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Aging in Germany and the United States: International Comparisons

Axel Börsch-Supan

8.1 Introduction

This paper reports on a set of international comparisons of how the German and the U.S. economies are affected by population aging. The purpose of the paper is to employ cross-national comparisons to learn about the microeconomic mechanisms in labor, financial, and housing markets that are most important for an analysis of how population aging affects our economies and, from an understanding of these mechanisms, to discuss policy options that may moderate the implications of population aging. The paper concentrates on three microeconomic decisions: when to retire, how much to save, and where to live. The paper is a continuation of Börsch-Supan (1991b). For a more macroeconomic view, the reader is referred to the many comparative studies that describe cross-national differences in the aging process and analyze aggregate economic implications (e.g., Organisation for Economic Cooperation and Development [OECD] 1988; Hagemann and Nicoletti 1989; Auerbach et al. 1990).

In order to discuss our policy options to alleviate negative implications of population aging on labor, financial, and housing markets, we must elucidate the economic mechanisms underlying retirement, savings, and housing choices by the elderly. In particular, we must understand how strongly they are affected by public policy, such as institutional arrangements, government regulations,

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and laws. The main idea of this paper is to exploit international differences in public policy in order to learn about the responses by the elderly to these policies.

The power of an international comparison comes from the fact that different countries have different institutional arrangements, government regulations, subsidies, and laws. In a study of only one country, it is often impossible to separate preferences from the impact of institutions and regulations, because there are commonly too few changes of institutions and regulations in one country to properly identify their impacts. Germany and the United States are particularly well suited for comparison. While they are sufficiently similar in mentality and social customs to make a comparison meaningful, they also feature important differences in institutions and public policy.¹ Moreover, Germany is one of the countries in which population aging is most advanced, leading the aging process in the United States by about 20 years. In this respect, changes that are occurring in Germany now may be indicative of changes to come in the United States. Indeed, retirement, savings, and housing behavior differ quite markedly between Germany and the United States, and I will show that most of these differences are consistent with the incentives applicable to each country.

The paper proceeds as follows. Section 8.2 summarizes the basic demographic trends in Germany, contrasting it to the United States. Section 8.3 reports on retirement decisions, particularly early retirement and its causes. Section 8.4 is devoted to a descriptive analysis of the strikingly different savings patterns among the aged in the two countries. Housing markets are examined in section 8.5 with particular attention to the elderly's choice of living arrangements. Each of these sections provides a sketch of the relevant government regulations, evidence of how these square with actual behavior, and implications for public policy. The paper concludes with a brief general summary.

8.2 Basic Demographic Facts

The expected change in the age structure of the industrialized countries is dramatic and will lead to a substantially higher proportion of older people. Population aging is particularly pronounced in Germany; see table 8.1.² Among the seven large OECD countries, the aging process is least marked but

1. On a more mundane yet important level, West Germany and the United States have rich and comparable longitudinal micro data sets that shed light on the economic situation of the elderly: the Panel Study of Income Dynamics (PSID) and its German counterpart, the Socio-Economic Panel (SOEP).

2. The numbers in this section are from OECD (1988) and refer to the former West Germany. Because East and West Germany have approximately the same age distributions, German unification does not affect the aging of the German population in any substantial way. East Germany features a higher mortality rate and had a decade of higher fertility between the mid-seventies and reunification. Higher mortality is commonly attributed to environmental problems and insufficient health services in the former East Germany. It is likely to adjust quickly to West German mortality rates. The period of high fertility appears to have been caused by the omnipresent East German

Table 8.1 Elderly Population in Seven OECD Countries

	Population Aged 65 and Over (%)			Population Aged 80 and Over (millions)	
	1950	1990	2030	1980	2030
Canada	7.7	11.4	22.4	0.44	1.89
France	11.4	13.8	21.8	1.53	3.40
Germany	9.4	15.5	25.8	1.60	2.65
Italy	8.0	13.8	21.9	1.28	2.56
Japan	5.2	11.4	20.0	1.63	6.64
United Kingdom	10.7	15.1	19.2	1.48	2.60
United States	8.1	12.2	19.5	5.22	12.43

Source: OECD (1988).

still dramatic in the United Kingdom and the United States. Within the next 40 years, the proportion of elderly in Germany will increase to more than a quarter of the population. Even more accentuated is the aging of households. The proportion of elderly households (headed by persons over age 60) in the German population is projected to increase from 21 percent in 1980 to 37 percent in 2030. Most marked is the increase among the oldest old: in the year 2030, Germany will have twice as many elderly over age 85 as now.

Two distinct processes are causing these dramatic changes. From 1950 to 1980, life expectancy at birth increased by about 7.2 percent on average in the OECD, while fertility in the industrialized countries declined to below replacement level; see table 8.2. From 1950 to 1980, German life expectancy increased by almost 7 years, from 66.4 to 73.3 years,³ while at the same time the fertility rate in West Germany decreased from 2.1 to 1.4, considerably below the reproduction rate necessary for a stable population. The effects of both processes sum to what is commonly termed “double aging” of the industrialized countries.

The effects of double aging on an economy are best captured by the old-age dependency ratio depicted in table 8.3. Again, the numbers for Germany are particularly dramatic. Its old-age dependency ratio will increase from 0.22 currently to almost 0.44 in the year 2030. Therefore, in 2030, twice as many elderly aged 65 and above will have to be supported by the same number of persons aged 15–64 as today. The projected German dependency ratio is the highest among all OECD countries except Switzerland.⁴ The dependency ratio will fall again after 2030, when the bulge of the baby boom works its way

child-care system, which used to support labor-force participation during the childbearing years of young women (Chesnais 1987). This system was dismantled after unification, and the East German fertility rate has dropped below the West German level.

3. In 1985, life expectancy at birth was 71.5 years for German males, 78.1 years for German females.

4. The projected old-age dependency ratio for Switzerland in 2030 is 0.47.

Table 8.2 Life Expectancy and Fertility Rates in Seven OECD Countries

	Life Expectancy ^a			Fertility Rate ^b		
	1950	1980	Increase (%)	1950	1980	1980/1950 (%)
Canada	68.4	75.0	9.6	3.4	1.8	52.9
France	66.8	74.3	11.2	2.9	1.9	65.5
Germany	66.4	73.3	10.4	2.1	1.4	66.7
Italy	66.1	74.4	12.6	2.6	1.7	65.4
Japan	59.2	76.4	29.1	2.4	1.8	75.0
United Kingdom	68.9	73.8	7.1	3.0	1.8	60.0
United States	68.4	73.5	7.5	2.2	1.8	81.8

Source: OECD (1988).

^aAverage life expectancy at birth in years.

^bAge-specific fertility rates summed across all child-bearing ages.

Table 8.3 Old-Age Dependency Ratios for Seven OECD Countries

	Population Aged 65+/Population Aged 15–64					
	1980	1990	2000	2010	2020	2030
Canada	14.1	16.8	19.0	21.4	28.9	37.3
France	21.9	20.9	23.3	24.5	30.6	35.8
Germany	23.4	22.3	25.4	30.6	33.5	43.6
Italy	20.8	20.1	22.6	25.7	29.3	35.3
Japan	13.5	16.2	22.6	29.5	33.6	31.9
United Kingdom	23.2	23.0	22.3	22.3	25.5	31.1
United States	17.1	18.5	18.2	18.8	25.0	31.7

Source: OECD (1988).

through the age distribution. However, it is likely to remain substantially higher than now: the OECD estimate for 2050 is 41.6 percent.

The increase in the ratio of retirees to workers is even more accentuated than that in the demographic old-age dependency ratio. The retiree/worker ratio is closer to the economic meaning of an old-age dependency ratio but more difficult to project because of potential changes in labor supply behavior. The German ministry of labor affairs projects that this ratio will climb from 0.48 currently to about 0.91 retirees per worker in the year 2030.

The dependency ratios in table 8.3 show quite clearly how the double aging process will strain the pay-as-you-go social security systems of our countries simply because fewer contributors will have to support more retirees. However, this is not the only policy problem facing the industrialized countries. Because the average age of the work force will increase, aggregate productivity will decline, unless the hump-shaped age-productivity profile also shifts. Increasing the contribution rates to public pension systems will create work disincen-

tives, exacerbating the potential productivity decline and partly offsetting the contribution increases. The double aging process will also change the accumulation of aggregate wealth and skew its intergenerational distribution in a complicated fashion, because older people save differently than younger people. It will assign a growing burden of family support to the young generation, when the elderly become frail and unable to live independently. These issues are taken up in the following sections.

8.3 Retirement Decisions

8.3.1 Institutional Background

Germany and the United States have pay-as-you-go public pension systems, with the resulting sensitivity to shifts in the age distribution that is the focus of most debates about population aging. Both countries supply, in effect, a minimum level of retirement income to workers with little labor income. And both countries feature fairly broad coverage of workers by social security: in the United States, about 95 percent of all workers are insured by Social Security, including the self-employed, while in Germany only the self-employed (8.9 percent of the labor force in 1988) and workers with very small incomes (5.6 percent) are not covered (Casmir 1989).

Apart from these similarities, Germany and the United States differ substantially in their retirement incentives. First, about a quarter of the German labor force is subject to mandatory retirement. This includes the entire public sector and some private sectors. In most cases, the mandatory retirement age is 65 years. In the United States, age discrimination laws prohibit mandatory retirement. Part-time work is also very restricted in Germany, because of inflexible work regulations and high fringe benefits, independent of hours worked, sustained by an insider coalition of unions and employers.

Second, although in both countries the public retirement system is augmented by private pensions, they play only a minor role in Germany, while they are a significant source of retirement income in the United States. About half of the American elderly aged 60 and above are covered by pension plans. For 13 percent of these, pensions contribute more than 20 percent of their incomes, for 2 percent, more than half their retirement incomes (Hurd 1989, table II 6). This is in striking contrast to Germany. In 1984, 82 percent of all elderly in West Germany received only social security income. Another 8.5 percent have additional private pension income (mainly annuities from life insurance), and only 7.6 percent have both social security and firm pension income.⁵ The difference in the importance of private pension plans is most striking when the average contribution of firm pensions to retirement income is

5. According to the 1984 wave of the German SOEP.

considered: Private pensions contribute about 15 percent of the income of the American elderly, but only slightly more than 3 percent for the German elderly.

Not only the significance but also the pattern of private pension plans is different. The United States features a broad range of pension provisions among firms even within the same industry (Kotlikoff and Wise 1987), while pension plans are rather homogeneous in Germany (Jacobs, Kohli, and Rein 1987). The main reason for the homogeneity in Germany is the centralization of union activities: all unionized employees in a German industry are members of the same union, and labor contracts also apply for nonunion members of the same industry.

