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**Beiträge zur  
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## **TMR Project on Savings, Pensions and Portfolio Choice**

**International Savings Comparison Project**

### **Abstract**

This paper describes how German households save, and how their saving behavior is linked to public policy, notably pension policy.

Our analysis is based on a synthetic panel of four cross sections of the German Income and Expenditure Survey ("Einkommens- und Verbrauchsstichproben," EVS), 1978, 1983, 1988 and 1993. The paper carefully distinguishes among several saving measures and concepts. It separates discretionary savings from mandatory savings, and uses two flow measures, namely first the sum of purchases of assets minus the sum of sales of assets, and second the residual of income minus consumption.

Our main finding is a hump-shaped age-saving profile. However, savings remain positive in old age, even for most low income households. The generous mandatory German public pension system is a prime candidate to explain this pattern.

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# Household Savings in Germany

by Axel Börsch-Supan, Anette Reil-Held, Ralf Rodepeter,  
Reinhold Schnabel, and Joachim Winter

## *Introduction*

Household saving is still little understood, and answers even to the most basic questions – for instance, how does saving change over the life-cycle? – are controversial. Understanding saving behavior is not only an important question because the division of income into consumption and saving concerns one of the most fundamental household decisions, but it is also of utmost policy relevance since private household saving as a private insurance interacts with social policy as a public insurance.

To this end, this paper has two main purposes and is structured accordingly. In the first part, the paper describes how German households save. It investigates cross sectional as well as longitudinal patterns of household saving. Second, it links the saving patterns observed in the first part to public policies affecting saving behavior. Public policies include capital taxation and subsidies to specific forms of saving – most notably, however, pension policies. An electronic appendix includes all data in tabular form.

We begin by describing our data. Further information can be found in our companion paper (Börsch-Supan, Reil-Held, Rodepeter, Schnabel and Winter, 1999) which provides details on the data source, the definitions used for each variable used in this paper, and an inventory of measurement problems together with our preferred solutions.

## *Part I: Description*

We base our description of savings behavior in Germany on four waves of the German Income and Expenditure Survey ("Einkommens- und Verbrauchsstichproben," EVS). The EVS are collected every five years by the German Bureau of the Census. Their design roughly corresponds to the U.S. Consumer Expenditure Survey. The surveys include a very detailed account of income by source, consumption by type, saving flows, and asset stocks by portfolio category. Extensive descriptive

analyses have been carried out by members of the German Bureau of the Census (Euler, various years). Only the 1993 survey is available in public use form, while the 1978, 1983 and 1988 surveys are only available at high costs and under tight confidentiality restrictions. The 1978-1988 surveys have been analyzed with respect to household savings by Börsch-Supan and Stahl (1991), Velling (1991), Lang (1993), and Börsch-Supan (1992, 1994).

The Income and Expenditure Surveys are representative cross-sections of all West German households with annual gross incomes below DM 300,000. They include about 45,000 households in each wave. These large sample sizes provide for sufficiently large cell sizes in each age category, even for old ages. The EVS therefore allow for a separate analysis of consumption and savings patterns among the very old.

The data exclude the very wealthy households and the institutionalized population. The former represent about two percent of households who have annual gross incomes in excess of DM 350,000 in 1993. For this reason, the data cannot be expected to add up to national accounting figures. This is particularly salient for the wealth data. Due to the rather skewed wealth distribution, omission of the upper two percent tail of the income distribution results in a substantial underestimation of total household wealth in Germany. For the same reason, the saving rate aggregated from the EVS is lower than the aggregate household saving rate reported by the Deutsche Bundesbank. EVS savings in 1983 yields a net private saving rate of 12.0 percent while the corresponding Bundesbank figure is 13.6 percent.<sup>1</sup>

Omission of the institutionalized is serious only among the very old. Although less than four percent of all persons aged 65 and more in Germany are institutionalized, this percentage increases rapidly with age and is estimated to be about 9.3 percent of all persons aged 80 and more. Elderly in institutions are more likely to have few assets and no savings.

The EVS are stratified quota samples on a voluntary basis. The German Bureau of the Census establishes a target number of households for each stratum defined by household size, income and employment status. To meet these targets, a large number of households is contacted by various mechanisms; e.g., former participants of previous respondents to the EVS or other surveys are

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<sup>1</sup> This divergence is due to two differences in the base: The EVS omit the upper 2 percent of the income distribution while the Bundesbank also includes non-profit organizations.

asked by mail whether they would volunteer for another survey. The ratio of final acceptances to target size is published and was in excess of 120 percent in 1983. However, this ratio varied between 20 and 150 percent across strata. Moreover, response rates with respect to initial inquiries are not available and are only vaguely alluded to as rather small. Acceptance rates are lowest in the strata of low income households, one-person households, and blue collar workers and self-employed.

As opposed to earlier waves, the 1993 wave also includes the new states in East Germany, and foreign residents in West Germany. For comparability reasons, we will restrict our analysis to the subsample of West Germans.

The flow data (income and savings) are measured more precisely than the stock data (wealth) because the flows are aggregated from weekly diaries and cross-checked against yearly records such as salary slips. Most types of income add precisely to the national accounting totals with the qualification that the data cover only the first 98 percent of the income distribution.

The data permit two measurements of savings. The first measure is computed as the sum of purchases of assets minus sales of assets. Changes in financial assets reported in the EVS are deposits to and withdrawals from the various kinds of savings accounts; purchases and sales of stocks and bonds; deposits to and withdrawals from dedicated savings accounts at building societies ("Bausparkassen") which are an important savings component in Germany; and contributions to life insurances and private pension plans minus payments received. New loans are subtracted and repayments are added to net savings. Not reported are changes in cash and checking accounts. Changes in real assets reported in the EVS are purchases and sales of real estate and business partnerships. Not reliably reported are changes in durables (other than real estate). Unrealized capital gains remain unreported. To arrive at saving rates, household saving is divided by disposable household income, consisting of labor, asset, and transfer income minus taxes and social security contributions.

The second definition is the residual of income minus consumption. We will show that both definitions are very close on average although there is substantial discrepancy for some households. Precise details of both saving constructions can be found in our companion paper (Börsch-Supan, Reil-Held, Rodepeter, Schnabel and Winter, 1999).

A third definition, the difference between initial and end of period stocks of wealth, cannot be computed from the data since stocks are measured only once in each wave.

Households in the EVS cross sections are not necessarily the same and cannot be matched. It is therefore impossible to construct a panel of individuals. This would be most desirable for the identification of life-cycle saving behavior and the separation of age and cohort effects. In lack of longitudinal data on savings behavior in Germany, we have to resort to the construction of a synthetic panel by aggregating the cross sectional data into age categories and identifying adjacent age-groups across waves. The large sample sizes are of considerable help for the synthetic cohort approach because aggregation units can be defined sufficiently narrow to assure homogeneity without loss of statistical precision.

The sequel of Part I of the paper is structured as follows. Part Ia begins with a cross-sectional analysis and is structured around a set of tables and figures that present various concepts and measures of saving, and adds information on income, wealth and several covariates that might help explaining savings patterns. We show the results for the 1993 cross section, the latest available; other cross sections are displayed as tables in a computer-readable appendix. Part Ib uses a synthetic panel made from the four available cross sections and presents a set of figures that permit a rough cohort correction.

Part II interprets the data in the light of the extant institutional environment, in particular the role of public and private pension provision.

### ***Part Ia: Cross Sectional Description***

We distinguish three components of household savings:

- (A) *Discretionary saving* is defined as changes in financial and real wealth that are under the control of the household as it concerns the absolute volume and its portfolio composition.
- (B) *Mandatory saving* is defined as changes in financial wealth that are beyond the control of the household, either in terms of volume (e.g., a fixed percent of gross income) or in terms of portfolio composition (e.g., the employer provides only one pension plan).

(C) A third component – sometimes dubbed „*notional*“ *saving* – are contributions to pay-as-you-go systems such as public pensions, health and long-term-care insurance that may substitute for actual saving.

The crucial difference between (B) and (C) is that contributions under (B) are funded while contributions under (C) will not add to the capital stock of the economy.

The distinction between (A) and (B) can only be made when we have a detailed account how total saving is split among different usages. This is obviously not possible for a residual saving measure when consumption is subtracted from income. We will therefore begin by concentrating on the first saving measure: the sum of purchases of assets minus sales of assets.

We then measure income (D), in order to compute a residual saving measure (E) and saving rates (F). We finish our cross sectional data description by a brief look at some covariates (G).



## A. Discretionary Saving

### A1: Financial Saving

Financial saving is defined as

- Deposits into, minus withdrawals from, saving accounts, mutual money market accounts, and other money-like investments
- plus purchases of, minus sales of, bonds
- plus purchases of, minus sales of, stocks
- plus contributions to, minus out payments from, whole life insurance
- plus contributions to, minus out payments from, dedicated saving plans (defined by a contract that determines for which purpose withdrawals may be made, e.g., building societies, individual health spending accounts, etc.)
- plus voluntary contributions to, minus payments from, individual retirement accounts and pension funds where withdrawals may be made only after retirement or a prespecified age
- plus amortization of, minus take-up of, consumer loans.

Figure A1(a) shows financial saving in the 1993 wave. All amounts are in DM per year. We use the consumer price index to convert all amounts to 1993 purchasing power. 1 DM in 1993 has a purchasing power of about 0,51 Euro (€) in 1999.

The striking difference between mean and median saving, and the hump shaped pattern in particular for the median and the 3<sup>rd</sup> quartile are the main features of this figure. However, the interpretation of a “hump shape” should be guarded as these are cross-sectional profiles. Each age category also represents a cohort, and comparing points on a cross sectional line drawn in figure A1 compares households that are simultaneously in different age categories and cohorts. Thus, moving along a cross-sectional line does not depict a life-cycle pattern but the combined influence of the average household’s aging and changes from cohort to cohort.

