mea – Mannheimer Forschungsinstitut Ökonomie und Demographischer Wandel
Gebäude L 13, 17_D-68131 Mannheim_Sekretariat +49 621 181-2773/1862_Telefax +49 621 181-1863_www.mea.uni-mannheim.de

Stockholding in Germany

Axel Börsch-Supan and Lothar Essig

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Axel Börsch-Supan*

Lothar Essig

Mannheim Research Institute for the Economics of Aging (MEA)
at the University of Mannheim, Germany, and
***National Bureau of Economic Research (NBER), Cambridge, Mass., USA**

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Abstract

Germany is not a country of stock holders – but this may change. This paper analyses the main trends in stockholding – either directly or indirectly through mutual funds and other managed investment accounts – among German households. We find a significant shift towards riskier portfolios and an increase in stock market and in mutual funds participation in the past decade. We document how stockownership evolves during the life cycle and the relation between stock market participation and wealth, education, and other demographic characteristics. Similar to other countries, we find that stockholding is concentrated among the wealthy households. Unlike to the Anglo-Saxon countries, however, the share of households who do not hold stocks is large even in the richest segment of the German population.

ADDRESS:
Axel Börsch-Supan, Lothar Essig
MEA, University of Mannheim
D-68131 Mannheim, Germany
Fax: +49-621-181-1861
Email: Axel@Boersch-Supan.de

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1. Introduction

Germany is not a country of stock holders. Financial portfolios are still dominated by relatively safe assets, notably checking and savings accounts and domestic bonds, and by illiquid assets, mainly life insurance policies.[1] In 1993, only 12% of West Germans directly held stocks while almost two thirds of West German households owned a whole life insurance policy and about one third held domestic bonds. Private pension funds are still uncommon.

There are, however, signs for change. Table 1 shows financial shares derived from aggregate financial accounts compiled by the Deutsche Bundesbank. This tables indicates that conventional saving products decrease in significance (first two rows), while more sophisticated financial products (second two rows) have increased their portfolio share from about 40% to more than 60% between 1975 and 1992.

Table 1: Financial asset shares (aggregate financial accounts), 1975-1992

	West Germany: Households and non-profit organizations				
	1975	**1980**	**1985**	**1990**	**1992**
Checking, deposit, and savings accounts	51.6	46.7	39.6	37.1	35.4
Building society savings contracts	7.8	7.3	5.5	4.1	3.7
Stocks, bonds, mutual funds on stocks and bonds and other financial assets	27.4	31.7	38.5	40.4	42.5
Insurance and pension wealth	13.2	14.5	16.3	18.6	18.6
Total financial assets	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Deutsche Bundesbank (1994b), Deutsche Bundesbank (1999b), and own computations.

Table 1 gives only a very coarse picture. This paper will shed more light on who holds stocks in Germany, how stockholding evolves during the life cycle and how it is related to wealth, education, and other demographic characteristics. Moreover, the paper may help to give some answers

[1] Life insurance can be a vehicle for indirect stockholding. Traditionally, however, the share of stocks in a typical German life insurance portfolio was small and restricted by various laws. Life insurance companies rather have placed their investments directly. Section 2 will show that all this is currently changing.

why stockholding – either directly or indirectly through mutual funds and other managed investment accounts – is still underdeveloped in Germany and why it may change in the future.

The saving and portfolio choice behavior of German households has attracted the interest of a number of researchers[2] since a combination of three features distinguish the saving patterns of Germans from those in other industrialized countries: First, financial saving rates have been fairly high by international standards, notwithstanding a very generous social security system. Second, home ownership rates are exceptionally low and have risen only very slightly during the last two decades. Third, consumer credit is rare compared to the Anglo-Saxon countries; debt financing of real estate increased to roughly two thirds of the sales value of housing only in the course of the nineties.

In spite of this general interest, there are only a few empirical studies of the determinants of German households' portfolio choices. Most of these studies focus exclusively on the impact of socioeconomic characteristics on West German households' behavior.[3] The lack of a panel survey of financial behavior in Germany and the very restricted access to earlier waves of the Income and Expenditure Survey (EVS) have inhibited empirical researchers interested in the determinants of portfolio composition, direct and indirect stockholding, and their changes over time.

Eymann and Börsch-Supan (2001) provide a more thorough and econometric analysis of East and West German households' portfolios. They analyze how they can be traced back to financial institutions and socio-demographic characteristics, using both macro- and micro-data. While they present stylized facts and recent trends in the households' general portfolio composition, this paper focuses specifically on stockholding, either directly or indirectly through mutual funds and other managed investment accounts. In order to overcome the most severe data deficiencies, we

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[2] Deutsche Bundesbank (1992, 1993b, 1999b), Euler (1985, 1990, 1992), Kim (1992), Börsch-Supan (1994a,b), Schönig (1996), Schnabel (1999), and Börsch-Supan, Reil-Held, Rodepeter, Schnabel and Winter (2001).

[3] Schlomann (1992), Grimm (1998), and Lang (1998) have used waves 1983, 1988, and 1978, 1983, 1988 of the Income and Expenditure Survey, respectively, to analyze the socioeconomic determinants of household portfolio choice. Börsch-Supan and Stahl (1991), Brunsbach and Lang (1998) and Walliser and Winter (1999) have focused on specific assets, i.e. building society savings ("*Bausparverträge*") and life insurance contracts, to analyze the effect of tax incentives and policy changes on asset choice. Himmelreicher (1999) has used the German Socioeconomic Panel for a cohort study of wealth and portfolio choice, yet had to rely on reported income from interest and dividends and highly aggregated indications as to asset ownership in order to determine household wealth levels.

combine several data sets, most important among them the German Income and Expenditure Survey (EVS). WE will rely on two waves of this data set: The 1998 survey gives us the most recent picture, but we also need the 1993 survey because much of the 1998 data turns out to be too coarse for the questions asked in this paper.

The paper is structured as follows. The following section presents stylized facts about macroeconomic trends and major policy changes in Germany during the past decade. Section 3 describes our main data sources. Section 4 is devoted to participation. It investigates in detail who holds stocks, analyzing differences in stockholding by socioeconomic characteristics and total financial wealth. Section 5 turns to portfolio shares of stocks, i.e. the amount of wealth invested in stocks. This analysis is more complicated than participation since it requires very detailed financial data that German households provide only reluctantly. Section 6 explores the reasons why so few German households hold stocks. It discusses policy issues specific to Germany, such as taxes, savings subsidies, and pension policy, and it indicates how stockholding may change in the future. Section 7 concludes.

2. Macroeconomic trends and policy environment

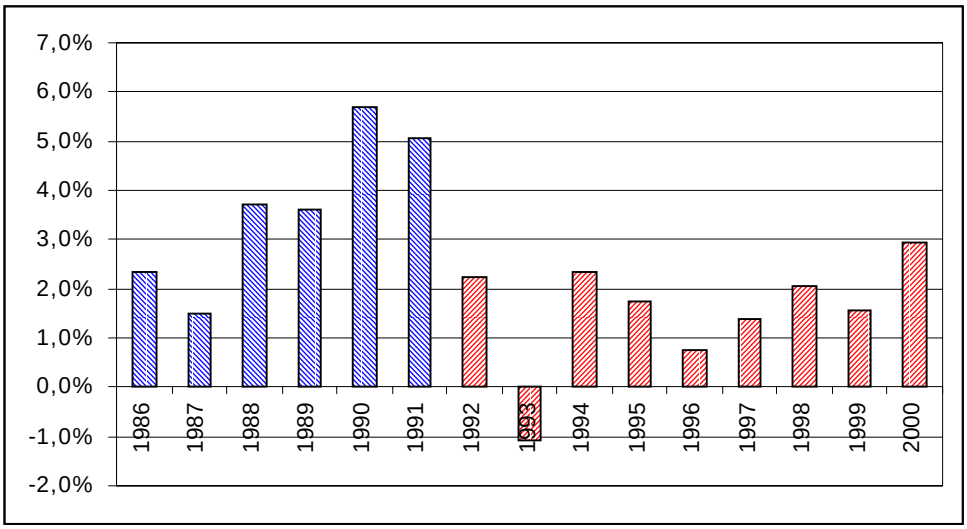
This section briefly presents the recent macroeconomic trends in Germany as well as changes in the regulatory and general policy environment that may have affected stockownership in Germany.