A third difference between the social security systems in the United States and Germany is the general level of public retirement income. In the United States, Social Security is tailored to prevent poverty among the elderly and to secure a minimum reasonable standard of living. In Germany, public pensions are essentially proportional to lifetime earnings, because they are intended to ensure approximately the same living standard before and after retirement. Hence, German public pensions provide for substantially higher replacement rates than their U.S. counterparts, particularly for higher income levels. As a matter of fact, the stated rationale for not having complete replacement in Germany is not the added utility of leisure but the cessation of work-related expenses after retirement. Only very high incomes are not subject to the proportionality rule, because the income subject to social security contributions is capped. Table 8.4 presents net replacement ratios by income class, i.e., average after-tax retirement incomes as percentages of average after-tax labor incomes. On average, German social security income is about 33 percent higher than American, resulting in an average net replacement ratio of more than 70 percent. This also implies that unbequeathable and intangible social security wealth is considerably higher in Germany than in the United States. This is, on average, only partially compensated by higher private pension wealth in the United States.

Incentives with respect to retirement timing also differ between the United States and Germany. While the social security provisions in both countries offer the opportunity to retire at different ages (the so-called "window of retirement"), they differ considerably in how benefit levels are adjusted for retirement at different ages. Table 8.5 displays these adjustments. They relate retirement income for retirement at age 65 (normalized to 100 percent) to retirement income at earlier or later retirement ages and combine the reduction factors for early retirement with the delayed retirement credit for retirement after full-benefit retirement age. Currently, full-benefit retirement age is 65 in both countries. It will remain so in Germany, while in the United States it will gradually increase to age 66 in the year 2005 and to age 67 in 2022.

The first column in table 8.5 displays nondistortionary adjustment factors

Table 8.4 Replacement Ratios of Social Security Old Age Pensions

Relative Income ^a (%)	Net Replacement Ratio ^b (%)	
	United States	Germany
50	61	67
75	55	66
100	53	71
150	45	77
200	41	75
300	30	53

Source: Casmir (1989).

^aAs a percentage of the wages of an average production worker.

^bAverage after-tax pension divided by average after-tax labor income; 40 years of services assumed; married couple supplement not included.

Table 8.5 Adjustment of Public Pensions by Retirement Age: Pension as a Percentage of Pension One Would Obtain by Retiring at Age 65

Retirement Age	"Fair" System ^a	Germany		United States	
		Before Reform ^b	After Reform ^c	Before Reform ^d	After Reform ^e
60	64.6	87.5 ^f	69.5 ^g	^h	^h
61	70.4	90.0 ^f	75.6 ^g	^h	^h
62	76.7	92.5 ^f	81.7 ^g	80.0	77.8
63	83.7	95.0 ^f	87.8 ^g	86.7	85.2
64	91.4	97.5 ^f	93.9 ^g	94.4	92.6
65	100.0	100.0	100.0	100.0	100.0
66	109.6	109.9	108.5	103.0	105.6
67	120.4	120.1	117.0	106.0	111.1
68	132.5	123.0	125.5	109.0	120.0
69	146.2	125.8	134.0	112.0	128.9
70	161.9	128.7	142.5	115.0	137.8

Sources: Frerich (1987); Casmir (1989); *Social Security Bulletin* 46, no. 7 (July 1983).

^aHypothetical adjustments that keep the present discounted value of retirement benefits minus contributions constant across all retirement ages between 60–70 at a 3.3 percent discount rate.

^bGesetzliche Rentenversicherung until 1992.

^cGesetzliche Rentenversicherung after 1992 reform has been fully phased in.

^dOld Age Social Security (OASDI) until 1983.

^eOld Age Social Security (OASDI) after 1983 reform has been fully phased in.

^fApplicable only to women and workers who cannot be appropriately employed due to health or mismatch reasons (*berufs- oder erwerbsunfähig*).

^gApplicable only to workers who cannot be appropriately employed due to health or mismatch reasons (*berufs- oder erwerbsunfähig*).

^hNot yet eligible for Social Security benefits.

ⁱRequires 35 years of service.

which I dub “fair.”⁶ These adjustment factors keep the present discounted value of retirement benefits minus contributions constant across all retirement ages between 60 and 70 and therefore do not distort the choice of retirement age, conditional on the fact that the worker has worked at least until age 59. I will use these adjustment factors as a yardstick for the current and the reformed relative pension benefits in the United States and Germany.

In the United States, benefits increase during the window of early retirement—ages 62–65—in a way that is reasonably close to actuarially fair. For retirement ages past 65, benefits increase less than actuarially fairly. The latest age to apply for an old-age pension is 70.

In Germany, until 1992, benefits were proportional to years of service, with no further adjustment applied, resulting in a very small percentage increase in retirement benefits for postponing retirement once a large number of years in service is reached. The window period—effectively ages 60–65—is characterized by three regulations. First, everybody can retire at age 65. Second, in order to receive retirement benefits at age 63, 35 years of service are necessary.⁷ Third, retirement at age 60 is possible for all women and for those male workers who cannot be appropriately employed (*berufs- oder erwerbsunfähig*) for health- or job-related reasons. The latter rule has been interpreted very broadly, and its application—loosely speaking—required only the help of the family doctor. Its application was traditionally encouraged by employers who wanted to thin out their work forces. The rule also applies when there are no vacancies for the worker’s specific job description available, thereby fudging the distinction between unemployment and retirement.⁸

In both countries, social security was reformed to steepen the adjustment rate profiles. In the United States, the reduction factors for retirement before age 65 are now very close to actuarially fair. For retirement past age 65, benefits increase faster than under the old law, but the increase remains less than actuarially fair. The reformed German system provides substantially more incentives for later retirement than does the American one. However, the reduced benefits for retirement before age 65 are still substantially higher than the non-distortionary ones in the first column of table 8.5.

Although not completely free of distortive incentives, the American public retirement system is more age neutral during the window period than the German system. Particularly in the reformed U.S. system, there is little economic

6. This term is somewhat misleading because the system as a whole is not actuarially fair. The present discounted values were computed for a discount rate of 3.3 percent, the value which would equalize lifetime discounted benefits and contributions for the historical contribution rates and current life expectancy.

7. This includes time spent in military service, on education, for childbearing (about one year), etc.

8. In the years between 1984 and 1989, Germany reduced the retirement age *de facto* to age 58 (Vorruhestandsregelung) because workers could apply for the status *berufsunfähig* at that age. They received unemployment compensation at ages 58 and 59 and then a social security pension as if they had retired at age 60.

incentive for Americans to retire at any particular age in the window of early retirement and only a small disincentive to retire later than at age 65, while the German social security system tilts the retirement decision heavily toward the applicable early retirement date. Strangely enough, the old German system provided a large increase in retirement benefits for work at ages 66 and 67. However, this reward was too small to offset the early retirement incentives (see below).

The tax treatment of labor earnings while receiving public pensions also differs strongly between the two countries. In the United States, receiving a public pension does not preclude working, although additional labor income during the entire window period of ages 60–70 is taxed at 50 percent if it exceeds certain limits. In Germany, labor income, additional to a public pension, which exceeds a very small allowance is taxed at 100 percent during the early retirement period. However, there is no penalty at all for working after age 65.

All differences between the public and private pension systems in the two countries—mandatory retirement age, the role of private pensions, replacement levels, adjustment factors of public pensions, and taxation of labor income while receiving public pensions—are likely to generate similar implications for retirement choices. If retirement choices respond at all to the economic incentives provided by public and private pension plans, they are likely to be more uniform in Germany, while they should be more diverse in the United States, i.e., more individual specific and more firm specific. Moreover, because retirement income in Germany is on average higher than in the United States and because the German system is less than actuarially fair for late retirees, we should observe a lower supply of labor in old age in Germany than in the United States—provided that the preference for leisure is roughly comparable in the two countries.

8.3.2 Descriptive Evidence: Old-Age Labor Supply

Indeed, this is what we find in a first glance at the data. Table 8.6 presents labor-force participation trends in seven OECD countries. The differences between Germany and the United States are striking. Although both countries have experienced a declining trend in retirement age (similar to that in the other OECD countries), labor-force participation of the elderly is substantially lower in West Germany than in the United States.⁹ In the United States, labor-force participation among persons aged 65 and over has fallen from 26.6 percent in 1965 to 10.3 percent in 1985. While in West Germany 24 percent of the elderly still had a job in 1965, this percentage has fallen to a mere 5.2 percent in 1985. This participation rate is the lowest in the seven major OECD countries.

The trend visible in table 8.6 is approximately in line with changes in the

9. Since I use pre-1990 data, I refer to West Germany only.

Table 8.6 Labor-Force Participation Rates among Persons Aged 65 and Over (%)

	1965	1975	1985
Canada	26.3	18.5	12.3
France	28.3	13.9	5.3
Germany	24.0	10.8	5.2
Italy	18.4	10.4	8.9
Japan	56.3	44.4	37.0
United Kingdom	23.7	15.8	7.6
United States	26.6	20.7	10.3

Source: OECD (1988).

ratio of retirement to labor income. In the United States as well as in West Germany, social security retirement income has increased relative to labor income. While nominal wages have increased 3.7-fold in the United States and 4.1-fold in West Germany, the average old-age social security benefits have increased 4.6-fold in the United States and 4.3-fold in West Germany.¹⁰ This increase of pension income relative to labor income is due to the effective indexation of social security benefits in both countries. In West Germany, for example, pension benefits have been linked to gross average labor income.¹¹ Retirement income is taxed at a much lower rate than labor income because of the generous exemptions. Hence, the progressivity of the income tax schedule has produced a more than proportional increase of net retirement income relative to the increase of net labor income.

Cross-national survey data provide additional evidence that economic factors have strongly influenced old-age labor supply behavior. Table 8.7 presents a closer look at retirement rates for male workers in West Germany and the United States, based on the 1984 wave of the Panel Study of Income Dynamics (PSID) and its German counterpart, the 1984 wave of the Socio-Economic Panel (SOEP). Because incentives for part-time work are rather different in the two countries, it is important to define retirement consistently and to distinguish full retirement from partial and no retirement. We define retirement by hours worked and use three states of labor-force participation. Full-time work is 35 hours or more per week, part-time work is between 15 and 34 weekly hours, and full retirement is less than 15 hours of work per week.

The range of retirement ages is much wider in the United States than in West Germany. While the United States features a smooth transition between work and retirement, with a large percentage of part-time work, the West German

10. The numbers are obtained from *Statistical Abstracts of the United States* (*Statistical Abstract*, various issues) and the *Statistisches Jahrbücher für die Bundesrepublik Deutschland* (*Statistisches Jahrbuch*, various issues).