**Figure A1(a): Financial Saving in 1993**

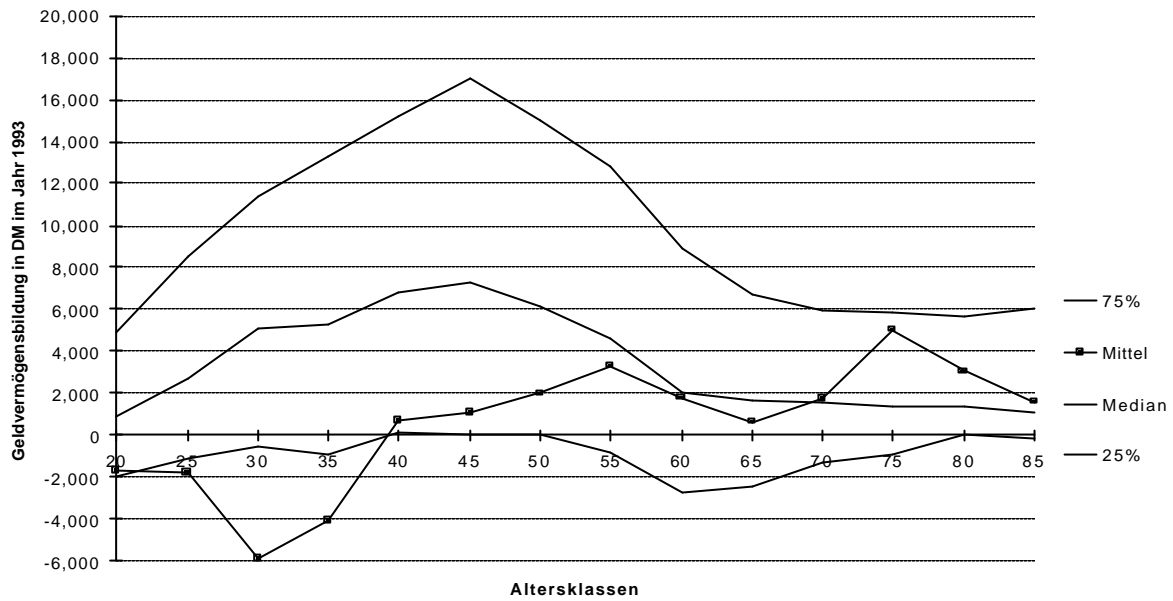
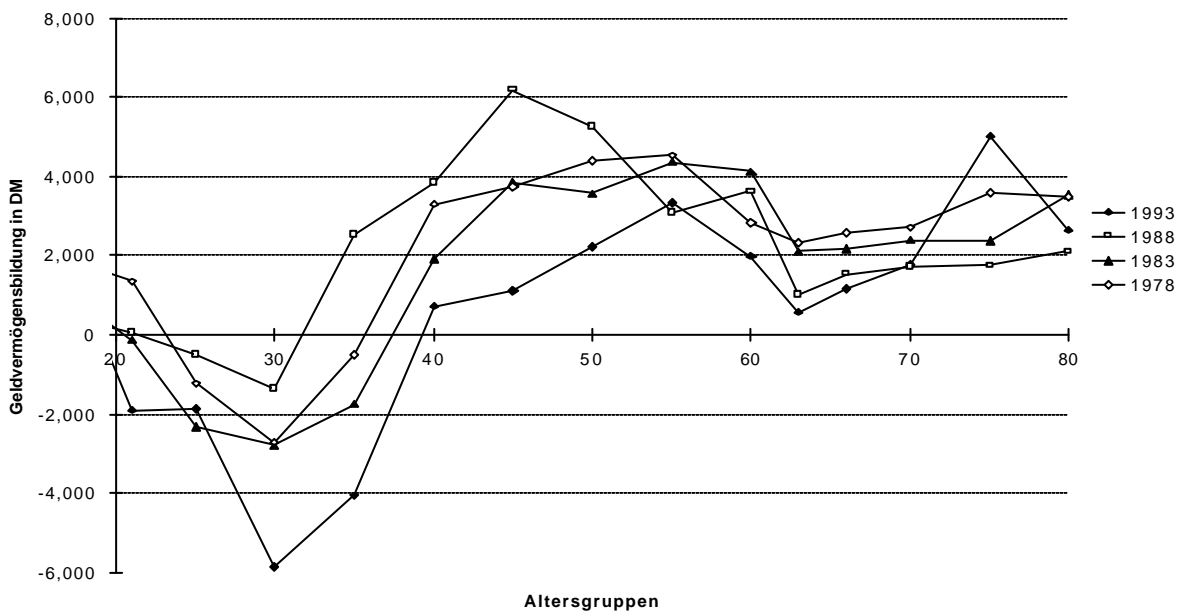


Figure A1(b) picks the 1993 mean profile and adds those from the other three waves, 1978-1983-1988. The shapes are roughly similar. Changes across years are far from a simple shift of each profile: for the younger age groups, 1988 was the year with highest financial saving, while there is less of a clear picture for the older ones.

**Figure A1(b): Mean Financial Saving in 1978-1993**



Note: All data in prices of 1993 and weighted. Age/Cohort-groups denoted by *begin* of 5-year interval.  
 Source: Own calculations on the basis of the EVS 1978-1993.



## A2: Real Saving

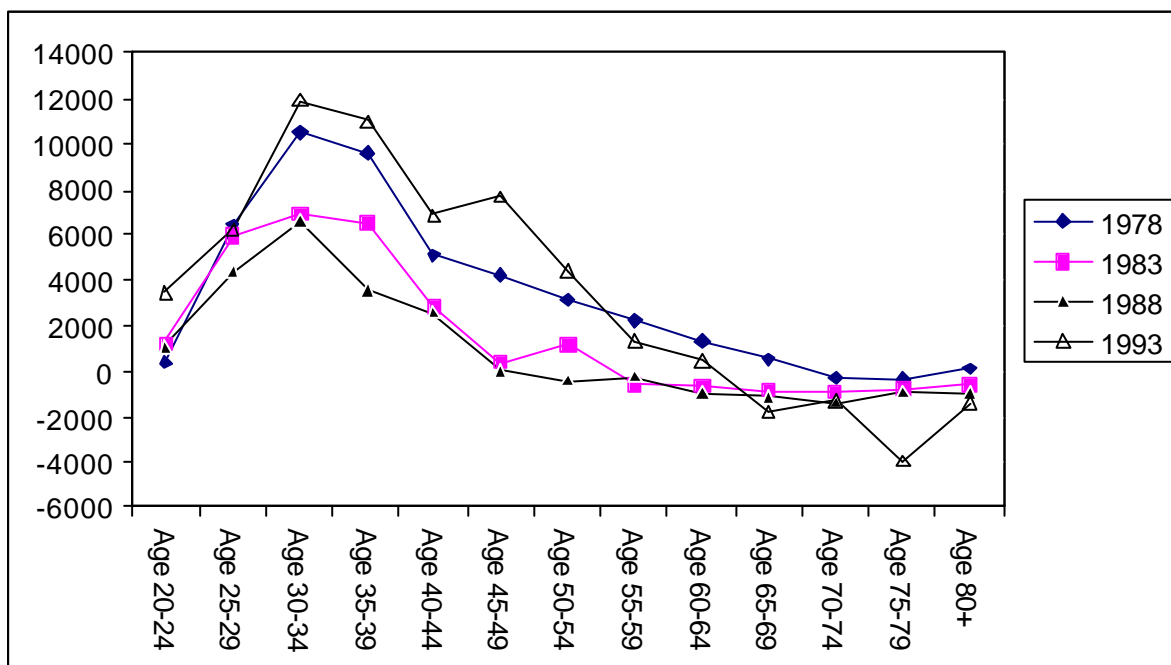
Real saving consists of:

- Purchases of, minus sales of, real estate (incl. owner-occupied housing)
- plus expenditures in upkeep and improvement of housing, minus 2% depreciation
- plus amortization of, minus take-up of, mortgages
- plus purchases of, minus sales of, gold and other jewelry.

The EVS data do not permit a sensible measurement of changes in wealth that is invested in business partnerships. This does affect only some households in a large way but not the average, see our companion paper. More serious are biases due to the fact that we do not have the regional information necessary to impute capital gains from real estate and business partnerships. Our measure of real saving is therefore less than satisfactory.

Figure A2 shows real saving, 1978-1993. It is dominated by saving and dissaving in owner-occupied housing. The median is mostly zero and not shown, while the mean exhibits a very strong hump shape across age/cohort-groups with substantial dissaving for the older age groups.

**Figure A2: Real Saving, 1978-1993**

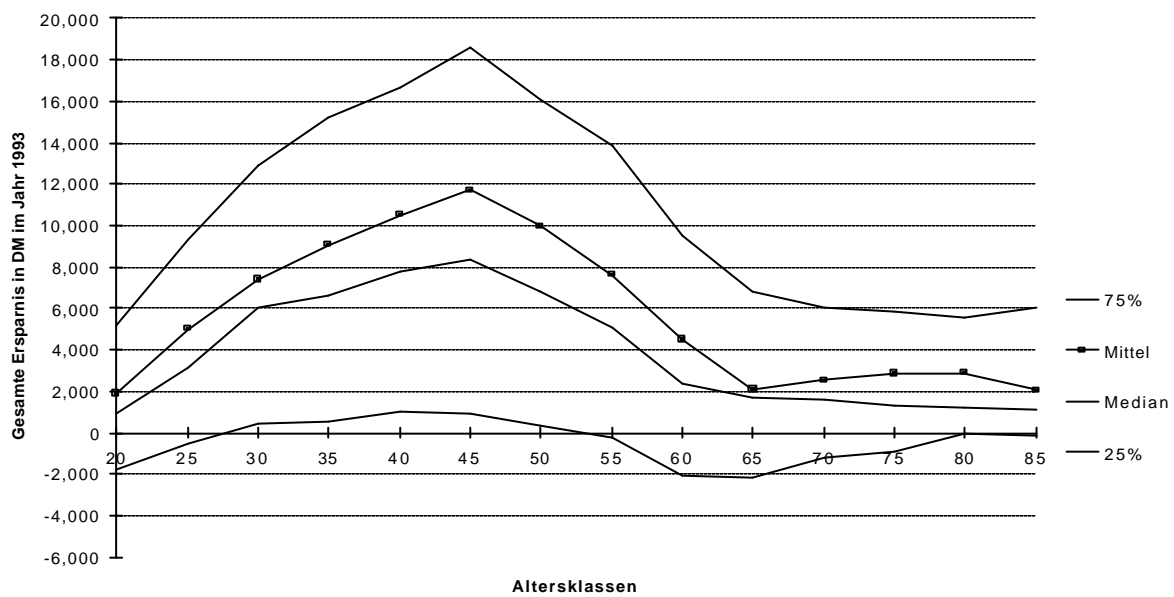


Note: All data in prices of 1993 and weighted. Source: Own calculations on the basis of the EVS 1978–1993.

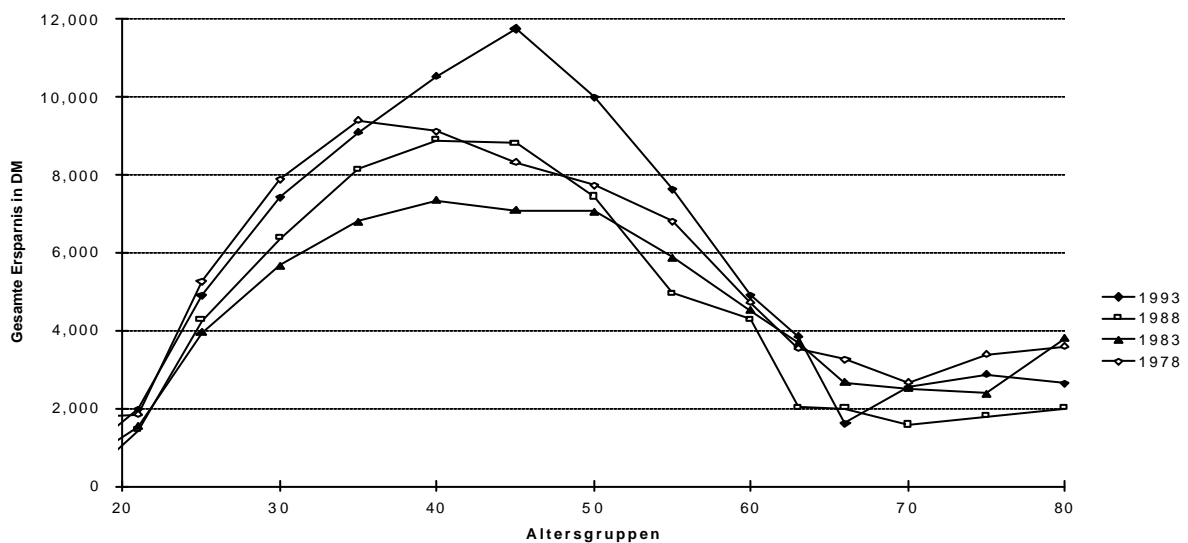
### A3: Total Discretionary Saving

Figures A3(a) and (b) depict the sum of discretionary financial and real saving. Financial Saving dominates real saving in the flows, so total saving is positive for all but the very poor. Median and mean saving have the familiar hump shape, and remain positive for all age groups, except for the lower quartile.

*Figure A3(a): Financial Saving in 1993*



*Figure A3(b): Mean Total Saving in 1978-1993*



*Note:* All data in prices of 1993 and weighted. Age/Cohort-groups denoted by *begin* of 5-year interval.  
*Source:* Own calculations on the basis of the EVS 1978–1993.