2.1 Macroeconomic trends

Unlike in the other countries in Europe and in the United States, the early 1990s were dominated by the post-unification boom in Germany, see Figure 1. Slower growth eventually also hit Germany, but later and then much deeper. In the year 1993, at the trough of the downturn, GDP fell by 1.1%, see Figure 1. A period of slow stabilization followed until the recent recession in early summer 2001 began to hit all industrial countries including Germany (not shown in Figure 1).

1998 brought a new government under social-democratic leadership and first-time participation of the green party after 16 years of the conservative Kohl government. The first year of the new government was characterized by a great deal of uncertainty which only stabilized after the sudden resignation of the secretary of finance.

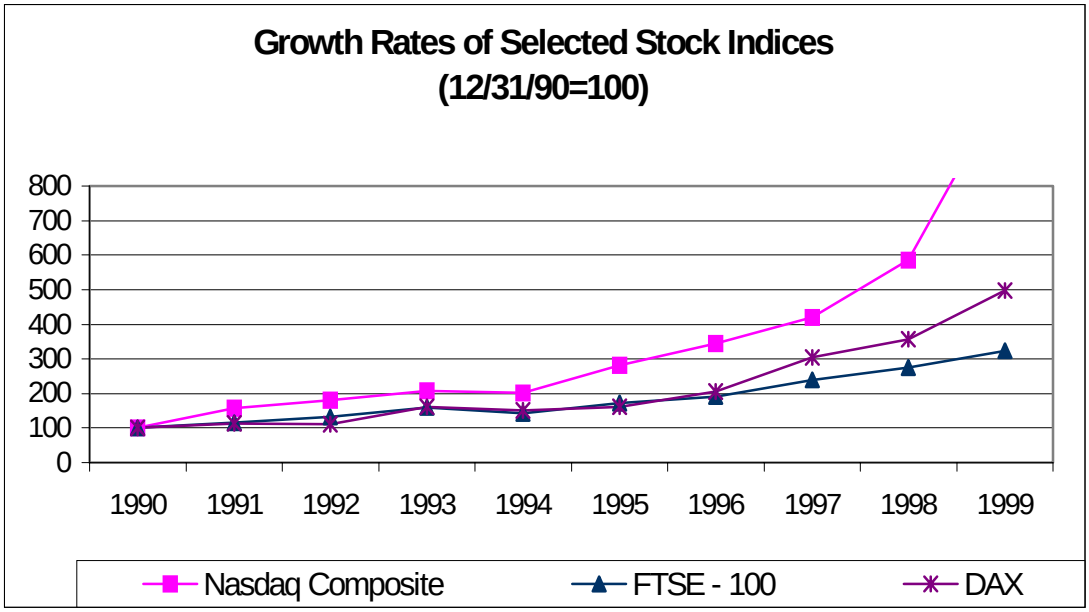
Figure 1: Growth rates of GDP, 1985-2000



Source: Statistisches Jahrbuch (2001). 1986-1991: West Germany, 1992-2000: Germany.

The stock market in Germany shared the run up elsewhere. Figure 2 shows the German stock index (DAX) relative to two common indexes in the United States.

Figure 2: Growth rates of selected stock indices



Source: Deutsche Börse (1999)

The decade of the 1990s also brought a few but incisive structural changes that will impact on stockholding. A main change was the privatization of a few but very large state-owned firms, most notably Deutsche Telekom and Deutsche Post. The privatization of Deutsche Telekom is particularly important for this paper as it marked the start of a "Volksaktie", a popular stock, that was bought by many medium-income households who had not previously participated in stockholding.

In 1992, a small reform of the public pay-as-you-go social security system was put in place. This reform substantially reduced future benefits by linking benefits to net rather than gross wages, thereby introducing a mechanism that reduces benefits when contributions increase (sharing of the burden between young and old generation). The reform also increased future retirement ages (phased in until 2004) but left most early retirement incentives in place (see Börsch-Supan, 2000 for a discussion). The diminished expectation of pension benefits could potentially increase the demand for private pensions and thus also indirect stockholding; this will be discussed in Section 6.

The 1992 pension reform quickly proved to be insufficient, and a new pension reform was decided on in 1998 shortly before the federal elections. The new government in 1998 first revoked this reform, but then changed this policy in order to follow the path of benefit cuts. Moreover and important for this study, the so-called "Riester-Reform" introduced a new funded pillar that is effective since January 2002. Section 6 will discuss the implications of this new pillar on stockholding in Germany.

Finally, the 1990s were characterized by some spectacular mergers among banks and between insurance companies and banks, preparing the way for new pension instruments that combine financial and insurance products in the wake of the Riester-Reform. The most significant merger was between Allianz, the largest German insurance company, and Dresdener Bank, the third largest German bank, potentially easing the current institutional restrictions on indirect stockholding.

2.2 Policy environment

Financial regulations were revised frequently in the eighties and nineties, leading to changes in the real returns on assets both before and after taxes. In the following, we summarize the effects of financial market deregulation, privatization, and German reunification on the German stock

market. We then briefly visit the main substitute markets and look at related developments in the German bonds and money markets.

2.2.1 Stock markets

Until recently, German stock markets were thin, decentralized, and comparatively "neglected". In 1990, stock market capitalization amounted to just 23% as compared with 42% in the Netherlands, 87% in the United Kingdom, and 55% in the United States.[4] Moreover, Wenger and Kaserer (1997) report that cross-holdings account for at least 27% of the gross capitalization; 46.8% of the stocks are held by banks and non-financial companies. Hence, only 11.4% of common stocks are held by private and institutional investors. Even after the soaring stock prices of the late nineties (Figure 2), capitalization has risen to only 39.4% of GDP in Germany as compared to 130% in the Netherlands, 155% in the United Kingdom, and 144% in the United States.

The deregulation of the German stock markets began only in 1989. It was initiated by the need to transpose EU directives into German law in order to comply with the regulations of the single market in services. Unlike that of bond markets, stock market deregulation was initiated by foreign rather than domestic interest groups. At first, German authorities were not at all quick in transposing EU directives into law.[5] The process only gained speed when the regionally separated stock markets in Germany were centralized (1993) and the Frankfurt stock exchange was reorganized and expanded (1990, 1991, and 1997). Stock market gathered momentum with the privatization of some public sector industries, notably the initial public offering of Deutsche Telekom shares in November 1996 mentioned earlier. We expect that the process will accelerate further when Germany's ailing pay-as-you-go social security system is reformed by adding a new funded pillar to the pension system and further reducing the generosity of public health insurance.[6]

Major advances in stock markets deregulation, whose purpose was to make the German market more attractive to domestic and foreign institutional investors, to private investors with modest wealth, and to smaller companies willing to issue stocks, were made in 1990, 1994, and 1998. These legal changes substantially lowered transaction costs (1990). Access for international and

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[4] World Development Indicators, Table 5.2.

[5] In the late eighties, the average lag between the EC directive and the respective legal adjustments was five years.

[6] Börsch-Supan and Winter (1999).

domestic institutional investors (especially mutual funds) was widened (1990, 1994, and 1998). Entry barriers for small corporations (discriminatory accounting and codetermination rules) and for private investors (minimal stock values) were reduced in 1994. In the end, stock market surveillance was tightened substantially (1994 and 1998). To foster widespread ownership, the corporate income tax code was revised in December 1999. This controversial change will eventually make capital gains tax-free if they derive from sales of corporate reserves, which consist mainly in corporate cross-holdings valued at cost. Anticipation of the reform led to an 18 % spurt in the DAX performance index in just a month (December 1999).

For a person subject to the top marginal tax rate of 56 %, Stehle (1999) shows that the average annual after-tax yield from German stocks was 4.6 % from January 1969 to December 1997. From January 1988 to December 1998, however, it was 11.5 %. The difference between the after-tax yield of government bonds and stocks, averaged 4.8 %, for the whole period, was 11.1 % in the latter decade.[7]

The German stock markets appears to have gained in attractiveness only in the wake of third wave of the deregulation. We have four pieces of evidence: First, the number of initial public offerings started to increase in 1997 and then rocketed, in 1999, to roughly ten times the previous average level.[8] Second, turnover on the stock market increased by roughly 30% in 1996, 1997, and 1998 and exceeded the growth rate of the DAX performance index in 1996 and 1998.[9] Third, the DAX performance index accelerated only recently, evident in Figure 2. Fourth, Table 2 shows that the share of stocks in household portfolios held largely stable during the first half of the nineties and started to rise only after 1995.

