individuals. In the first case, we have used for each cohort the retirement paths observed in the French Labor Force Survey; in the second case we have carried out a set of simulation holding the retirement path constant and using the one's of the 1935 generation. The effects of the pension rules are significant only when holding the retirement path constant. The endogeneity problem is better controled in that case and we have thus a better identification of the impact of a changes in the rules of social security on the income level. At the mean level, when significant, the estimated coefficients are very small. This suggests an important crowding out effect; which means that individuals have adapted their behavior to the changes of the pension system. Indeed, the decresase in the mean retirement age was very important after the 1982 reform. As this reform is one of the main change of social security pension rules during the period, most of the identification of the model rely on it and this can explain the high crowding out effect at the mean level. Results are more constrasted whith the percentiles regressions.

The coefficients are higher at the top of the distribution than at the bottom. Taken fully simulated benefits and reduced form regression, one euro increase in simulated benefits leads to a 33.3 percent increase in after-tax income at the 10^{th} level of the distribution and to a 62 percent increase at the 90^{th} level. For instrumental variables regressions, a euro increase gives nearly a one to one match at the top of the distribution. Regressions exhibits no crowding out effects at the top of the distribution and less at the bottom than at the mean level. For the richer, we can imagine less substitution with labor force participation but higher with saving than for the other groups. We are not able to see that in our data. Anyway, due to the extent of the pension scheme this phenomenon is probably less important in France than in other countries. For individuals at the bottom of the distribution, an increase in the social security rules generosity induces an increase in income. Even if people adjust their behavior to the changes in the rules of the social security system, they seize the opportunity of an increases in the pension system generosity to increase their income.

As far as poverty is concerned, nearly all results are non significant. Regressions are made using low wage earners simulations which is probably not the best indicator to test poverty. It is more likely that poor people would be those non-eligible for a pension but eligible for a minimum allocation, the AVTS, given in France to old age workers under income conditions. Previous studies have shown that the decrease in old age poverty in France has be due to the pension system but essentially via mechanisms such as the AVTS. Since we can't control for the specific characteristics of individuals eligible to the AVTS, it might be excluded variables that drives the results in the regression on income poverty.

Results exhibit similarities in the patterns of consumption and income. Consumption behaviors follow the changes in earnings. We note, for consumption as for income, a high crowding out effect which is constrasted. Results are significant at the mean, bottom and top of the distribution but not at the median level. The coefficients are higher at the top of the distribution than at the bottom or the mean. The main difference between the two sets of indicators are relative to poverty. The regression coefficients on absolute consumption poverty are small but positive and significant. However, the same remark holds as for income poverty regressions.

The impact of an increase in benefit has a direct effect on happiness, i.e. it increases the share of old age households who declare to be happy and decrease the share of old age households who declare to be unhappy. For the subjective well-being indicators, regressions

are made using successively the three levels of simulated pension benefits for low, mean and high wage earners. The impact is higher at the bottom level but still persist at the top level, but naturally for the happiness indicator only.

5 Focus on the 1982 and 1993 reforms

Figures 4 and 5 compare simulated benefits for birth cohorts affected differently by the pension schemes reforms. They show that simulated benefit profiles are different for the different cohorts, depending on the fact that people are or not concerned by the 1982 or 1993 reforms. Moreover, estimation results exhibits some crodwing out effects suggesting that individuals have adapted their behavior to the changes in the pension system either by changing their labor supply, their saving or the level of transfers from other family members. It is difficult with our data to disentangle this three possibilites. However, the patterns of the 1982 and 1993 reforms are opposite. The first reform induces an increases in the generosity of the system, the second a decrases in generosity. We can thus test if the individual adjustement depends on the pattern of the reform.

To begin, we have performed tests of structural change in the mean income and consumption instrumental variables regressions to test if our assumption of some breaks in 1982 or 1993 is supported by the data. Results are given in table 8. Tests of structural changes have been performed for each reform on the whole sample and then on subsamples to separate the effect of the reforms. The critical value of the χ_2 is equal to 3.84. The assumption of a break is rejected only once, for the 1982 reform when the estimations are performed on the subsample of years 1979-1989.

To evaluate the effect of the two reforms, we have thus performed difference in difference estimations using the "Budget des Familles" survey. Both reforms being only for the workers of the private sector, we use workers of the public sector as the reference group. To be more precise, the reference group is composed of individuals living in households in which nobody is a former worker of the private sector.

For the 1982 reform we have made three regressions, depending on the definition of the cohorts affected by the reform. The change in the normal retirement age has been decided in 1982. We can thus either consider that:

- the first cohort affected by the reform is the cohort 1922;
- the first cohort affected by the reform is the cohort 1918 as people born in 1918 were 64 in 1922 and could thus retire one year before people of the 1917 cohort.

In the first case, we consider as treated cohorts of workers of the private sector born after 1921, in the second case cohorts of workers of the private sector born after 1917. We have also perfomed estimations excluding cohorts born between 1918 and 1921 to avoid the contamination problem between groups. Results for mean and consumption are similar in the three cases, i.e. the impact of the 1982 reform on the mean income is positive and significant and it is non significant for consumption. The coefficients are higher when we consider that the first cohort affected by the reform is generation 1922. To test the robustness of our results, we have restricted the sample to the 1914-1924 cohorts. Coefficients on income are no longer significant. Differences are greater between the younger and the oldest generations. This is coherent with the knowledge that many people were already on early retirement between 60

and 65 in the late seventies. They only switch from early retirement to retirement, what lessen the impact of the reform.

For the 1993 reform, the treatment group is easier to define as the reform was implemented on a cohort criteria. Individuals concerned by the reform are those born after 1933. The 1993 reform tended towards a diminution of the system generosity and its impact on income and consumption is indeed highly significantly negative. Results are robust to the sample choice.

The difference in the magnitude of the coefficients estimated for the 1982 and 1993 reforms underlines that it exists asymmetry in the substitution effects between the different sources of income of the elderly depending on the sign of the change in generosity of the pension reforms.

Conclusion

Changes in the pension system in France since the 50's have induced many changes in the well-being and standard of living of the elderly. Our estimations conclude to a general increase in income, consumption and subjective well-being. For income, a one euro increase in simulated benefit doesn't induce a 100 percent increase in after tax income (except at the top of the distribution), which shows some substitution between the different sources of income available for the elderly households. However, the effect of a change in the pension benefits remain significant.

Estimation of difference in difference models to evaluate the impact on income and consumption of the 1982 and 1993 reforms underlines that it may exist asymmetry in the substitution effect between the different sources of income of the elderly depending on the sign of the change in generosity of the pension reforms. Further research on that point should be made.

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Table 2: Availability of Well-Being Data

Measure	Source	Years available	Ages available	Number of obs.	Variable description
Benefits	Family Budget Survey (National Institute of statistics)	1979, 1984, 1989, 1994, 2000 (5 waves)	65 -> 100	14422	Household net benefits
Income	Family Budget Survey (National Institute of statistics)	1979, 1984, 1989, 1994, 2000 (5 waves)	65 -> 100	14422	Household net income Relative and absolute income poverty rate
Consumption	Family Budget Survey (National Institute of statistics)	1979, 1984, 1989, 1994, 2000 (5 waves)	65 -> 100	14422	Household consumption Relative and absolute consumption poverty rate
Self-assessed life satisfaction	Family Budget Survey (National Institute of statistics)	1979, 1984, 1989, 1994, 2000 (5 waves)	65 -> 100	14422	Assessed financial situation

Table 3: Income regression results

			First Stage		Reduced Form		IV	
	Mean	# obs	Partially Simulated	Fully Simulated	Partially Simulated	Fully Simulated	Partially Simulated	Fully Simulated
Mean SS Inc	9795	14422	0,671**	0,689**				
			(0,015)	(0,016)				
10th Pct SS Inc	4896	14422	0,863**	0,884**				
			(0,081)	(0,083)				
50th Pct SS Inc	8705	14422	0,340**	0,397**				
			(0,084)	(0,198)				
90th Pct SS Inc	15171	14422	0,586**	0,614**				
			(0,070)	(0,075)				
Mean Income	12586	14422			0,047	0,053*	0,069	0,077*
					(0,030)	(0,030)	(0,044)	(0,043)
Relative Inc Pov	0,050	14422			-0,001	-0,001	-0,001	-0,001
					(0,001)	(0,001)	(0,002)	(0,002)
Absolute Inc Pov	0,076	14422			0,001	0,001	0,001	0,001
					(0,002)	(0,002)	(0,003)	(0,003)
10th Pct Inc	7432	14422			0,319**	0,333**	0,370**	0,376**
					(0,094)	(0,095)	(0,082)	(0,081)
50th Pct Inc	11189	14422			-0,062	-0,013	-0,182	-0,034
					(0,0958)	(0,111)	(0,313)	(0,285)
90th Pct Inc	19283	14422			0,565**	0,620**	0,965**	1,010**
					(0,115)	(0,118)	(0,163)	(0,160)