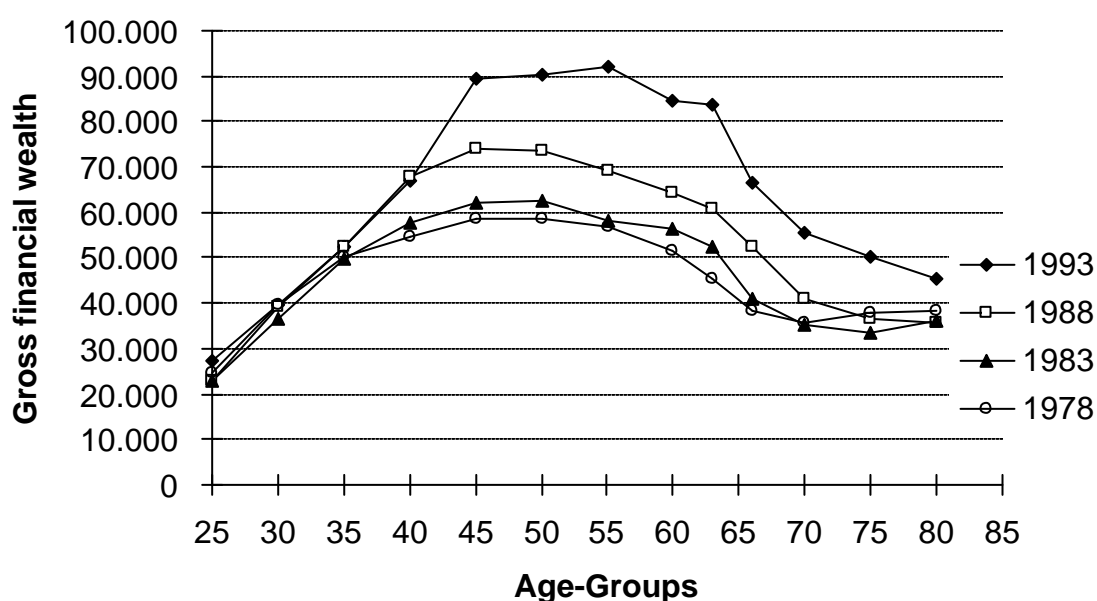
## A4: Financial Wealth

The stocks of financial, real and total discretionary wealth are defined in accordance with the flow measures A1 through A3.

Age and cohort profiles of a longitudinal comparison of gross financial wealth for 1978 to 1993 are presented in Figure A4. Average real financial wealth has increased between 1978 and 1993 by 38 percent. This increase was mainly caused by a wealth expansion of middle age classes. The expansion of financial wealth is striking between 1988 and 1993. The reason is a large increase in securities ownership for all age classes. The development of gross financial wealth does not take into account an increase in loans, e.g. for the purchase of an apartment or house.

The composition of gross and net financial wealth in the four EVS waves is presented and discussed in Table II-2. There have been dramatic shifts: Traditional investment instruments like savings deposits or deposits with savings and loan associations have decreased by around 30 percent in real terms, while investments in securities have increased threefold. As a result the *relative* proportion of savings deposits and deposits with savings and loan associations has decreased from 47 to 25 percent. The proportion of life insurances was relatively stable.

**Figure A4: Gross Financial Wealth, EVS 1978–1993 (Means)**



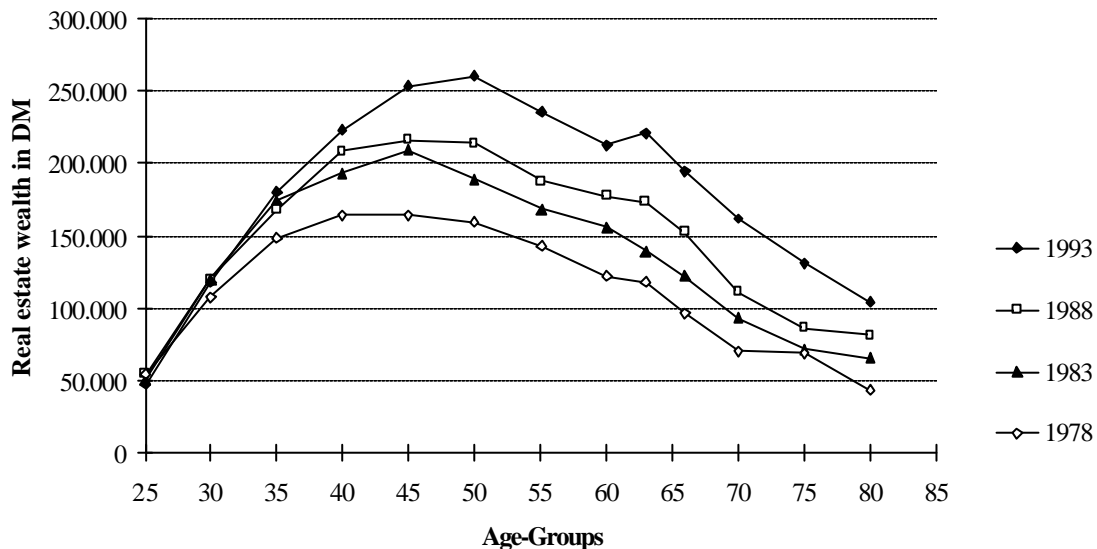
*Note:* All data in prices of 1993. Age/Cohort-groups denoted by *begin* of 5-year interval. *Source:* Own calculations on the basis of the EVS 1978–1993.

## A5: Real Wealth

Average wealth in real estate property is presented in Figure A5 by age/cohort-class. We do not have a measure of business wealth in the EVS data.

Similar to financial wealth, wealth in real estate had increased until 1993. A more detailed analysis (Schnabel, 1998) shows that this is partly caused by the noticeable higher ownership rates in the EVS 1993. It is apparent from the EVS that ownership rates increased from cohort to cohort. Using the longitudinal SOEP data, one learns that ownership rates remain essentially constant with increasing age after age 60 for a given cohort.

**Figure A5: Real Estate Wealth, EVS 1978–1993 (Means)**



*Note:* All data in prices of 1993 and weighted. Age/Cohort-groups denoted by *begin* of 5-year interval.  
*Source:* Own calculations on the basis of the EVS 1978–1993.

## A6: Total Discretionary Wealth

Adding gross financial wealth (Figure A4), real estate wealth (Figure A5), and other real wealth and subtracting outstanding loans, we arrive at total discretionary wealth, as measurable in the EVS data.

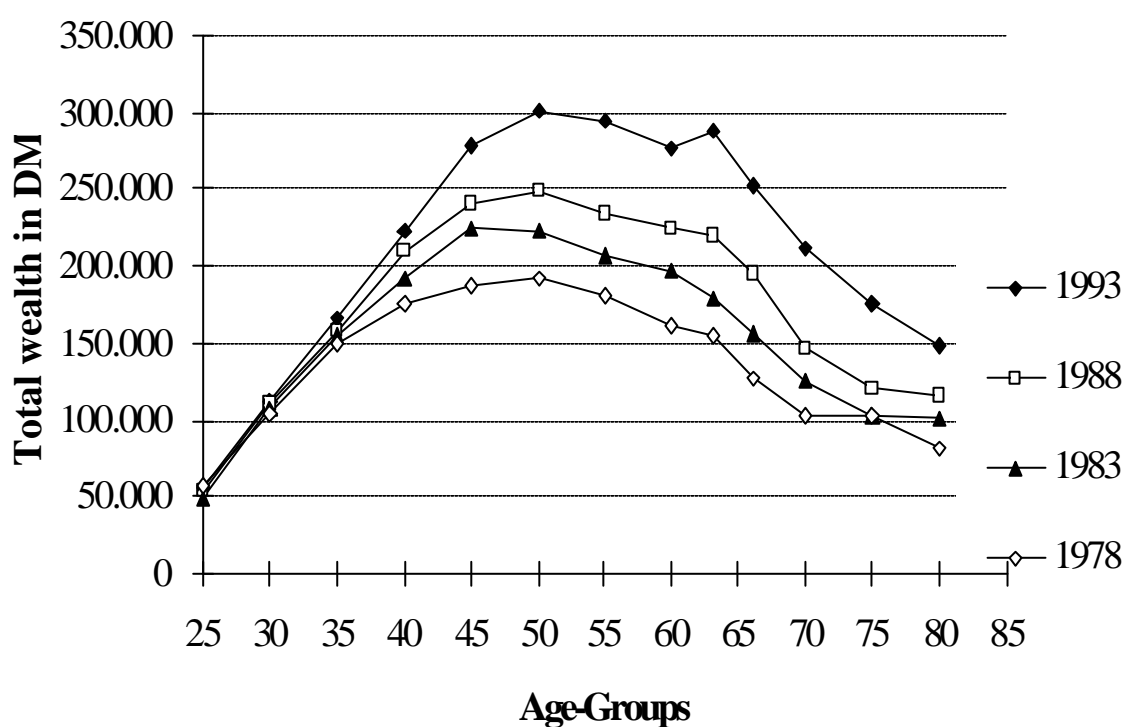
This measure omits business wealth, as noted before. Its age/cohort pattern is depicted in Figure A6.



West German private households possessed an average total wealth of DM 245,000 (€ 122,000). The largest part was real estate. For the group aged 30 to 59 this makes 80 to 90 percent of total wealth. The most important part of this is homeownership.

At the time of the head's retirement an average German household owned around DM 275,000 (€ 138,000) of total wealth in 1993. This is 12.5 times the public pension of an average employee with 45 years of service in 1993 (net DM 22,000, € 11,000). The median wealth is DM 200,000, (€ 100,000) which is lower than the mean but still relatively high. Thus, it could quite substantially contribute to consumption - especially in old age (Schnabel, 1999). Nevertheless, accumulation of even more wealth in the form of financial wealth takes place on average in old age, as was illustrated in the savings profiles presented earlier. This is a surprising departure from the life-cycle hypothesis.

**Figure A6: Total Discretionary Wealth, EVS 1978–1993 (Means)**



*Note:* All data in prices of 1993 and weighted. Age/Cohort-groups denoted by *begin* of 5-year interval.  
*Source:* Own calculations on the basis of the EVS 1978–1993.

## **B: Mandatory Saving**

Germany has essentially no mandatory contributions to public funded pension plans. Only a minority of civil servants are required to contribute a small percentage of their salary increases to funds that are effectively invested in government bonds. The contributions amount to roughly 0,5% of salary.

Many companies offer private pension plans to their employees. In many cases, they are mandatory in the sense that they come as package deals with the employment contract with no opt-out possibilities. Contributions are shared between worker and company at various percentages ranging from all employer paid to equally shared. Actual economic incidence is of course another matter.

Although more than 50% of workers are covered by a firm pension at least part of their career, firm pensions play a small role in Germany. On average, about 5-6 percent of retirement income comes from employer provided pensions although some companies have generous funded pension plans. Most of these plans invest in the own firm ("book reserves") although recently several companies started to offer pension plans that invest in the capital market at large.

## **C. Contributions to Pay-as-you-go Systems**

All dependent employees and their employers must contribute to the German retirement insurance system which is unfunded. The contribution rate is currently (2000) 19.3% of gross earnings. In addition, an estimated 8.5% of gross earnings is levied indirectly via other taxes, mainly V.A.T. and the new eco-tax, see Figure C1 below.

The contribution base for public pension contributions is capped at about 1.6 times the average earnings. High wage earners therefore pay a lower percentage of their income (and will receive a lower replacement rate in accordance, see Part II).