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[7] The difference-in-difference is about the same for lower marginal tax rates.

[8] Deutsche Börse (1999), Table 2.3.

[9] Deutsche Börse (1999), Table 10.4.

Table 2: Financial asset shares according to aggregate financial accounts

	Unified Germany: Households excluding non-profit organizations			
	1990	**1993**	**1995**	**1997**
Checking, deposit, and savings accounts	37.8	38.0	35.7	33.6
Bonds	20.0	18.0	18.9	17.1
Stocks	5.5	5.8	5.5	8.3
Mutual funds and managed investment accounts	3.9	6.2	7.6	8.6
Building society savings contracts	4.1	3.7	3.4	3.4
Insurance and pension wealth	20.9	20.9	21.8	22.5
Other financial assets	7.8	7.4	6.9	6.6
Total financial assets	**37.5**	**39.2**	**40.4**	**42.8**
Real estate wealth	83.0	82.4	82.7	81.9
Stock of durable goods	17.0	17.6	17.3	18.1
Total non-financial assets	**62.5**	**60.8**	**59.6**	**57.2**
Mortgage loans	76.6	75.8	78.1	79.6
Consumer credit	23.4	24.2	21.9	20.4
Total debt	**13.1**	**13.4**	**14.2**	**14.8**

Source: Deutsche Bundesbank (1994b), Deutsche Bundesbank (1999b), and own computations.

2.2.2 Bond markets

The small size of the German stock market may be even more of a surprise since its main competitors, the bonds and money markets, are also small in Germany. During the eighties, government and the universal banks in Germany typically relied on the domestic bond market to finance the budget deficit and refinance loans. Thus, bond issues by non-bank companies were nearly negligible until the late nineties. Capital export restrictions hindering foreigners' purchase of domestic bonds were abolished in the mid-eighties. Bond market deregulation sought to widen the range of possible purchasers of domestic bonds, which consisted more or less exclusively of government and bank bonds. Deregulation was also supported by the Bundesbank, because it secured the role of the central bank's minimum reserve policy as a major instrument of monetary control. In hindsight, the deregulation process came just in time to permit German banks and several government agencies to attract international capital to issue bonds in order to finance the rebuilding

of East Germany after reunification. The share of rebuilding financed by issuing new stock was minimal.

2.2.3 Money markets

Money market mutual funds appear to have been an important avenue facilitating stockholding by a broad audience in the United States, mainly during the early 1980s. This "facilitating device" has been lacking in Germany. Unlike the deregulation process of the bond market which had occurred earlier than in other European countries, the process of deregulating the German money market has started only in 1989. As of 1985, the Deutsche Bundesbank used the money market as the primary means to control monetary growth. The Deutsche Bundesbank therefore opposed the deregulation of the money market throughout the late eighties and only gradually gave in to the introduction of commercial papers (1989, 1991) and of money market mutual funds (1994). Their share is still small but growing, as Table 2 has shown.

The Bundesbank estimates do not allow disentangling stock- and bond-based mutual funds. Deutsche Bundesbank (1994c) reports that the increase in mutual fund units in the early nineties was accounted for almost exclusively by bond-based mutual funds. Presumably, the increase in the late nineties is due to stock-based funds, both in absolute and relative terms. The example of mutual funds shows that we cannot unambiguously assign a causal link for these changes. The data deficiencies both in the financial accounts and in the survey data mean that it remains unclear whether it was the gradual loosening of the regulations for mutual funds, beginning in 1990, or the increased yields on both bonds and stocks that boosted the attractiveness of the funds. More can be learned from micro data to which we now turn.

3. Data: The German Income and Expenditure Survey (EVS)

Our main data set is the German Income and Expenditure Survey ("Einkommens- und Verbrauchsstichprobe", EVS). Since 1962/63 the EVS has been carried out by the Federal Statistical Office every 5 years. The idea behind the EVS is to provide a comprehensive examination of the economic and social situation of private households (Euler, 1992). Data on income, expenditures,

home ownership, wealth and debt is collected[10]. The data has been confidential until recently. The EVS 1993 was the first wave released as "*scientific use file*" which is accessible to all researchers for a nominal fee. The "*scientific use file*" of the EVS 1998 has just been released. It is accessible to all researchers in principle but the fee is very high and often prohibitive except for research institutes. The EVS 1993 included for the first time the new states and foreigner households. The EVS 1993 includes the main socioeconomic characteristics of all household members, while earlier surveys carry information only about the head of the household. The EVS 1993 is the newest data set with a reliable data base for stock holding and the portfolio share of stocks, and we have to base much of our analysis on these data.

The EVS 1998 returned to a more restrictive set of variables and bunched assets which were reported separately in 1993, again in broad categories. Most significantly for this paper, indirect stockholding cannot properly be identified in the 1998 survey. To make matters worse, the general category "funds" includes not only stock- and bond-based mutual funds, but also funds based on real estate. Hence, using the category "funds" as an upper limit of stockholding is essentially meaningless, and we therefore do not provide such numbers for the EVS 1998.

Parts of the EVS 1998 have been evaluated in tabular form (see Hahlen, 1998). A general analysis of saving behavior using the EVS 1998 can be found in Börsch-Supan and Reil-Held (2002). Details about sample properties such as coverage and representativeness of the EVS micro data have been relegated to an appendix. Here, we just summarize the four most important points:

- *Accuracy:* The EVS requires very careful record keeping by the interviewed household and thus is likely to generate high-quality data. During the survey period each household keeps a monthly diary in which all income sources and expenditures for the most important areas are recorded. In addition, for one month in the year, a detailed recording of all expenditures is done in detail.
- *Representativeness*: Although the EVS is claimed to be a representative sample of Germany's private households, it does not include persons living in institutions and – most significantly for this study – households with very high incomes. In the EVS 1993, the monthly net house-

[10] Classified according to socioeconomic household properties this data is presented in the Fachserie 15 "Wirtschaftsrechnungen", income and expenditure sample 1993, by the Federal Statistical Office.

hold income was limited to 35.000 DM. Since the highest income bracket of the micro-census is 7.500 DM or more, the weights are not guaranteed to represent the upper income segment (Laue, 1995). There is also doubt about how representative in the bottom income segment (Börsch-Supan, Schnabel and Reil-Held, 1998). Comparisons of the EVS with other data sources indicate too much weight given to middle income brackets. Overall, the EVS is likely to underestimate stockholding, and it is important to keep this in mind especially when we look at the distribution of stock ownership by wealth in Section 4.3.

- *Coverage*: The coverage of wealth reported in the EVS can be checked against data from the national flow-of-funds statistics constructed by the German Bundesbank, see Börsch-Supan et al. (2000). This confirms our suspicion about underestimating stockholding insofar as the coverage of financial wealth of private households is only around 56 percent of the wealth reported in the aggregate (Guttmann, 1995). The two main reasons for this severe underreporting is that the Bundesbank data includes financial wealth owned by private non-profit organizations while the EVS only includes private households, and that the EVS excludes households with very high incomes as mentioned earlier.
- *Comparability*: There are serious deficiencies in the EVS 1998, compared with the EVS 1993, since variables crucially necessary to analyze stockholding are missing. As a compromise between accuracy and timeliness we always use a combination of the 1993 and the 1998 data.

4. Who holds stocks?

With these restrictions in mind, this section begins the analysis of our micro data by describing the stock market participation of German households. It relies on two definitions of stockownership. The first and narrow definition refers to direct stockholding only. Since many households hold stocks through mutual funds, this is an underestimate of total stockholding. The second definition is broader, and includes direct and indirect stockholding. The latter includes also mutual funds and other managed investment accounts (to the extent that these funds invest at least part of their portfolio in stocks). Due to data limitation we cannot distinguish the exact share of these funds that is invested in stocks. Thus, direct and indirect stockholding is an upper bound for total stockholding. In aggregate data – as we have seen in tables 1 and 2 – and in the EVS 1998 – as

described in the previous section – we cannot compute this upper bound since these data do not distinguish mutual funds by base asset at all.

Table 3 reports summary statistics for the 1998 sample. Characteristics refer to the head of the household.

