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Stockholding in Italy

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Luigi Guiso[**] **and Tullio Jappelli**[***]

Abstract

The study describes the aggregate trends in Italian households' portfolios in the past decade and documents a massive shift towards riskier portfolios and an increase in stock market and mutual funds participation. The study then uses microeconomic data to analyze the pattern of direct and indirect stockholding and their determinants. It documents how stockholding evolves during the life cycle and the relation between stock market participation and wealth, education, and other demographic characteristics. A major finding is that stockholding – either direct or through mutual funds and other managed investment accounts – is present only among investors with above median wealth. Even among the richest segment of the population, non-participation in stocks is quite common.

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1. Introduction

This paper illustrates the determinants of stockownership in Italy paying particular attention to the most recent developments. Historically, stockownership in Italy – as in other European countries – has not been widespread. Recently, however, there have been important developments in the composition of the portfolio of Italian households. The most significant changes are the increased participation in the equity market, the sharp increase in the share of stocks in the portfolio (held either directly or through mutual funds), and the parallel decline of transaction accounts and government bonds.

In the eighties direct stockholding accounted for about only 15 percent of households' financial assets. Indirect holding through mutual funds was virtually absent. The thinness of the Italian stock market and its volatility discouraged equity holding, even after the introduction of mutual funds in 1984. Capital controls, in place until 1989, prevented households from achieving international diversification. The high level of government debt and the high interest rates necessary to finance it, made stocks relatively unattractive.

By 1998 direct stockholding accounted for about 30 percent of household financial wealth; mutual funds and other managed investment represented another 16 percent. Stockownership has become more widespread and households are now much more used to invest in stocks and mutual funds than in the past.

In this paper we provide a thorough analysis of the trends in the portfolio of Italian households and of their propensity to invest in stocks. We study the determinants of the decision to invest in the stock market and of the share of equities in total financial wealth, and identify the main variables that explain household heterogeneity in the propensity to invest in stocks. The main source of data is the Survey of Household Income and Wealth, a biannual survey run by the Bank of Italy with the specific purpose of providing information on household saving, income and wealth. The survey is particularly well suited for the purpose at hand because it collects detailed information on the composition of household financial wealth and on demographic variables. It is also repeated over time, allowing interesting comparisons in trends in the composition of the household portfolios.

In Section 2 we document the main trends in household portfolios that took place in the last decade drawing from the aggregate financial accounts. We also refer to institutional

changes and financial reforms that are likely to have contributed to the increase in the share of risky assets in household portfolios and to the development of an equity culture. In Section 3 we present household level data on stockownership in Italy. In Section 4 we identify critical variables that are associated with stockownership. The analysis considers variables that economic theory predicts should be relevant to explain the decision to invest in stocks: investor's age (as an indicator of planning horizon), wealth and education (as an indicator of financial information). We then summarize the data with regression analysis. The regressions allow us to explore the relation between the decision to invest in stocks and relevant explanatory variables controlling for other determinants of stockholding. In Section 5 we explain the determinants of the share of stocks in total financial wealth among households that have chosen to invest in stocks. We characterize the relation between portfolio shares (conditional on participation) and age, wealth, education and other demographic characteristics. In Section 6 we explore further the role of financial information and of transaction costs in shaping the portfolio of Italian households. Section 7 summarizes the main patterns of stockholding in Italy.

2. Macroeconomic trends in household portfolios

Before turning to a thorough analysis of stockholding with household level data, we describe the trends of the financial portfolio and of stockholding drawing from the national financial accounts of the household sector. Table 1 reports aggregate shares of financial assets in total financial wealth in 1990 and 1998. The table immediately reveals that the composition of household financial assets has changed dramatically during the past decade. Currency and deposits (checking and saving accounts) declined sharply, from 36.8 percent in 1990 to 22.7 percent in 1998. The share of government bonds has more than halved, while bonds issued by private corporations have significantly increased.

The most significant change, however, is the increase in the share of stocks, mutual funds and other managed investment accounts. The combined share has risen from about 23 percent of financial wealth in 1990 to 47 percent in 1998. By the end of the millennium direct stockholding accounts for about a third of households financial wealth and mutual funds by

16 percent. Although part the increment reflects the increased market valuation that has taken place in the second half of the past decade, this is not the whole story.