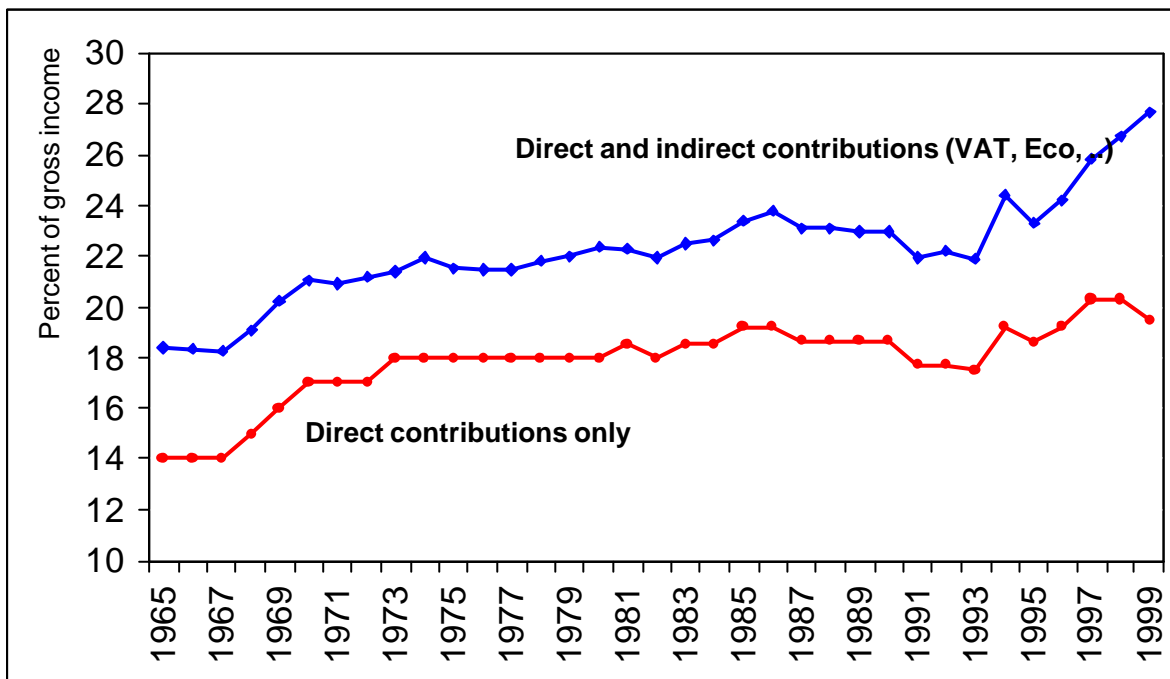
Coverage of workers is about 85 percent. The remaining workers are self-employed (who could contribute to the public pay-as-you-go scheme but do not do so, although this was different in the mid 1970s), civil servants (who receive pensions direct from the state budget and, at least implicitly, pay contributions through lower salaries than their private business counterparts), and workers who

earn less than a threshold that is currently about 15% of the average wage. Since 1999, the latter group pays a reduced contribution rate, mainly through the employer.

Social insurance also covers health, long-term care, and unemployment insurance. For most workers, again excluding the self-employed, civil servants, and low earners, they add up to another 21 percent of gross income, with a tax base capped similarly as the contributions to the public pension system.

Since contributions are proportional to earnings up to the earnings ceiling, they essentially follow the life-cycle pattern of income which we turn to in the following section.

**Figure C1: Contribution rates to public pension system**



## D. Income

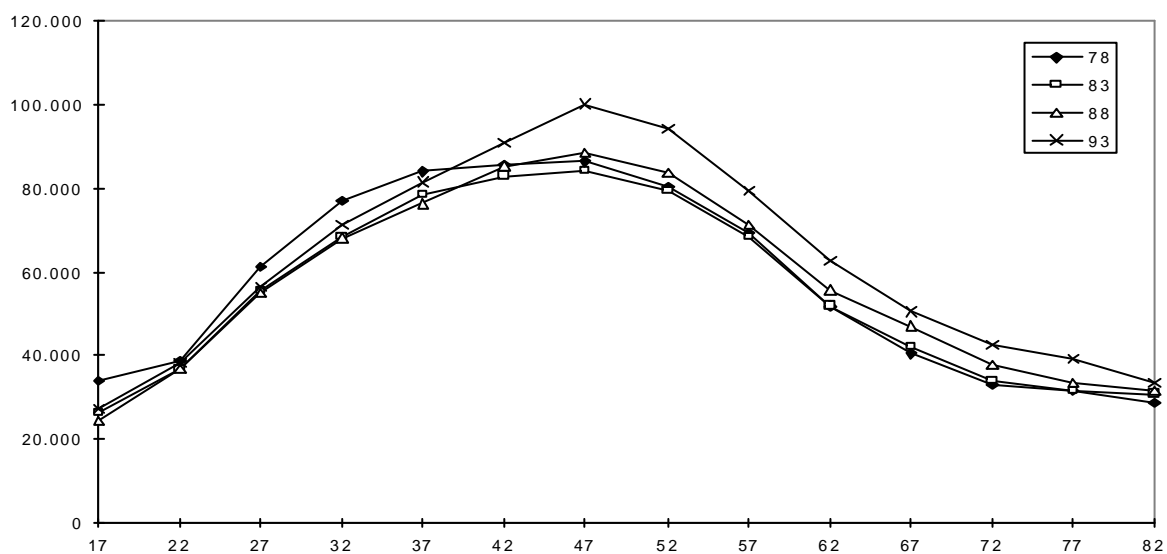
### D1. Total Gross Income

In order to compute saving rates and a residual saving measure, we need an income base which is defined internally consistent with our saving and wealth concepts. Total gross income is:

- Wages and salary
- plus asset income from financial and real assets
- plus annuitized pensions from the public PAYG pension system
- plus annuitized and lump-sum company pensions
- plus net family transfers, including alimonies received minus those paid, and regular as well as one-time inter vivos transfers.
- plus all other public transfers except public pensions (mainly social assistance, unemployment compensation, and family allowances)

Figure D1 depicts total gross income for all four waves. We see the familiar hump shape pattern but should be warned again: the actual life-cycle pattern is much flatter as each later cohort profits from the secular productivity increase, shifting the cross-sectional lines to the right from wave to wave, see Section Ib.

*Figure D1: Total gross income*



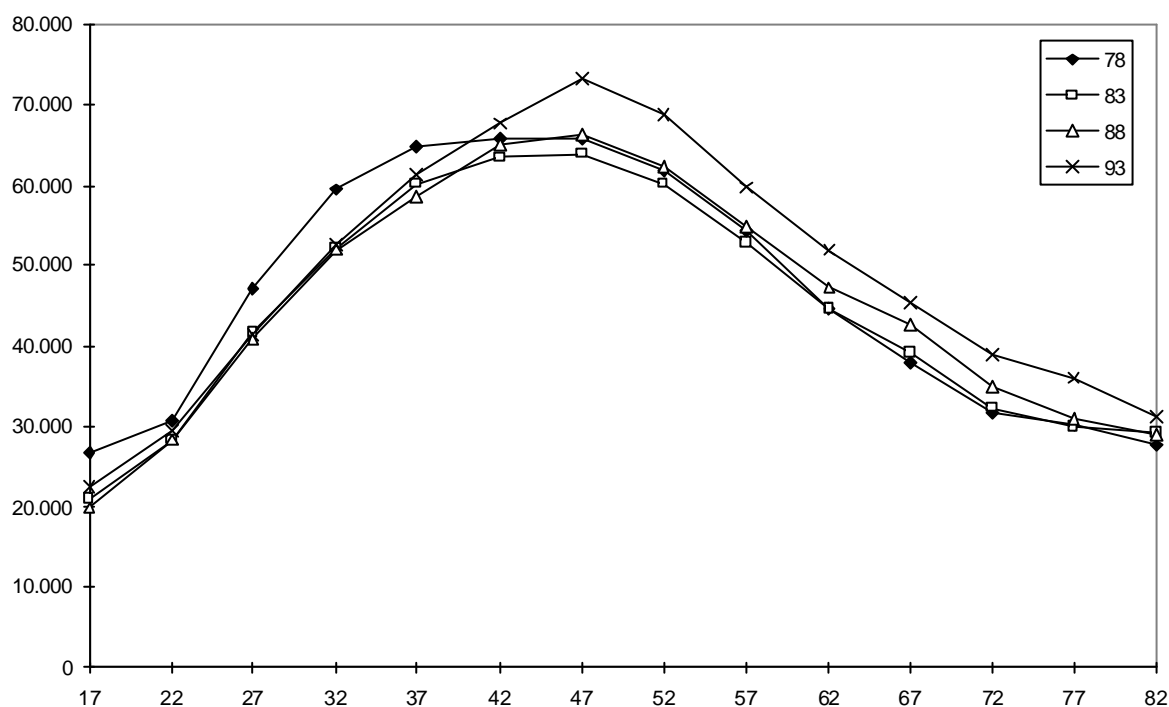
*Note:* All data in prices of 1993. Age/Cohort-groups denoted by *midpoint* of 5-year interval. *Source:* Own calculations on the basis of the EVS 1978–1993.

## D2. Total Disposable Income

Disposable income is simply gross income minus direct taxes (Federal income tax) minus the contributions to mandatory social security systems that were mentioned in section C.

Disposable income is about DM 50.000 (€25,000) p.a. for the average household in the sample. It is 30 percent higher at the peak ages from 40 to 50 years, and about 30 percent lower for the older age groups and cohorts, see Figure D2. Compared to gross income, disposable income is roughly two thirds of this. The median is 10-20 percent lower than the mean, see Table D2 in the appendix, pointing to a considerably less skewed income distribution than, e.g., in the United States.

*Figure D2: Total Disposable Income*



*Note:* All data in prices of 1993. Age/Cohort-groups denoted by *midpoint* of 5-year interval. *Source:* Own calculations on the basis of the EVS 1978–1993.

## D3. Annuitized Retirement Income

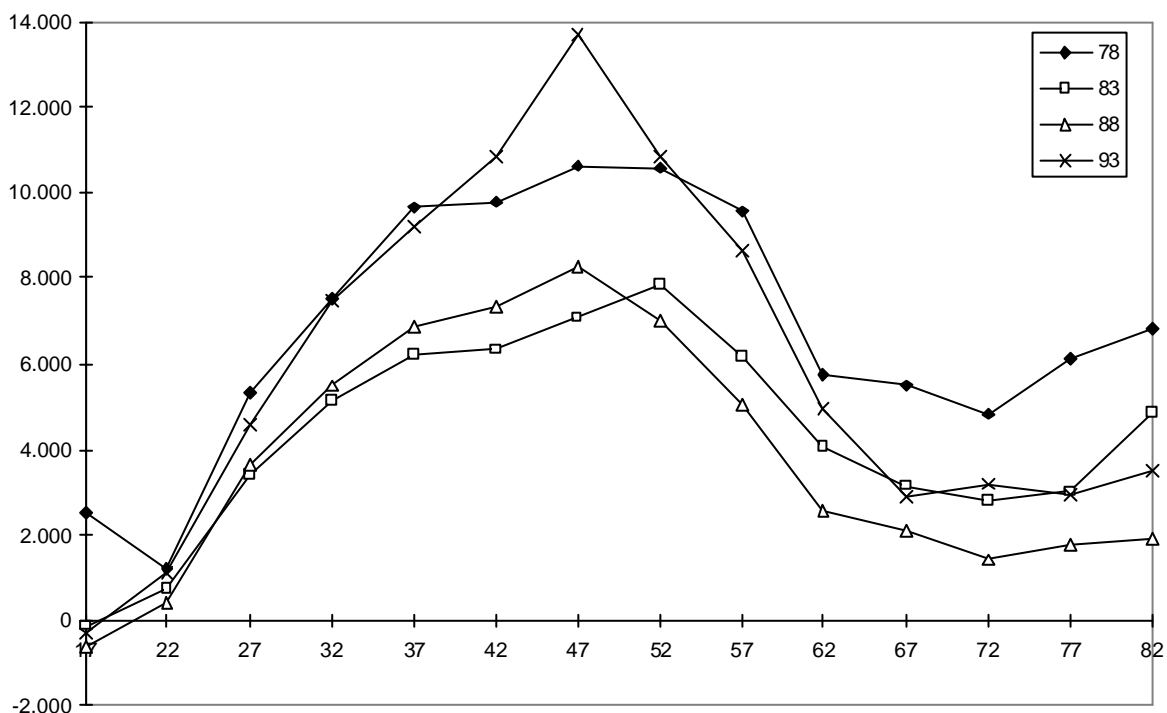
Annuitized income dominates retirement income in Germany. It consists of private and (mostly) public pensions. Less frequent are annuities from life insurance contracts, although this will change in the future when the current working generation will retire.