Table 3: Summary Statistics of Sample, EVS 1993 and 1998

	1993		**1998**	
	Mean	**Std. D.**	**Mean**	**Std. D.**
Age	51.1	16.6	51.2	16.6
Education: less than high school	71.3%	45.2%	n.a.	
Education: high school	11.2%	31.6%	n.a.	
Education: college	17.6%	38.1%	21.2%	40.8%
Married	56.8%	49.5%	52.8%	49.9%
Male	67.8%	46.7%	65.7%	47.5%
Singles	34.1%	47.4%	36.0%	48.0%
Between 2 and 4 household members	60.7%	48.8%	59.5%	49.1%
More than 4 household members	5.3%	22.4%	4.5%	20.6%
One income recipient	40.7%	49.1%	42.1%	49.4%
Two income recipientsc	20.1%	40.1%	18.2%	38.6%
More than two income recipients	2.5%	15.7%	1.7%	13.1%
Wage earner	52.1%	50.0%	53.3%	49.9%
Self-employed	6.0%	23.8%	6.4%	24.5%
Unemployed	4.3%	20.3%	4.6%	21.0%
Pension recipient	31.7%	46.5%	30.4%	46.0%
Income	27,527	17,998	29,139	19,179
Financial assets	33,026	54,030	35,350	63,236
Real assets	110,823	168,924	115,222	188,585
Credits	17,923	49,711	21,472	60,291
Direct stockownership	12.0%	32.5%	17.6%	38.0%
Indirect stockownership	10.3%	30.4%		
Total stockownership	19.8%	39.8%		
Asset Values for those who hold these assets:				
Stocks	13.266	45.907	17.500	53.731
Funds	10.920	19.056		
Stocks and Funds	13.745	40.022		

Source: EVS 1993 and 1998, all financial values in €.

The average age is 51 years, some 55 percent are married and about two-third of the household heads are male. More than two thirds of the 1993 sample has compulsory education. The remaining third has either high school degrees (11.2% in 1993) or college degrees (17.6% in 1993, increasing to 21.2% in 1998). The majority of households (about 60 percent) has between 2 and 4 members; the proportion of single-earner (40 percent) is about twice as high as that of two-earners (20 percent). About 30 percent of our households are pension recipients, while some 53 percent are wage earners. Self-employed are relatively rare in Germany (6 percent, slightly increasing). 4 percent of our households report that they are unemployed.[11]

The proportion of households that hold stock directly was 12.0 percent in 1993 and increased to 17.6 percent in 1998. The fraction holdings stock indirectly is a bit smaller and amounts to 10.3 percent of the 1993 sample. The latter figure is obtained on the assumption that at least part of the mutual funds or investment accounts are invested in equity. Since there is some overlap in these categories, total stock ownership is not the some of the two, but a bit lower: 19.8% in 1993, an upper bound of stockholding (direct or indirect) in 1993. As mentioned earlier, the latter data is not available in 1998.

Hence, stock market participation has increased considerably, but it is still low relative to the Anglo-Saxon countries. It is significantly higher, however, than for instance in Italy. There are at least two reasons for the higher participation in Germany compared to Italy, and the lower participation than in the Anglo-Saxon countries. First, entry and management costs have been traditionally high in Italy while they are much lower in Germany, although not as low as in the Anglo-Saxon countries. Germany still has significant minimum investment requirements which prevent participation for many, especially low wealth households. Second, the German stock market was less volatile than in Italy, where the standard deviation of the real growth rate of stock prices was 35 percent during the last four decades, almost twice as large as in Germany. Stock prices may also explain part of the difference between Germany and the Anglo-Saxon countries. While their volatility was comparable, their levels were lower in Germany (see Börsch-Supan, 1998) and the recent stock market run-up slower (see Figure 2).

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[11] The relative small fraction of unemployed depends on the fact that statistics refer to the household head. The incidence of unemployment among spouses and adult dependents is much larger.

We now turn to examine some of these characteristics in detail.

4.1 Age and stock ownership

We begin with age, see Table 4 and Figures 3 and 4. The age profile of participation is clearly hump-shaped. It peaks around age 47 in 1993, and around age 51 in 1998. At this peak, direct stockholding in 1993 is 14.8 percent (i.e., 3 percentage points above average), and total stockholding 23.2 percent (again 3 percentage points above average).

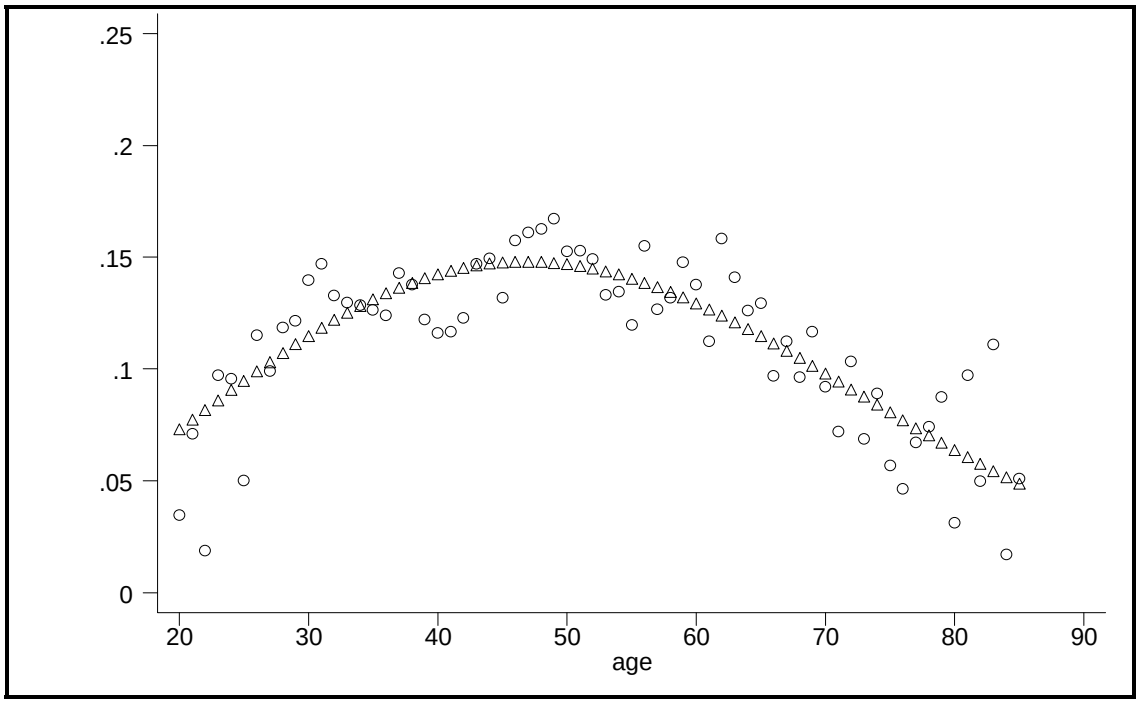
We should be careful in interpreting these age patterns since they compound age and cohort effects. Figures 3 and 4 do not represent the effect of age during the life-cycle only; they also include the differences in attitudes towards stock holding between persons born earlier and born later (so called "cohort effects"). It would be wrong to infer from Figures 3 and 4 that households sell their stocks when they age; rather, these are different households who may have started with much lower stock market participation in their life-cycles. Similarly, households aged 60-69 years in the future might exhibit a much higher stock market participation because they have grown up in times with higher stockholding.