Table 4: Consumption and Subjective Well-Being regression results

			First Stage		Reduced Form		IV	
	Mean	# obs	Partially Simulated	Fully Simulated	Partially Simulated	Fully Simulated	Partially Simulated	Fully Simulated
Consumption								
Mean Cons	13923	14422			0,070**	0,088**	0,105**	0,128**
					(0,031)	(0,032)	(0,046)	(0,047)
Relative Cons Pov	0,182	14422			0,003	0,002	0,005	0,004
					(0,002)	(0,002)	(0,004)	(0,004)
Absolute Cons Pov	0,219	14422			0,007**	0,007**	0,012**	0,011**
					(0,003)	(0,003)	(0,005)	(0,005)
10th Pct Cons	7040	14422			0,250*	0,271*	0,289**	0,306**
					(0,139)	(0,140)	(0,143)	(0,139)
50th Pct Cons	11550	14422			-0,153	-0,051	-0,452	-0,129
					(0,135)	(0,155)	(0,456)	(0,407)
90th Pct Cons	21656	14422			0,365**	0,474**	0,623**	0,772**
					(0,110)	(0,116)	(0,177)	(0,179)
Happiness								
10th Pct SS Inc								
Very Happy	0,109	14422			0,006**	0,006**	0,011**	0,011**
					(0,002)	(0,002)	(0,004)	(0,004)
Unhappy/ Very Unhappy	0,090	14422			-0,005**	-0,005**	-0,009**	-0,009**
					(0,002)	(0,002)	(0,004)	(0,004)
Mean SS								
Very Happy	0,109	14422			0,004*	0,003	0,006*	0,005
					(0,002)	(0,002)	(0,003)	(0,003)
Unhappy/ Very Unhappy	0,090	14422			-0,005**	-0,005**	-0,007**	-0,007**
					(0,002)	(0,002)	(0,003)	(0,003)
90th Pct SS Inc								
Very Happy	0,109	14422			0,002*	0,002*	0,005*	0,005*
					(0,001)	(0,001)	(0,003)	(0,003)
Unhappy/ Very Unhappy	0,090	14422			-0,002	-0,002	-0,004	-0,004
					(0,002)	(0,002)	(0,004)	(0,004)

Note: Controls are gender, education and marital status. Education has been dropped in the percentiles regressions.

Table 5: Regressions per period

	Before/After 1982 Whole sample		Before/After 1982 Years 1979 - 1989		Before/After 1993 Whole sample		Before/After 1993 Years 1984 - 2001	
	Partially Simulated	Fully Simulated	Partially Simulated	Fully Simulated	Partially Simulated	Fully Simulated	Partially Simulated	Fully Simulated
				Income				
Mean Income Before	-0,289	-0,294	-0,288	-0,294	-0,070	-0,067	0,029	0,030
	(0,192)	(0,195)	(0,192)	(0,196)	(0,071)	(0,071)	(0,048)	(0,048)
Mean Income After	0,152**	0,155**	0,029	0,030	0,239**	0,239**	0,239**	0,239**
	(0,032)	(0,032)	(0,048)	(0,048)	(0,041)	(0,042)	(0,041)	(0,042)
Wald statistic	5,12	5,12	2,57	2,58	14,01	13,89	10,99	10,67
				Consumption				
Mean Cons Before	-0,270*	-0,260*	-0,270*	-0,260	-0,079	-0,058	0,027	0,045
	(0,148)	(0,150)	(0,148)	(0,151)	(0,062)	(0,062)	(0,056)	(0,058)
Mean Cons After	0,177**	0,197**	0,027 (0,056)	0,045	0,286**	0,301**	0,286**	0,030**
	(0,045)	(0,047)		(0,058)	(0,067)	(0,068)	(0,067)	(0,068)
Wald statistic	8,3	8,41	3,49	3,57	16,05	15,02	8,84	8,16

Note: Controls are gender, education and marital status.

Table 6: Difference in difference models

	Before/After 1982	
	Cohorts born before 1924	Cohorts 1914- 1924
	Income	
Treatment : cohorts born after 1921	1,163** (0,568)	0,808 (0,608)
Treatment : cohorts born after 1917	0,739* (0,395)	0,405 (0,545)
Treatment : cohorts born after 1921, without cohorts 1918-1921	1,211** (0,576)	0,860 (0,686)
	Consumption	
Treatment : cohorts born after 1921	0,214 (0,886)	-0,311 (0,957)
Treatment : cohorts born after 1917	0,521 (0,569)	-0,007 (0,762)
Treatment : cohorts born after 1921, without cohorts 1918-1921	0,289 (0,849)	-0,226 (1,041)

Note: Controls are gender, age, education and marital status.

	Before/After 1993	
	Cohorts 1922 - 1936	Cohorts 1929 - 1936
	Income	
Treatment : cohorts born after 1933	-2,157** (0,949)	-1,762* (1,059)
	Consumption	
Treatment : cohorts born after 1933	-4,520** (2,094)	-3,889* (2,238)

Note: Controls are gender, age, education and marital status.

