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ABSTRACT

This paper reports on a set of international comparisons of how the German and the U.S. economies are affected by population aging. The paper's main focus is on the influence of institutional arrangements such as government regulations and subsidies on retirement, savings and housing choices in the two countries. Germany faces a particularly pronounced aging process. Her dependency ratio is already now as large as it will be in the year 2015 in the U.S., and it is predicted to exceed 43 percent at its peak in 2030. In this respect, changes that are occurring in Germany now may be regarded as indicative for changes to come in the United States. 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.

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AGING IN GERMANY AND THE UNITED STATES: INTERNATIONAL COMPARISONS

by Axel Börsch-Supan

1. INTRODUCTION

This paper reports on a set of international comparisons of how the German and the US economies are affected by population aging. 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 areas of microeconomic decisions: when to retire, how much to save, and where to live. The paper is a continuation of Börsch-Supan (1991a). For a more macroeconomic view, the reader is referred to the many internationally comparative studies that describe cross-national differences in the aging process and analyse aggregate economic implications (e.g., 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, it is necessary to elucidate the economic mechanisms underlying retirement, savings and housing choices by the elderly. In particular, it is necessary to understand how strongly they are affected by public policy, such as institutional arrangements, government regulations 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 most 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 in order to properly identify their impacts. Germany and the United States are particularly well suited for international comparisons. While they are sufficiently similar in terms of mentality and social costums to make an international 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 occuring in Germany now may be regarded as indicative for 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 in-

centives applicable to each country.

The paper proceeds as follows. Section 2 summarizes the basic demographic trends in Germany contrasting her to the United States. Section 3 reports on retirement decisions, particularly early retirement and its causes. Section 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 5 with particular attention devoted 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 policy policy. The paper concludes with a brief general summary.

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 1.[2] Among the seven large OECD countries, the aging process is least marked but still dramatic in the United Kingdom and in the United States. Within the next 40 years, the proportion of elderly persons 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 aged 60 and

above) 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 aged 85 and above as now.

Two distinct processes are causing these dramatic changes. From 1950 to 1980, life expectancy at birth has increased by about 7.2 percent on average in the OECD while fertility in the industrialized countries has declined to below the level that is required for replacement of the population, see Table 2. From 1950 to 1980, German life expectancy has increased by almost 7 years from 66.4 to 73.3 years,[3] while at the same time the fertility rate in West Germany has decreased from 2.1 to 1.4, considerably below the reproduction rate that is necessary for a stable population. The effects of both processes sum to what is commonly termed "double aging" of the industrialized countries.

---- Tables 1-3 go about here ----

Its effects on the economy are best captured by the old-age dependency ratio depicted in Table 3. Again, the numbers for Germany are particularly dramatic. Her old-age dependency ratio will increase from currently 0.22 to almost 0.44 in the year 2030. Therefore, twice as many elderly aged 65 and above will have then to be supported by the same number of persons aged 15 to 64 as now. The projected German depen-

dency ratio is the highest among all OECD countries except Switzerland.[4] The dependency ratio will fall again after year 2030 when the bulge of the baby boom has worked its way through the age distribution. However, it is likely to remain at a substantially higher level than now: the OECD estimate for the year 2050 is 41.6 percent.

The increase of the ratio of retirees to workers is even more accentuated than that of the demographic old-age dependency ratio. This 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. Projections by the German ministry of labor affairs indicate that this ratio will climb from currently 0.48 to about 0.91 retirees per worker in the year 2030.

The dependency ratios in Table 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 disincentives, 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 the

intergenerational distribution of it in a complicated fashion because older people save differently than younger people. It will assert a growing burden of family support on the young generation when elderly are becoming frail and unable to live independently. These issues are taken up in the following sections.

3. RETIREMENT DECISIONS

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 in 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 a fairly broad coverage of workers by social security: in the United States, about 95 percent of all workers are insured by Social Security, including self-employed, while in Germany only 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 labor force is subject to mandatory retirement in Germany. This includes the entire public sector and

some private sectors. In most cases, mandatory retirement age is 65. In the United States, age discrimination laws prohibit mandatory retirement. Part-time work is also very restricted in Germany due to 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 to more than 20 percent of their incomes, for 2 percent to even more than half of their retirement incomes.[5] 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.[6] The difference in the importance of private pension plans is most striking when the average contribution of firm pensions to retirement income is considered: Private pensions contribute to about 15 percent to the income of American elderly, but to only slightly more than 3 percent for German elderly.