Table 4: Direct and Indirect Stockholding by Age

Age	**<30**	**30-39**	**40-49**	**50-59**	**60-69**	**>=70**	**Total**
1993							
Direct stockholding	9.8%	13.3%	14.2%	14.0%	12.2%	7.4%	12.0%
Indirect Stockholding	12.6%	12.0%	10.5%	11.0%	8.9%	7.3%	10.3%
Direct plus indirect stockholding	19.9%	22.4%	22.2%	22.0%	18.4%	13.2%	19.8%
Sample Proportion	10.3%	20.5%	16.8%	18.4%	16.4%	17.5%	100%
1998							
Direct stockholding	16,5%	18,9%	18,3%	21,4%	18,7%	11,1%	17,6%
Sample Proportion	8,6%	22,1%	18,5%	17,4%	14,9%	18,3%	100%

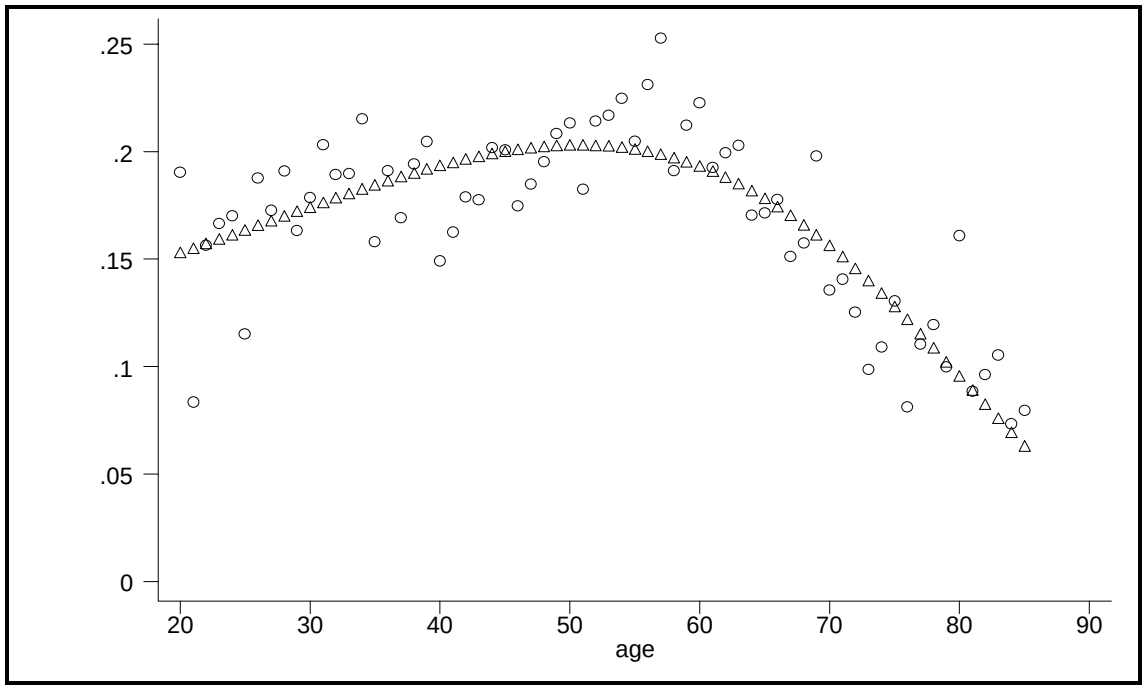
Source: EVS 1993 and 1998

Figure 3: Direct Stockholding by Age, 1993



Source: EVS 1993. The figure shows actual means (circles) and fitted values of a third order polynomial (triangles).

Figure 4: Direct Stockholding by Age, 1998



Source: EVS 1998. The figure shows actual means (circles) and fitted values of a third order polynomial (triangles).

4.2 Education and stock ownership

We expect a positive correlation between education and stockholding. Education is correlated with a person's permanent income and wealth, thus, education affects stockholding indirectly through this channel. Education also has a direct effect since it is correlated with an investor's ability to acquire and process information, and with financial sophistication in general.

This positive correlation is indeed what we find in Table 5. We classify education in three groups: compulsory education (corresponding to 10 years of schooling in Germany), high school degree (3 additional years of schooling, mainly "Abitur" in Germany) and college degree or higher. The first two categories are bundled in the EVS 1998.

Table 5 indicates that in the group with college degree participation is almost twice the average. In the group with compulsory education it is less than on average. The effect of education on indirect stockholding is quite similar to that on direct stockholding.

Table 5: Direct and Indirect Stockholding by Education

1993				
	Less than High School	High School	College	Average
Direct Stock-holding	9.8%	12.8%	20.5%	12.0%
Indirect Stock-holding	8.4%	12.4%	16.6%	10.3%
Direct plus Indi-rect Itockholding	16.6%	21.8%	31.3%	19.8%
Sample Propor-tion	71.3%	11.3%	17.6%	
1998				
	No College	College	Average	
Direct Stock-holding	14.7%	28.1%	17.6%	
Sample Propor-tion	78.8%	21.2%		

Source: EVS 1993 and 1998

4.3 Wealth and stock ownership

Gollier (2001) summarizes conditions under which wealth should correlate positively with the ownership and the portfolio share of risky assets such as stocks. In addition to the indirect correlation with education mentioned in the preceding subsection, fixed participation costs in the stock market due to information costs, participation fees, or other types of entry costs imply that investment in stocks is optimal once the investor's wealth exceeds a given threshold. Minimum thresholds for purchasing listed stocks also act as a barrier to entry and lead to a positive correlation between wealth and stockholding even in the absence of fixed participation costs. Indeed,

several studies have found wealth to be the major determinant of households' willingness to hold risky assets.[12]

Table 6: Proportion of Households Investing in Stocks, by Financial Asset Quartiles

1993							
	Quartile I	Quartile II	Quartile III	Quartile IV	Top 5%	Top 1%	Average
Direct stockholding	2.9%	8.3%	14.0%	27.8%	43.3%	56.0%	12.0%
Indirect stockholding	2.5%	6.5%	13.4%	23.3%	33.8%	34.9%	10.3%
Direct plus indirect stockholding	5.1%	14.1%	25.1%	42.5%	59.0%	69.8%	19.8%
1998							
	Quartile I	Quartile II	Quartile III	Quartile IV	Top 5%	Top 1%	Average
Direct stockholding	1.7%	14.1%	24.4%	42.2%	59.3%	78.9%	17.6%

Source: EVS 1993 and 1998

We find the same pattern in Table 6 which shows the proportion of direct and indirect stockholders by financial assets quartile and for the top 5 and 1 percent of the financial wealth distribution. Direct investment in stocks is very rare in the first quartile (3 percent have stock) but increases quickly in the second quartile (9.4 to 13.3 percent in 1993 and 1998, respectively). Indirect stockholding features about the same percentages. Hence, even after subtracting the double counting, total stockholding is substantially higher than just direct stockholding among those households who have below median financial wealth.

The effect of wealth on stockownership is rather steep. In the third quartile of the wealth distribution, almost a quarter of the households held stocks in 1993, both directly and indirectly. In 1998, the proportion of households holding stocks only directly had already reached that level. Direct stock market participation in the fourth quartile reaches 28 percent in 1993 and has dramatically

[12]Cf. Guiso, Jappelli, and Terlizzese (1996), Bertaut (1998), Hochgürtel, Alessie, and van Soest (1997), Börsch-Supan, Euwals, and Eymann (1999), or Vissing-Jørgensen (1999).

increased to 42 percent in 1998. In the top 5 and 1 percent of the wealth distribution, direct stock holding was 40 percent and almost 50 percent in 1993, increasing to 58 and 77 percent in 1998).

Still, the main surprise is that direct stock holding remains substantially below the 95% mark even among the very wealthy where one might expect that everybody will hold at least some stocks, particularly after the stock market run up between 1993 and 1998. A quarter of all households in the top 1 percent wealth distribution, which is even higher in the income distribution, do not hold stocks directly. This is hard to explain with the presence of fixed costs alone and suggests that features other than monetary participation costs are relevant in explaining stockownership. One potential explanation is that the richer households have directly invested in business assets, for example, to have a tighter control over this business than through the stock market. We have little information on business assets (it was not ascertained in the EVS 1998 at all, and unreliably in the EVS 1993) to check this hypothesis, but it may have particular relevance for owners of small enterprises, while large companies are typically held in complicated crossholding schemes involving financial institutions, see Köke (2002).

It is noteworthy that these qualitative features are similar in Germany and in Italy, however, German households with below median wealth invest in stocks to a much higher extent than Italian households. Thus, the distribution is more "even" than in Italy.

4.4 Characteristics of stock holders and non-stockholders

The descriptive evidence shown thus far suggests that the typical stockholder is a middle-aged, with relatively high level of financial assets and possibly a high level of education. In this subsection, we lock at the typical stock holders and non-stockholders in more detail. We still focus on correlations between two variables at a time, keeping in mind that the direct effect of the variable at hand on stockholding may be smaller or larger, depending on the magnitudes and directions of indirect effects exerted by third variables through the variable at hand on stockholding. Section 4.5 will report multivariate analyses focussing on the direct effects only.