Table D3 in the appendix details annuitized retirement income. For the young households, this income mainly includes survivor pensions that are paid to widows and (half-)orphans.

## E: Saving as Residual

The tables in Section A were based on flows, such as purchases and sales of assets during one calendar year. In this section, we compute saving as a residual, subtracting all consumption expenditures from disposable income (Section D). Consumption expenditures are reported fairly detailed in the EVS, based on weekly diaries. Expenditure categories are enumerated in Börsch-Supan et al. (1999).

**Figure E1: Total Saving, Measured as Residual**

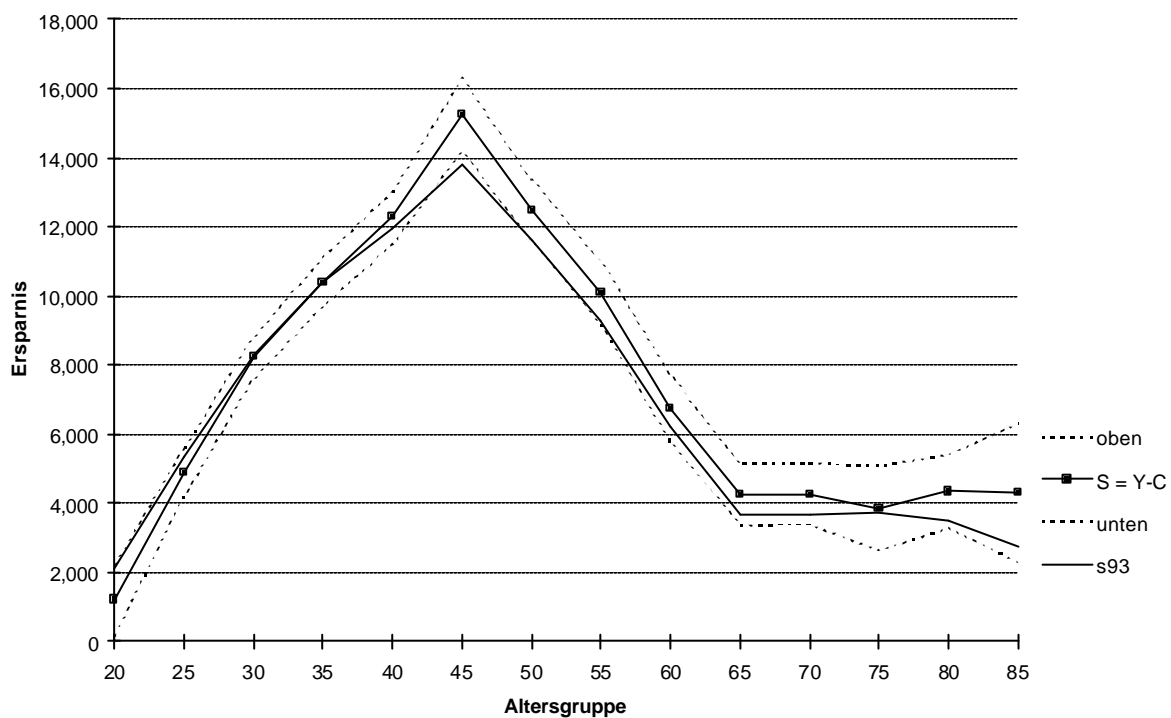


*Note:* All data in prices of 1993. Age/Cohort-groups denoted by *midpoint* of 5-year interval. *Source:* Own calculations on the basis of the EVS 1978–1993.

The discrepancy between the two savings measures is very small. As Figure E2 shows, the flow measure of saving is almost always within the  $2\sigma$ -confidence bands of the residual measure. Using

confidence bands for both measures, the difference is not significant. This is an important result as it strengthens the belief in the internal consistency of the data. Nevertheless, our companion paper details that there are important departures from coincidence for some households which are masked by the averages depicted in Figure E2.

**Figure E2: Total Saving, Definitions A and E, 1993**



Note: All data in prices of 1993. Age/Cohort-groups denoted by *begin* of 5-year interval.  
Source: Own calculations on the basis of the EVS 1978–1993.

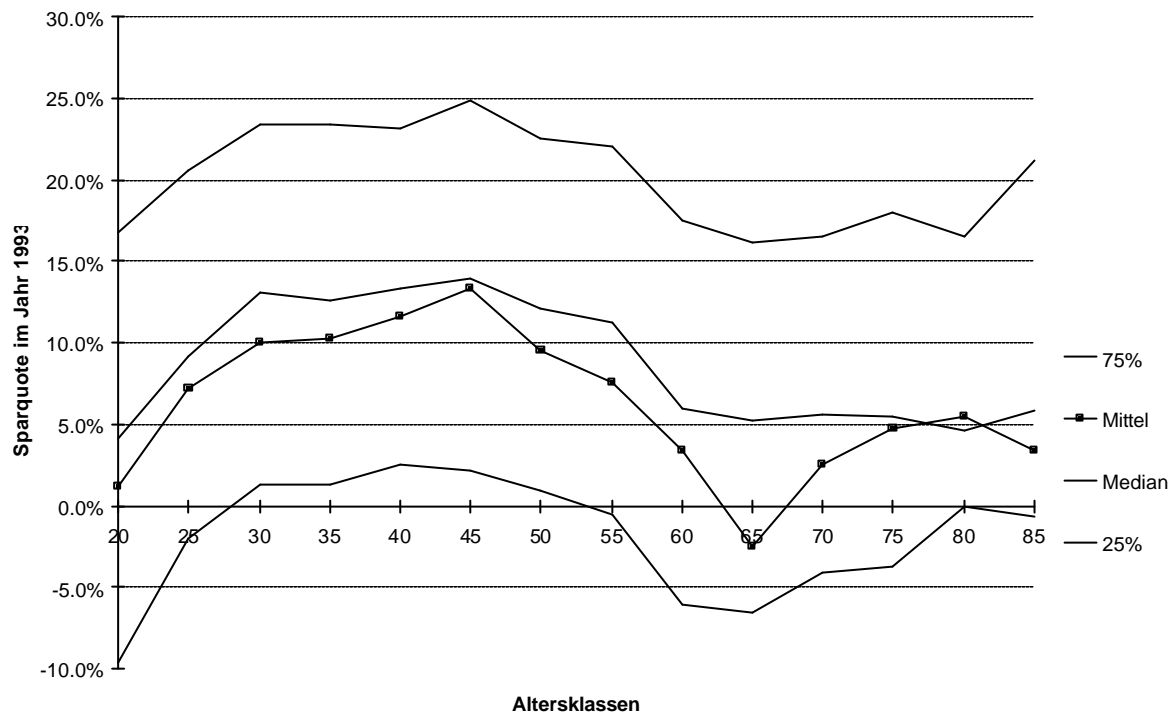
## F: Saving Rates

We finally compute saving rates. Because mean saving rates are very sensitive to changes in nominator and denominator, we focus on the median and quartile saving rates in each age category, see Figure F1 below. This figures shows that the age/cohort pattern is rather stable across income quartiles. The differences (pronounced hump shape for the richer, fairly flat for the poorer households) are thus mainly due to differences in income profiles. The increase in saving rates in very old age is interesting. Remember, however, that the data only covers households, not elderly in institutions.



Thus, the sample selects those who are less likely to dissave. A back-on-the-envelope calculation (Börsch-Supan, 1992) shows that this selection effect by itself cannot explain the high saving rates in old age, but without longitudinal data, no final analysis is possible.

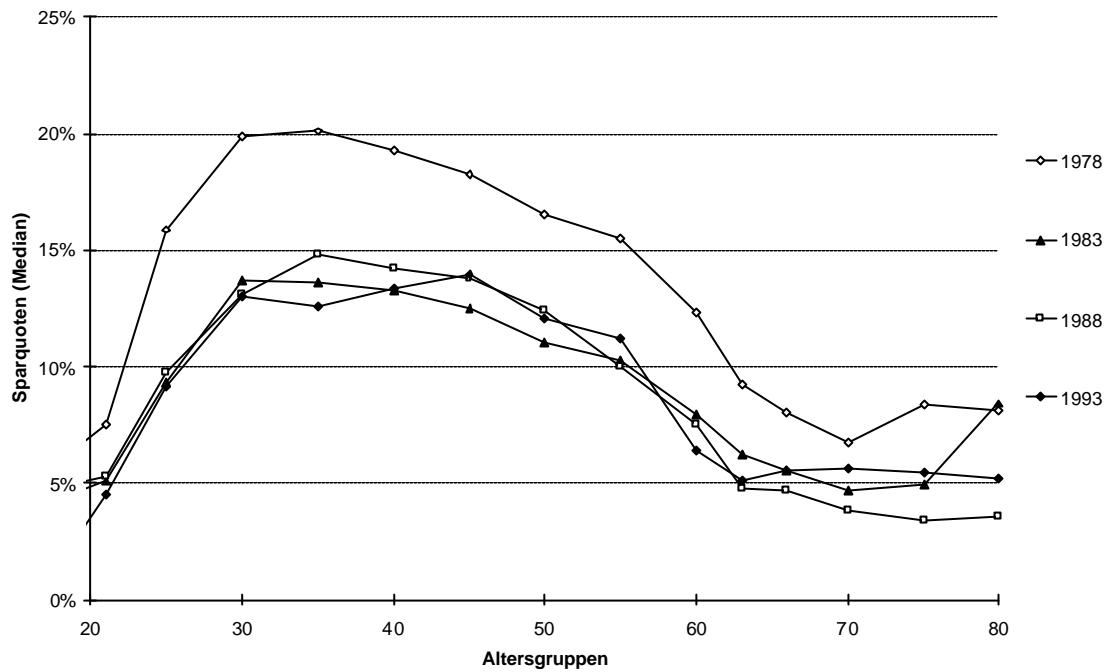
**Figure F1: Saving Rates, 1993 (Based on Saving Measure A)**



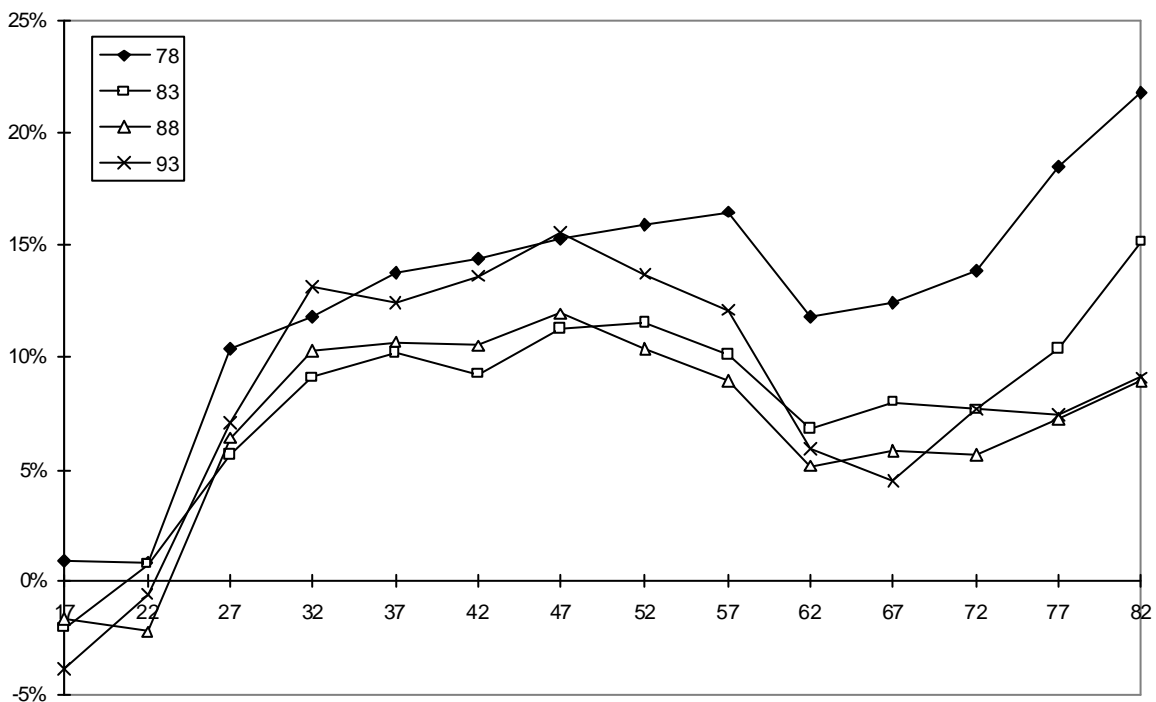
Note: All data in prices of 1993. Age/Cohort-groups denoted by *begin* of 5-year interval. Source: Own calculations on the basis of the EVS 1978–1993.