Not only the significance but also the pattern of private pension plans is different. The United States feature 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). 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 apply also for non-union 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 life time earnings because they are intended to provide approximately the same living standard before and after retirement. Hence, German public pensions provide for a substantially higher replacement rates than their US counterparts, particularly so 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 4 presents net replacement ratios by income classes, 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 the American one, resulting in an average net re-

placement ratio of more than 70 percent. This also implies that the 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.

---- Table 4 goes about here ----

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 5 displays these adjustments. They relate the retirement income for retirement at age 65 (normalized to 100 percent) to the 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 it will gradually increase to age 66 in the year 2005 and to age 67 in 2022 in the United States.

The first column in Table 5 displays non-distortionary adjustment factors which I dubbed "fair".[7] 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.

---- Table 5 goes about here ----

In the United States, benefits increase during the window of early retirement -- age 62 to age 65 -- in a way that is reasonably close to actuarially fair. For retirement ages past age 65, benefits increase less than actuarially fair. Latest date to apply for old age pensions is 70.

In Germany, until this year, 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 age 60 to 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.[8] 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 ap-

plication was traditionally encouraged by employerw who wanted to thin out their work forces. The rule applies also when there are no vacancies for the worker's specific job description available, thereby fudging the distinction between unemployment and retirement.[9]

In both countries social security reforms took place which steepened the adjustment rate profiles. In the United States, the reduction factors before retirement age 65 are now very close to actuarially fair. For retirement ages 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 the American one. However, the reduction factors before retirement age 65 are still substantially above the non-distortionary ones in the first column of Table 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 system, there is little economic incentive for Americans to retire at one age or another 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 towards 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 retire-

ment incentives, see below.

The tax treatment of labor earnings while receiving public pensions differs also 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 age 60 to 70 is taxed at a 50 percent rate 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 on 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 divers in the United States, i.e., more individual-specific and more firm-specific. Moreover, because retirement income is on average higher than in the United States, and the German system is less than actuarially fair for late retirees, we should observe a lower supply of labor in old age in Germany as compared to the United States -- provided that the preference for leisure is roughly comparable in the two

countries.

3.2 Descriptive Evidence: Old-Age Labor Supply

Indeed, this is what we find in a first glance at the data. Table 6 presents labor force participation trends in seven OECD countries. The differences between Germany and the United States are striking. Although both countrieshave experienced a declining trend in retirement age (similar to the other OECD countries), labor force participation of the elderly is substantially lower in West Germany than in the United States.[10] In the United States, labor force participation among persons aged 65 years and more 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.

---- Table 6 goes about here ----

The trend visible in Table 6 is approximately in line with changes in the 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.[11] 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.[12] Retirement income is taxed at a much lower rate than labor income due to the generous exemptions. Hence, the progressivity of the income tax schedule 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 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 hour per week.

---- Table 7 goes about here ----

The range of retirement ages is much wider in the United States than in West Germany. While the United States feature a smooth transition between work and retirement with a large percentage of part-time work, the West German age-retirement profile is characterized by a sudden jump from full-time work to full-time retirement at 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 people retire at all ages, most notably also at ages 63 and 64 in the interior of the window period. This is quite different in Germany. Here, retirement is very much concentrated at ages 60, 63 and 65, at exactly the first years when each of the three above-mentioned retirement regulations apply, and very few people retire at ages in between these dates.

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-dependend adjustment factors -- to observed retirement age, conditional on other determinants of retirement behavior such as socio-

demographics and health. Its key variable capturing economic incentives is the option value to postpone retirement at a given age. It is defined as the maximum attainable expected discounted utility from consumption if the worker would retire at some later age minus the expected discounted utility if the worker would 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 4 together with the retirement age-dependent adjustment factors from Table 5. In the United States, private pensions plans may dominate the importance of the public pension system for an individual worker. However, survey data in the United States have little information on the structure of each private pension plan that may be applicable to each individual worker. I will therefore shy away from attempting 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 in which I regress the probability of being retired on the option value, socio-demographic variables, 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 statistical-

ly highly significant, and age-specific constants remain insignificant. These are strong findings because they imply that during the main window of retirement, the actual behaviour 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 summarizes the microsimulation results in form of the average retirement age and required contibution 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 relates to the German social security system as it was in place until 1992. The second row presents simulation

results for the German social security system, when the adjustment factors of the 1992 reform were employed. Finally, the third row displays results for a "fair" system using the non-distortionary adjustment factors of column one in Table 5.