11. The 1992 social security reform has changed this to an indexation with respect to net income.

Table 8.7 Male Retirement and Labor-Force Participation Rates (%)

Age	United States			West Germany		
	Full-Time	Part-Time	Retired	Full-Time	Part-Time	Retired
50–54	76.6	11.0	12.4	91.5	0.6	7.8
55–59	65.9	17.4	16.7	79.1	1.5	19.4
60–64	38.8	16.9	44.3	37.7	1.6	60.8
65–69	12.2	22.3	65.4	4.1	7.5	88.4
70–74	7.2	13.7	79.1	1.7	3.2	95.3
75–79	2.5	12.7	84.8	2.5	1.7	95.7
80+	1.6	4.8	93.5	1.2	0.0	98.8

Sources: 1984 PSID; 1984 SOEP.

Notes: Full-time: More than 35 weekly work hours. Part-time: Between 15 and 35 weekly work hours. Retired: Less than 15 weekly work hours.

age-retirement profile is characterized by a sudden jump from full-time work to full-time retirement in the age range 60–64, accompanied by a rather low percentage of part-time occupation. More detailed analysis shows that in the United States retirement ages are more evenly distributed, with a peak at age 62. This is consistent with the fact that the adjustment of benefits in the United States is approximately actuarially fair. We observe that in the United States people retire at all ages, most notably also at ages 63 and 64 in the interior of the window period. This is quite different from Germany. Here, retirement is very much concentrated at ages 60, 63, and 65, at exactly the first years when each of the three retirement regulations mentioned in subsection 8.3.2 apply, and very few people retire at ages between these.

In order to turn these pieces of suggestive evidence into numbers which can be employed for policy analysis, I employ a simplified version of the option value model developed by Stock and Wise (1990). It relates applicable economic incentives—mainly the replacement rate and the retirement-age-dependent adjustment factors—to observed retirement age, conditional on other determinants of retirement behavior, such as sociodemographics and health. Its key variable capturing economic incentives is the value of the option to postpone retirement at a given age. It is defined as the maximum attainable expected discounted utility from consumption if the worker were to retire at some later age minus the expected discounted utility if the worker were to retire now (Lazear and Moore 1988).

The consumption possibilities entering the option value are computed using the applicable pension rules. In Germany, the public pension system dominates retirement income. Therefore, economic retirement incentives are rather well captured by the replacement rates of the public pension system from table 8.4 together with the retirement-age-dependent adjustment factors from table 8.5. In the United States, private pension plans may dominate the importance of the public pension system for an individual worker. However, survey data in

the United States give little information on the structure of each private pension plan that may be applicable to each individual worker. I will therefore not attempt to make parallel analyses for the United States and Germany.

The detailed construction of the model and estimation results are presented in Börsch-Supan (1992a). In essence, I estimate a logit model, regressing the probability of being retired on the option value, the sociodemographic variables, the health variables, and a set of age-specific constants for each age in the window period. The main results can be summarized as follows: the model fits the data rather well, the option value is statistically highly significant, and the age-specific constants remain insignificant. These are strong findings because they imply that, during the main window of retirement, actual behavior is well described by the option value, the main economic incentive for retirement.

These estimation results can be used in a microsimulation model to predict retirement ages under alternative social security rules. Specifically, I replace each person's actual option value by the option value computed with alternative retirement-age-dependent adjustment factors. The baseline retirement probabilities are fitted to replicate the population retirement probabilities. I therefore project all other determinants of retirement timing not included in the explanatory variables into the future, particularly preferences and social customs. In this respect, I am likely to underestimate the total effects of the simulated social security changes.

Table 8.8 summarizes the microsimulation results in form of the average retirement age and required contribution rates. From the number of pensioners implied by the simulation results, I compute the average retirement age and the ratio of pensioners to employed persons. Using the pay-as-you-go budget equation of the social security system, I then calculate the social security contribution rates necessary to balance contributions and payments for the years 1990 and 2000. The first row of table 8.8 relates to the old German social security system, as it was in place until 1992. The second row presents simulation results for the German social security system, employing the adjustment factors of the 1992 reform. Finally, the third row displays results for a "fair" system using the nondistortionary adjustment factors of column 1 in table 8.5.

Taking the 1992 social security reform into account removes some but by no means all of the distortion toward early retirement in Germany. The proportion of the population retiring before age 60 drops from 32.2 percent to 28.4 percent, in 1990, and the average retirement age increases by about half a year. As a consequence, the contribution rates necessary for a balanced budget are 18.1 percent rather than 18.7 percent, in 1990, and are 19.5 percent rather than 20.1 percent, in 2000.

However, a system with nondistortionary adjustment factors, as defined above, has a much stronger effect on retirement age and also therefore on the contribution rate necessary to balance the public pension system's budget. It increases the average retirement age by about two years and results in contribution rates that are substantially lower (by more than two percent) than the ones under the old and under the reformed German social security systems.

Table 8.8 Simulated Average Retirement Age and Contribution Rates

	Mean Retirement Age	Contribution Rate (%)	
		1990	2000
System before 1992 reform	58.5	18.7	20.1
System after 1992 reform	59.0	18.1	19.5
Nondistortionary ("fair") system	60.7	16.2	17.4

Source: Author's calculations.

8.3.3 Policy Implications

The main conclusion from the evidence presented is the strong and consistent response of retirement behavior to public policy. The differences in retirement behavior between Germany and the United States are clearly in line with economic incentives to retirement in each country and with the institutional differences between them. The fine tuning by retirement-age-dependent benefit adjustments appears to be well reflected in observed choices of retirement ages. We learned that our pension systems indeed powerfully influence retirement decisions.

In principle, an individual should be able to choose his retirement date. However, changes in the average retirement age have side effects on the soundness of the social security system, on average wages, on aggregate productivity, on tax revenues, and on aggregate savings. Advancing retirement ages amplify the effects of a rising old-age dependency ratio, potentially above the economic potential and the will of a generation of workers to come. While this affects mainly the public pension system, private pension funds and health insurance systems are also affected because health insurance for retirees is heavily subsidized in Germany and in the United States. The increase in the general support ratio will lead to a level of social security and general taxes that will create strong work disincentives. In West Germany, Schmähl (1989) projected social security contribution rates exceeding 40 percent of gross labor income, not including rising general taxes to finance added health expenditures. Such high tax rates are simply not sustainable. Although this effect has been the focus of most debates about population aging and has led to the above-mentioned social security reforms in Germany and in the United States, our simulation shows that this lesson has not yet been learned in Germany because the 1992 social security reform has not really removed early retirement incentives.

Replacing the strong incentives for German workers to retire early by a more age-neutral system appears likely to generate more evenly distributed retirement ages than those depicted in table 8.7. As a way to induce later retirement, a gradual adjustment of replacement rates may be not only more subtle but also more efficient than the shift of eligibility ages that was enacted in the German social security reform act of 1992. It is likely to be more efficient,

because it avoids the bunching that is a current characteristic of German retirement behavior and that appears to be an expression of constraints imposed on retirement choices.

Changing the retirement system too late will be complicated by the change in the politics of the social security system. Political power will shift from the working population, where it now resides, to the older generation, along with the surge in the dependency ratio. In West Germany, for example, from about 2020 onward, the majority of the voters will be pensioners and workers who will retire within the next 10 years. We then obtain a typical free-rider situation because the older generation can outvote the younger generation in determining their retirement income as well as the rate of social security taxes the younger generation has to pay.

8.4 Savings Behavior

8.4.1 Historical and Institutional Background

American and German attitudes toward saving are very different. Germans have traditionally valued saving per se and were reluctant to follow American consumerism, despite the strong American influence on German postwar development. Although this attitude appears to be changing with each new generation, it changes surprisingly slowly. Table 8.9 presents comparable personal savings rates for the two countries. Savings rates have always been higher in Germany than in the United States, but the discrepancy has been particularly large in recent years. Although both countries have experienced declining savings rates since 1975, the relative decline is much larger in the United States.

The different historical experiences of Germans and Americans may help explain the higher aggregate savings rates that emerged in Germany as soon as a moderate standard of living was achieved in the 1960s. The elderly in this decade all experienced World War II. This catastrophe, however, has affected Americans and Germans very differently. During the war and until the Germany currency reform in 1948, most Germans could not even satisfy their basic need for food and clothing. This experience was not shared by their American contemporaries. In addition, during the so-called economic miracle in the 1950s in Germany, saving was heavily promoted in large-scale public campaigns.

The attitude that saving is good per se (and that personal loans are something to be avoided) is reflected in the German tax treatment of savings and loans. There are several schemes subsidizing savings in Germany, many of them heavily advertised. And taxation of interest income is only half-heartedly enforced.

On paper, asset income, including capital gains, is taxed as ordinary income. Income from stocks and bonds is subject to automatic 25 percent withholding, which is then credited against the actual income tax burden. Although divi-

Table 8.9 Aggregate Savings Rates (%)

Year	West Germany	United States
1960	8.6	5.7
1965	12.2	7.0
1970	13.8	8.0
1975	16.2	8.7
1980	14.2	7.9
1985	13.0	6.4
1990	14.8	5.1

Sources: *Monatsberichte der Deutschen Bundesbank* (Frankfurt am Main: Deutsche Bundesbank, various issues); *Economic Report of the President*, Statistical Appendix (Washington, D.C.: Government Printing Office, 1992).

Note: Table reports personal saving as percentage of personal disposable income.

dends are subject to corporate income tax, this tax is credited against personal income taxes. Hence, Germany has no double taxation of dividend income as in the United States. Interest income from passbook savings and similar liquid capital is not currently subject to automatic withholding. Moreover, direct notification of the internal revenue service by the bank (as routinely done in the United States on form 1099) would be a violation of German privacy laws. Although the government has stepped up its public relations effort to stimulate compliance with the tax code, interest income remains routinely undeclared. Finally, capital gains are only taxable when earned by "speculation." The law considers the holding of financial assets to be speculative if the assets are sold within six months of purchase. For land, holding periods are speculative if they are shorter than two years. Long-run capital gains therefore escape taxation in Germany.

The German government has several special incentive programs to subsidize savings. A general program is designed to foster capital accumulation among the lower-income groups (*Vermögensbildungsgesetz*). This program has been in place since 1961 and was substantially extended in the 1970s. Employees or pensioners deduct a certain amount from their incomes and direct deposit it in long-term savings accounts. The government then supplements the contributions of eligible savers by a fixed-percentage savings premium capped by an upper limit. In the seventies, these premia were as high as 40 percent and the income limit for eligibility was high enough to cover incomes far into the middle class. Currently, savings in productive capital are subsidized by a 20 percent savings premium, savings in real estate by 10 percent, and the income limit is DM 54,000 per year for married couples, a lower middle-class income of about \$33,000.