The change in portfolio composition towards more stocks reflects a deep change in household portfolio strategies. The importance of foreign assets has also increased steadily over the 1990s. Almost absent in 1990, they now account for more than 6 percent of financial wealth. Of these, 40 percent are stocks, 10 percent mutual funds and 50 percent long-term bonds, suggesting that foreign assets are offering better opportunities to diversify risk. While home-country bias is definitely a feature of the portfolio of Italian households, the trend suggests that the weight of foreign securities in financial wealth is bound to increase even more in the future. Finally, the indebtedness of Italian households has also increased albeit at a slow pace.[1]

In sum, over the past decade the portfolio of Italian households has become much more oriented towards risky assets than it has ever been before. A number of factors contribute to explain the observed trends. Some relate to changes in asset return, others to institutional developments that have increased the incentive to invest in the stock market.

First, the nominal yield on transaction accounts and on short-term bonds has declined significantly over the nineties, while the return on equities, mutual funds and managed investment accounts has been substantial. The nineties witness also a remarkable development of mutual funds. Introduced in 1984, when only 10 were operating, their number rose to 184 in 1990, 459 in 1995 and over one thousand in 2,000. The market value of mutual funds increased especially in recent years, from 7.2 percent of GDP in 1995 to over 20 percent by the end of the nineties. Commercial banks have massively entered the sector increasing competition and reducing entry costs and management fees. Fierce advertising campaigns to acquire market shares have contributed to spreading financial information. Financial innovation in terms of packaging of new financial products has been substantial. By offering diversification opportunities not available before and reducing minimum investment constraints, mutual funds have enhanced Italian households' willingness to invest in domestic and foreign risky financial assets.

A second factor has been the privatization of state-owned enterprises and public utilities that has taken place in the 1990s. Starting in 1992, over 25 large state-owned corporations, including public utilities and state-owned banks, were successfully privatized with total

revenue of about 71 trillion euro. The privatization process and the number of firms going public have increased stock market capitalization.[2] The privatization process was accompanied by massive advertising campaigns, which helped households to become acquainted with stocks and their return and risk characteristics.[3] It is likely that this dissemination of information has increased permanently stockholding.

The reform of the social security system and the diminished expectations of pension benefits are urging households to rely increasingly on their own savings for retirement. As a consequence, private pension funds – traditionally negligible items of households' portfolios – have started to increase. Pension funds, in turn, tend to hold riskier portfolios than the representative household contributing to increase stock market liquidity and thus direct participation. Finally, the lifting of capital controls, which have been in place until 1989, has improved portfolio diversification through acquisition of foreign assets. The marked fluctuations in the exchange rate following the exit of the Lira from the ERM in October 1992 slowed down the process, which has in fact accelerated after Italy has rejoined the fixed exchange rate agreement in November 1996. With the single currency and the consequent elimination of exchange rates risk and regulatory standardization in different European countries, we expect a further reduction in the home bias in the coming years.

These developments notwithstanding, the financial portfolio of Italian households – as it results from the financial accounts – retains several features of backwardness. The share of currency and transactions accounts in financial wealth is still relatively high in comparison with other industrialized countries; many financial assets have short maturities. The breadth of the Italian stock market has not yet reached the standards of other industrialized countries. In 1996 the number of listed firms was 3.8 per million inhabitants, while in the EU it was 13.5. Stock market capitalization was 21 percent of GDP, against 40 percent in the EU (Cecchetti, 1999). Finally, household debt remains low by international standards, despite deregulation, which has prompted an increase in the supply of loans to households. Low indebtedness reflects mainly supply side factors and financial backwardness. Imperfections in the credit market and limited access to credit have important interactions with portfolio

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[1] In 1998 the ratio of debt to financial assets was only 8 percent.

[2] Between 1990 and 1997, 71 firms went public. An almost equal number de-listed, so that the number of listed firms has remained unchanged at 244.

[3] For instance, the privatization of ENEL – the national electric company - the last to take place in October 1999, featured 3.8 million bookings. To meet all demands the government has raised to 34 percent the share of

decisions, as investors may be discouraged from holding stock in anticipation of liquidity constraints (Paxson, 1990; Guiso, Jappelli and Terlizzese, 1996).