---- Table 8 goes about here ----

The 1992 social security reform will remove some but by no means all of the distortions towards early retirement in Germany. Retirement before age 60 will be reduced from 32.2 percent to 28.4 percent in 1990, and the average retirement age will increase by about half a year. As a consequence, the contribution rates necessary for a balanced budget would have been 18.1 percent rather than 18.7 percent in 1990, and will be 19.5 percent rather than 20.1 percent in the year 2000.

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

3.4 Policy Implications

Main conclusion from the evidence presented is the strong and consistent response of retirement behavior to public policy. The differences in retirement behavior between the two countries are quite 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 the observed choices of retirement ages. We learned that our pension systems are indeed powerful instruments to influence retirement decisions.

In principle, individuals should be able to decide about their retirement date. However, changes in the average retirement age have side effects on the soundness of the social security systems, average wages, aggregate productivity, tax revenues, and aggregate savings. Advancing retirement ages amplifies 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 is heavily subsidized for retirees 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 contri-

bution 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 in 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 arrived in Germany because this year's 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 7. A gradual adjustment of replacement rates may be not only a more subtle but also probably a more efficient way to induce later retirement than the shift of eligibility ages that were 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 the German retirement behavior and that appears to be an expression of the constraints imposed on retirement choices.

Changing the retirement system too late will become more complicated by the change in the politics of the social security system. The political power will shift from the working population, as it is now the case, to the older generation along with the surge of the dependency ratio. In West Germany, for example, from about the year 2020 on, the majority of the voters will be

pensioners and workers who will become retired within the next ten 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.

4. SAVINGS BEHAVIOR

4.1 Historical and Institutional Background

Attitudes towards saving are very different between the United States and Germany. Germans have traditionally valued saving per se and were reluctant to follow the American consumerism despite the strong American influence on German post-war development. Although this attitude appears to be changing with each new generation, it changes surprisingly slowly. Table 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 is particular large in recent years. Although both countries have experienced declining savings rates since 1975, the relative decline is much larger in the United States.

---- Table 9 goes about here ----

The different historical experiences of Germans and Americans may help to explain the higher aggregate savings rates that have emerged in Germany as soon as a moderate standard of living was achieved in the 1960s. The elderly in this decade have all experienced World War II. This catastrophe, however, has affected Americans and Germans very differently. During war time and until the German currency reform in 1948, most Germans could not even satisfy their basic needs such as 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 of valuing saving as being good per se (and valuing personal loans as 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. In turn, taxation of interest income is only half-heartedly enforced.

On paper, asset income including capital gains is taxed like ordinary income. Income from stocks and bonds is subject to automatic withholding of 25 percent which is then credited against the actual income tax burden. Although dividends are subject to corporate income tax, this tax is credited against personal income taxes. Hence, Germany has no double taxation of dividend income like the United States have. Interest income from pass book savings and similar liquid capital is currently not

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 they were earned by "speculation." The law considers holding financial assets speculative if these are sold within six month after 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 is in place since 1961 and was substantially extended in the 1970s. Employees or pensioners deduct a certain amount from their income and direct deposit it into long-term savings accounts. The government then supplements the contributions of eligible 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 sufficiently high to cover incomes far into the middle class. Currently, savings into productive capital are subsidized by a 20 percent savings premium, savings into 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 in the two countries. If at all, the well-to-do in the United States face more portfolio options due to a somewhat more dynamic market for financial instruments than their German counterparts. Differences in savings options between Germany and the United States include mainly 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 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 for this. As we have seen in Table 4, social security income differs dramatically between

Germany and the United States. The German old age social security system in Germany provides a substantially more generous replacement of net income across all income ranges compared to the social security system in the Unites States. The high average net replacement ratio of more than 70 percent may provide a sufficient level of retirement income for the elderly and hence reduces the incentive for life cycle savings in order to finance consumption in the retirement period.

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. 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 have a mixed message concerning 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 precaution against high health expenses -- are less im-

portant 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 in Germany might actually increase net savings since the generous retirement income might not only prevent 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.