Capital market institutions do not differ greatly between the United States and Germany. In both countries, financial markets are only mildly regulated, and portfolio options are quite comparable. If they differ at all, it is because the

well-to-do in the United States face more portfolio options than their German counterparts, because of a somewhat more dynamic U.S. market for financial instruments. Differences in savings options between Germany and the United States mainly include different dedicated savings programs. In the United States, IRAs and Keoghs are subsidized savings dedicated to retirement income (Venti and Wise 1987); such programs do not exist in Germany. However, bequeathable savings dedicated to housing investments are substantially subsidized and play a major role in German private capital accumulation (Börsch-Supan and Stahl 1991a).

An important difference in the institutional background for savings decisions in the two countries is the extent of income maintenance by compulsory social security programs. This brings up the question of whether social security and private savings are substitutes, a topic of great interest and the subject of controversial discussions (Barro 1974; Feldstein 1974). Because one needs to observe differences in the extent of social security programs in order to measure these potential substitution effects, an international perspective is helpful. As we have seen in table 8.4, social security income differs dramatically between Germany and the United States. The German old-age social security system replaces net income across all income ranges much more generously than the U.S. social security system. The high average net replacement ratio of more than 70 percent may provide a sufficient level of retirement income for the elderly and hence reduce the incentive for life-cycle savings in order to finance consumption in retirement.

In addition, there are pronounced differences in the health insurance systems between the two countries. In Germany, all retirees are enrolled in the mandatory health insurance system which covers all health expenditures, with the exception of long-term institutionalized care not related to acute illness. This coverage is far more comprehensive than that of Medicaid and Medicare in the United States. Therefore, the precautionary savings motive to safeguard against unexpected expenditures, particularly health-care-related expenditures, should be less pronounced in Germany.

In summary, we receive a mixed message about the impact of institutions on savings. On one hand, tax treatment of savings is more favorable in Germany than in the United States, which should, *ceteris paribus*, induce relatively higher savings rates in Germany. On the other hand, two of the main economic rationales for saving—assuring a comfortable retirement income and taking precautions against high health expenses—are less important in Germany than they are in the United States, because the safety net is tighter in Germany. This should, *ceteris paribus*, reduce savings among households younger than retirement age. Among the older elderly, however, the tighter safety net in Germany might actually increase net savings, since the generous retirement income might not only prevent the German elderly from depleting their assets but even provide income levels sufficiently large to induce savings in old age. We will take up this point when we look at the evidence on savings behavior among the aged.

8.4.2 Evidence on Savings Behavior among the Aged

It is not straightforward to compare wealth data between the two countries. In both, the wealth distribution is very skewed. Average wealth is therefore sensitive to a few very wealthy persons, while median wealth is zero for most asset categories. I employ wealth data from the PSID and SOEP wealth supplements in 1984 and 1988. Response rates to these supplements were lower than to the core questionnaire (particularly in Germany), and the quality of the wealth data is likely to be less reliable than other PSID and SOEP data, mainly because the wealth data is self-reported and subject to severe underreporting. However, the wealth data presented is roughly comparable between the two countries, because the PSID and SOEP wealth supplements are based on the same design principles. Valuation is complicated by the large discrepancy between exchange rate and purchasing power in the mid-1980s. The average exchange rate between the deutsche mark and the U.S. dollar was about \$1 to DM 2.70, substantially higher than the average purchasing power parity, which was about \$1 to DM 1.70, according to OECD figures. Because I am interested in real wealth, I use purchasing power parity.

Table 8.10 displays tangible wealth by household, stratified by age categories. The reported values for the United States are in line with data from the American Retirement History Survey reported by Hurd (1989), which gives us some confidence in the data.¹² Total tangible household wealth is the sum of several asset categories reported in the two surveys. Financial wealth includes liquid wealth, such as passbook savings and money market mutual funds, dedicated savings, such as the above-mentioned IRA and Keogh accounts in the United States and *Bausparkassen* (building societies) savings in West Germany, and stocks and bonds. Nonhousing wealth is defined as the sum of financial wealth plus farm and business property plus real estate not including an owner-occupied home. The self-reported estimated sales value of an owner-occupied home is then added, to yield total tangible household wealth.

In addition to the tangible wealth reported in table 8.10, almost all elderly persons have intangible and unbequeathable wealth, mainly social security and pension wealth. Total intangible wealth in the United States is estimated to be almost as large as the tangible wealth reported in table 8.10 (Hurd 1989), and it is even more in Germany.

According to the PSID and SOEP data, total tangible household wealth is, on average across ages 50 and above, lower in West Germany than in the United States. Valued by purchasing power, West German elderly households hold roughly 20 percent less tangible wealth than American elderly households. However, this 20 percent lower level of tangible wealth in West Germany corresponds to a 33 percent higher level of intangible social security wealth (according to the replacement ratios in table 8.5). The higher sum of tangible and intangible wealth in West Germany is a reflection of the higher

12. However, the Retirement History Survey data are subject to measurement problems similar to those for PSID data.

Table 8.10 Household Wealth by Age and Asset Category
(averages across households; thousand \$)

Age	United States			West Germany		
	Nonhousing	Own Housing	Total	Nonhousing	Own Housing	Total
50–54	40.2	51.9	92.1	19.8	54.2	73.9
55–59	47.1	48.2	95.3	29.8	43.4	73.2
60–64	45.1	41.6	86.7	41.9	54.5	96.4
65–69	37.8	38.8	76.6	35.0	36.8	71.8
70–74	38.0	31.5	69.5	22.4	45.7	68.1
75–79	41.3	34.3	75.6	31.4	28.7	60.1
80+	37.2	30.5	67.7	31.0	29.8	60.8

Sources: 1984 PSID; 1988 SOEP at 1984 prices, valued at purchasing power parity (\$1 = DM 1.70).

Notes: Financial wealth includes passbook savings, money market mutual funds, dedicated savings (IRA, Keogh, *Bausparkassen*, etc.), stocks and bonds. Nonhousing wealth is financial wealth plus real estate (except an owner-occupied home), farm, and business property. Housing wealth is the estimated sales value of an owner-occupied home. All values are self-reported.

aggregate savings rate depicted in table 8.9. The difference in wealth levels between the two countries is therefore consistent with Feldstein's (1974) view that private wealth has, at least in part, been substituted for by social security wealth in West Germany.

Another, although more indirect, piece of evidence in favor of the Feldstein view can be drawn from data on income sources displayed in table 8.11. In West Germany, annuity income (almost exclusively social security income, as I noted in the discussion about the role of private pensions, in section 8.3) is the most important income source for all households aged 60 and above. In turn, asset and labor income play a more important role in the United States. For very old Americans (aged 75 and above), income from assets contributes about one-quarter of total income. Hurd obtains similar results based on a much larger sample from the American Current Population Survey (Hurd 1989, table I 5).

Not only the levels of tangible and intangible wealth but also the age-wealth profiles are different between the two countries, as revealed by table 8.10. While American elderly have nonhousing wealth levels that only slowly decline after age 55, the German age-wealth profile is irregularly shaped with a pronounced peak at ages 60–64 and a remarkable increase in financial wealth at very old ages. These observations are not in line with pure life-cycle theory predictions and deserve a more careful analysis than the PSID and SOEP data can provide.

Wolff (1990) analyzes American wealth data, using the Survey of Consumer Finances and the Consumer Expenditure Survey. His results show a similarly slow decline in wealth levels. Also, the German age-wealth profiles are not specific to the relatively small SOEP sample on which table 8.10 is based. The

Table 8.11 Sources of Income (% of total income)

Age	United States			West Germany		
	Labor	Annuities	Assets	Labor	Annuities	Assets
50-54	75.6	18.7	5.6	85.4	7.3	7.3
55-59	66.1	26.0	7.8	76.5	14.4	9.0
60-64	43.2	47.4	9.3	37.0	51.9	11.1
65-69	14.5	70.1	14.8	4.1	87.0	8.9
70-74	6.4	79.9	13.7	2.7	82.0	15.3
75-79	2.6	74.1	23.2	0.6	81.8	17.6
80+	1.8	72.9	25.3	0.7	86.3	12.9

Sources: 1984 PSID; 1984 SOEP.

Notes: Labor includes full-time and part-time wages. Annuity income includes social security, pensions, and other transfers. Asset income includes interests, dividends, rents, and profits.

same pattern is also evident in the much larger sample of the German 1978 and 1983 consumer expenditure surveys.¹³

Tables 8.12 through 8.14 display results from these two surveys. Table 8.12 reports on net household savings, defined as the sum of all purchases of assets minus the sum of all sales of assets. These assets include financial assets and real estate, including owner-occupied housing. Changes in financial assets are deposits and withdrawals to and from all kinds of savings accounts and purchases and sales of stocks and bonds, partnerships, and dedicated savings programs (particularly to building societies). New loans are subtracted and repayments added to net savings. Not included in savings are durables (other than housing), cash, and unrealized capital gains.

Savings rates in table 8.13 are computed by dividing the above net household savings by household income net of taxes and social security contributions, if applicable. Finally, table 8.14 reports on financial wealth, defined as in table 8.10.¹⁴ All three tables are stratified by survey year, age, and birth cohort. Cell sizes range from 776 to 4,343 observations, resulting in precise averages. The upper number refers to the 1978 German income and expenditure survey, the lower number to the survey conducted in 1983.

Although it would be desirable to consider more than just two periods, the data permit a rough distinction between age and cohort effects. In particular, table 8.12 reveals that savings among the very old in Germany are not only positive, but actually increase with age, holding birth cohort constant. This increase is even more pronounced in the savings rates (table 8.13) and generates levels of financial wealth that are increasing with age (table 8.14). Since housing wealth stays virtually unchanged as households age (see section 8.5

13. Einkommens- und Verbrauchstichproben; see Börsch-Supan and Stahl (1991b) and Börsch-Supan (1992b).

14. It excludes business and farm property included in table 8.10.

Table 8.12 Household Savings by Age and Cohort, 1978 and 1983 (DM per year, in 1983 DM)

Age	Birth Cohort					
	1928-24	1923-19	1918-13	1912-09	1908-04	<1904
50-54	5,136					
55-59	3,771	4,477				
60-64		2,468	2,830			
65-69			1,459	2,450		
70-74				2,016	2,368	
75-79					2,501	3,717
80+						4,015

Source: Einkommens- und Verbrauchstichproben (EVS) tapes (Stuttgart: Statistisches Bundesamt, 1978, 1983).

Table 8.13 Saving Rates by Age and Cohort, 1978 and 1983 (net household savings/net household income)

Age	Birth Cohort					
	1928-24	1923-19	1918-13	1912-09	1908-04	<1904
50-54	7.3					
55-59	5.3	7.0				
60-64		3.5	3.8			
65-69			2.4	3.9		
70-74				4.1	4.8	
75-79					5.8	8.8
80+						9.7

Source: EVS tapes (Stuttgart: Statistisches Bundesamt, 1978, 1983).