Figure 1: Average Income Security Benefits

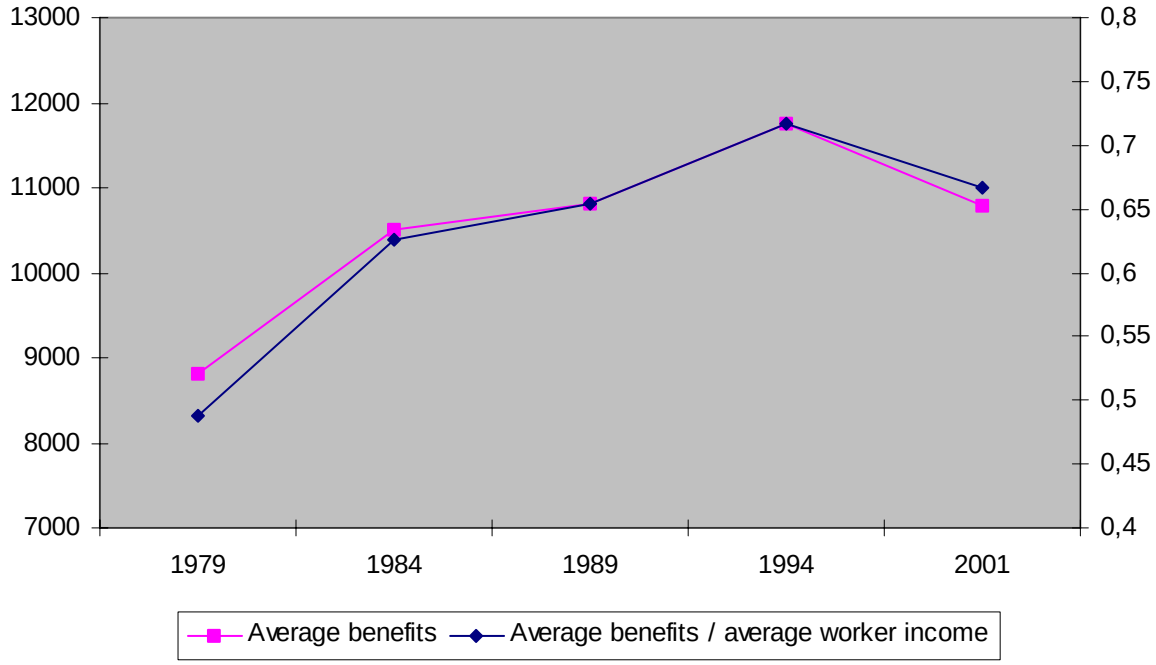


Figure 2: Average Simulated Benefits

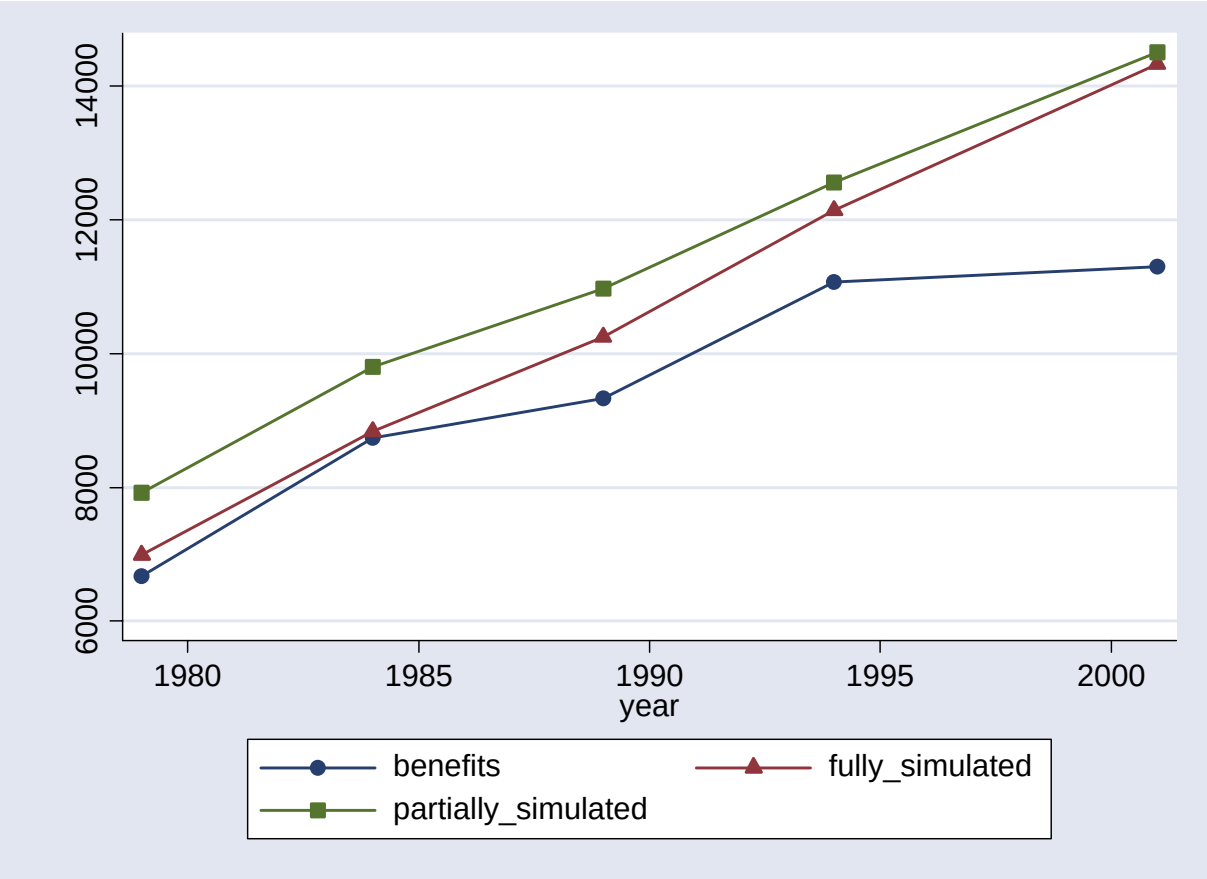
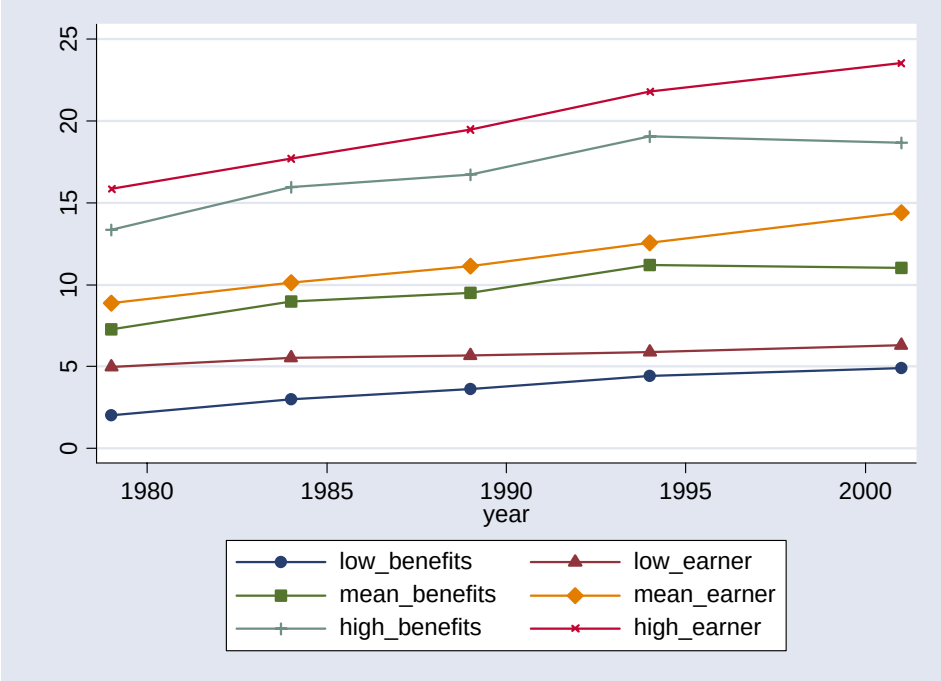


Figure 3: Simulated Benefits by Earnings Level

Partially Simulated



Fully Simulated

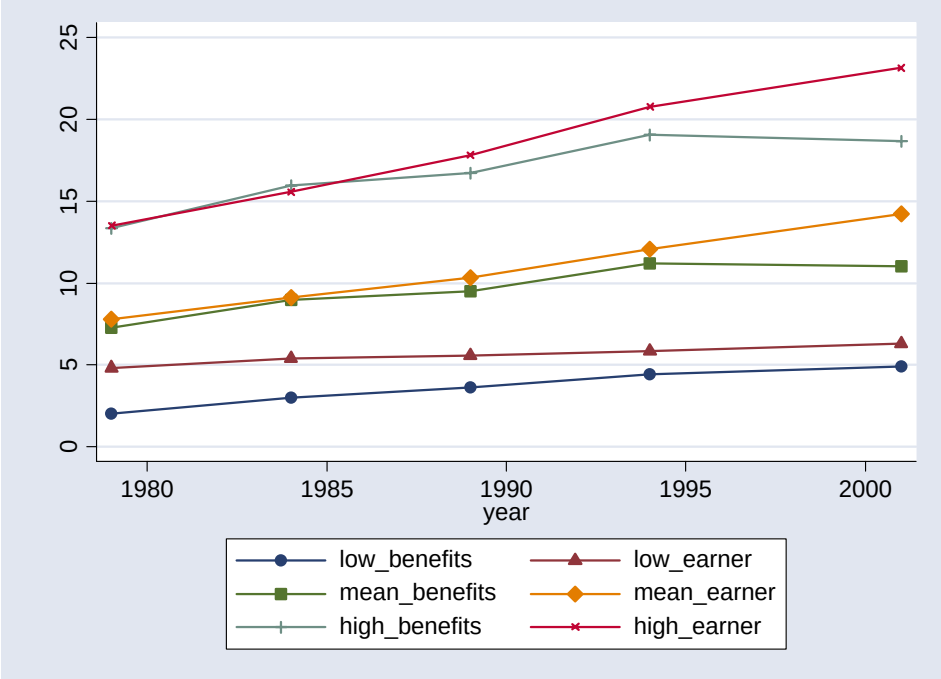
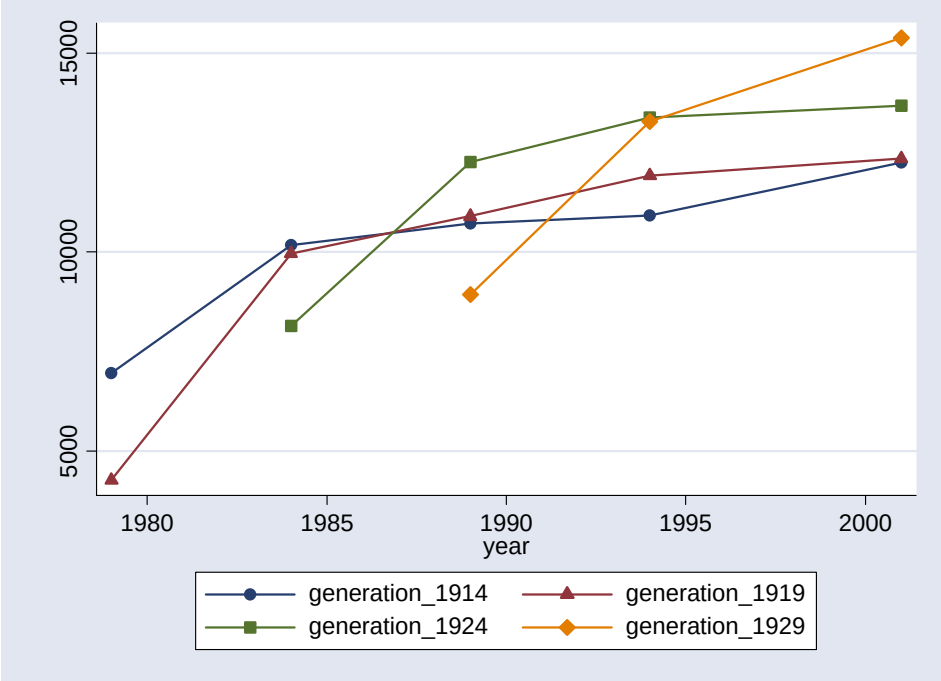


Figure 4: Simulated Benefits by Cohorts

Partially Simulated



Fully Simulated

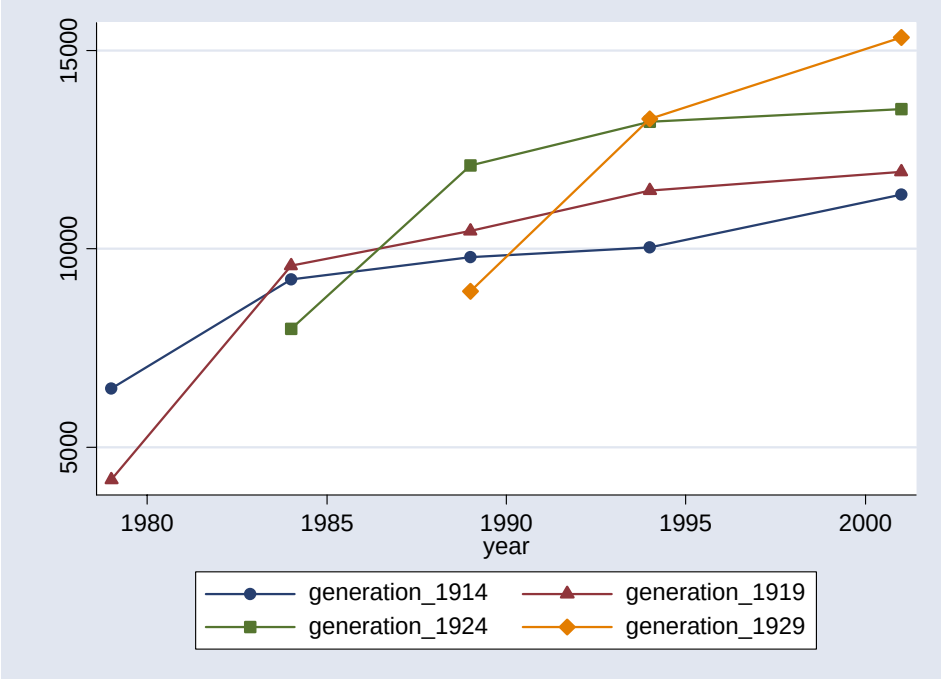
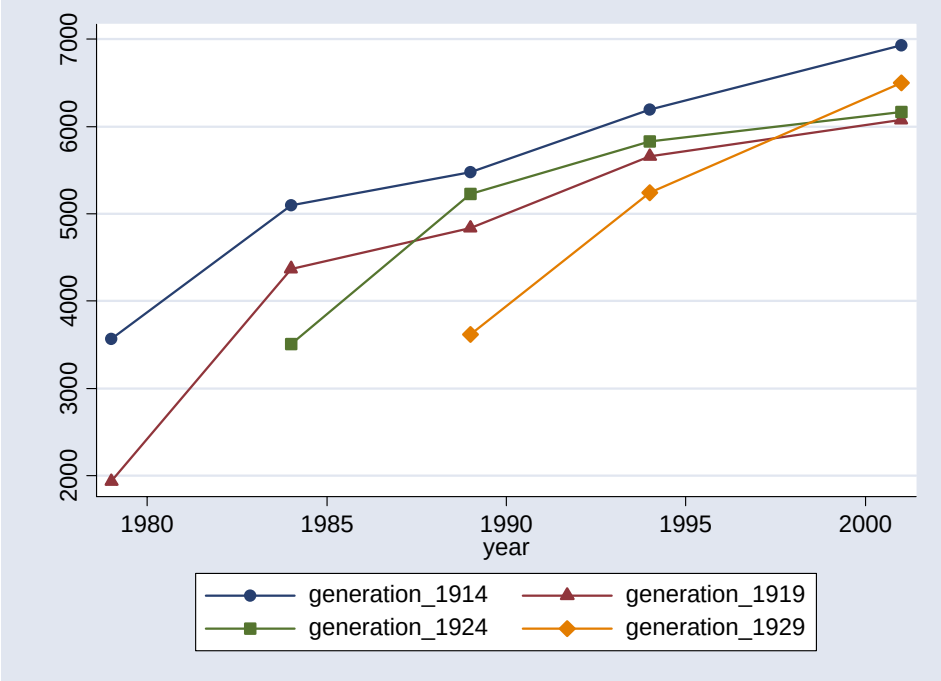