4.2 Evidence on Savings Behavior Among the Aged

It is not straightforward to compare wealth data between the two countries. The wealth distribution is very skewed in both countries. 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 so 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 princi-

ples. 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 US-Dollar was about 1$ to 2.70DM, substantially higher than the average purchasing power parity, about 1$ to 1.70DM according to OECD figures. Because I am interested in real wealth, I use purchasing power parity.

Table 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 yields some confidence into the data.[13] 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 savings in West Germany, and stocks and bonds. Non-housing 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.

---- Table 10 goes about here ----

In addition to the tangible wealth reported in Table 10, al-

most all elderly have intangible and unbequethable 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 10 (Hurd, 1989) and 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 at purchasing power, West German elderly households hold roughly 20 percent less tangible wealth than American elderly households. However, the 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 5). The higher sum of tangible and intangible wealth in West Germany is a reflection of the higher aggregate savings rate depicted in Table 9. The difference in wealth levels between the two countries is therefore consistent with Feldstein's view that private wealth has at least in part been substituted for by social security wealth in West Germany.[14]

---- Table 11 goes about here ----

Another although more indirect piece of evidence in favor of the Feldstein view can be drawn from data on income sources displayed in Table 11. In West Germany, annuity income (almost exclusively social security income, as I noted in the discus-

sion about the role of private pensions in Section 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 to about a quarter to 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 10. While American elderly have non-housing wealth levels that are only slowly declining after age 55, the German age-wealth profile is irregularly shaped with a pronounced peak at ages 60 to 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) analyses 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 10 is based. The same pattern is also evident in the much larger sample of the German 1978 and 1983 consumer expenditure surveys.[15]

Tables 12 through 14 display results from these two surveys. Table 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, 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 13 are computed by dividing the above net household savings by household income net of taxes and social security contributions, if applicable. Finally, Table 14 reports on financial wealth, defined as in Table 10.[16] All three tables are stratified by survey year, age and birth cohort. Cell sizes range from 776 to 4343 observations, resulting in precise averages. The upper number refers to the 1978 German income and expenditure survey, the lower number to the one conducted in 1983.

---- Tables 12-14 go about here ----

Although it would be desirable to consider more than just two periods, the data permits a rough distinction between age and cohort effects. In particular, Table 12 reveals that savings

among the very old in Germany is not only positive, savings actually increase with age, holding birth cohort constant. This increase is even more pronounced in the savings rates, Table 13, and generates levels of financial wealth that are increasing with age, Table 14. Since housing wealth stays virtually unchanged as households age (see Section 5 on housing), the German data features a flat if not increasing age profile of total wealth. Börsch-Supan (1992b) shows that qualitatively similar profiles are obtained by analysing 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 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 so little of their financial assets down at old ages, particulary in West Germany? One reason would be to leave bequests. If that were the case, elderly with children should, on average, arrive at higher wealth levels than elderly without children -- otherwise, there would be little to bequeath.[17] However, regressions of non-housing wealth on the

number of children born, holding age and income constant, do not produce positive coefficients, neither in Germany nor in the United States.[18] While the estimated negative coefficients are only weakly significant, they rule out that a bequest motive has created the flat or increasing asset profiles in Germany.[19]

There is also little reason to suspect that precautionary savings generates the observed savings pattern in Germany. As I mentioned in the previous subsection, the comprehensive coverage of the German health insurance should permit the German elderly to draw down their assets disregarding potential health expenditures while the American elderly who are on average much less covered should have a stock of precautionary liquid wealth. However, the opposite is the case: non-housing 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 are rising even faster than absolute savings (see Tables 12 and 13). It is therefore unlikely that the observed patterns have been created by differential mortality between rich and poor elderly.

I am favoring a different interpretation of the data which is supported by Table 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 German elderly consume so little than wondering why German elderly save so much. Annuity income exceeds consumption expenditures and this increasingly with age. The decline in consumption expenditures is too large to be attributed merely to underreporting: 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 the compulsory health insurance, unlike to the United States.

---- Table 15 goes about here ----

The wealth pattern observed in Table 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 the 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.

4.3 Policy Implications

A first, although 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, although 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 thirty years when the baby-boom

generation becomes aged. One should be cautious 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.

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 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 one cannot borrow.