Table 7 displays sample means of demographic and economic characteristics for households who invest in stocks (a) directly, (b) indirectly through mutual funds and similar instruments, (c) directly and indirectly together, and (d) who do not own stocks at all. The information for (b) and (c) are not available in 1998, as explained earlier.

Compared to non-stockholders, stockholders are more likely to be married (especially for direct holding), male and have households of between two and four members with more than two income earners. Earning wages rather than receiving transfers increases the likelihood to buy stocks. The self-employed are substantially more likely to invest in stocks. One explanation for this finding, which is common to other countries as well, is that the self-employed hold a larger fraction of their wealth in their business and invest in stocks in order to diversify their portfolio. In addition, the self-employed are less risk averse and risk aversion increases the propensity to invest in stocks (Guiso and Paiella, 2001). These effects, however, are counteracted by the fact that the self-employed are more exposed to risk, which should discourage them from further investing in risky assets. Needless to say, the unemployed and pension recipients are less likely to invest in stocks, reflecting their low wealth as well as their age.

Table 7: Demographic Characteristics of Stockholders and Non-Stockholders

	1993			**1998**		
	Direct Stock-holders	**Indirect Stock-holders**	**Total Stock-holders**	**Non Stock-holders**	**Direct Stock-holders**	**Non Stock-holders**
Married	70.2%	63.5%	66.7%	54.4%	64.2%	50.3%
Male	80.3%	74.7%	77.2%	65.6%	78.0%	63.1%
Singles	21.5%	26.6%	24.2%	36.5%	26.2%	38.1%
Between 2 and 4 household members	73.0%	67.8%	70.2%	58.3%	68.7%	57.5%
More than 4 household members	5.5%	5.7%	5.7%	5.2%	5.0%	4.3%
One income recipient	43.8%	44.4%	44.2%	39.8%	46.9%	41.0%
Two income recipients	29.4%	27.7%	28.4%	18.1%	24.5%	16.8%
More than two income recipients	3.1%	3.4%	3.3%	2.3%	2.7%	1.6%
Wage earner	61.9%	63.0%	62.6%	49.5%	61.7%	51.6%
Self-employed	8.0%	6.9%	7.3%	5.7%	9.4%	5.8%
Unemployed	2.5%	1.7%	2.2%	4.8%	2.4%	5.1%
Pension recipient	23.7%	25.2%	24.3%	33.5%	23.2%	31.9%
Households	4454	3855	7275	24499	8785	30608

Source: EVS 1993 and 1998

4.5 Econometric Estimates

It is important to check these findings in a multivariate analysis in order to distinguish between direct effects of each variable and indirect effects caused by third variables. Hence, we end this section on stock market participation ("who holds stocks?") with a multivariate regression analysis, using the probit regression technique. Our dependent variable is whether a household holds stocks, and the independent variables are the socio-economic characteristics mentioned in the previous subsection. While Table 7 combines direct and indirect effects on stockholding, Table 8 isolates the direct effects which each variable exerts on stock holding.

Table 8: Probit Regressions for Direct and Indirect Stockholding

	1993			**1998**
	Direct Stockholding	**Indirect Stockholding**	**Total Stockholding**	**Direct Stockholding**
Age between 36 and 50	-2.9% (0.00)	-4.7% (0.00)	-7.0% (0.00)	-5.2% (0.00)
Age between 51and 65	-3.1% (0.00)	-5.5% (0.00)	-8.0% (0.00)	-5.9% (0.00)
Over 65 years old	-3.4% (0.00)	-5.1% (0.00)	-7.9% (0.00)	-7.4% (0.00)
Highschool	2.3% (0.00)	2.4% (0.00)	3.7% (0.00)	n.a.
College	1.1% (0.01)	1.5% (0.00)	0.2% (0.00)	3.8% (0.00)
Married	-2.0% (0.00)	-3.1% (0.00)	-5.1% (0.00)	-1.0% (0.13)
Male	2.1% (0.00)	0.2% (0.587)	2.1% (0.00)	3.4% (0.00)
Between 2 and 4 household members	-0.9% (0.16)	-1.1% (0.06)	-1.5% (0.07)	-4.2% (0.00)
More than 4 household	-3.7%	-2.2%	-4.5%	-6.4%

members	(0.00)	(0.00)	(0.00)	(0.00)
Two income recipients	-1.5%	-0.5%	-1.7%	-2.4%
	(0.00)	(0.20)	(0.00)	(0.00)
More than two income recipients	-4.2%	0.8%	-4.5%	-2.9%
	(0.00)	(0.361)	(0.00)	(0.01)
Self-employed	-3.9%	-3.2%	-7.0%	-2.9%
	(0.00)	(0.00)	(0.00)	(0.00)
Pension recipient	-0.4%	0.1%	0.2%	-1.2%
	(0.55)	(0.08)	(0.80)	(0.08)
Second Income Bracket	4.1%	5.3%	8.6%	3.4%
	(0.00)	(0.00)	(0.00)	(0.00)
Third Income Bracket	9.1%	8.5%	15.1%	7.1%
	(0.00)	(0.00)	(0.00)	(0.00)
Fourht Income Bracket	17.1%	12.0%	24.4%	14.2%
	(0.00)	(0.00)	(0.00)	(0.00)
Second Wealth Bracket	9.1%	7.5%	14.4%	17.1%
	(0.00)	(0.00)	(0.00)	(0.00)
Third Wealth Bracket	12.9%	13.9%	23.0%	29.3%
	(0.00)	(0.00)	(0.00)	(0.00)
Fourth Wealht Bracket	24.7%	22.6%	37.2%	46.1%
	(0.00)	(0.00)	(0.00)	(0.00)
Households	31.774	31.774	31.774	39.393
Log Likelihood	-10128.96	-9407.37	-13562.51	-15072.75
Pseudo R^2	0.1310	0.1082	0.1416	0.1767

Source: EVS 1993 and 1998. DPROBIT estimates using STATA. z-values in parenthesis.

The numbers in Table 8 represent the percentage change if a continuous variable changes by 1% of its value, and the percentage change if a dummy variable is changed from 0 to 1, respectively.

The age pattern is quite pronounced, and is particularly strong for total stockholding in the 1993 sample. Thus, the multivariate analysis confirms what we have seen before. Married households, however, hold less frequently stocks once all other socio-economic characteristics are accounted

for. Here, the multivariate analysis discloses a direct effect which is of opposite sign to the indirect effects generated by other socio-economic characteristics correlated with the marital status.

Single member households, holding all other socio-economic characteristics constant, are most likely to hold stocks. This is visible in Table 8 since all other household sizes have negative coefficients.

Income and wealth exhibit the strong gradient that we seen before. Households in the top quartile of the financial wealth distribution have a nearly 40% higher likelihood to own stocks (directly and indirectly) in 1993 than households with less wealth, all other characteristics equal. This effect is even more pronounced in 1998, although we cannot measure indirect stockholding.

5. The amount invested in stocks

So far, we have investigated participation in the stock market. In this section, we look at the intensity of participation, measured as the share of total financial wealth that is invested in stocks. Portfolio shares are much harder to measure since the respondents have to do more than simply saying yes or no to the question whether they hold assets. Rather, they have to state the exact amount invested in stocks and the exact amount invested in all other financial assets. Often, households refuse to state these exact amounts, increasing the likelihood those who remain in the sample are respondents which are not representative. Moreover, reporting errors are much more likely which may bias the reported figures. The results in this section should therefore be taken cautiously. Börsch-Supan and Essig (2002) provide an extensive discussion of the methodological issues which arise in the collection of wealth data. They also report non-response rates and the representativity of numerical answers by various survey methods.

Tables 9 and 10 show the portfolio shares of stocks by age and education. The complicated pattern in Table 9 is likely due to the combination of age and cohort effects. On the one hand, households born later are more open to stockholding, creating the high portfolio shares of the young (cohort effect). On the other hand, wealth increases by age, resulting in an increasing portfolio share that peaks in old age (age effect). Only panel data – not existing in Germany (and most other countries) – can tell us which effects dominate in each age range.

Table 9: Portfolio Share of Stocks by Age, Conditional on Stockholding

Age	<30	30-39	40-49	50-59	60-69	>=70	All
	1993						
Stocks	29.7%	18.3%	28.5%	14.9%	20.4%	31.1%	19.9%
Mutual funds	18.6%	23.2%	17.5%	17.3%	24.2%	29.8%	21.5%
Stocks and mutual funds	30.3%	23.7%	26.0%	18.8%	25.4%	35.0%	24.0%
	1998						
Stocks	29.9%	24.6%	18.9%	18.7%	22.3%	30.1%	22.9%

Source: EVS 1993 and 1998.