Figure 5: Simulated Benefits by Cohorts, Partially Simulated

Low Earners



High Earners

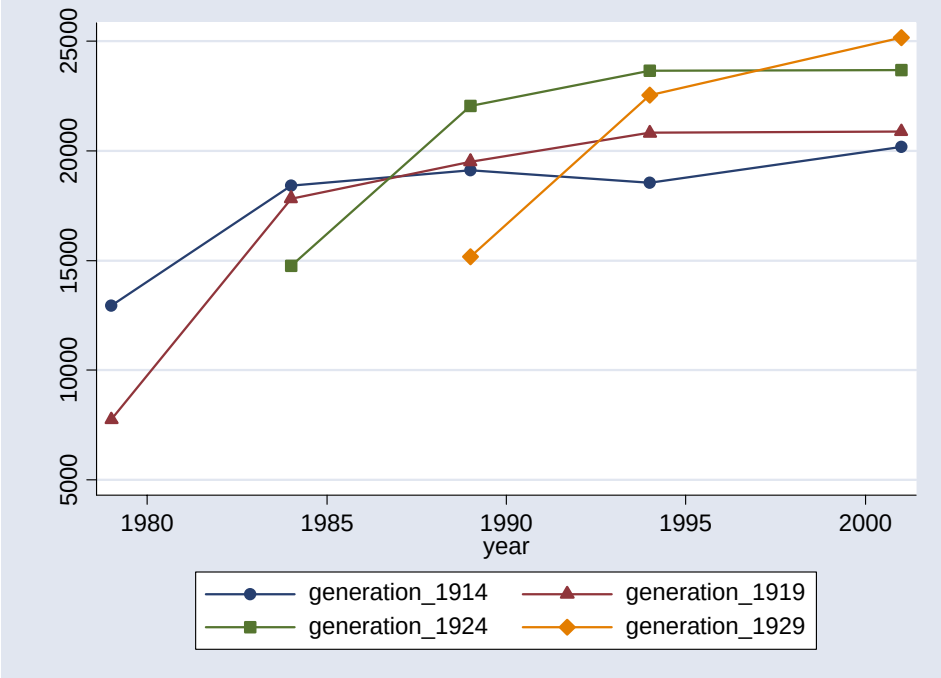
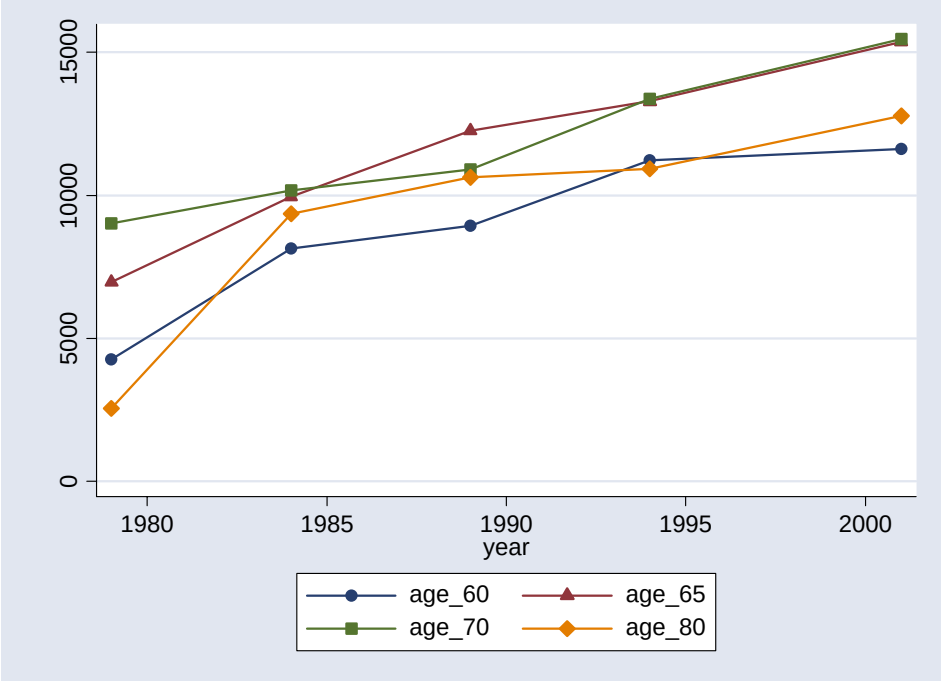


Figure 6: Simulated Benefits by Ages

Partially Simulated



Fully Simulated

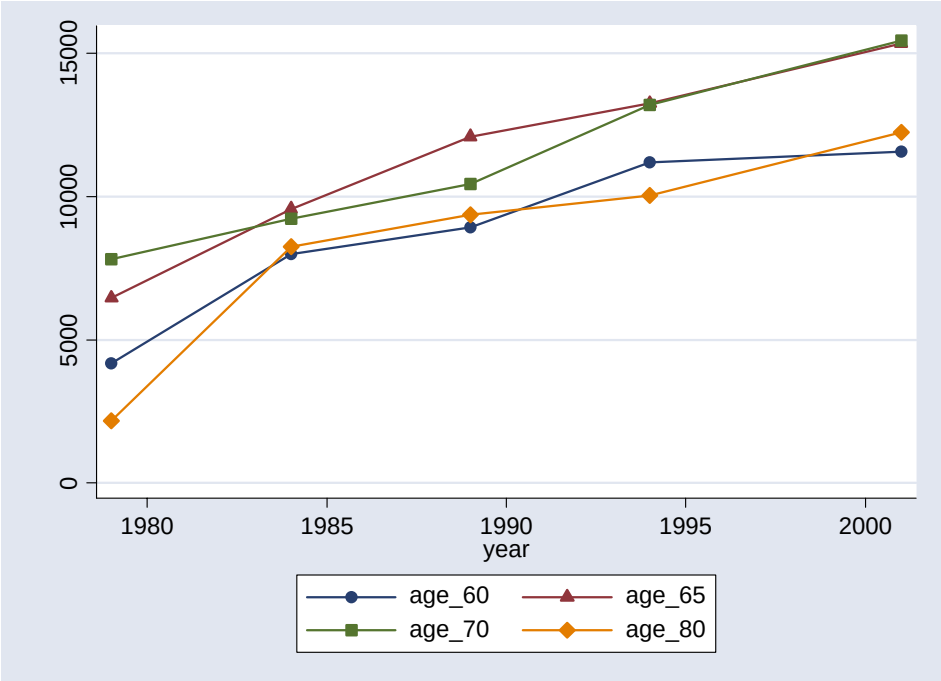
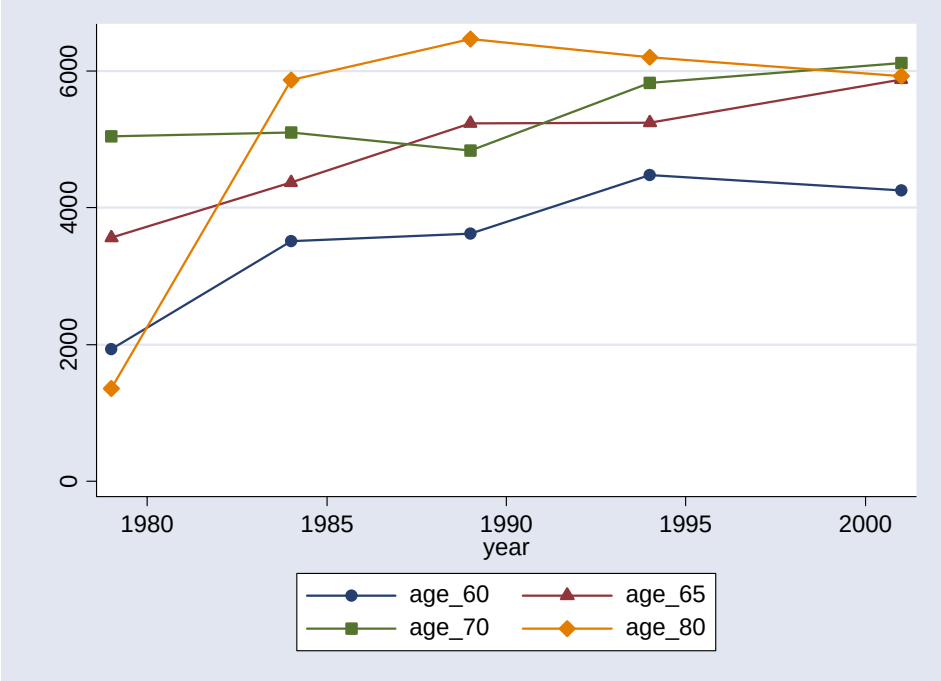