Macroeconomic aggregates conceal crucial issues in analyzing household portfolio. The aggregate financial accounts cannot establish if the change in asset shares that we observe in the last decade is due to a change in participation or in amount invested conditional on participation. Aggregate data are of no use in assessing whether holdings of stocks and other assets vary systematically with wealth or demographic characteristics (age, education, and demographic characteristics of the household). They also cannot address issues of portfolio mobility: even though an aggregate asset share is constant over time, there can be large and compensating movements in and out the financial markets. To address these issues one must rely on survey data.

3. Data on stockownership in Italy

The main microeconomic data source used in this paper is the Survey of Households Income and Wealth (SHIW). For most purposes we rely on the last publicly available wave, which refers to 1998; but for comparison we use also some of the previous waves, covering the period 1989-1995. The Bank of Italy conducted the 1998 SHIW on a representative sample of 7,147 households. The survey collects detailed information on the composition of Italian households' wealth, both real and financial. A special section of the questionnaire addresses crucial issues in the analysis of household portfolios and stockholding, such as knowledge of the various financial instruments and exposure to background risk. Thus portfolio data are particularly rich. Besides reporting portfolio data, the SHIW contains a comprehensive set of demographic characteristics of all household members. Here we summarize the main characteristics of the data.

Table 2 illustrates information available on stockholding in the 1998 SHIW. The survey contains data on direct and indirect stockholding through mutual funds and other managed investment accounts. It reports data on direct stockholding, both on participation and amounts, separately for listed and non-listed shares. It also has data on the shares of the

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ENEL capital on sale from the initial share of 24 percent.

company where a member of the household works (reported as a fraction of the total value of the stocks) and on the number of companies in which shares are held. These variables offer some guidance on the degree of diversification of risky assets and reasons for participation. Finally, the survey reports information on ownership and amount of foreign stocks and stocks in privatized firms. This level of detail is absent in the previous surveys and has been introduced in the 1998 wave after the privatization program and the increasing international diversification of the second half of the nineties.

Many investors do not hold stocks directly, but through mutual funds and other managed accounts. The SHIW reports participation and amount invested in mutual funds and participation in pension funds and life insurance (the cash-value of life insurance and pension funds must be imputed). No detail is offered as to the composition of the fund. Considering that all those who invest in mutual funds also invest in stocks overstates stockholding, though it is difficult to say by how much.

Participation and amount invested is elicited with considerable care. For each of 17 assets, respondents report participation and amount invested. Those who don't report the amount are asked to indicate the bracket where the asset value falls (14 brackets are provided). For these respondents, asset values must therefore be imputed. The problem of bracketing can be handled by assuming that households own the mid-point of the interval or by applying more sophisticated imputation procedures, such as that suggested by Stewart (1983). Imputation requires modeling the responses within each bracket, and its advantage diminishes when the number of brackets is relatively detailed, as in the case at hand, see Miniaci and Weber (2001). We thus proceed with the first alternative.[4]

Though this study uses the best available source to study the portfolio of Italian households, the data are almost surely contaminated by reporting errors and (unavoidable) imputation on our part. The difference observed between the aggregate financial accounts and the survey value of stocks could be traced back to various sources, including non-reporting, underreporting and imputations. Even absent these problems, however, the survey data are bound to underestimate the national aggregate. With the notable exception of the US Survey

[4] The cash value of life insurance and pension funds is not reported in the survey. In the 1998 wave we have information only on participation and annual contributions and on the year in which the household started to contribute. This information is used to impute the cash value of pension funds and of life insurance policies on the assumption that the average years of contributions remained constant over time and that contributions accumulate at the real interest rate of 3 percent.

of Consumer Finances, richer households are largely under-represented in virtually all surveys. Given the high concentration of stocks in the richest segment of the wealth distribution, stock amounts are therefore grossly understated in any representative survey.

This suggests two considerations. First, as explained, reporting errors and imputation affect estimates of asset amounts more than asset participation, so we are more confident about statements on the latter than on the former. Second, if the main source of the difference between the national accounts and the survey information on stocks is that the rich are under-represented, then the survey data remain very useful for understanding differences in participation and amounts invested for the remaining portion of the population.

4. Who holds stocks?

In this section we describe stock market participation relying on two definitions of stockownership:

- The first definition is narrow, and considers only shares held directly. 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, managed investment accounts and pension funds (to the extent that these funds invest at least part of their portfolio in stocks). Due to data limitation we cannot distinguish mutual funds that invest in stocks from those that invest in bonds, or that part of the fund that is invested in stocks. Thus, direct and indirect stockholding is an upper bound for total stockholding.