The picture is less clear with respect to education and financial wealth, see Tables 10 and 11.

Table 10: Conditional Portfolio Share of Stocks by Education

	Less than High School	High School	College	All
	1993			
Stocks	18.8%	24.8%	19.8%	19.9%
Funds	23.1%	20.9%	18.5%	21.5%
Stocks or funds	23.1%	29.2%	23.6%	24.0%
	1998			
Stocks	22.4%		23.9%	22.9%

Source: EVS 1993 and 1998.

Table 11: Conditional Asset Share of Stocks by Financial Asset Quartiles

	Quartile I	Quartile II	Quartile III	Quartile IV	Top 5 %	Top 1 %	Total
Stocks	44.9% (441)	27.5% (1447)	20.2% (2569)	19.1% (4328)	23.5% (1175)	28.0% (287)	22.8% (8785)

Source: EVS 1998. Number of observations in paranthesis.

On first sight, it might seem surprising that richer households allocate a smaller share to stocks than poorer ones. Considering the number of observations in each wealth group, this result is less puzzling: Only a small share of households in the poorer wealth groups invest in shares at all, but if they do so, their share is then rather high, so that these households are less diversified than richer ones.

Table 12: Heckman regression model with sample selection

	Stocks
Regression stage (Portfolio share of stocks)	
Age between 36 and 50	-0.0269
	(0.01)
Age between 51and 65	-0.024
	(0.02)
Over 65 years old	0.053
	(0.00)
College	0.024
	(0.00)
Married	-0.061
	(0.00)
Male	0.012
	(0.24)
Second Wealth Bracket	-0.167
	(0.00)
Third Wealth Bracket	-0.231
	(0.00)
Fourth Wealht Bracket	-0.237
	(0.00)
Constant	0.465
	(0.00)
Selection stage (Stockownwership)	

Age between 36 and 50	-0.246 (0.00)
Age between 51and 65	-0.286 (0.00)
Over 65 years old	-0.430 (0.00)
College	0.269 (0.00)
Married	-0.107 (0.00)
Male	0.185 (0.00)
Second Wealth Bracket	0.722 (0.00)
Third Wealth Bracket	1.120 (0.00)
Fourth Wealht Bracket	1.640 (0.00)
Constant	-1.734 (0.00)
Rho	-0.012
Sigma	0.217
Lambda	-0.003
Log Likelihood	-111,000,000
Households: 39393; Censored households: 30608; Uncensored households: 8785	

Source: EVS 1998. z-values in paranthesis.

6. Issues specific to Germany

Germany has a tradition of promoting the formation of household wealth. It rests on two pillars – favorable tax treatment of asset holdings and direct savings subsidies. Both pillars have strong implications for stockholding.

Starting in the fifties, German tax and subsidy policies were initially set up to foster the formation of industrial capital and housing in the early post-war years. In the sixties and seventies, the focus was gradually shifted to low- and medium-income earners with children. In the wake of reunification, subsidies and tax exemptions were temporarily expanded to promote industry, infrastructure, and housing construction in East Germany, much in spirit of the policies of the early fifties. It is in spite of this generous tax treatment that German households hold so little of their portfolio in stocks.

6.1 Savings subsidies

Three different systems of subsidies for long-term saving plans were introduced in the late fifties and sixties: Subsidies to undedicated long-term saving contracts (Sparprämie), subsidies to contributions to building society saving contracts (Wohnungsbauprämie), and subsidies to employer-sponsored saving plans (Arbeitnehmer-Sparzulage). Subsidy rates varied over time and were generally higher for dedicated saving plans. In the early years of the Federal Republic, this channeled funds away from stocks, also indirectly, because most employer-sponsored saving plans and occupational pensions were direct investments, not investments funneled through the stock market.

The inflation of the seventies seriously eroded the accessibility of the subsidies because income limits and contribution caps remained unadjusted. In the eighties and nineties, the scope of assets was narrowed to building society saving contracts and loans to the employer, but also included stocks and stock-based mutual funds. Germany may soon see yet another shift in the use of dedicated saving subsidies: It is now planned to funnel most saving subsidies to mutual funds dedicated to retirement income as an individual or company-sponsored supplement to the public pension system. This is likely to increase indirect stockownership already in the near future, see Section 6.3.

Savings subsidies were availiable to lower-middle-income households and amounted to less than 200 DM per year during the eighties and nineties.13 Successive policy changes have left their traces on households' portfolio choice. The decrease in long-term saving contracts in the eighties (Table 1) is most likely due to the decrease in real after-tax yields of long-term saving contracts compared with bonds. Table 1 suggests that a growing number of eligible households took out building society saving contracts during the nineties, but held their investment to roughly 1000 DM per year, the ceiling for the subsidies. This may have left more room for investment in stocks during the nineties.

6.2 Taxation

Stocks and mutual funds were substantially tax-favored because capital gains were not taxed if assets were held beyond the "speculation period" which was six months until recently. However, these periods were lengthened to two years in 2000, significantly reducing this incentive. Moreover, this advantage has to be seen in comparison to tax relief given to other investments. The favorable tax treatment of rented and, to a lesser degree, owner-occupied housing[14] as well as of life insurance contracts form the strongest pillars of German saving policy. Like the subsidies described above, tax exemptions generally favor low- and medium-income employee households with children.[15]

Several changes in the German tax code in the late eighties and nineties are likely to shift the balance slightly more to a leveled playing field. The two most important developments were:

- In 1991, a ruling by the German Supreme Court (*Bundesverfassungsgericht*) forced the government to end tax discrimination between labor and capital income and to introduce a withholding tax on interest income which previously (essentially) escaped taxation. The planned

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[13] A maximum subsidy of € 100 on a maximum contribution of € 500.

[14] Börsch-Supan (1994c).

[15] Life insurance contracts are a noteworthy exception to this rule. The tax treatment of interest and capital gains favors the rich. Moreover, contributions to life insurance contracts are (partly) tax exempt for civil servants and the self-employed (cf. Brunsbach and Lang, 1998).

income tax reform in 2000 aims to further reduce loopholes in the personal income tax code and to reduce tax exemptions for interest income by 50%.[16]

- In 1995, another Supreme Court ruling targeted the discriminatory tax treatment of housing against financial assets in 1995. As a consequence, the wealth tax was abolished which had favored housing and penalized stocks.

6.3 Public Pensions, Pension Reform and Pension Funds

The most important institutional change for future stockholding, however, is most likely the recent pension reform. Our assessment of importance stems from the observation that it does not appear to be a pure coincidence that countries with large and generous pay-as-you-go pension systems have small stock markets, and vice versa (Börsch-Supan and Winter, 2001, Triangle). Germany takes an extreme point in this respect: it has an almost pure pay-as-you-go pension system for the current generation of pensioners, and a very small stock market as well. If the observed cross-national correlation is indeed causal, as Börsch-Supan and Winter (2001) claim, then the recent reform will also increase stockholding. This subsection pursues this argument in more detail.

Currently, the German public pension system ("Gesetzliche Rentenversicherung", GRV) covers about 85% of the German workforce and provides about 85% of their retirement income. For the average current retiree, occupational pension do not play a major role, nor do individual retirement accounts. While there are important exceptions from this general picture, the German system is, broadly speaking a monolith that makes private retirement investment in stocks largely unnecessary.[17] The omnipresence of the public pension system is also the most plausible cause for the virtual absence of pension funds in Germany. What there is in terms of private pensions is mainly funneled through whole life insurance, while occupational pensions are largely invested in reserve accounts.

Moreover, since benefits are strictly work-related and are computed on a life-time basis in proportion to earnings, public pension benefits are roughly proportional to lift-time earnings and

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[16] For a survey of loopholes in Germany cf. Lang, Nöhrbaß, and Stahl (1997).

[17] Börsch-Supan and Brugiavini (2001) discuss the preponderance of evidence.

exhibit relatively little redistribution. Hence, the need for additional (and often stock based) investment is proportional to income and not as much a necessity for the richer households as in the UK and the US. Hence, percentages of stockholding and portfolio shares of stocks are not only small, but also rather evenly distributed in Germany, as we have seen in Table 11.