The different measures of saving (A=flow, E=residual) in Figures F2(a) and (b) appear to exhibit rather different qualitative patterns. Measure E shows even less of a typical life-cycle pattern than one might expect. In addition to the now frequently reiterated caveat, that these profile present a mixture of cohort and age effects and do not identify life-cycle changes, one also needs to take the large standard deviations into account: The saving rates depicted by Figures F2(a) and (b) are only weakly different in a statistical sense for the old-age groups.<sup>2</sup> Thus, the proximity between the absolute saving measures in Figures E2 (a) and (b) is no contradiction to the apparent difference in Figures F2 (a) and (b). Particular at the low income end, saving rates are typically a division of small amounts of saving that exhibit high variation by small incomes that equally variable.

**Figure F2(a): Saving Rates, 1978-93 (Based on Flow Saving Measure A)**



**Figure F2(b): Saving Rates, 1978-93 (Based on Residual Saving Measure E)**



<sup>2</sup> (All groups 60+ are statistically different at 10%, but none at 1% confidence)

*Note:* All data in prices of 1993. Age/Cohort-groups denoted by *begin* (Fig.F2a) and *midpoint* (Fig. F2b) of 5-year interval. *Source:* Own calculations on the basis of the EVS 1978–1993.

## **G: Covariates**

The table below shows that “households” are not a stable concept over time in order to analyze saving behavior. Household size changes from 1.5 at age 20-24 to about 3.2 at age 40-44, then returns to the initial value at age 70 and declines even further. This is an important insight as it implies that life-cycle models of saving behavior have to jointly model the change in household composition, at least the change in household size.

Employment status has the typical pattern for mid-European countries: virtually everybody is retired at age 65. Homeownership depicts a mixture of age and cohort effects. Since it is well-known from longitudinal data (e.g., GSOEP) that few elderly move in old age, the apparent decline of homeownership in old age is purely a cohort effect.

***Table G: Household Characteristics***

	<b>Household Size</b>	<b>Head employed</b>	<b>Home-owner</b>
<b>Age 20-24</b>	1,46	0,59	0,075
<b>Age 25-29</b>	1,86	0,74	0,179
<b>Age 30-34</b>	2,55	0,87	0,357
<b>Age 35-39</b>	3,02	0,90	0,515
<b>Age 40-44</b>	3,16	0,90	0,602
<b>Age 45-49</b>	2,84	0,89	0,627
<b>Age 50-54</b>	2,45	0,85	0,653
<b>Age 55-59</b>	2,16	0,71	0,629
<b>Age 60-64</b>	2,05	0,22	0,626
<b>Age 65-69</b>	1,76	0,02	0,573
<b>Age 70-74</b>	1,48	0,01	0,505
<b>Age 75-79</b>	1,39	0,005	0,448
<b>Age 80+</b>	1,28	0,003	0,386

*Source:* Own calculations on the basis of the EVS 1993.

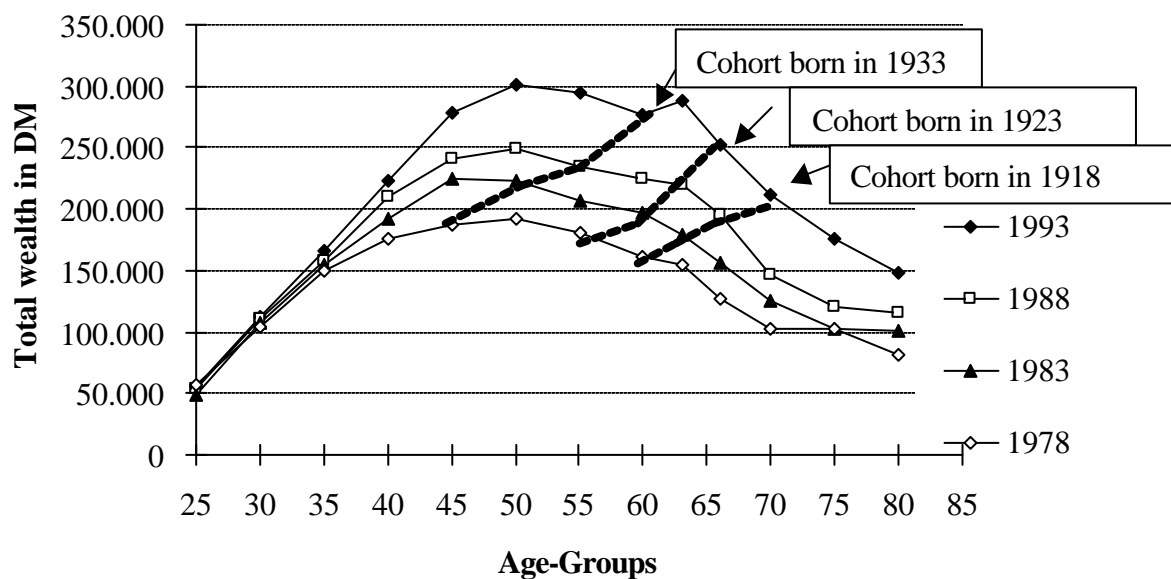
Note that virtually all households in Germany have health insurance. It is mandatory except for the upper 15% of the income distribution, and almost all of the latter households have private health insurance. Germany also has a mandatory long-term care insurance.

### ***Part Ib: Cohort Profiles***

As already stressed at several times in this paper, the tables in Part Ia display cross-sectional variation across age/cohort-groups and do not identify life-cycle changes. In order to do understand life-cycle behavior, we need to follow households over time. In lack of longitudinal data on savings in Germany, we combine the data of the available four EVS cross-sections from 1978 to 1993 and construct a synthetic panel of groups of households by identifying households in subsequent five-year age-groups with each other, i.e., by identifying the 45-49 year old persons in 1978 with the 50-54 year old persons in 1983, the 55-59 year old persons in 1988, and the 60-64 year old persons in 1993.

We then construct cohort-specific age savings profiles under the identifying assumption that time effects are zero. Under this assumption, discussed at length in Chapter X of this volume, “pure” age effects are visible when points of neighboring age groups are connected as they proceed in time, i.e., by connecting the age groups as described at the end of the preceding paragraph. The three examples in Figure 1, derived from, and to be compared with, Figure A6 in Part Ia, make the point:

***Figure Ib-1: Total Discretionary Wealth by Cohort***

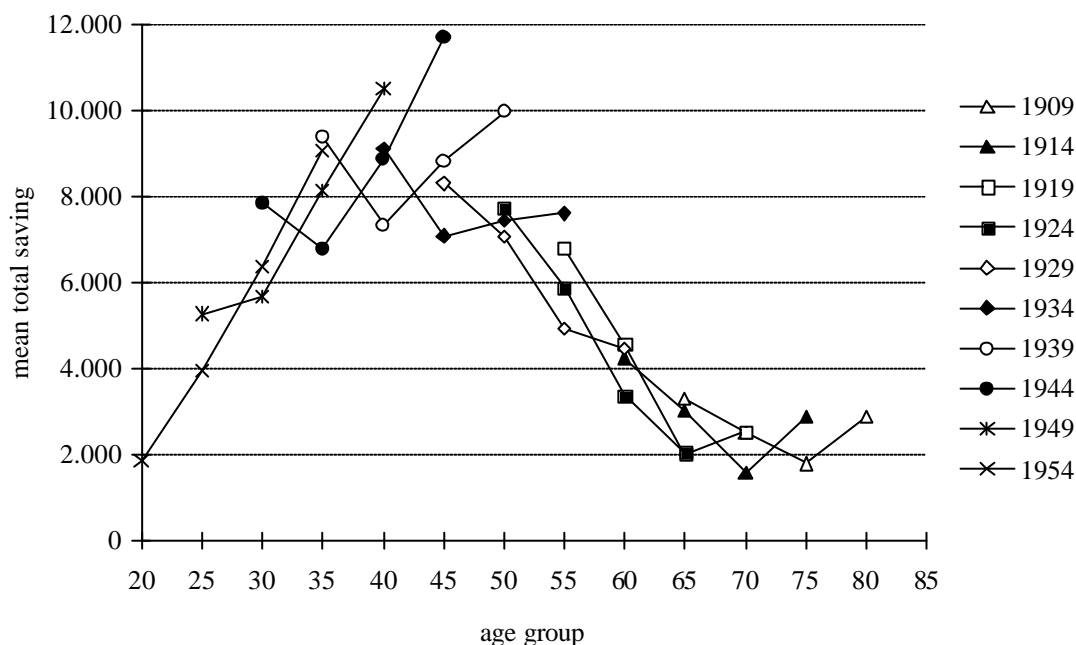


*Notes and Sources:* See Figure A6.

Figure 2 displays total discretionary saving by cohort, starting at the left side with the youngest cohort in our data, born between 1954 and 1958, and proceeding to the oldest cohort, born between 1909 and 1913.

Saving increases until it reaches a peak in the age range 45-49, then declines until the age group of the 65-69 old. It then remains essentially flat. As already stated several times, saving remains positive even in old age, according to these data.