Table 3 reports 1998 summary statistics. Sample characteristics refer to the head of the household. The average age is 54 years, 68 percent are married and 72 percent are males. Almost two thirds of the sample has compulsory education. The remaining third has either high school degrees (27.6 percent) or college degrees (7.7 percent). The vast majority of households (72 percent) have between 2 and 4 members; the proportion of single-earner is

about the same as that of two-earners (40 percent). Pension recipients represent 41 percent of the sample, 36 percent are wage earners, 14 percent are self-employed, and 4 percent unemployed.[5]

The proportion of households that invest in stock directly is 7.9 percent, while that investing in mutual funds and other managed investment accounts is 11.1 percent and that having pension funds is 7.9 percent. This allows us to place the upper bound of stockholding (direct or indirect) at 19.9 percent. It is worth noting that participation has increased considerably in the last decade, from about 8 percent in 1989 to 19.9 percent in 1998. However, it is fair to say that even in 1998 only a minority of households invests in stock, and that the share is relatively low by international standards. Recent data from the 2001 BNL Survey on household saving confirms these figures: estimating that direct and indirect participation in 2001 is 21 percent (Jappelli, Julliard and Pagano, 2001).

There are at least two reasons for the low stock market participation. First, information, entry, and management costs are not trivial. Second, historically the Italian stock market has been extremely volatile, a consequence of a small and illiquid stock market.[6] In the last four decades the standard deviation of the real growth rate of stock prices was 35 percent, as opposed to standard deviations ranging from 16 to 19 percent in France, Germany, the UK and the US. The increased participation in mutual funds has been favored by the appearance of mutual funds leading to lower transaction costs and better risk diversification.

However, entry costs remain high, particularly at low wealth levels. Minimum investment requirements further prevent entry. Transaction costs can explain why stock market participation is low compared to other countries at a similar stage of economic development. However, they cannot account fully for cross-sectional differences between stockholders and non-stockholders. We now turn to examine some of these characteristics in detail.

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[5] 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 and close to the national average (11 percent).

[6] In turn, stock market illiquidity, can be imputed to a number of factors that act either on the supply of publicly held stock, their demand, or both. Creditors' weak legal protection is often claimed to make investors unwilling to hold shares; lack of transparency and low-quality accounting standards have similar effects, see Panetta, Pagano and Zingales (1998). On the supply side, ownership concentration can inhibit firms to go public.

4.1 Age and stockownership

Table 4 reports the age profile of stockholding separately for direct holding, mutual funds and other investment accounts, pension funds, and for the total. In all cases, participation is hump shaped. With the exception of pension funds, at the beginning and at the end of the life cycle the proportion of stockholders is about the same. Participation peaks in the age class 50-59. At peak, the proportion of direct stockholders is 10.2 percent (2 points above average), that of mutual funds is 13.9 percent (3 points above average), and that of pension funds is 8.9 percent (1 point above average). For total stockholding, the peak is at 24 percent.

Figure 1 plots the age profile of the three categories (stocks, mutual funds and pension funds) and total (direct plus indirect) stock market participation. The raw data are smoothed by a probit regression with a third-order age polynomial. The figures confirm most graphically a marked hump in participation. With pure cross-sectional data it is not possible to distinguish a pure age profile from cohort effects, that is it might well be that older households in Figure 1 invest less in stocks because they belong to a different generation, not because a genuine age effect. Repeated cross-sectional data can be used to purge the cross-sectional age-profile from cohort effects. We thus use the 1989, 1991, 1993, 1995 and 1998 to explore if cohort effects contaminate the cross-sectional profile.

Given the collinearity between age, time and cohort, with repeated cross-sectional data we can identify only two of these effects. In principle, there are two plausible identifying assumptions. One is to explain the raw data in terms of cohort and age effects. This decomposition disregards time effects, or assumes that they reflect idiosyncratic macro shocks that sum to zero and are orthogonal to a time trend (Deaton and Paxson, 1994). The other is to interpret the data as a combination of age and unrestricted time effects. We experimented with both to see which provides a more plausible description of the data. The decomposition in terms of cohort dummies (or polynomials), age dummies (or polynomials) and restricted time effects produces an increasing age profile (from 10 percent at age 20 to 80 percent at age 80), an offsetting and declining cohort effect and absence of time effects. Since the theory of portfolio choice provides no strong reason for including cohort effects in participation, we believe that the implausible combination of increasing age effects and decreasing cohort effects simply reflects a trend in participation. Financial innovations and increased competition among financial intermediaries (see Section 2) supports such an

interpretation of the data, so we conclude that the age-profile in Figure 1 is a valid description of the data.