This raises several welfare issues. There is the question of whether the elderly are "over-annuitized," 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 a social security reform. Notwithstanding the need to prevent poverty among some of the elderly, it may be reasonable to tax wealth heavier 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 of social security contribution rates exceeding 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 bequests volumes are relatively large -- about 1.8 percent of GDP in the United States (Kotlikoff and Summers, 1981), 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.

5. HOUSING AND LIVING ARRANGEMENT CHOICES

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 is illuminating how public policy influences actual behavior.

In the United States, most housing subsidies are directed to home ownership, while subsidies in Germany are directed towards 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 home and land can be deducted without 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, mortage 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 rents in 1985 (Mayo and Barnbrock, 1985). Since mobility in rental housing is much higher than in owner-occupied housing, largely because of much higher trans-

action costs, the subsidies in the United States do not only distort the tenure choice but indirectly also 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, most notably 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 so for the elderly who have typically particularly long tenure durations 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 that are larger (and possibly more expensive) than those which 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 com-

pulsory 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.[20] Until recently, hospitals had an excess supply of beds, and elderly used to stay for extended periods of time in hospitals. The 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 hospital and nursing homes early and 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.

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 choices and living arrangement choices. Consider first the choice of tenure. Table 16 presents ownership rates and average relative shares of housing and non-housing assets for the elderly in the two countries. 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 home, less than a half of the elderly do so in West Germany. In both countries, ownership rates peak at age 55-59 and decline thereafter. The decline of home ownership is of course reflected in the increasing share of non-housing 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.

---- Table 16 goes about here ----

Another important housing policy difference mentioned above are the tenants' 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 17 which presents mobility rates in the two countries. Mobility is much higher in the United States for all age groups, but particularly so for the elderly aged 70 and above who have about five times higher mobility rates than their German counterparts. The very large number of moves among elderly aged 80 and above in the United States are moves to family members, particularly to their own adult children.

---- Table 17 goes about here ----

Moves among the elderly, when they occur, release housing for the younger generation, as can be seen in the other columns of Table 17. On average, in both countries recent movers have about one room less than movers.[21] This result is in line with panel data observations (Venti and Wise, 1990; Feinstein and McFadden, 1988).

However, although movers reduce dwelling size in both countries, there are just too few moves in Germany to have an impact on dwelling size consumption. 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 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.

---- Table 18 goes about here ----

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 the 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 given age, later birth cohorts show an increase in housing consumption. Table 19 presents the German case. The bottom row represents the average floor space consumption of a panel of households in the SOEP in 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.

---- Table 19 goes about here ----

I now turn to the evidence on living arrangement choices. I cast living arrangements into four categories. An elderly person lives "independently" if no other person lives in the households 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 20 presents how frequently these 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.

---- Table 20 goes about here ----

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 a third of the very old live with their adult children or others. This fraction is only a fifth in Germany. Note that the percentage living alone is about comparable for 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, 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 20. The PSID attempts to keep track of institutionalized sample persons with less than perfect success (Börsch-Supan, 1990; Ellwood and Kane, 1990). The SOEI starts in 1984 with a non-institutionalized sample and therefore underestimates the percentage of elderly living in nursing homes. If at all, these panel studies reveal a decreasing proportion of elderly living with adult children and an increasing proportion living alone and 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 in with children see Table 21, set up in a similar fashion as Table 19 on housing consumption. The longitudinal data reveals three effects. Going down each column, the pure age effect mirrors Table 20 and shows the familiar fact that the proportion of elderly living in 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 in with their children than the older ones. These cohort effects are statistically highly significant and dominate the aggregate effect in the bottom row of Table 21: The proportion of the elderly in the SOEP survey who live in with their children decreases from 1984 to 1988.

---- Table 21 goes about here ----

5.3 Policy Implications

The different housing market policies in West Germany and the United States have the predicted impacts: higher ownership 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 the responses is striking.

Having realized the effectiveness of housing market policies we should ask ourselves whether these policies make sense in a situation of rapid population aging. I recognize several problems here. First, housing supply by intergenerational transfer is impeded due to suppressed mobility by the elderly. Second, supply by new construction is distorted into the direction of too few, too large houses. Third, there are too little incentives, 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 tenants' protection legislation in West Germany. The second point relates mostly to the United States, again because of homeownership subsidies, while the third one is most

relevant in West Germany with her compulsory health insurance system. In the following, I will comment on these points in more detail.