Notes: Age is age of household head. In each column, the upper number refers to 1978, the lower number to 1983.

Table 8.14 Financial Wealth by Age and Cohort, 1978 and 1983 (thousand DM, in 1983 DM)

Age	Birth Cohort					
	1928-24	1923-19	1918-13	1912-09	1908-04	<1904
50-54	26.5					
55-59	27.1	28.3				
60-64		28.9	27.5			
65-69			27.5	25.8		
70-74				28.7	26.5	
75-79					28.7	30.3
80+						31.9

Source: EVS tapes (Stuttgart: Statistisches Bundesamt, 1978, 1983).

Notes: Age is age of household head. In each column, the upper number refers to 1978, the lower number to 1983.

on housing), the German data feature a flat, if not increasing, age profile of total wealth. Börsch-Supan (1992) shows that qualitatively similar profiles are obtained by analyzing mean and median savings, savings per household and per capita, and savings by pensioners and savings averaged across all households.

The American and the German age-wealth profiles are not consistent with the ones predicted by the pure life-cycle hypothesis. The upward swing in the German age profile of savings rates is in straight contradiction to the predictions of the life-cycle hypothesis. In the United States, according to the PSID wealth data (table 8.10), the elderly aged 80 and above still hold more than two-thirds of the maximum wealth attained immediately before retirement.

Why do the elderly draw down so little of their financial assets at old ages, particularly in West Germany? One reason would be to leave bequests. If that were the case, the elderly with children should, on average, arrive at higher wealth levels than the elderly without children—otherwise, there would be little reason to bequeath.¹⁵ However, regressions of nonhousing wealth on the number of children born, holding age and income constant, produce positive coefficients neither in Germany nor in the United States.¹⁶ While the estimated negative coefficients are only weakly significant, they rule out the idea that a bequest motive has created the flat or increasing asset profiles in Germany.¹⁷

There is also little reason to suspect that precautionary savings generate the observed savings pattern in Germany. As I mentioned in the previous subsection, the comprehensive coverage of German health insurance should permit the German elderly to draw down their assets, disregarding potential health expenditures, while the American elderly, on average much less covered, should have a stock of precautionary liquid wealth. However, the opposite is the case: nonhousing assets increase with old age in West Germany, while they slightly decrease in the United States. Hence, it is unlikely that precautionary savings drive the pattern of age-asset profiles in the two countries.

Concerning the German sample, it also appears unlikely that mortality differences between the rich and the poor are behind the U-shaped age-savings profile. If the rich survive the poor and if saving is positively correlated with income, sample selection generates higher savings in the sample of older people, unless income had concurrently fallen, which was not the case between 1978 and 1983. Savings rates, however, should stay approximately constant, because they hold income constant and therefore roughly correct for the sample selection by differential mortality. However, savings rates rise even faster

15. One might also wish to leave bequests to persons or institutions other than one's children, but the bequest motive appears strongest with respect to children.

16. See Börsch-Supan (1991b). I intentionally excluded housing wealth, because larger families have larger houses that have, on average, higher sales prices. Because mobility is low among homeowners, many elderly who had large families are still living in their large houses, with or without a bequest motive.

17. To get the semantics straight: the point is not to test for the presence of a bequest motive per se, but to test whether a bequest motive is the source of the asset and savings profiles observed as people age.

than absolute savings (see tables 8.12 and 8.13). It is therefore unlikely that the observed patterns have been created by differential mortality between rich and poor elderly.

I favor a different interpretation of the data, one supported by table 8.15. This table displays the relative frequency of elderly households with an excess of annuity income over consumption expenditures. This table points out that it is more helpful to investigate why the German elderly consume so little than to wonder why the German elderly save so much. Annuity income exceeds consumption expenditures, and this happens increasingly with age. The decline in consumption expenditures is too large to be attributed merely to under-reporting: for about a quarter of the elderly aged 75 and above, annuity income is more than 50 percent higher than consumption expenditures. In fact, almost all of this decline can be attributed to a reduction in food, travel, and transportation consumption, categories in which the marginal utility from consumption is very likely to decline in old age because of deteriorating health or increasing loneliness. It is important to note that in Germany the decline in food, travel, and transportation expenditures is not offset by larger health expenditures since almost all of the (indeed increasing) health bills are covered by compulsory health insurance, unlike in the United States.

The wealth pattern observed in table 8.10 is therefore consistent with the view that the elderly in Germany find themselves saving out of generous annuity income and not drawing down their existing wealth, as they might have planned before realizing their declining marginal utility from certain kinds of consumption. Moreover, since borrowing against social security wealth is impossible, anticipation of declining expenditures may generate low levels of tangible wealth immediately before retirement but could not prevent asset accumulation once expenditures fall short of retirement income.

8.4.3 Policy Implications

A first, though tentative, conclusion can be drawn about future aggregate savings as the German and the American population ages. It appears counterfactual to employ asset profiles drawn from a textbook version of the life-cycle hypothesis in order to forecast lower future wealth levels in Germany and, to a lesser degree, in the United States. Decreases in savings in the United States and Germany may be less dramatic than projected by Auerbach et al. (1990) or may not occur at all. The high savings rates and the associated large asset holdings among the elderly in Germany are more likely to lead to an increase in aggregate savings, at least during the medium-run transition period in the next 30 years when the baby-boom generation becomes aged. One should be careful not to exaggerate the dread of lower capital intensity due to population aging and a need to borrow at the expense of worsening the terms of trade. Whether aggregate savings will be lower or higher in the long-run, when the bulge of the baby-boom generation has disappeared and new cohorts with potentially very different savings attitudes are present, is impossible to tell.

Table 8.15 Elderly with Expenditures Lower than Annuity Income (% of elderly in age group)

Age Group	Ratio of Annuity Income to Consumption Expenditures			
	<1.0	1.0–1.2	1.2–1.5	>1.5
50–54	97.7	1.5	0.5	0.3
55–59	92.0	3.9	2.9	1.2
60–64	69.3	13.4	11.4	5.9
65–69	47.3	23.5	18.0	11.2
70–74	42.9	22.7	20.6	13.8
75–79	38.1	19.2	21.6	21.1
80+	30.5	17.3	23.2	29.0

Source: EVS tapes (Stuttgart: Statistisches Bundesamt, 1983), based on 18,259 elderly age 50 and above.

Notes: Annuity income includes public and private pensions, payments from life insurance, and private transfers.

Second, the cross-sectional evidence is consistent with the so-called Feldstein view that social security wealth replaces private savings. Although aggregate savings are higher in West Germany, this is due to higher annuity wealth, while the average tangible wealth held by elderly German households is actually lower than in the United States.

Moreover, the evidence is consistent with the view that the elderly reduce their consumption because of declining health and that the German elderly, endowed with generous social security benefits, even realize savings which may have been unintended when they were younger and against which they cannot borrow.

This raises several welfare issues. There is the question of whether the elderly are “overannuitized,” specifically in Germany. Evidence that the level of annuity income for the oldest old is, on average, considerably larger than their expenditures has strong implications for social security reform. Notwithstanding the need to prevent poverty among some of the elderly, it may be reasonable to tax wealth more heavily or to adjust annuity incomes more than the recent social security reforms did. Such an argument must be judged in light of the above-mentioned projections that social security contribution rates will exceed an unsustainable 40 percent in Germany when the dependency ratio peaks.

Finally, there is little evidence for a bequest-motive-driven increase in savings during old age. Although bequest volumes are relatively large—about 1.8 percent of GDP in the United States (Kotlikoff and Summers 1981) and 3 percent of GDP in France (Kessler 1990)—the bulk of this appears to be unintended bequests. The efficiency arguments against taxing bequests—distorting efficient intergenerational transfers—are therefore not really applicable.

8.5 Housing and Living Arrangement Choices

8.5.1 Institutional Background

Policy intervention in housing markets is intense both in Germany and in the United States. Subsidies and regulations strongly distort tenure choice, mobility, and living arrangement decisions in the two countries. However, the actual subsidies and regulations are quite different. Once again, an international perspective illuminates how public policy influences actual behavior.

In the United States, most housing subsidies are directed to home ownership, while subsidies in Germany are directed toward rental housing (Mayo and Barnbrock 1985). Both countries subsidize homeownership by deductions from income taxes. In the United States, mortgage interest for the purchase of a home and land can be deducted without any upper limit, thereby changing the marginal price of housing and inducing more housing consumption in terms of land, dwelling space, and housing quality. In Germany, mortgage interest is not deductible for owner-occupied homes. Rather, depreciation of the dwelling can be deducted as a fixed percentage of dwelling value, up to a limit which is slightly lower than the average dwelling value in Germany. Hence, the marginal price of housing is lowered only for relatively small houses. Land, which is a much larger percentage of total purchase price in Germany than in the United States, is not subsidized at all. For middle-class households and a typical home in 1985, homeownership subsidies were approximately 2.5 to 3 times higher in the United States than in Germany (Börsch-Supan 1985, tables 3–6).

Rental housing subsidies in the United States are typically directed to low-income families, while the rental allowances in Germany are administered as entitlements. Traditionally, most older people were eligible for housing assistance, which covered, on average, 23 percent of rent in 1985 (Mayo and Barnbrock 1985). Since mobility in rental housing is much higher than in owner-occupied housing, largely because of much higher transaction costs, the subsidies in the United States not only distort tenure choice but indirectly reduce mobility and may therefore create lock-in effects for the elderly.

Differences in rental housing regulations between the two countries are also important. Germany has very stringent tenant protection laws. While initial rents are essentially unrestricted, later rent increases are bound by an index that considerably lags the spot-market level, preventing fast rent increases when land and house values appreciate quickly. Eviction is generally not permitted. In the United States, only very few cities have rental housing regulations; the most notable is New York. These rules make rental housing relatively more attractive in Germany than in the United States, and they are likely to discourage housing mobility, particular for the elderly who typically have particularly long tenure and therefore high tenure discounts.

The financial and regulatory incentives which reduce mobility in West Germany may also induce the elderly to live in housing units larger (and possibly

more expensive) than those the elderly would choose in an undistorted housing market. At the same time, the housing market distortions in Germany make it more difficult for younger households to buy larger housing units (Behring, Börsch-Supan, and Goldrian 1988).

Another major institutional difference between Germany and the United States that is likely to distort housing and living arrangement choices is the already-mentioned extent of compulsory health insurance. In Germany, compulsory health insurance includes coverage for long-term hospital care, while there is virtually no compensation for in-home care of elderly parents.¹⁸ Until recently, hospitals had an excess supply of beds, and the elderly used to stay for extended periods in hospitals. Public health insurance has no preset limit on the length of hospital stays to be covered, as long as a hospital doctor approves the stay. In the United States, hospital and nursing home bills not covered by health insurance may force the elderly to leave hospitals and nursing homes early and to stay with their children.