Figure 7: Simulated Benefits by Cohorts, Partially Simulated

Low Earners



High Earners

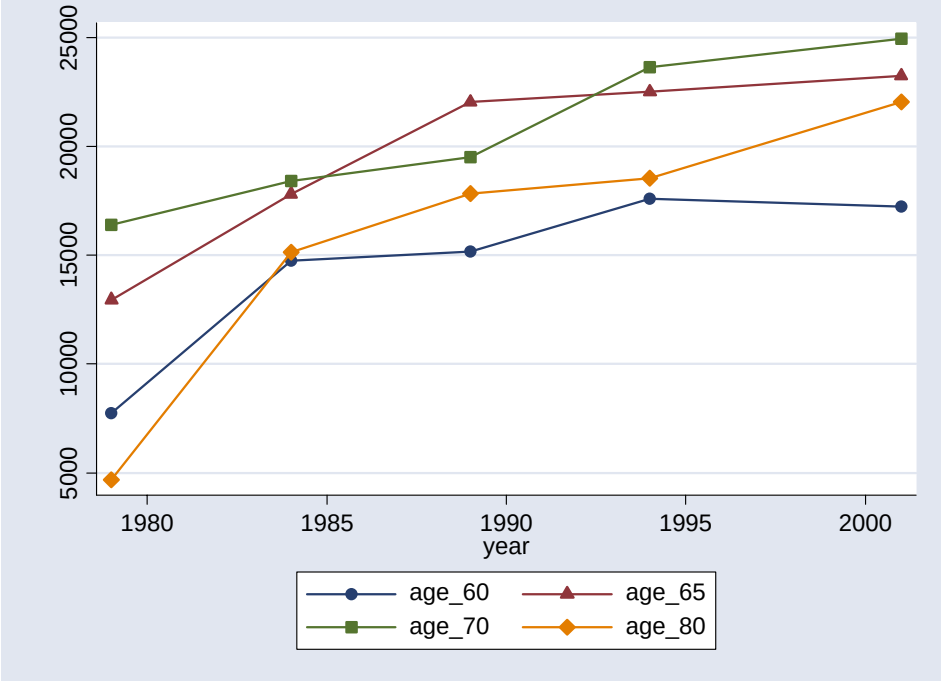


Figure 8: Benefits

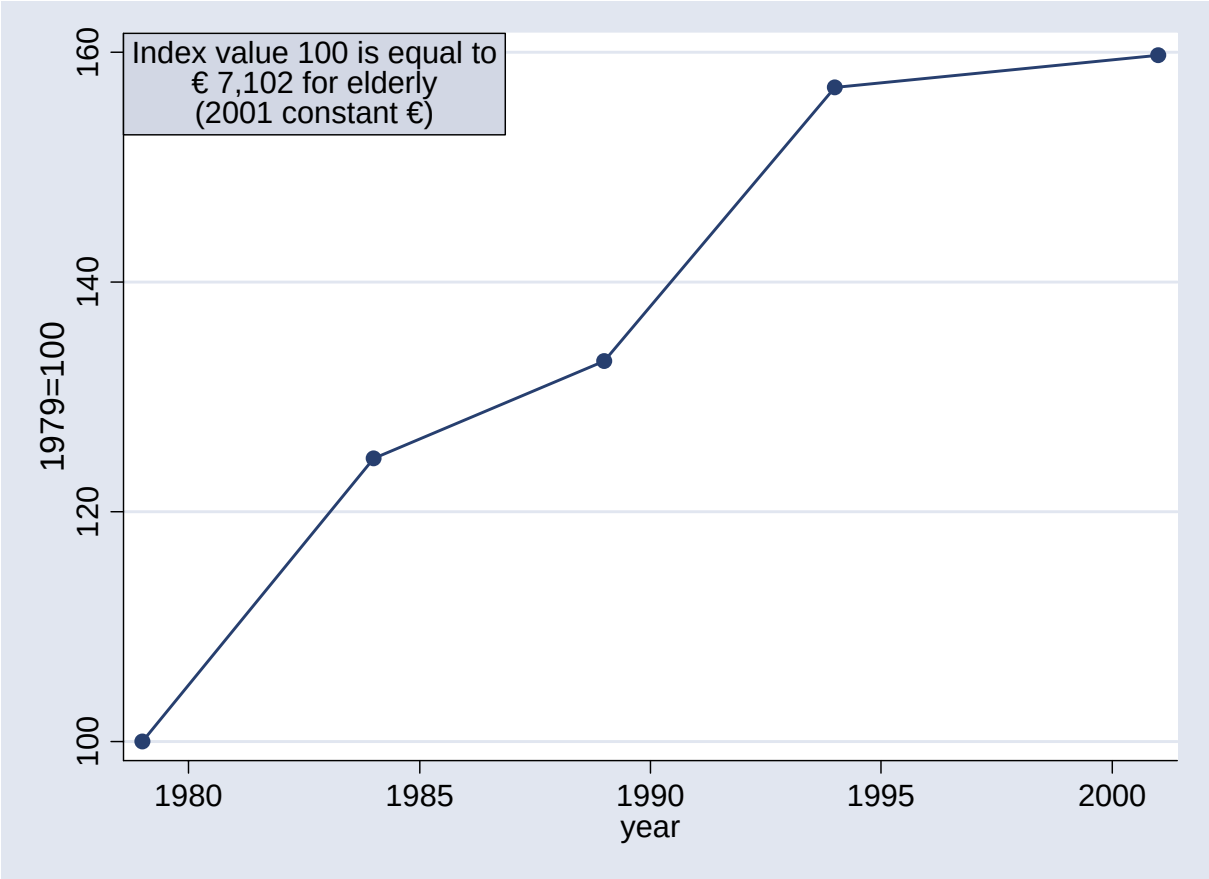


Figure 9: Income