A first problem is that elderly who ponder moving in 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 offer little attractive appartment 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.

In West Germany, where many more elderly live in rental housing, the rent adjustment provision of the tenants' 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 large rental burden for the young. The size of the wedge between rents for flow and stock supply appears inefficient and a smoother adaptation of rents in times of demand pressures welfare improving. Let me stress that, if elderly want to stay, they should do so. My point is that the numbers in Table 17 indicate that there are elderly who would adjust their housing consumption downwards if it were not for the penalty of a large rent increase.

The homeownership subsidies in the United States and

the rent adjustment provision in West Germany also distort the supply of new housing. By lowering the marginal price of land and dwelling, 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 serve as an efficient device to minimize maintanance and revolving costs in a similar manner as 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 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.[22]

Mobility reducing policies impede the intergenerational transfer of housing which represents an important mechanism of housing supply. The direct transfer alone -- homes that are inherited-- amounts to 28 percent of all owned homes in

Germany.[23] The indirect transfer is much larger: in 1983, about 74 percent of all recent home buyers purchased existing homes in the United States. This percentage has been steadily increasing to over 80 percent in 1989.[24] Population aging implies an increased length of 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-on-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 the entire new construction activities in 1986.[25]

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 next future unless more downgrading of dwelling size in old age and a quicker speed of new construction is forcefully encouraged. Since population aging is slower in the United States and housing markets 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 low income elderly, the associated expenses have to be born 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.

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 to realize 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 better-to-do elderly. The United States have adjusted their social security system relatively earlier in spite of a less pronounced increase in the ratio of pensioners to workers. Neither country provides adequate support for family care and multigenerational living arrangements.

Providing incentives here is particularly important in order to offset the shortage of family care generated by the demographics of a dwindling number of children per elderly.

FOOTNOTES

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 quoted from OECD (1988) and refer to 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 the lack of sufficient health services in former East Germany. It is most likely to adjust quickly to the West German mortality rates. The period of high fertility appears to have been caused by the omnipresent East German 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 came down to below the West German level.

3. In 1985, life expectancy at birth was 71.5 years for German male, 78.1 years for German female.

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

5. Hurd (1989), Table II 6.

6. According to the 1984 wave of the German Socio-Economic Panel.

7. This term is somewhat misleading because the system as a whole is not actuarily fair. The PDVs were computed for a discount rate of 3.3 percent, the value which would equalize life time discounted benefits and contribution for the historical contribution rates and current life expectancy.

8. This includes time spent at military service, education, about one year for childbearing, etc.

9. In the years between 1984 and 1989, Germany reduced the retirement age de facto to age 58 ("Vorruhestandsregelung") because workers could apply to 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.

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

11. The numbers are obtained from the Statistical Abstracts of the United States and the "Statistische Jahrbücher für die Bundesrepublik Deutschland".

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

13. However, the Retirement History Survey data are subject to the similar measurement problems as the PSID data.

14. Feldstein (1974).

15. "Einkommens- und Verbrauchsstichproben", see Börsch-Supan and Stahl (1991b) and Börsch-Supan (1992b).

16. It excludes business and farm property included in Table 10.

17. One might also wish to leave bequests to persons or institutions other than own children, but the bequest motive appears strongest with respect to own children.

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

19. To get 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 observed asset and savings profiles as people age.

20. The German income tax provides a tax deduction of just DM 1800 (roughly $ 1100) in this case.

21. 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).

22. It is important to stress that tenants' protection per se -- the prohibition of eviction and a rent increase beyond market

rents -- is a social achievement particularly important for the elderly who face higher psychic, sometimes also monetary moving costs.

23. Computed from the 1988 wave of the Socio-Economic Panel.

24. Statistical Abstract , various issues.

25. In 1986, 225,00 dwelling units were constructed in West Germany (Statistisches Jahrbuch, 1988).

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TABLE 1: Elderly Population in Seven OECD Countries

	Population Aged 65 and Over (percentages)			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