The hump in the age-profile of participation suggests the presence, at all ages, of significant fixed costs in purchasing stocks, and that investors consider investing in stocks only after they have accumulated substantial wealth. This effect is even more apparent if one considers that the incentive to invest in stocks is stronger for the young, as suggested by several theoretical models, see Heaton and Lucas (2000) and Haliassos (2001). Yet in the data we observe a humped shape.

4.2. Education and stockownership

Table 5 breaks down stockholding by the educational attainment of the head. Education can affect portfolio choice for at least two reasons. It is correlated with a person's permanent income and wealth. Education also correlates with an investor's ability to acquire and process information, and with financial sophistication in general. Both reasons suggest a positive correlation between education and stockholding. We classify education in three groups: compulsory education (corresponding to 8 years of schooling), high school degree (5 additional years of schooling) and college degree or higher. Table 5 indicates that in the group with college degree participation is more than twice the average, while in the group with compulsory education it is about half the average. The effect of education on indirect stockholding is even stronger than that on direct stockholding. Interestingly, in the group with a college degree (8.7 percent of the total sample) total stockholding is 43.6 percent.

If the age profile of stockownership is plotted by educational attainment one observes for each group the same humped shape in participation that we document in Figure 1 for the whole sample (for brevity these graphs are not reported). In particular, for investors with a college degree the profile of participation is steeper early in life and peaks later than for the less well educated.

4.3. Wealth and stockownership

Portfolio models with fixed participation costs into 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. The theoretical prediction is therefore that stock market participation is an increasing function of wealth. 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. In Italy in the past decade the threshold level was about euro 5,000 (slightly higher than median financial wealth in 1998).

Table 6 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 virtually absent in the first quartile (0.4 percent have stock, 1.2 percent mutual funds, 0.3 percent pension funds) and very low even in the second. Thus, below median financial wealth virtually no household invests in stocks. This finding is confirmed even if one considers direct and indirect stockholding (only 1.5 percent of those in the first quartile and 5.3 percent in the second quartile invest in stocks). Even in the third quartile the proportion of households investing in stocks is only 4.6 percent, about half the sample average. Stock market participation is much higher in the fourth quartile (26.8 percent), and even higher in the top 5 and 1 percent of the wealth distribution (50.5 and 60.9 percent, respectively).

Indirect stockholding is higher than direct stockholding above the third quartile of the wealth distribution, consistent with the fact that direct entry in the stock market is more costly than purchasing stocks indirectly through mutual funds. Overall, about 53.8 percent of those in the fourth quartile invest in stocks, either directly or indirectly. The proportion rises to 76.7 and 78.3 percent for households in the top 5 and 1 percentiles, respectively. Sorting the data by disposable income reveals a similar pattern. Participation is virtually absent in the two bottom income quartiles. Significant stockholding appears in household portfolios only for those with income above the median. For brevity these results are not reported.

It is worth pointing out that even in the top percentiles of the wealth and income distributions there is a non-negligible fraction of households that do not invest in stocks or in mutual funds. This is hard to explain with the presence of fixed costs alone and suggests that features other then monetary participation costs are relevant in explaining stockownership.

4.4. Characteristics of stockholders 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. Here we extend the comparison between stockholders and non-stockholders to a richer set of household characteristics. Table 7 displays sample means of demographic and economic characteristics for households that invest in stocks directly, indirectly through mutual funds and pension funds, for those that invest in either stocks, mutual funds and pension funds, and for those who do not invest in stocks.

Compared to non-stockholders, stockholders are more likely to be married (especially for indirect holding), male and have households of 2 to 4 members with more than 2 income recipients. Being a wage earner does not seem to affect the decision to invest in stocks. The self-employed are two times 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 share of their wealth in their own 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, is 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.

The last rows of Table 7 report also the proportion of respondents that work in small and large business by stock-ownership status. If one reason for stockownership is investing in the company one works for, then the fraction of stockowners should be higher for employees of a large company than for those of a small one. The data are consistent with this hypothesis: the proportion of those employed by a company with more than 50 employees is higher for stockholders (50 percent) than for non-stockholders (47 percent). The reverse is true for the proportion of those employed by smaller companies (less than 50 employees).