In the future, however, this pattern is likely to change fundamentally. During the period of this analysis, there have been two major pension reforms, 1992 and 2001, and many smaller adjustments in between. The main changes in the 1992 reform were to anchor benefits to net rather than to gross wages. This mechanism is particularly important when population aging will speed up and thus increase taxes and social security contributions, and it is likely to increase (indirect) stockholding through own retirement savings as a response to lower pension benefits.

The 2001 reform is intended to change the monolithic German system of old-age provision to a genuine multi-pillar system. Benefits will gradually be reduced by about 10%, lowering the replacement rate with respect to the average net earnings from 72% in 1997 to 64% in 2030. The effective benefit cuts are even larger since the credit of earnings points for education and training will be greatly restricted. The resulting "pension gap" of slightly less than 20% of the current retirement income is supposed to be filled with occupational and individual pensions. This new pillar is not mandatory, but the required private savings will be subsidized or tax privileged.

While it is speculative at this point to project how much savings will be accumulated in response to the 2001 reform, and how much of this will enter the stock market, we have some guidance. Börsch-Supan and Brugiavini (2001) present projections resting on a sophisticated macroeconomic simulation model. In the long run (year 2050), the projected new savings amount to about 10% of current gross fixed capital, and about 16% of gross fixed capital in the production sector. Most of this will be indirect stockholding.

Moreover, their simulations indicate that there will be no sudden decline in the accumulated stock around the year 2030 when the baby boomers retire. Hence, rates of return are likely to remain relatively stable in spite of the demographic changes.[18]. This long-run stability of macroeconomic

[18] Börsch-Supan and Brugiavini (2001) project a maximum decline of about 80 basis points. Main reason is that the baby boom retirement entry stretches about 10 years, during which the new pillar has not yet matured. The increase in new accounts therefore compensates for a substantial portion of dissaving among the retired baby

rates of return appears to be an important prerequisite for future stockholding in a country as conservative and risk adverse as Germany.

7. Conclusions

Stockholding is not very common in Germany but the proportion has been quickly changing between 1993 and 1998 which is the time range which our data covers. The main traits of the German stockholders are similar to those in other countries. They are individuals in their middle ages with high financial wealth and high income. They are also better educated but this effect almost vanishes once one corrects for income and wealth – the *direct* effect of education is probably small. German stock holders are more frequently singles and male. Surprisingly, stockholding is less frequent among German households who receive two incomes while recipients of self-employment income – not surprisingly – are more often stockholders than recipients of wage income.

There are many reasons to expect significant portfolio changes in the future. Germany is likely to experience more privatization, and the capital market reforms have just began. The same holds for social security reform where another reform step is expected after the 2002 Federal elections. The tax treatment of financial wealth, in particular pensions, is under review by the German Supreme Court. The increase in own provision for retirement income – via private and occupational pensions -- is likely to be the main reasons for future increases in the stock market size, similar to the developments in the Netherlands, the UK and the US since the mid 1980s.

It will be interesting to observe these changes and learn from them, not the least by comparing Germany with countries where private pensions already have more weight – and to compare the German development with countries who reform their capital markets and pension systems at an even slower speed. However, this will require new and better data. It is just astounding how weak the data base for assets and portfolios is in a country which is as wealthy as Germany, and how hard it is to reliably measure stock holdings and the portfolio share of stocks.

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boomers. Moreover, an aging economy needs additional productive capital to compensate for the decline in labor supply.

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Appendix: Details on EVS Micro Data

1. Representativity

The EVS is claimed to be a representative sample of Germany's private households. Since taking part in the EVS is voluntary for the interviewed households, the Federal Statistical Office applied quota sampling to reach proper representation. This stratified sampling of households is carried out on the basis of the EVS micro-census of the preceding year. The social position of the head of household (unemployed persons are also classified according to age and marital status of the head of household even though the head earns no income), household size and household income are taken into account. The stratified sample is used for the calculation of a target number of interviews and to compute the final. (Pöschl, 1993).

The EVS does not include segments of the population living in institutions and households with very high incomes. In the EVS 1993, the monthly net household income was limited to 35.000 DM. Since the highest income bracket of the micro-census is 7.500 DM or more, the weights are not guaranteed to represent the upper income segment (Laue, 1995). There is also doubt about how representative in the bottom income segment (Börsch-Supan, Schnabel and Reil-Held, 1998). Comparisons of the EVS with other data sources indicate too much weight given to middle income brackets, see section 2.3 as well as the discussion on ownership rates in section 3.2.[19]

2. Method of data acquisition

During the survey period each household keeps a monthly diary in which all income sources and expenditures for the most important areas are recorded. Around 70 percent of total expenditures are accounted for, without encumbering households with too much detailed bookkeeping (Lang, 1991). In addition, for one month in the year, a detailed recording of all expenditures helps account for the remaining 30 percent.[20] The records in the household-diaries are complemented by two interviews. In the "basic interview" the composition of the household, socioeconomic char-

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[19] See also Lang (1997) for an elaborate critical analysis of the EVS.

[20] In order to exclude seasonal effects, the "Detailed Record Months" are equally distributed across households. Thus each month one out of twelve households record in detail.

acteristics, as well as equipment with durable goods, and living conditions are recorded. Changes during the survey period are noted in the monthly reports. The survey ends with the "final interview," during which the household is asked for its financial circumstances and public transfer payments. This interview also permits checking the information given during the sample period.

3. Coverage

The coverage of the wealth reported in the EVS has been checked by using data from the national flow-of-funds statistics constructed by the German Bundesbank, see Börsch-Supan et al. (2000). This comparison points to severe undercoverage. Total financial wealth of private households has a coverage of around 56 percent (Guttmann, 1995). The two main reasons for this severe underreporting is that the Bundesbank data includes financial wealth owned by private non-profit organizations while the EVS only includes private households, and that the EVS excludes households with very high incomes as mentioned earlier. It is importnat to keep the latter restriction in mind especially when we look at the distribution of stock ownership by wealth in Section 4.3.

4. Scientific Use Files

While earlier surveys are confidential, an extract of the 1993 and 1998 surveys has been “factually anonymized” and is supplied to researchers. With 40,230 households in 1993 these scientific use files contain nearly 80 percent of the original sample. The basic and the final interview as well as the summarized diaries for the surveyed period are included. Selected information on income, wealth and expenditure from the upper and bottom decile were aggregated in coarser categories than originally surveyed.[21] Further selected discrete characteristics were summarized in a sophisticated manner so that no univariate distribution consists of less than 5000 cases. These “factually anonymized” scientific use files are the basis of the analysis in this paper.

[21] This coarsening was developed in two steps: a one percent error on each information in these deciles. Moreover, each of the five lowest and highest characteristics were replaced by their mean. See also Helmcke and Knoche (1992) for the method of anonymization.

5. Coding Changes

The Federal Statistical Office carries out several checks for plausibility of the EVS. Obvious coding errors are corrected. Information about wealth is estimated to correct for missing or implausible information. For example, if households offer only information about the sum of their equity wealth, this sum is distributed equally across the different kinds of equities, not a breakdown by type (Lang, 1997 and Euler, 1985). Unfortunately, an external user cannot distinguish between the original information and the changes undertaken by the Federal Statistical Office.

6. Construction of longitudinal data

Each wave of the EVS represents a separate cross-section. Even if a household has participated in two or more surveys, its identification is not possible. This makes the analysis of a major task of this paper – why has stockholding changed in the recent decade – much harder since we can only compare aggregates in a synthetic panel of the EVS waves 1993 and 1998. Households of each survey are divided up into as many homogenous household types ("cells") as possible. We then identify these cells across time. At this point, no panel data on savings and assets is available in Germany, a major obstacle to research on issues like the change in stockholding.

The task is made even more difficult by differences between EVS surveys. The EVS 1993 contains much more detailed information than earlier surveys, but also more information than the EVS 1998. Many variable definitions have changed from survey to survey. In order to obtain consistent variable definitions across cross sections, we often had to restrict ourselves to the smallest common denominator with considerable loss of information. As mentioned earlier, a main victim of this reduction in detail is indirect stockholding. All mutual funds, independent of their financial base (stocks, bonds, and/or real estate) are summarized in one category in the EVS 1998.