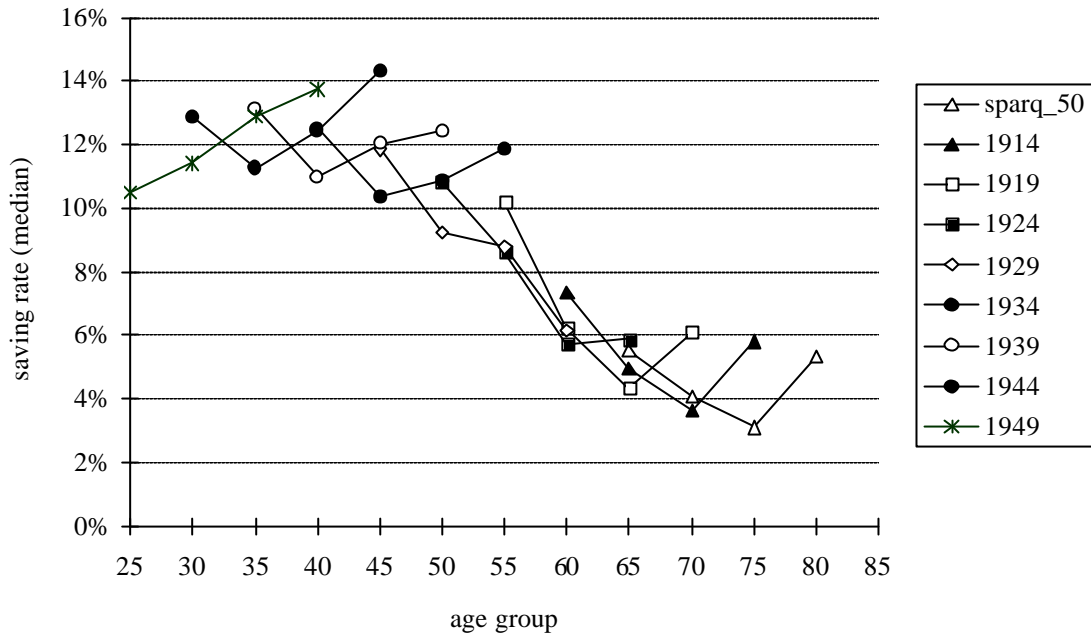
**Figure 1b-2: Total Discretionary Saving by Cohort (Means)**



Note: All data in prices of 1993. Age-groups denoted by begin of 5-year interval. Source: Schnabel (1999)

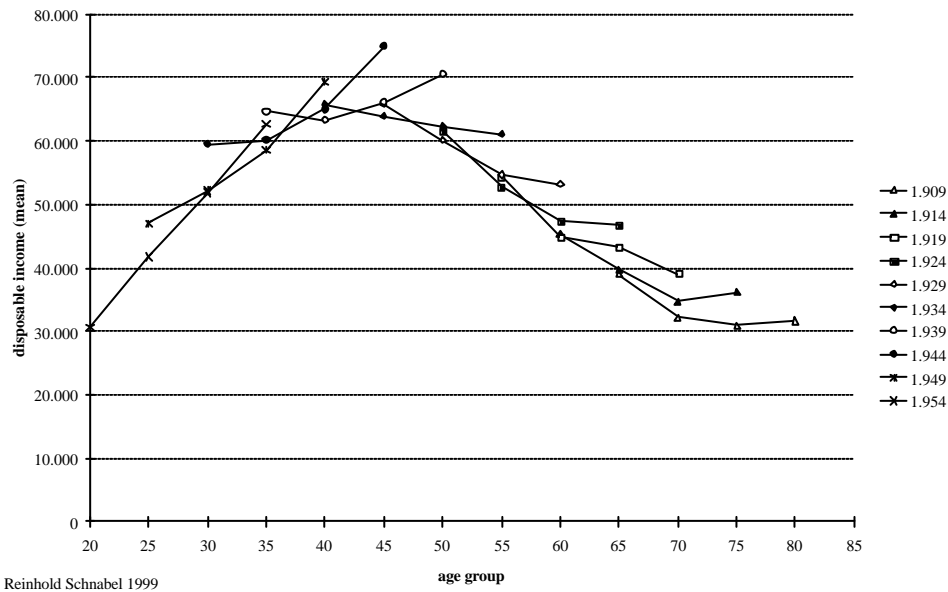
The life-cycle pattern in saving visible in Figure 2 has two components, displayed in Figures 3 and 4. First, savings rates exhibit much less of a hump-shaped pattern than total saving. They are fairly stable around 12% for all young and middle-aged groups until around age 45-49. They then decline and stabilize around age 65-69, when they remain at about 4%. The data suggests an increase for the 1988 wave for all older cohorts. We have no satisfactory explanation for this effect, particularly, because the pension level decreased between 1983 and 1988.

**Figure Ib-3: Saving Rates by Cohort (Means)**



Note: All data in prices of 1993. Age-groups denoted by begin of 5-year interval. Source: Schnabel (1999)

**Figure Ib-4: Disposable Income by Cohort (Means)**

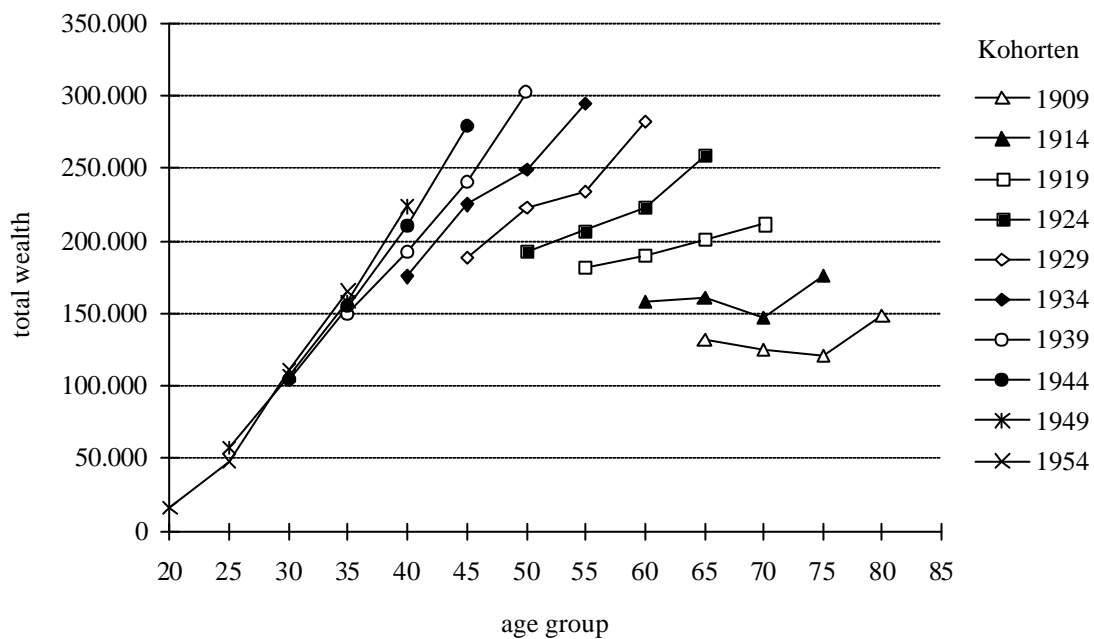


Note: All data in prices of 1993. Age-groups denoted by begin of 5-year interval. Source: Schnabel (1999)

Figure 4 shows the second component of the life-cycle changes in total discretionary saving, namely the change in disposable household income. Income rises until about the 45-49 age group, then declines when household sizes become smaller (see Section G in Part Ia) and transfer income frequently changes sign (from receiving family allowances to giving inter family transfers). From age-groups 55-59 onwards, we also see the effects of declining labor force participation, i.e., pre- and early retirement.

The positive saving rates throughout all age-groups are reflected in the life-cycle pattern of wealth, see Figure 5 below. Total discretionary wealth increases until late in life.

**Figure Ib-5: Total Discretionary Wealth by Cohort (Means)**



Note: All data in prices of 1993. Age-groups denoted by begin of 5-year interval. Source: Schnabel (1999)



## ***Part II: Policies Affecting Savings***

This section argues that the observed savings patterns are strongly influenced by the current public pension system. By the same token, we anticipate a distinct change in savings patterns in Germany if the German public pension system were to be reformed. In particular, a partial transition to a funded pension system is likely to change how saving is related to age and how households select their portfolios.

We first very briefly describe the German pension system as it relates to savings. Börsch-Supan and Schnabel (1999) provide a more extensive description as part of the international comparison of retirement behavior in Gruber and Wise (1999).

The last section of this part of the paper deals with other savings incentives, mainly the German system of capital taxation and dedicated savings incentives.

### *The German pension system*

Germany has a contribution-based PAYG system. It is very monolithical, covering almost all workers and providing almost all retirement income in a single system with relatively transparent rules. Until recently, it has been successful in providing a high and reliable level of retirement income and was praised as one of the causes for social and political stability in Germany. It has survived two major wars, the Great Depression, and more recently, unification. However, times have changed, and a flurry of reforms since 1992 has not succeeded in stabilising contribution rates, public support, and system enrolment. There are two main reasons for the increasing difficulties of the German public pension system: population ageing and negative incentive effects on labour supply.

As opposed to other countries such as the United Kingdom and the Netherlands, which originally adopted a Beveridgian social security system that provided only a base pension, public pensions in Germany were from the start designed to extend the standard of living that was achieved during work life also to the time after retirement. Thus, public pensions are roughly proportional to labor income averaged over the entire life course and feature only few redistributive properties. Benefits include old-age pensions, survivor benefits at 60% of old-age pensions, and disability benefits exceeding old-age pension benefits before age 65.

Benefits are computed on a life-time contribution basis. They are the product of four elements: (1) the employee's relative wage position, averaged over the entire earnings history, multiplied by (2) the

number of years of service life and (3) adjustment factors for pension type (old-age and two disability pension types) and retirement age (since the 1992 reform), both in turn multiplied by (4) the average pension level that is indexed „dynamically“ (i.e., during the entire retirement period) to the current average net wage of the working population. Until 1992, indexation was to gross wages. The first three factors make up the “personal pension base” while the fourth factor determines the income distribution between workers and pensioners in general. The wage indexation has kept the income distribution between workers and pensioners constant as it has automatically transferred productivity gains also to pensioners.

The German retirement insurance system has a high replacement rate, generating net retirement incomes that are currently about 70 percent of pre-retirement net earnings for a worker with a 45-year earnings history and average life-time earnings, see Figure 2.<sup>3</sup> This is substantially higher than, e.g., the corresponding United States net replacement rate of about 53 percent.<sup>4</sup> In addition, the German retirement insurance system provides generous survivor benefits that constitute a substantial proportion of total unfunded pension wealth, and disability benefits at similar and sometimes even higher replacement levels than old-age pensions.

Because of this high replacement rate, public pensions are by far the largest pillar of retirement income, much more so than in many other countries, see Figure 3.<sup>5</sup> Public pensions constitute more than 80 percent of the income of households headed by persons aged 65 and older, while funded retirement income, such as asset income or firm pensions, plays a much smaller role than, e.g., in the Netherlands or the Anglo-Saxon countries. Pension funds are largely unknown in Germany, although an increasing number of workers, in particular young ones, have bought whole life insurance. As a result, Germany has few institutional investors and stock market capitalisation is very low in international standards.

Adding to the generosity are the early retirement provisions. The 1972 pension reform introduced the opportunity to retire at different ages („flexible retirement“) during a „window of retirement.“ This

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3 This replacement rate is defined as the current pension of a retiree with a 45-year average earnings history divided by the current average earnings of all dependently employed workers. This concept is different from the replacement rate relative to the most recent earnings because these are usually higher than the life-time average.

4 Using the same replacement rate concept as in the preceding footnote.

5 See the international comparisons in Gruber and Wise (1997) and OECD (1998).

window began at age 60 for women, unemployed, and workers who could not appropriately be employed for health or labour market reasons. It began at age 63 for workers with a long service history (35 years, including higher education, military service, a certain number of years for rising children, etc.). Normal retirement age was (and still is) age 65. The 1972 reform did not introduce an actuarial adjustment. The reforms in the 1990s will shift the window of retirement for all workers to age 62 and will include an adjustment of benefits. However, this adjustment will be about half of the actuarially fair adjustment.

The introduction of early retirement in 1972 had a huge impact on retirement age. Within a few years, retirement age among men dropped by about 3 years and average retirement age fell below age 60.<sup>6</sup> The resulting distribution of retirement ages became marked by distinct „spikes“ at ages 60, 63 and 65, see Figure 5. The retirement age of 65 now mostly applies to women with a very short earnings history, while the most popular retirement age among men became age 60. Since average life expectancy of a male worker at age 60 is about 18 years, the earlier retirement age amounts to an increase in pension expenditures of about 15 percent. The effect is smaller, but still significant, for women.

Disability status is granted for medical reasons. In this case, no actuarial adjustments apply, even after the 1992 reform. Moreover, pensions received before age 60 are calculated as if the worker had worked to age 60. Incentives to take up disability pensions are thus strong if one manages to claim full disability status. Disability status is also given for economic reasons, for instance, when a worker could not find a job at all, or could not find an appropriate job. In the latter case, a lower replacement rate applies.