Health-care coverage, public subsidies which reduce rental housing costs for the elderly, and the generally tighter social safety net for the elderly in West Germany represent economic disincentives for family support and shared living arrangements as compared to the United States.

8.5.2 Evidence on Housing and Living Arrangement Choices

The institutional differences between Germany and the United States are indeed reflected in the differences in housing and living arrangement choices. Consider first the choice of tenure. Table 8.16 presents ownership rates and average relative shares of housing and nonhousing assets for the elderly in the two countries. The elderly in West Germany are much more likely to live in rental housing than the elderly in the United States. While in the United States roughly 70 percent of the elderly own their own homes, less than half the elderly do so in West Germany. In both countries, ownership rates peak at ages 55–59 and decline thereafter. The decline of homeownership is, of course, reflected in the increasing share of nonhousing assets in total wealth among the elderly. In spite of lower ownership rates, the average share of housing assets is quite high in Germany, because the relative price of housing and land is substantially higher in Germany than in the United States.

Another important housing policy difference mentioned above is the tenant protection regulations in West Germany, which are much tighter than in the United States. They are indeed mobility deterring, as can be seen from table 8.17, which presents mobility rates in the two countries. Mobility is much higher in the United States for all age groups, but particularly for the elderly aged 70 and above, who have mobility rates about five times higher than their German counterparts. The very large number of moves among the elderly aged

18. German income tax provides a tax deduction of just DM 1,800 (roughly \$1,100) in this case.

Table 8.16 Ownership Rates and Shares of Housing and Nonhousing Assets

Age	United States		West Germany	
	Ownership Rate (%)	Housing Wealth Share (%)	Ownership Rate (%)	Housing Wealth Share (%)
50-54	75.8	63.4	56.3	73.3
55-59	76.0	61.2	60.8	59.3
60-64	73.5	58.4	53.7	56.5
65-69	69.2	55.5	49.2	51.3
70-74	64.8	50.1	41.7	67.1
75-79	68.4	53.1	46.7	48.3
80+	62.4	46.2	40.8	49.0

Sources: 1984 PSID; 1984 and 1988 SOEP.

Note: Housing wealth is a self-reported estimate of the sales price of an owner-occupied home.

Table 8.17 Mobility Rates and Housing Consumption Adjustments

Age	United States			West Germany		
	Mobility Rate (%)	Dwelling Size		Mobility Rate (%)	Dwelling Size	
		Mover	Nonmover		Mover	Nonmover
50-54	10.6	3.8	5.0	2.6	} 2.8	} 3.7
55-59	10.2	3.2	4.8	2.0		
60-64	9.4	2.7	4.5	2.5		
65-69	6.9	3.3	4.2	2.8		
70-74	9.1	3.0	4.1	1.8		
75-79	4.8	3.3	3.9	1.1		
80+	15.4	2.7	4.0	1.3		

Sources: 1984 PSID; 1984 SOEP.

Note: Mobility rate is the percentage of movers, i.e., households who moved within the last 12 months since being interviewed. Dwelling size is number of rooms excluding kitchen, bathrooms, and rooms smaller than 6 square meters (about 60 square feet).

80 and above in the United States are moves to family members, particularly to their own adult children.

Moves among the elderly, when they occur, release housing for the younger generation, as can be seen in the other columns of table 8.17. On average, in both countries, recent movers have about one room less than nonmovers.¹⁹ This result is in line with panel data observations (Venti and Wise 1990; Feldstein and McFadden 1988).

However, though movers reduce dwelling size in both countries, there are just too few moves in Germany to have an impact on dwelling size consump-

19. It should be noted that the observed reduction in dwelling size does not, at least on average, imply a reduction in housing equity among elderly American homeowners when they move (Venti and Wise 1990).

tion. This is in line with the speculation that the mobility-reducing regulations in Germany have, in effect, reduced dwelling size adjustments among the aged. Indeed, table 8.18 shows that, although Germans have smaller houses than Americans when they are aged 50 and younger, this difference levels out when they become aged.

The decline in housing consumption with age is much more pronounced in the United States than in West Germany. In particular, there is little if any reduction of dwelling size among German homeowners as they age.

Per capita housing consumption increases in both countries, a consequence of the decreasing average household size. In the United States, this increase is partially offset by moves to smaller dwellings, in contrast to Germany where low mobility implies a much steeper increase of per capita dwelling size consumption.

So far we have relied on cross-sectional evidence. In both countries, housing consumption declines very little as households age. In fact, longitudinal data show strong cohort effects: for a given age, later birth cohorts show an increase in housing consumption. Table 8.19 presents the German case. The bottom row represents the average floor-space consumption of a panel of households in the SOEP in the five years from 1983 through 1988. The lack of change replicates the result that German households, on average, do not decrease their housing consumption as they age. However, by comparing different cohorts at the same age—i.e., by comparing the entries on the seven diagonals for each of the seven age groups—we see that succeeding cohorts increased their housing consumption. The right-most column depicts the range of standard deviations for each age group. The cohort effects for the 55–75-year-old households are significant even though the households were traced within only a short five-year span of the German panel data.

I now turn to the evidence on living arrangement choices. I cast living arrangements into four categories. An elderly person lives “independently” if no

Table 8.18 Housing Consumption (number of rooms)

Age	United States			West Germany		
	Owners	Renters	Per Capita	Owners	Renters	Per Capita
50–54	5.2	3.7	1.9	4.6	3.4	1.6
55–59	5.0	3.3	2.0	4.6	3.3	1.7
60–64	4.8	3.1	2.1	4.5	2.9	2.1
65–69	4.6	2.9	2.2	4.2	2.8	2.3
70–74	4.6	2.7	2.3	4.2	2.6	2.2
75–79	4.4	2.7	2.3	4.1	2.5	2.2
80+	4.5	2.3	2.4	4.5	2.5	2.4

Sources: 1984 PSID; 1984 SOEP.

Note: Number of rooms excludes kitchen, bathrooms, and rooms smaller than 6 square meters (about 60 square feet).

Table 8.19 Age and Cohort Effects in Housing Consumption (dwelling size, area in square meters)

Cohort	Survey Year					Age	Standard Deviation
	1984	1985	1986	1987	1988		
1934–38					102.5	50–54	1.7–2.2
1933–37				101.1			
1932–36			100.5				
1931–35		99.4					
1930–34	101.6						
1929–33					98.7	55–59	2.0–2.2
1928–32				95.4			
1927–31			95.0				
1926–30		94.3					
1925–29	93.7						
1924–28					92.2	60–64	2.1–2.3
1923–27				92.4			
1922–26			91.4				
1921–25		91.5					
1920–24	90.5						
1919–23					87.4	65–69	2.3–2.7
1918–22				84.7			
1917–21			82.4				
1916–20		78.6					
1915–19	80.0						
1914–18					79.8	70–74	2.4–2.7
1913–17				76.7			
1912–16			76.1				
1911–15		73.3					
1910–14	75.2						
1909–13					71.2	75–79	2.8–3.1
1908–12				73.6			
1907–11			74.0				
1906–10		74.9					
1905–09	72.7						
1904–08					70.8	80+	3.4–4.4
1903–07				71.1			
1902–06			69.5				
1901–05		70.7					
1900–04	69.3						
All	93.3	93.4	93.5	93.4	93.5	50+	0.93

Source: SOEP, waves 1984–88.

other person lives in the household, except a spouse and minor children, and in "shared living arrangements" if at least one other person lives in the household, most frequently an adult child. For independent living arrangements, we distinguish the cases of a spouse present and absent. For shared living arrangements, we differentiate between "head" and "taken-in." In the first case, the elderly person is the head of household, while in the second case somebody else is head of household. Most frequently, an adult child has taken her or his parent in. Table 8.20 shows how frequently the different living arrangements were chosen by the elderly in the United States and West Germany, based again on comparable survey data from the PSID and the SOEP.

The most significant difference in living arrangement choices between the two countries is in the percentage of shared living arrangements. It is much higher in the United States. Almost one-third of the very old live with their adult children or others. This fraction is only one-fifth in Germany. Note that the percentage living alone is about comparable for the elderly aged 65 and above, while the percentage living as couples is substantially lower in the United States. This is a reflection of the much higher incidence of divorces in the United States. In 1986, the United States had about 22 divorces per 10,000 married women, West Germany only 8.3. Consequently, U.S. marital rates are about 10–12 percent lower than in West Germany for elderly aged 65 and above.

The data in both countries do not produce reliable estimates of institutionalization. They have thus been omitted from table 8.20. The PSID attempts to keep track of institutionalized sample persons with less than perfect success (Börsch-Supan 1990; Ellwood and Kane 1990). The SOEP starts in 1984 with a noninstitutionalized sample and therefore underestimates the percentage of elderly living in nursing homes. If at all, these panel studies reveal a decreasing

Table 8.20 Living Arrangements of the Elderly (% of elderly population)

Age	United States				West Germany			
	Independent		Shared		Independent		Shared	
	Couple	Alone	Head	Taken-In	Couple	Alone	Head	Taken-In
50–54	55.3	14.2	17.6	12.2	82.2	7.9	7.3	2.6
55–59	58.3	16.9	13.8	10.1	82.9	8.5	7.2	1.4
60–64	51.2	20.1	18.6	9.4	77.4	14.3	5.9	2.4
65–69	48.7	25.5	14.3	11.2	67.8	22.1	6.4	3.7
70–74	44.0	33.3	12.0	8.8	57.3	34.5	5.1	3.1
75–79	38.5	40.3	9.5	11.3	45.0	44.6	3.8	6.7
80+	18.6	46.6	9.0	23.5	31.4	47.8	4.8	16.0

Sources: 1984 PSID; 1988 SOEP.

Notes: Independent (Couple): No other adult except spouse in household. Independent (Alone): No other adult in household. Shared (Head): Elderly is head of household that contains another family unit. Shared (Taken-In): Elderly lives in household headed by another person.

proportion of elderly living with adult children and an increasing proportion living alone or in institutions (Börsch-Supan 1990; Ellwood and Kane 1990).

A similar trend is observed in the German SOEP panel for the choice between living alone and living with children; see table 8.21, set up in a fashion similar to table 8.19 on housing consumption. The longitudinal data reveal three effects. Going down each column, the pure age effect mirrors table 8.20 and shows the familiar fact that the proportion of elderly living with children increases with age. However, this effect is more than offset by a strong cohort effect. This effect is visible by following each diagonal, holding age constant. Younger German cohorts are much less inclined to live with their children than were the older ones. These cohort effects are statistically highly significant and dominate the aggregate effect in the bottom row of table 8.21: the proportion of the elderly in the SOEP survey who live in with their children decreases from 1984 to 1988.