TABLE 2: Life Expectancy and Fertility Rates in Seven OECD Countries

	Life Expectancy[a]			Fertility Rate[b]		
	1950	1980	Increase	1960	1980	Increase
Canada	68.4	75.0	9.6%	3.9	1.7	-56.4%
France	66.8	74.3	11.2	2.9	1.9	-34.5
Germany	66.4	73.3	10.4	2.1	1.4	-33.3
Italy	66.1	74.4	12.6	2.6	1.7	-34.6
Japan	59.2	76.4	29.1	2.0	1.8	-10.0
United Kingdom	68.9	73.8	7.1	2.8	1.8	-35.7
United States	68.4	73.5	7.5	3.2	1.8	-43.8

Notes: a. average life expectancy at birth in years

b. age-specific fertility rates summed across all child-bearing ages

Source: OECD 1988

TABLE 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

TABLE 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

Notes: a. In percent of the wages of an average production worker.

b. Average after tax pension divided by average after tax labor income. 40 years of services assumed. Married couple supplement not included.

Source: Casmir (1989).

TABLE 5: Adjustment of Public Pensions by Retirement Age

Retirement Age	Pension as a percentage of the pension that one would obtain if one had retired at age 65						
		Germany				United States	
	"Fair" System[a]	before Reform[b]		after Reform[c]		before Reform[d]	after Reform[e]
60	64.6%	87.5%	f)	69.5%	h)	i)	i)
61	70.4	90.0	f)	75.6	h)	i)	i)
62	76.7	92.5	f)	81.7	h)	80.0	77.8
63	83.7	95.0	g)	87.8	h)	86.7	85.2
64	91.4	97.5	g)	93.9	h)	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

Notes:

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

b. "Gesetzliche Rentenversicherung" until 1992.

c. "Gesetzliche Rentenversicherung" after 1992 Reform has fully phased in.

d. Old Age Social Security (OASDI) until 1983.

e. Old Age Social Security (OASDI) after 1983 Reform has fully phased in.

f. Applicable only for women and workers who cannot be appropriately employed due to health or mismatch reasons ("berufs- oder erwerbsunfähig")

g. Requires 35 years of service.

h. Applicable only workers who cannot be appropriately employed due to health or mismatch reasons ("berufs- oder erwerbsunfähig").

i. Not yet eligible for Social Security benefits.

Source: Frerich, 1987; Casmir, 1989; Social Security Bulletin 46.7, July 1983.

TABLE 6: Labor Force Participation Rates Among Persons Aged 65 and Over

	1965	1975	1985
Canada	26.3a	18.5a	12.3a
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

TABLE 7: Male Retirement and Labor Force Participation Rates

	United States			West Germany		
Age	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

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.

Source: 1984 PSID, 1984 SOEP.

Table 8: Simulated Average Retirement Age and Contribution Rates

	Mean Retirement Age	Contribution Rate	
	(years)	1990	2000
Current System	58.5	18.7%	20.1%
System After 1992 Reform	59.0	18.1	19.5
Nondistortionary System	60.7	16.2	17.4

Source: Author's calculations.

TABLE 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

Note: Personal Savings as Percentage of Personal Disposable Income

Source: Monatsberichte der Deutschen Bundesbank, various issues;

Economic Report of the President 1992, Statistical Appendix

TABLE 10: Household Wealth by Age and Asset Category
(Averages across households, in 1000 $)

	United States			West Germany		
Age	Non-Housing	Own Housing	Total	Non-Housing	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

Notes: Financial wealth includes pass book savings, MMMFs, dedicated savings (IRA, Keogh, Bausparkassen etc.), stocks and bonds. Non-Housing wealth is financial wealth plus real estate (except owner-occupied home), farm and business property. Housing wealth is the estimated sales value of owner-occupied home. All values are self-reported.

Source: 1984 PSID, 1988 SOEP at 1984 prices, valued at purchasing power parity (1$=DM1.70).

TABLE 11: Sources of Income

	United States			West Germany		
Age	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

Notes: Labor includes full- and part-time wages.

Annuity income includes social security, pensions and other transfers.

Asset income includes interests, dividends, rents, and profits.

Source: 1984 PSID, 1984 SOEP.

TABLE 12: Household Savings by Age and Cohort, 1978 and 1983
(DM per year, in 1983 DM)

	Birth Cohort					
Age	1928-24	1923-19	1918-13	1912-09	1908-04	< 1904
50-54	5136					
55-59	3771	4477				
60-64		2468	2830			
65-69			1459	2450		
70-74				2016	2368	
75-79					2501	3717
80+						4015

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

Source: Einkommen- und Verbrauchstichproben 1978 and 1983.