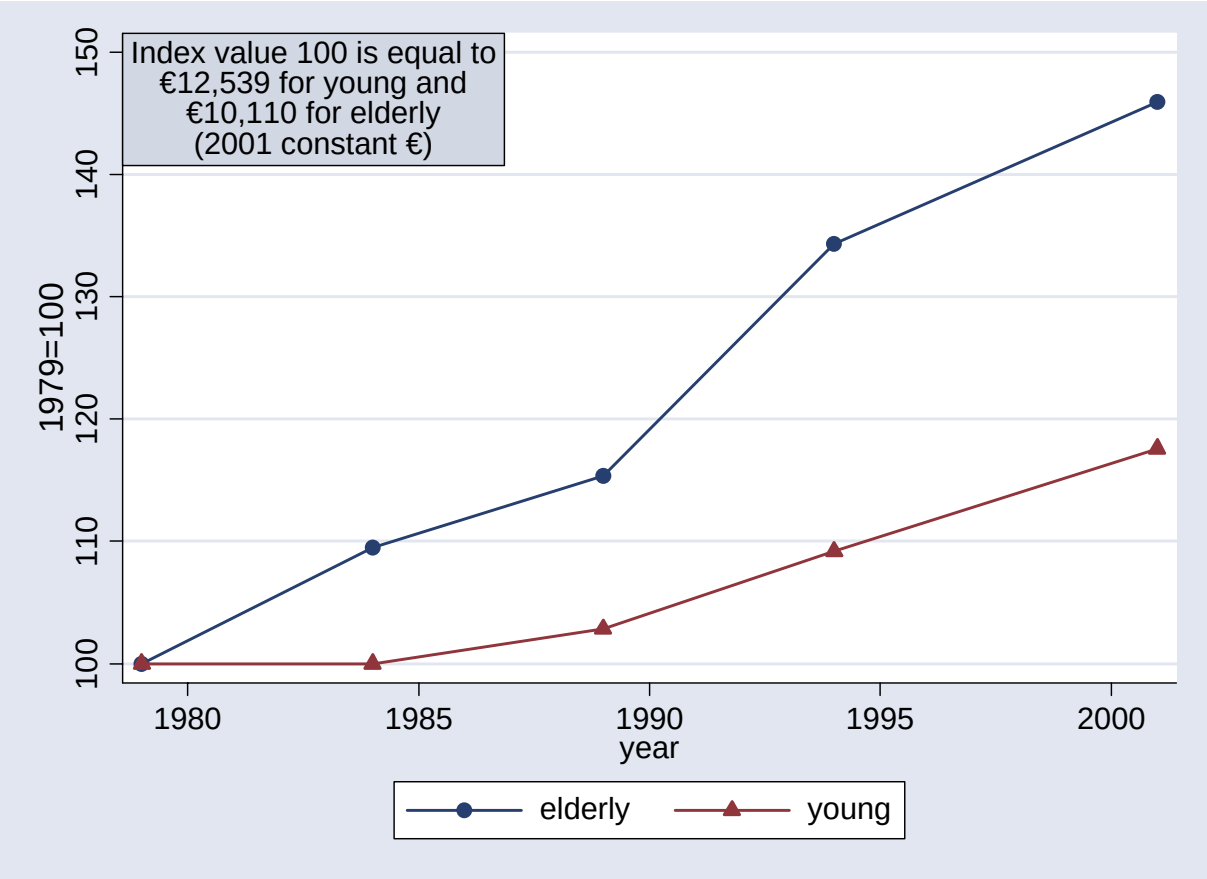


Figure 10: Income – relative poverty

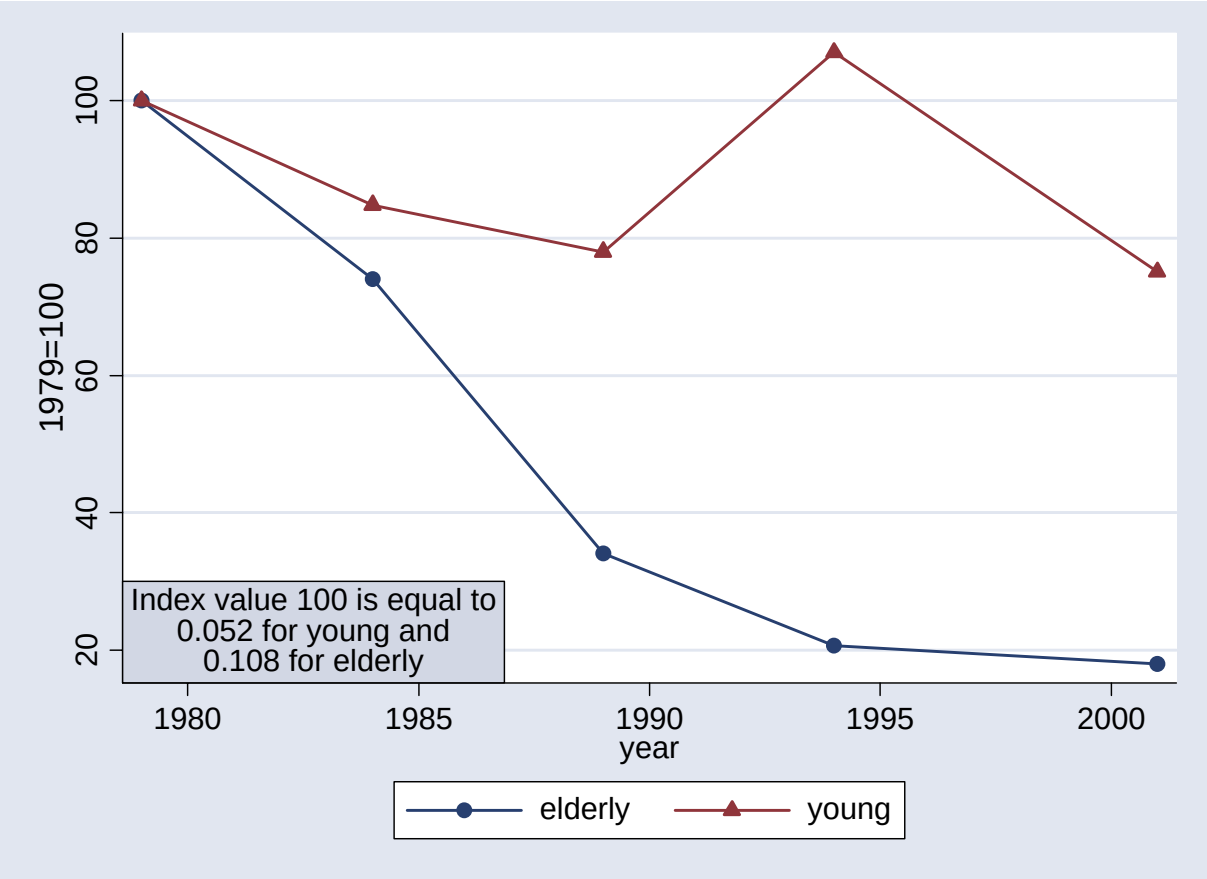


Figure 11: Income – absolute poverty

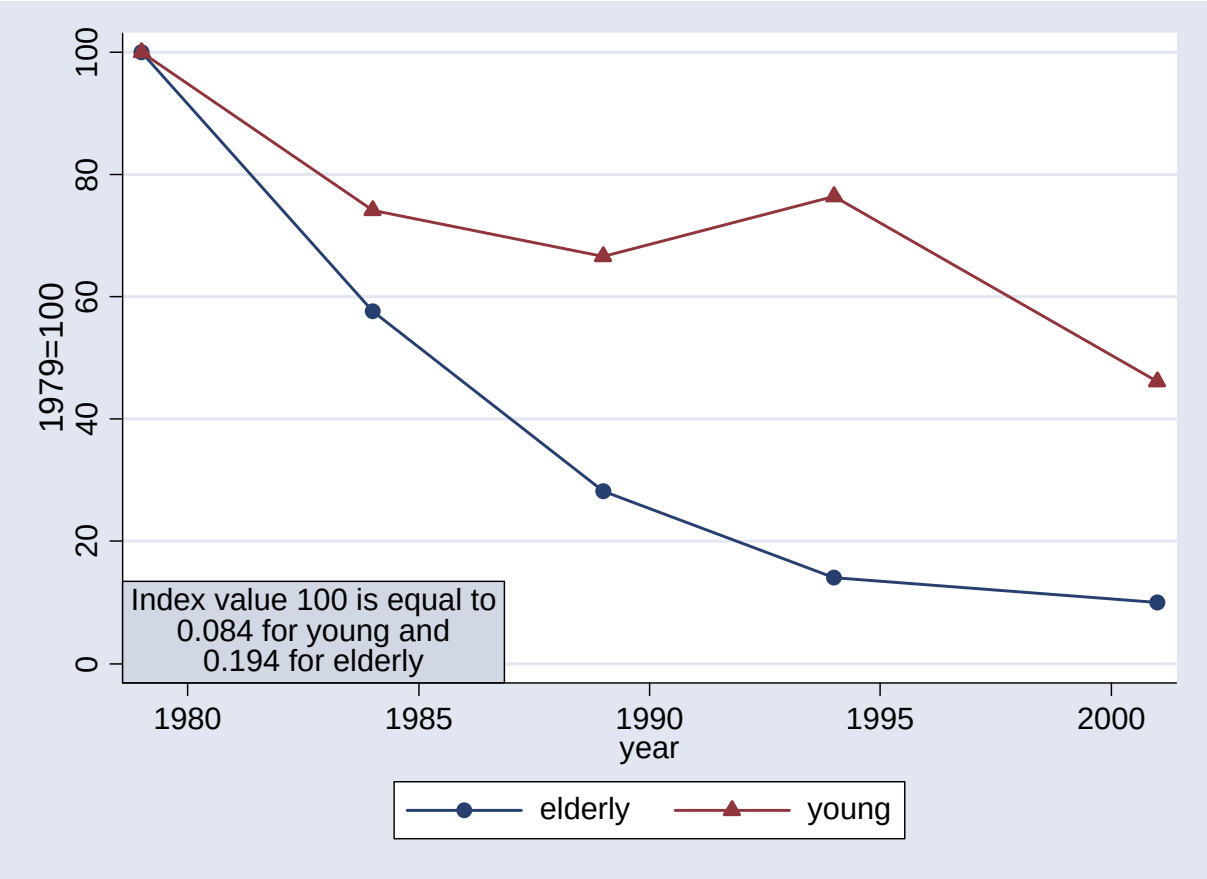


Figure 12: Percentiles of Income