8.5.3 Policy Implications

The different housing market policies in West Germany and the United States have the predicted impacts: higher homeownership rates in the United States, dramatically lower mobility rates and a lower proportion of shared living arrangements in West Germany. While it would be unreasonable to attribute all differences in observed housing and living arrangement choices by the elderly to the different housing market policies, the consistency of responses is striking.

Having realized the effectiveness of housing market policies, we should ask ourselves whether these policies make sense when the population is aging rapidly. I recognize several problems here. First, housing supply by intergenerational transfer is impeded because of the suppressed mobility of the elderly. Second, supply by new construction is distorted in the direction of too few, too large houses. Third, there are too few incentives, and even some economic disincentives, for family care and multigenerational living arrangements. The first point is caused by the homeownership subsidies in the United States and by the tenant protection legislation in West Germany. The second point relates mostly to the United States, again because of homeownership subsidies, while the third point is most relevant in West Germany with its compulsory health insurance system. In the following, I will comment on these points in more detail.

A first problem is that the elderly who consider moving into a smaller dwelling are discouraged to do so in both countries. In the United States, there is little incentive to give up valuable tax deductions unless reductions in dwelling size are compensated by quality improvements in dimensions other than size. The situation is complicated by the fact that the United States offers little attractive apartment housing for rent since the tax laws split the tenure choice along income lines, creating the well-known external effects that make rental housing so inferior in the United States.

Table 8.21 Age and Cohort Effects in the Living Arrangement Choice
(proportion of persons living in multigenerational households)

Cohort	Survey Year					Age	Standard Deviation
	1984	1985	1986	1987	1988		
1919–23					2.3	65–69	1.1–1.4
1918–22				2.0			
1917–21			2.0				
1916–20		2.0					
1915–19	4.3						
1914–18					1.6	70–74	1.3–1.5
1913–17				2.0			
1912–16			2.3				
1911–15		2.7					
1910–14	5.6						
1909–13					4.2	75–79	1.3–1.6
1908–12				5.8			
1907–11			8.6				
1906–10		9.3					
1905–09	9.1						
1904–08					13.7	80+	1.4–2.2
1903–07				13.6			
1902–06			13.2				
1901–05		17.6					
1900–04	19.8						
All	7.54	5.95	5.20	4.83	4.72	65+	0.76

Source: SOEP, waves 1984–88, persons aged 65+.

Note: Multigenerational households are composite households consisting of elderly parents and their adult children.

In West Germany, where many more elderly live in rental housing, the rent adjustment provision of the tenant protection laws supports high initial rents for movers and large discounts for sitting tenants, so-called tenure discounts, creating windfall gains for the older and a large rental burden for the young. The size of the wedge between rents for flow and rents for stock supply appears inefficient, and a smoother adaptation of rents in times of demand pressures would be welfare improving. Let me stress that, if the elderly want to stay, they should do so. My point is that the numbers in table 8.17 indicate that there are elderly who would adjust their housing consumption downward were it not for the penalty of a large rent increase.

Homeownership subsidies in the United States and rent adjustment provisions in West Germany also distort the supply of new housing. By lowering the marginal price of land and dwellings, the tax deductions in the United States channel resources to large houses where the marginal room has little utility, thereby suppressing the supply of a larger number of smaller houses, which

appears to be more appropriate in times of population aging. In West Germany, the rent adjustment clause, if binding, lowers expected returns of a prospective landlord and therefore reduces supply. The argument, however, is quite subtle, because not all of the wedge between spot market and long-term rent must be inefficient. Tenure discounts may be an efficient way to minimize maintenance and revolving costs in a manner similar to that in which seniority payments create efficient wage schedules. Since tenure discounts are also observed in completely unregulated markets, one may argue that the German rent adjustment provision is not binding and can be dropped without harm. This may be true in the steady state. However, the policy dilemma starts when increases in demand raise spot market rents. Now the rent adjustment provision becomes binding and suppresses supply at the expense of the newcomers, while protecting sitting tenants (and providing windfall gains to them). Population aging is an example where this is the case.²⁰

Mobility-reducing policies impede the intergenerational transfer of housing, which represents an important mechanism of housing supply. Direct transfer alone—homes that are inherited—amounts to 28 percent of all owned homes in Germany.²¹ Indirect transfer is much more common: in 1983, about 74 percent of all recent home buyers purchased existing homes in the United States. This percentage increased steadily to over 80 percent in 1989 (*Statistical Abstract*, various issues). Population aging implies a longer stay in the family home by the older generation, which leads to a relative shortage of housing for the younger generation.

The magnitude of this longevity-induced shortage effect is substantial, as is evident from the following back-of-the-envelope calculation. The current cohort of elderly aged 80 comprises about 350,000 persons in approximately 250,000 households. If a one-year increase in life expectancy implies that this cohort will stay one year longer in their current dwellings, an increased housing demand of 250,000 units is generated. Since average life expectancy has increased by 1.3 years in West Germany from 1981 to 1986, the annual additional demand due to population aging amounts to 65,000 dwelling units. This is about 28 percent of all new construction in 1986.²²

In Germany, the prolonged duration of more elderly in their homes is unlikely to be offset by a decreasing demand of the younger generation. Hence, German housing markets will stay tight for the near future, unless more downgrading of dwelling size in old age and faster new construction is forcefully encouraged. Since population aging is slower in the United States and housing

20. It is important to stress that tenant protection per se—the prohibition of eviction and rent increases beyond market rents—is a social achievement particularly important for the elderly, who face higher psychic, and sometimes monetary, moving costs.

21. Computed from the 1988 wave of the SOEP.

22. In 1986, 225,000 dwelling units were constructed in West Germany (*Statistisches Jahrbuch* 1988).

markets there are currently not as tight as in Germany, similar problems are less pronounced in the United States.

Another area in which we identified distortions are living arrangement choices. In the United States, the extent of family care appears to be much higher than in West Germany, although the trend is in direction of a decreasing proportion of elderly living with adult children and an increasing proportion living alone and in institutions. Since living alone and living in an institution incur much higher social costs (induced health expenditures, stationary and ambulatory services for the elderly, etc.) than living with others, it appears wise to intercept some of the external effects by subsidizing home care. The case is strongest in West Germany, where current health insurance policies create an additional distortion by effectively subsidizing living alone.

If the current proportions of living arrangements are not reversing, the demand for social support services such as ambulatory care will increase dramatically. For the low-income elderly, the associated expenses have to be borne by welfare programs financed by general taxes. They are thus subject to the familiar problems of pay-as-you-go social insurance schemes in times of increasing dependency ratios.

8.6 Summary and Conclusions

What do we learn from a microeconomic, cross-national analysis about the interrelation between economic policy and population aging? A first and important point is the effectiveness of economic policy. Retirement decisions, savings behavior, and housing and living arrangement choices are very consistent with the incentives provided by economic policy in form of regulations, taxes, and subsidies in Germany and the United States. Examples are the response of retirement dates to pension schedules, the consistency of cross-national differences in savings with cross-national differences in retirement income and health insurance provisions, and the reaction of housing choices and mobility to homeownership subsidies and rental regulations.

Second, the analysis identifies several trouble spots where incentives set by economic policy work in the wrong direction in times of population aging. Germany has failed to respond quickly to the dangers of unsustainably high social security contributions. This is particularly worrisome in the light of social security benefits which are so large in old age that they induce forced savings among the well-to-do elderly. The United States has adjusted its social security system relatively earlier in spite of a less pronounced increase in the ratio of pensioners to workers. Both countries have fiscal disincentives for family care and multigenerational living arrangements. Providing positive incentives here could help to offset the shortage of family care generated by the demographics of a dwindling number of children per elderly.

References

- Auerbach, Alan J., L. J. Kotlikoff, R. P. Hagemann, and G. Nicoletti. 1990. The economic dynamics of an aging population: The case of four OECD countries. *OECD Economic Studies*, no. 12 (Spring): 97–130.
- Barro, Robert J. 1974. Are government bonds net wealth? *Journal of Political Economy* 82, no. 6: 1095–1117.
- Behring, Karin, A. Börsch-Supan, and G. Goldrian. 1988. *Analyse und Prognose der Nachfrage nach Miet- und Eigentümerwohnungen in der Bundesrepublik Deutschland*. Berlin: Duncker und Humblot.
- Börsch-Supan, Axel. 1985. Tenure choice and housing demand. In *U.S. and West German housing markets*, ed. K. Stahl and R. Struyk. Washington, D.C.: Urban Institute Press.
- . 1990. Elderly americans: A dynamic analysis of household dissolution and living arrangement transitions. In *Issues in the economics of aging*, ed. David Wise. Chicago: University of Chicago Press.
- . 1991a. The choice of living arrangements in Germany. Paper prepared for the European Population Conference, Paris, October.
- . 1991b. Implications of an aging population: Problems and policy options in West Germany and the United States. *Economic Policy* 12 (April): 103–39.
- . 1992a. Population aging, social security design, and early retirement. *Journal of Institutional and Theoretical Economics* 148:533–57.
- . 1992b. Saving and consumption patterns among the elderly: The German case. *Journal of Population Economics* 5:289–303.
- Börsch-Supan, Axel, and Konrad Stahl. 1991a. Do dedicated savings programs increase aggregate savings and housing demand? *Journal of Public Economics* 44:265–97.
- . 1991b. Life cycle savings and consumption constraints. *Journal of Population Economics* 4:233–55.
- Bundesminister für Arbeit und Sozialordnung. 1990. *Die Rentenreform 1992*. Bonn: Bundespresseamt.
- Casimir, Bernd. 1989. *Staatliche Rentenversicherungssysteme im internationalen Vergleich*. Frankfurt: Lang.
- Chesnais, Jean-Claude. 1987. Quand un peuple en devient deux: une Allemagne et l'autre. *Population et Sociétés* 209:1–4.
- Ellwood, David, and Thomas Kane. 1990. An American way of aging. In *Issues in the economics of aging*, ed. David Wise, Chicago: University of Chicago Press.
- Feinstein, J., and D. McFadden. 1988. The dynamics of housing demand by the elderly. In *Issues in the Economics of Aging*, ed. David Wise. Chicago: University of Chicago Press.
- Feldstein, Martin. 1974. Social security, induced retirement, and aggregate capital accumulation. *Journal of Political Economy* 82:905–26.
- Frerich, Johannes. 1987. *Sozialpolitik*. München: Oldenbourg.
- Hagemann, Robert P. and Giuseppe Nicoletti. 1989. Population ageing: Economic effects and some policy implications for financing public pensions. *OECD Economic Studies* no. 12 (Spring): 51–96.
- Hurd, Michael D. 1989. Issues and results from research on the elderly: Economic status, retirement, and savings. *Journal of Economic Literature* 21:637–56.
- Jacobs, Klaus, Martin Kohli, and Martin Rein. 1987. Testing the industry-mix hypothesis of early exit. Discussion paper prepared for Wissenschaftszentrum Berlin.
- Kessler, Denis. 1990. Presidential address at the fourth annual meeting of the European Society of Population Economics, Istanbul. *Journal of Population Economics*, in press.