4.5. Types, number of stocks and investment in the employer's company

The microeconomic survey allows us to highlight some interesting features of stockownership, such as the type of stocks held, the number of different stocks in the portfolio, and the nature of the equity issuer. Table 8 reports the distribution of stockholding by type of stock in 1998. Among stockholders (direct and indirect) the fraction of those holding listed stocks is 44 percent. Half of these listed stocks are stocks of privatized companies, consistent with the important role of the privatization process in promoting stockownership.[7] Almost 10 percent invests in stocks of non-listed companies and about 4 percent in other stocks, typically non-listed. A tiny fraction of households (2.8 percent) invests directly in foreign stocks, a reflection of the extent of the home bias in household portfolios.

Table 9 focuses on direct stockholders only. For this group, it reports the distribution of the number of different stocks. Most stockholders (43 percent) invest in only one company, 25 percent in two companies, 25.6 percent in three to five different companies. Very few investors have stocks of more than 5 companies, suggesting that household portfolios are poorly diversified. Monitoring costs and costs of acquiring information on several companies may limit the number of stocks in the portfolio. This explanation is consistent with the previous evidence concerning low participation in foreign stock markets, which are more costly to monitor.

To complete the picture, Table 10 reports the number and proportion of households that own equity in the employer's company (first panel) and the proportion of the value of stocks in the total value of stocks held (second panel). The table focuses again on direct stockholders. About 16 percent owns stocks of the employer's company, on which presumably it is easier to have better and direct information. For about half of them this is the only stock owned directly. For another 20 percent, stocks in the employer's business account for between 50 and 99 percent of total direct stockholding.

4.6. Econometric estimates

We summarize our exploratory analysis of the determinants of stockownership by reporting

[7] It also reflects the fact that privatized companies were already listed prior to privatization.

probit regressions for stockholding. The results are reported in Table 11 separately for stocks, mutual funds, pension funds, and overall participation. Results are easy to interpret, because each of the regressors is a dummy variable, and each of the coefficients indicate the effect of the dummy on the probability of investing in a particular asset. The results broadly confirm the descriptive evidence.

Although several of the age dummies are not statistically different from zero, the probits indicate the presence of a humped shape in participation. High school and college degree raise the probability of investing in stocks by 2 and 4 percentage points, respectively. Results for mutual funds, are similar, while for pension funds we do not find a clear association between education and participation. Demographic variables such as married and male are not important determinants of stock-ownership. Other demographic variables, such as household composition, have been excluded for lack of significance.

Financial and real wealth quartiles are very important determinants of all the probit regressions in Table 11. Focusing on the last column (direct and indirect participation) we find that the probability of investing in stocks in the second financial wealth quartile increases by 21 percent (with respect to the first quartile), 48 percent in the third quartile, and 68.9 percent in the third quartile. The effect of real wealth is not as strong as that financial wealth, and is statistically different from zero only in the fourth quartile.

The last rows of Table 11 indicate that residency in the South is generally associated with less participation, and that households resident in provinces with higher unemployment rates invest less in stocks, mutual fund and pension funds. The result for the unemployment rate is particularly interesting, as this variable is a proxy for the overall riskiness of the economic environment in which households make their decisions. This variable may therefore reflect the discouraging effect of background, undiversifiable risk on risky investment (Guiso, Jappelli and Terlizzese, 1996; Lucas and Heaton, 2000). On the other hand, households resident in provinces with more developed capital markets (as measured by the number of bank branches in the province) invest more in stocks and mutual funds, raising overall participation in the stock market.

5. The amount invested in stocks

While age, education and wealth are important determinants of the decision to invest in stocks, mutual funds and pension funds, the asset share invested in stocks, mutual funds and pension funds is much harder to predict. Table 12 reports a breakdown of the shares by the age of the household head. Each share is computed in the group of households that invest in stocks, mutual funds or pension funds (1493 observations). This way the different shares can be more easily compared.

In the total sample, the asset share of stocks is 10.7 percent, 24.2 percent for mutual funds, and 16.9 percent for pension funds, with a total investment in these assets of 51.8 percent. While for stocks and mutual funds the share is slightly increasing in age, the pattern of pension funds is opposite, reflecting much higher contribution rates for the young. Thus, the overall profile of the share is rather flat, ranging from 44.1 percent for the youngest group to 49.6 percent for the oldest.