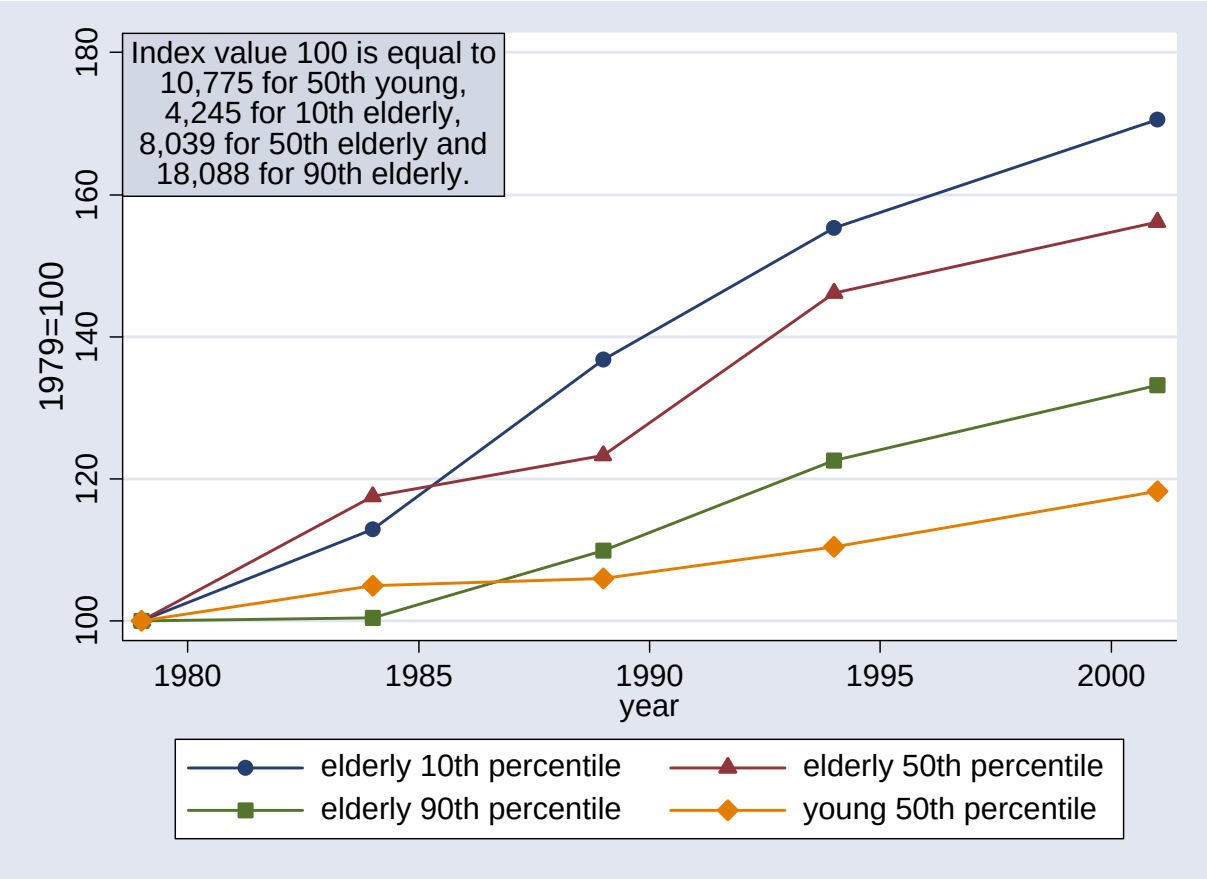


Figure 13: Mean consumption

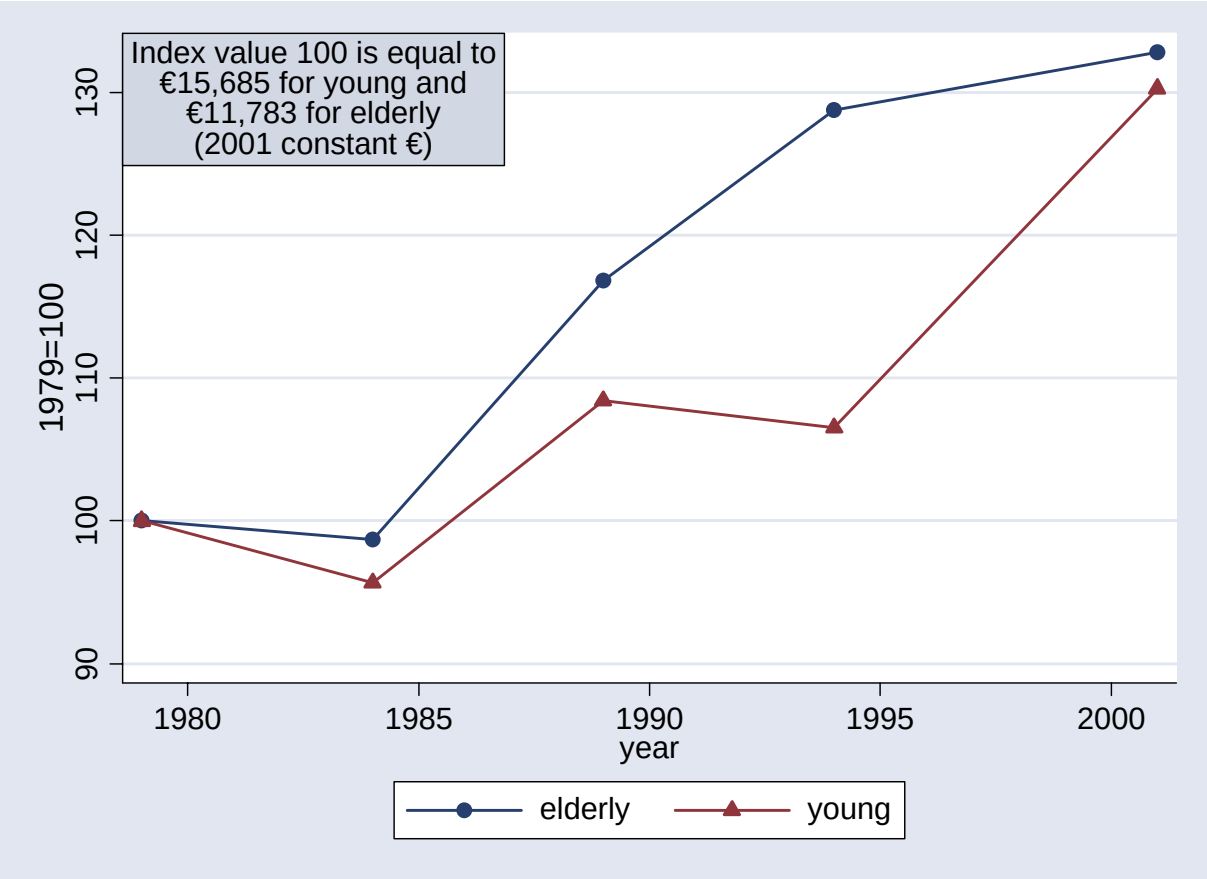


Figure 14: Consumption – relative poverty

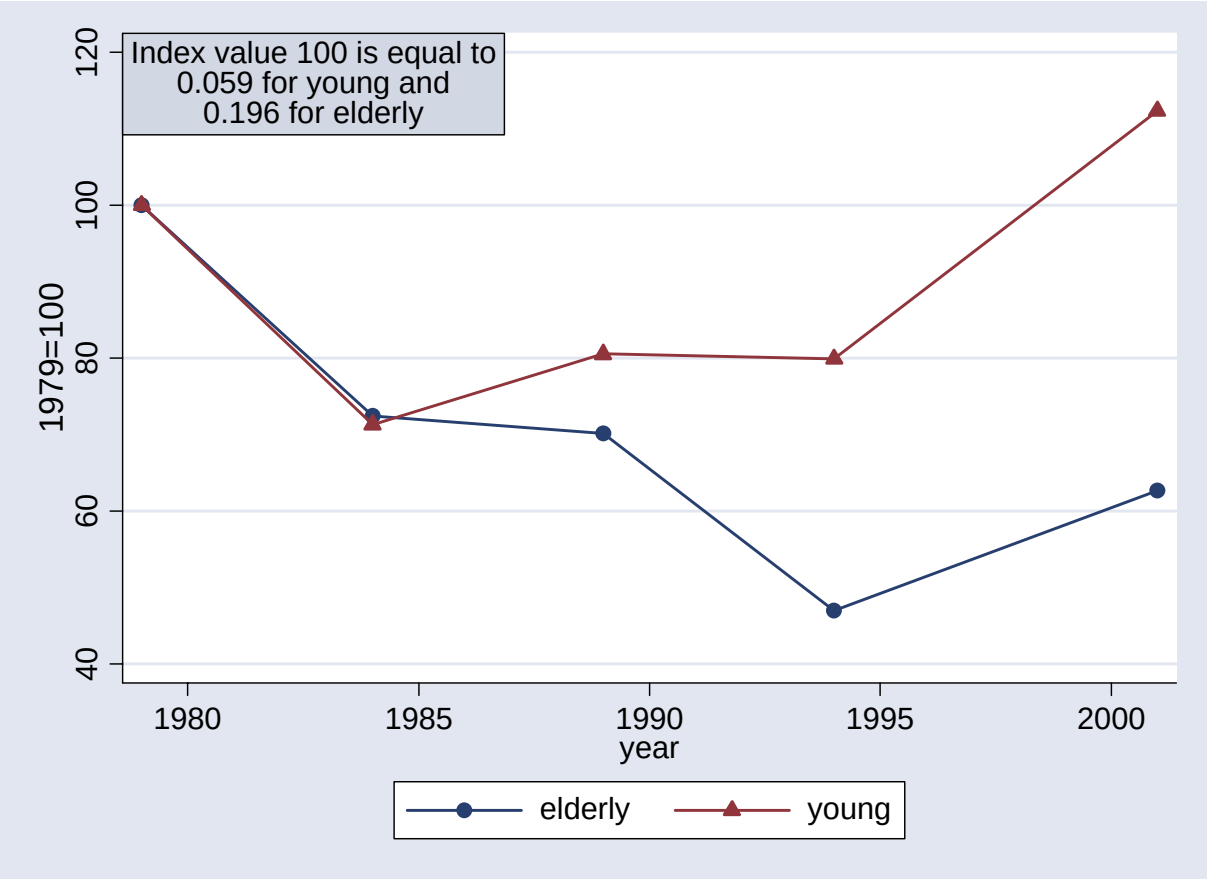


Figure 15: Consumption – absolute poverty