TABLE 13: Saving Rates by Age and Cohort, 1978 and 1983
(net household savings/net household income)

	Birth Cohort					
Age	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

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

Source: Einkommen- und Verbrauchstichproben 1978 and 1983.

TABLE 14: Financial Wealth by Age and Cohort, 1978 and 1983
(1000DM, in 1983 DM)

	Birth Cohort					
Age	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

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

Source: Einkommen- und Verbrauchstichproben 1978 and 1983.

TABLE 15: Elderly with Expenditures Lower than Annuity Income

Age	Percentage of Elderly in Age Group with a Ratio of Annuity Income to Consumption Expenditures			
	< 1.0	1.0 to 1.2	1.2 to 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

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

Source: 1983 EVS, based on 18,259 elderly age 50 and above.

TABLE 16: Ownership Rates and Shares of Housing and Non-Housing Assets

	United States		West Germany	
Age	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

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

Source: 1984 PSID, 1984 and 1988 SOEP.

TABLE 17: Mobility Rates and Housing Consumption Adjustments

Age	United States			West Germany		
	Mobility Rate	Dwelling Size: Mover	Non-Mover	Mobility Rate	Dwelling Size: Mover	Non-Mover
50-54	10.6%	3.8	5.0	2.6%		
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	2.8	3.7
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		

Note: Mobility rate is the percentage of movers, i.e., households who moved within the last 12 months since being interviewed.

Source: 1984 PSID and 1984 SOEP.

TABLE 18: Housing Consumption (Number of Rooms)

	United States			West Germany		
Age	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

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

Source: 1984 PSID and 1984 SOEP.

TABLE 19: Age and Cohort Effects in Housing Consumption
(Dwelling size [area in square meters])

	Survey year						
Cohort	1984	1985	1986	1987	1988	Age	Standarddev.
1934-38					102.5	50-54	1.7-2.2
33-37				101.1			
32-36			100.5				
31-35		99.4					
1930-34	101.6						
1929-33					98.7	55-59	2.0-2.2
28-32				95.4			
27-31			95.0				
26-30		94.3					
1925-29	93.7						
1924-28					92.2	60-64	2.1-2.3
23-27				92.4			
22-26			91.4				
21-25		91.5					
1920-24	90.5						
1919-23					87.4	65-69	2.3-2.7
18-22				84.7			
17-21			82.4				
16-20		78.6					
1915-19	80.0						
1914-18					79.8	70-74	2.4-2.7
13-17				76.7			
12-16			76.1				
11-15		73.3					
1910-14	75.2						
1909-13					71.2	75-79	2.8-3.1
08-12				73.6			
07-11			74.0				
06-10		74.9					
1905-09	72.7						
1904-08					70.8	80+	3.4-4.4
03-07				71.1			
02-06			69.5				
01-05		70.7					
1900-04	69.3						
All	93.3	93.4	93.5	93.4	93.5	50+	0.93

Source: SOEP, waves 1984-1988

TABLE 20: Living Arrangements of the Elderly

	United States				West Germany			
	Independent		Shared		Independent		Shared	
Age	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

Notes: Independent (Couple): No other adult except spouse in household.

Independent (Alone): No other adult in household.

Shared (Head): Elderly is head of household with another family unit.

Shared (Taken-In): Elderly lives in household headed by another person.

Source: 1984 PSID and 1988 SOEP.

TABLE 21: Age and Cohort Effects in the Living Arrangement Choice
(Proportion of Persons Living in Multigenerational Households)

	Survey year						
Cohort	1984	1985	1986	1987	1988	Age	Standarddev.
1919-23					2.3	65-69	1.1-1.4
18-22				2.0			
17-21			2.0				
16-20		2.0					
1915-19	4.3						
1914-18					1.6	70-74	1.3-1.5
13-17				2.0			
12-16			2.3				
11-15		2.7					
1910-14	5.6						
1909-13					4.2	75-79	1.3-1.6
08-12				5.8			
07-11			8.6				
06-10		9.3					
1905-09	9.1						
1904-08					13.7	80+	1.4-2.2
03-07				13.6			
02-06			13.2				
01-05		17.6					
1900-04	19.8						
All	7.54	5.95	5.20	4.83	4.72	65+	0.76

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

Source: SOEP, waves 1984-1988, persons aged 65-.