- Kotlikoff, Lawrence J., and Lawrence Summers. 1981. The role of intergenerational transfers in aggregate capital accumulation. *Journal of Political Economy* 89:706–32.
- Kotlikoff, Lawrence J., and David A. Wise. 1987. Incentive effects of private pension plans. In *Issues in pension economics*, ed. Z. Bodie, J. Shoven, and D. Wise. Chicago: University of Chicago Press.
- Lazear, Edward P., and Robert L. Moore. 1988. Pensions and turnover. In *Pensions in the U.S. economics*, ed. Z. Bodie, J. Shoven, and D. Wise. Chicago: University of Chicago Press.
- Mayo, Stephen K., and Jörn Barnbrock. 1985. Rental housing subsidy programs in West Germany and the United States. In *U.S. and West German housing markets*, ed. K. Stahl and R. Struyk. Washington, D.C.: Urban Institute Press.
- Organisation for Economic Cooperation and Development (OECD). 1988. *Aging populations: The social policy implications*. Paris: OECD.
- Schmähl, Winfried. 1989. Labour force participation and social pension systems. In *Workers versus pensioners: Intergenerational justice in an ageing world*, ed. P. Johnson, C. Conrad, and D. Thomson. Manchester and New York: Manchester University Press.
- Statistical abstract of the United States*, various issues. Washington, D.C.: Government Printing Office.
- Statistisches Jahrbuch für die Bundesrepublik Deutschland*, various issues. Wiesbaden: Statistisches Bundesamt.
- Stock, James H., and David A. Wise. 1990. In *Issues in the economics of aging*, ed. David Wise. Chicago: University of Chicago Press.
- Venti, Steven F., and David A. Wise. 1987. Have IRAs increased U.S. savings? Evidence from consumer expenditure surveys. *Quarterly Journal of Economics*, in press.
- . 1990. But they don't want to reduce equity. In *Issues in the economics of aging*, ed. David Wise. Chicago: University of Chicago Press.
- Wolff, Edward N. 1990. Methodological issues in the estimation of the size distribution of household wealth. *Journal of Econometrics* 43:179–95.

Comment N. Gregory Mankiw

I learned a lot from reading this paper by Axel Börsch-Supan. It presents a large variety of facts about the behavior of the elderly in Germany and the United States as well as about some of the policies that influence that behavior. The facts are presented in the way that I like to consume them—simply, with a minimum of econometric processing.

In some ways, this is a hard paper to comment on. Börsch-Supan does not offer a single, grand theory that purports to explain all the differences between these two countries. In fact, he is so reserved in drawing conclusions, and so careful about presenting caveats, that there is little to argue about. So, in my comments, rather than being disagreeable, I would like to discuss those areas in which I see some important puzzles left unanswered.

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Saving Behavior of the Elderly

I would like to begin with a topic that has puzzled both microeconomists and macroeconomists for many years: the saving behavior of the elderly. It is now a well-known stylized fact that the elderly do not behave as Franco Modigliani said they should (Ando and Kennickell 1986). According to the life-cycle hypothesis, wealth should decline after retirement, and that just does not happen—at least not as quickly as the most basic version of the theory predicts.

There are various explanations of this failure of the life-cycle hypothesis, but none seems fully satisfactory. These explanations can be grouped into two broad categories: those that allow the elderly to be rational and those that assume some element of irrationality. In the rational category, there are two candidates. One is that the elderly have a bequest motive—altruistic, strategic, or otherwise. The second is that the elderly hold onto their wealth for reasons of precautionary saving—either because of uninsurable medical expenses or because of uncertainty about life span.

Both of these rational explanations seem hard to square with the evidence. As Börsch-Supan notes, the elderly without children do not seem to obey the life-cycle hypothesis any more than those with children. Since children are the most likely beneficiaries of a bequest motive, this fact casts doubt on the bequest explanation. The precautionary-saving explanation is hard to rule out with only U.S. data, but the German data seem more conclusive. According to Börsch-Supan, most of the risks that the U.S. elderly face are absent in Germany. The comprehensive health insurance system should eliminate the worry about large medical bills, and the high level of annuity income should insure against the uncertainty regarding life span. Yet the elderly in Germany do not listen to Franco Modigliani any more than do those in the United States. In fact, according to Börsch-Supan's numbers, a majority of the German elderly are consuming less than their annuity income; these elderly must be accumulating wealth rather than spending it.

One is, therefore, tempted to explain the behavior of the elderly by appealing to some sort of irrationality. Yet even that is not so easy. One possibility is that the elderly have excessively optimistic expectations about their own life span: admittedly, it is hard to accept one's own mortality. Such excessive optimism can explain lower consumption than is predicted by the life-cycle model with rational consumers. It cannot, however, explain consumption lower than annuity income. Even if a person plans to live to age 150, he should consume at least his annuity, since the annuity will continue as long as he does.

Börsch-Supan proposes another type of irrationality. Perhaps the elderly are excessively optimistic regarding marginal utility rather than life span. According to Börsch-Supan, the elderly save in the expectation of enjoying consumption during retirement, but then, because of deteriorating health, they are systematically surprised that the marginal utility of consumption is lower than expected.

I am not convinced by this story. Even if marginal utility does fall unexpectedly, the elderly should still consume their wealth—after all, you can't take it with you. Sure, they will just enjoy the consumption less, but unless the marginal utility of consumption falls to zero, it is still in the elderly's interest to spend their wealth as they age.

In the end, the failure of the elderly to dissave remains a puzzle. My own guess is that the resolution will come from a combination of bequest and precautionary-saving motives. If both motives are relevant, then the comparison between the elderly with children and those without children is ambiguous. Having children raises the bequest motive, but it also reduces the precautionary-saving motive, because children provide implicit insurance. The best thing that can be said about this explanation is that it is logically consistent and is not rejected by the data. As far as I know, however, there is no affirmative evidence to suggest that it is in fact the right explanation.

Saving and the Aging of Society

Let me now turn from the individual level to the societal level. In particular, how will the aging of society influence national saving? Börsch-Supan suggests that, since the elderly do not dissave, we should not expect national saving to fall as the elderly become a larger percentage of the population. I am not so sure.

There are two ways to examine the impact of demographic change on national saving. One way is to examine micro data on the saving of individuals and then to aggregate to get national saving. This is the approach that Börsch-Supan implicitly takes. The second way is to examine macro data—that is, to exploit the time-series and cross-country variation in demographic structure to examine how aging influences national saving.

In his Harvard dissertation, David Weil compared these two approaches and showed that they lead to strikingly different conclusions. Micro data show little dissaving by the elderly. Yet macro data show that nations with a large elderly population tend to have low saving rates.

Weil reconciles these two results by emphasizing the role of bequests. The failure of the elderly to dissave implies, as a matter of logic, that the elderly are dying with substantial wealth and thus leaving substantial bequests. Even if these bequests are accidental rather than the result of a bequest motive, they cannot be ignored, because somebody is receiving them. These recipients will presumably consume more in response. Thus, nations with a large elderly population save less not necessarily because the elderly dissave, but perhaps because the young consume more in response to the greater likelihood of receiving a bequest.

There are three reasons for believing this mechanism is important. First, there is substantial evidence (from Kotlikoff and Summers 1981, e.g.) that bequests are an important component of wealth accumulation, and it is hard to argue that those receiving the bequests should be unaffected by them. Second,

there is the disparity between micro and macro data that Weil documents; I do not know of any better way to explain it. Third, there is some direct evidence. In his dissertation, Weil examines the consumption of individuals in the PSID; he finds that those who have recently received a bequest, or say they expect to receive a bequest, tend to consume more than those without any prospect for receiving a bequest (holding other things, such as income, constant). Moreover, the estimated magnitude of this effect is large enough to reconcile the micro and macro data.

The bottom line is that the aging of a society may well depress national saving, but not for the reasons given by the life-cycle model. Rather, as the elderly population grows and bequests become more common, the young may save less than they otherwise would.

Social Security and the Disincentive to Work

The last issue that I will address is the disincentive to work provided by the social security system. Börsch-Supan shows that this disincentive is substantial in both Germany and the United States. He suggests that it would be better if social security were “nondistortionary”—that is, if it did not influence the work incentive of the elderly.

Although I am generally sympathetic with this conclusion, I do have one reservation. It is my understanding that the disincentive to work is a feature not only of the German and U.S. systems, but of the public pension system in almost every industrial society. As economists, we usually follow the methodological precept that people do not systematically make mistakes. Similarly, if we observe some policy adopted in many countries, we might be tempted to think that there is some reason for it—maybe even a good reason.

In a recent paper, Xavier Sala-i-Martin has suggested that social security’s work disincentive may be optimal. He argues that, because of depreciation, the elderly have low levels of human capital. Moreover, in the spirit of some recent work on economic growth, he argues that there are externalities to the average level of human capital. These two assumptions naturally lead to the conclusions that the working elderly depress an economy’s productivity and that public policy should encourage the elderly to leave the labor force.

Although Sala-i-Martin’s explanation of public pensions is ingenious, I am not persuaded by it, as I find it hard to believe that this externality is significant. Yet before I sign on with Börsch-Supan’s conclusion that we should move to a nondistortionary system, I would like to see this issue addressed more fully. Perhaps the work disincentive is so universal because it is optimal. If it is not optimal, at least in some second-best sense, then it is puzzling that it is so common. In the absence of any explanation of why social security systems so universally discourage the elderly from working, I am reticent to conclude that existing policies must be undesirable.

References

- Ando, Albert, and Arthur Kennickell. 1986. How much (or little) life cycle saving is there in micro data? In *Macroeconomics and finance: Essays in honor of Franco Modigliani*, ed. R. Dornbusch, S. Fischer, and J. Bossons. Cambridge: MIT Press.
- Kotlikoff, Lawrence, and Lawrence Summers. 1981. The role of intergenerational transfers in aggregate capital accumulation. *Journal of Political Economy* 89:706–32.
- Sala-i-Martin, Xavier. 1992. Pensions. Yale University.
- Weil, David N. 1990. Age and saving in micro and macro data. Chapter in Ph.D. dissertation, Department of Economics, Harvard University.

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