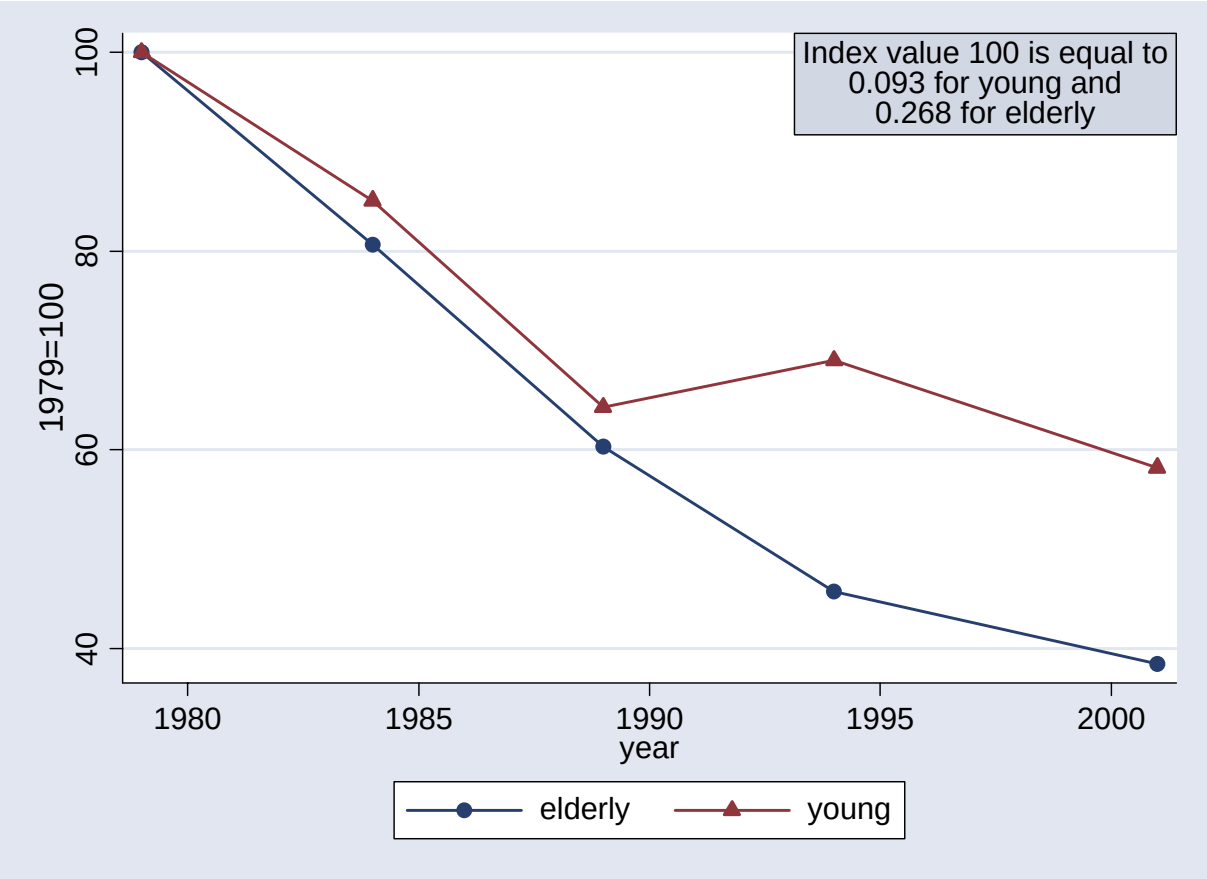


Figure 16: Percentiles of Consumption

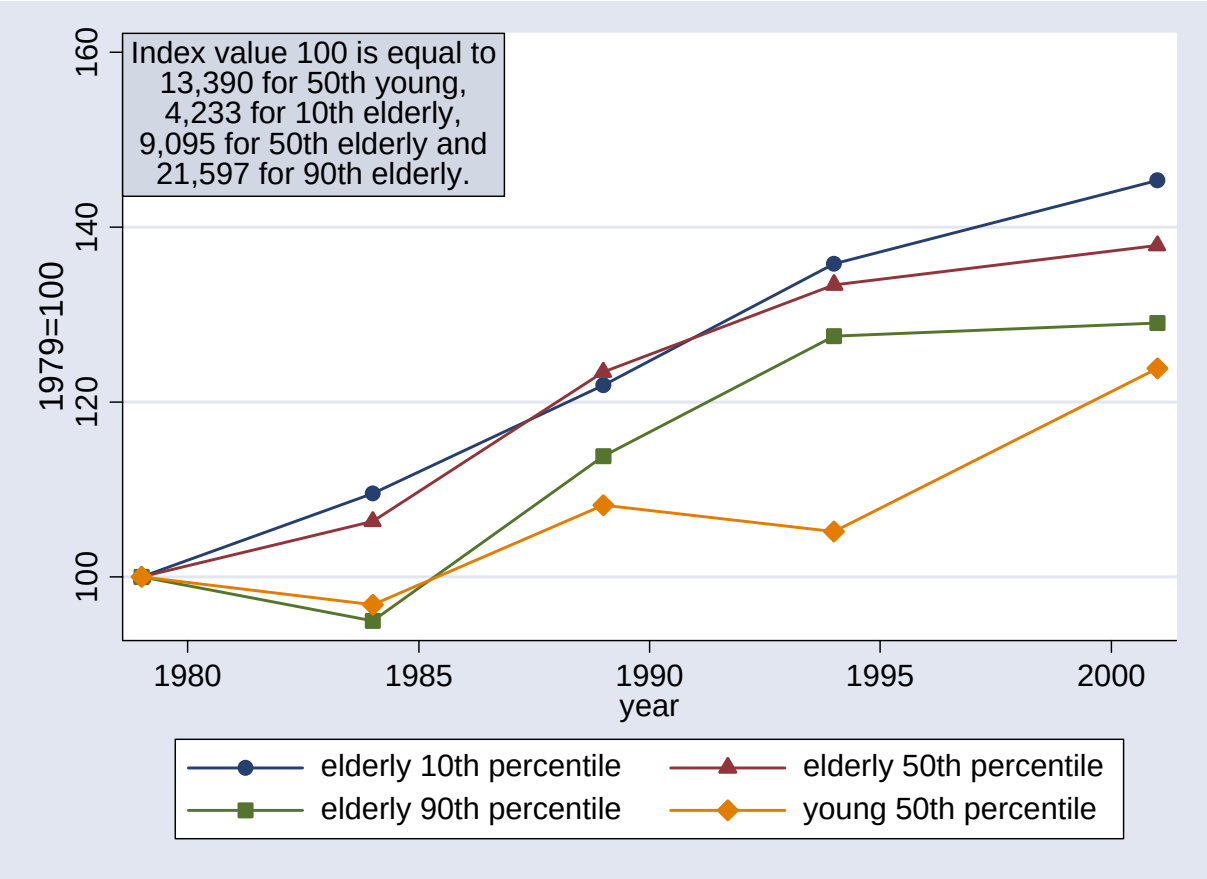


Figure 17: Very Unhappy

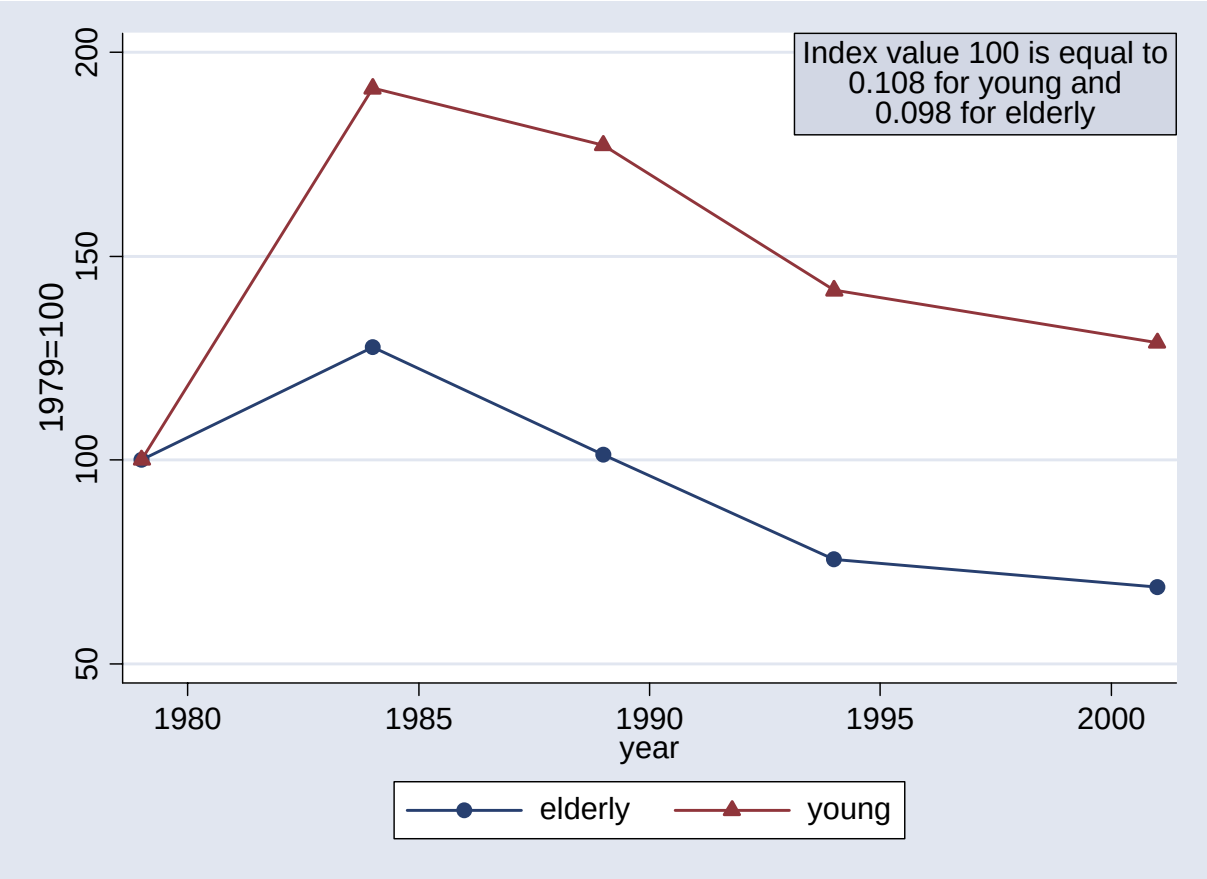


Figure 18: Very Happy