The German public pension system provides two floors for retirement income. First, contributions below a certain minimum have ex post been topped to lie between 50 and 75 percent of average contributions. Although not an entitlement by the law, the Bundestag has regularly enacted such ex post adjustments to poor workers earnings histories, and has thereby effectively introduced a minimum pension. Second, social assistance provides a minimum income to which all Germans are entitled. Older households receive a higher minimum income than younger households (about €600 for single elderly, €900 for an elderly couple, including housing assistance).

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<sup>6</sup> Averaged over new recipients of old-age and disability pensions. Results for women are similar.

The topping up mechanism has generated a redistributive element along the income scale into the German retirement insurance. However, quantitatively this intragenerational redistribution is small relative to the other intragenerational redistribution through early retirement. Social assistance is quantitatively more important, and has shielded the elderly from poverty. Indeed, poverty rates are much lower in Germany than in the United States and in the United Kingdom.

The generosity and the specific incentive effects of the German pension system have generated three distinct types of effects, which we discuss in the sequel: effects on the level of savings, essentially by crowding-out mechanisms; effects on the life-cycle pattern of savings; and effects on the portfolio composition of savings.

### *Crowding-Out Effects*

The generosity of the German pension system and the broad insurance it gives also to survivors and disabled workers is likely to crowd out private old-age provision. Indeed, the German composition of retirement income is much more dominated by public pensions than in the other countries in Table II-1 below:

***Table II-1: Retirement Income by Pillar (percentages)***

	<b>Germany</b>	<b>The Netherlands</b>	<b>Switzerland</b>	<b>UK</b>	<b>US</b>
<b>State</b>	85%	50%	42%	65%	45%
<b>Employer</b>	5%	40%	32%	25%	13%
<b>Individual</b>	10%	10%	26%	10%	42%

Notes: Income composition of two-person households with at least one retired person. UK: „State“ includes SERPS. US: „Individual“ includes earnings (25%).

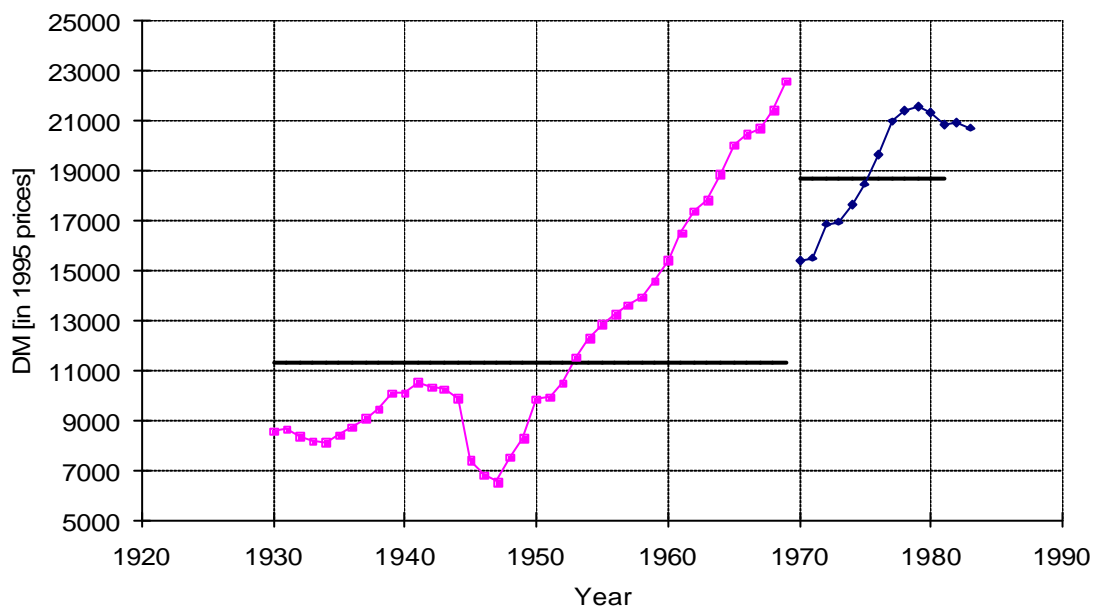
Source: DIA (1999), compiled from Gruber and Wise (1999) and OECD (1998).

This table shows that Germany holds an extreme position with a very thick public PAYG pillar and very thin private pillars. About 85% of retirement income stems from the public mandatory retirement insurance, and only 15% come from private sources such as funded firm pensions and individual retirement accounts, labour income, and family transfers.

Table II-1 is at odds with the fact, that Germany has such a high saving rate. Moreover, we saw that in particular the elderly in Germany had high saving rates and financial wealth levels that suffice for about 10 years of retirement income (see Section A6 in Part Ia).

Schnabel (1999) provides an explanation. He shows that the growth of income during the German economic miracle years and up to the seventies was so large and unprecedented that the elderly could just not have anticipated it. Figure II-1 displays the growth of earnings during the work history of a typical worker who retired in 1970, the jump due to the 70% replacement rate after retirement, and then the subsequent increase in pension income due to gross indexation. All numbers are in real terms. After less than 10 years, the average workers had essentially recouped their former earnings. The process was only stopped in the early eighties, when economic growth substantially slowed down in Germany.

**Figure II-1: Life-Cycle Income Path of the 1910 Cohort**



Source: Schnabel (1999)

Since this income path could hardly be anticipated, workers consumed “too little”, and ended up with too large a stock of wealth around retirement. One needs additional arguments why this wealth has not been spent at high rates in old age – arguments such as habit formation (the elderly did not want to change the accustomed level of consumption) or consumption constraints (increasingly fragile health prevented the elderly from consuming all their wealth).

### *Life-cycle saving patterns*

Our departure is Figure A1(a) in the first part of the paper which showed, by age group, financial saving in the 1993 wave of the EVS. The striking difference between mean and median saving, and the hump-shaped age pattern (in particular for the median and the third quartile), and the fact that there is no significant negative saving in retirement, are the main features of the data. We remind the reader that the cross-sectional results depicted in Figure A1(a) are not confounded by cohort effects, as could be seen by Figure A1(b) which shows that the life-cycle shapes remain roughly similar through the other waves of the EVS. We also remind the reader that although the EVS does not include the elderly living in institutions and that there might be an additional bias through differential mortality, the institutionalization rates and the actual mortality rates are not sufficiently large to explain the observed pattern (Börsch-Supan, 1992).

There are several explanations for what might be called the German old-age saving puzzle, all linked to the pension system. First and foremost, the high replacement rates of the German public pension system make additional private retirement income largely unnecessary as pointed out in the first subsection. Thus, saving for retirement, the only motive under the pure life-cycle hypothesis, cannot be the main savings motive in Germany. In fact, the previous subsection has shown that in Germany retirement is not a time of scarce resources for current generations of pensioners.

If other saving motives, such as precaution and intergenerational transfers, are more important than retirement saving, age-saving profiles are likely to be much flatter than under the pure life-cycle hypotheses. Indeed, Börsch-Supan and Stahl (1991), Börsch-Supan (1992), and Schnabel (1999b) find that after retirement, consumption remains low and there are high inter vivos transfers as well as positive savings.

Börsch-Supan and Stahl (1991) provide a complementary explanation. They argue that due to deteriorating health conditions, the elderly are simply less able to spend as much as they would need to make saving negative. Again, root cause is the high annuitized pension income which cannot be borrowed against even if the decline in health were anticipated.

While it may be suggestive and plausible that the deviations of saving patterns in Germany from those predicted by the life-cycle hypothesis are generated by the omnipresent German public pension system, the argument is vulnerable because we lack a counterfactual. The international comparisons in <<Chapter 1>> helps to overcome this problem. It shows that the hump-shaped life-cycle savings

pattern is most pronounced in the U.S. where the replacement rates of the public PAYG pension systems are lower than in continental Europe.

If most of the high saving in retirement that is currently observed in Germany is caused by the (in part unexpectedly) generous retirement benefits from the PAYG pension system due to the rapid growth of the economy in the post-war period, we should expect changes in saving patterns in the future. Growth rates have declined and the dependency ratio is deteriorating rapidly. As described in Section 2, this implies that the current generosity of the PAYG system is unlikely to prevail. This will revive the retirement motive for saving. Hence, saving rates among the young will increase to accumulate retirement savings, and saving rates among the elderly will decline sharply, because they will dissolve their retirement savings.

### *Portfolio composition*

The German PAYG public pension system appears also to have shaped the composition of household financial wealth. Table II-2 displays portfolio choice in the 1993 wave of the EVS. The important role of whole life insurance as a part of saving for retirement can be seen from the fact that in 1993, its share in total financial wealth was about a third. The central reason for the important role of whole life insurance in German households life-cycle savings decisions is its favorable tax treatment (see Brunsbach and Lang, 1998, and Walliser and Winter, 1999). At the household level, saving in whole life insurance is more important than saving in stocks and bonds.<sup>7</sup> This fact is also significant for financial markets, as life-insurance companies are not allowed to invest significantly in stocks, which in turn is one of the main reasons for thin capital markets in Germany (see Deutsche Bank Research, 1996).

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<sup>7</sup> The majority of stocks and bonds are bonds. Stocks are less than 10 percent of the average household portfolio.

**Table II-2: Composition of household wealth, Germany, 1978–1993**

	1978	1983	1988	1993	Share in 1993
Savings accounts	15.534	12.224	13.287	11.120	17.5%
Building societies	6.225	5.957	4.998	4.744	7.5%
Stocks and bonds	7.430	8.957	10.381	19.948	31.4%
Life insurance (cash value)	16.719	16.821	22.379	21.141	33.3%
Other financial wealth	-	1.811	1.784	6.614	10.4%
Gross financial wealth	45.909	45.770	52.830	63.567	100.0%
./. consumer loans	23.043	28,859	30.266	35.055	
Net financial wealth	22.866	16.912	22.563	28.512	

**Note:** Household data from the Einkommens- und Verbrauchsstichprobe (EVS). All figures in DM and in 1993 prices.

**Source:** Börsch-Supan et al. (1999).

It is highly speculative how this portfolio composition would change under a partial transition to pre-funding. If there were no substitution between new retirement saving and current saving, the household saving rate would increase by between 2 and 3 percent, see Birg and Börsch-Supan (1999). If all of this would be channeled into pension funds, which only recently have been introduced in Germany and still do not receive preferential tax treatment similar to whole life insurance, pension funds would amount to between 15 and 18 percent of households' portfolios, comparable to the United Kingdom, the U.S., the Netherlands and Switzerland. Substitution between new retirement saving and current saving would increase this share, but part of new retirement saving may also be done as whole life insurance. Households' direct and indirect exposure to stock markets then depends on future investment decisions of life insurance companies who only recently began to increase their portfolio share of stocks. Judging from the international experience in countries as diverse as the United Kingdom, the U.S., the Netherlands and Switzerland, a more prominent role of equities on the supply side of the capital markets seems very likely when more of the German retirement income will be prefunded.



## **Other policies affecting saving**

*Section still under construction.*

*(a) Brief description of tax treatment of capital income, homeownership, whole life insurance, pension funds*

*(b) Results. The main messages are:*

- ◆ *no capital gains taxation, but capital income taxed at high rate. Favors stocks over bonds.*
- ◆ *homeownership discouraged for median income since tax benefits for landlord higher than for median income renter.*
- ◆ *Tax subsidies for dedicated savings (whole life insurance, Bausparkassen) have been large, they are now rather small. The decline of Bausparkassen savings is visible in Table II-2. No decline for whole life insurances, probably because of compensating effect through increase in private old-age provision, see earlier part of section. Tax incentive effects on dedicated savings probably negligible at this point.*
- ◆ *No level playing field for pension funds: no tax advantage at all.*

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