Asset shares by education are reported in Table 13. As with age, the education profile is rather flat (and even decreasing for pension funds). Finally, grouping households by financial asset quartiles, reveals that the asset share invested in stocks by investors in the lowest quartile (14.9 percent) is similar to that invested by investors in the fourth quartile or top 5 percent of the wealth distribution. The total share (stocks, mutual funds and pension funds) is 46.5 percent in the lowest quartile, and 55.3 percent in the top quartile. Clearly, age, education and wealth matter for the decision to invest in stocks, and much less for the amount invested in each of these assets. This insight is confirmed by regressions analysis.

Estimation of asset shares with microeconomic data requires careful econometric modeling. To clarify, let's consider the case of the asset share invested in stocks. OLS estimates of the share invested in stocks on the entire sample are inconsistent, because not all households invest in stocks. OLS estimates of the share on the restricted sample of households who invest in stocks are also inconsistent because they are subject to selection bias. Miniaci and Weber (2001) explain that the best strategy is to model the demand for stocks as a two-stage decision process, where the first step is a probit regression for the probability of investing in stocks, and the second step consists in estimating the conditional demand of stocks, using the first stage probabilities to correct for selectivity bias.

In practice, we posit that households choose first whether to invest in stocks or not, and then how to allocate financial wealth between stocks and other assets. To identify the

demand for stocks, one must consider different sets of explanatory variables in the first and second stage regressions. The identification restriction in the empirical analysis is that information and transaction costs affect the decision to invest in stocks, but not the amount purchased. In the first stage (the probit regression), these costs are proxied by the number of bank branches in the province, region of residence, the index of financial development and the provincial unemployment rate. These variables are therefore excluded from the second stage regressions. We model the demand for mutual funds and pension funds and the overall share invested in stocks, mutual funds and pension funds in similar way.

The results of the second stage estimation are reported in Table 15. Overall, the regressions indicate that it is hard to predict conditional asset shares on the basis of standard economic and demographic variables. None of the age coefficients is statistically different from zero. With the exception of the "college" dummy in the equation for stocks, the education categories are also not statistically different from zero. The asset share of stocks increases with wealth but, again, the coefficients of the dummies for financial wealth are not statistically different from zero.

6. Information and transaction costs

In 1998 direct stock market participation was about 8 percent. Including also indirect participation through mutual funds and pension funds raises participation to about 20 percent. Participation is limited or absent below median financial wealth, and even in the fourth quartile of the wealth distribution it is only slightly above 50 percent. On the other hand, the correlation between the amount invested in stocks and financial wealth is weak at best.

The strong correlation between wealth and stock market participation points to the importance of fixed participation costs as a crucial element in understanding the portfolio choice of Italian investors. These costs take various forms, from minimum investment requirements, to transaction costs in purchasing stocks and mutual funds, to information costs.

Currently, typical entry costs or exit fees for equity funds are still generally in the order of 3 percent for investment under 5,000 euro. A significant reduction in costs applies only to very large investments, above 500,000 euros. Sometimes mutual funds do not charge

at entry but impose an exit fee that varies with the amount invested and the timing of disinvestments. Even these fees vary between 2 and 3 percent for investment of 5,000 euros withdrawn after 1 year. The finding that the index of bank diffusion – which we regard as a good proxy for financial transaction costs – correlates positively with participation lends indirect support to the importance of these costs in Italian financial markets.

Managing a portfolio requires effort and knowledge of transaction costs, asset returns, volatility, and covariances with other assets. In this respect, in Italy many households lack not only sophisticated financial information, but also basic knowledge of financial assets. A set of questions in the 1998 SHIW asks respondents to report knowledge of each 17 popular assets. About one third of the sample does not know of the existence of equities; over 50 percent are ignorant of the existence of mutual funds. About half of the sample is unaware of the existence of certificates of deposit and corporate bonds.

These results are confirmed by a recent survey carried out by Filippa and Franzosi (2001) for the Italian Stock Exchange. The survey indicates that most investors lack financial information: about two thirds of the investors do not even know how much time they use for this activity (implying that it must be a marginal activity), and about 75 percent for women, the elderly and resident in the South .Of those who know, median time dedicated to personal finance is less than 30 minutes per week. The results of this survey are even more telling considering that the sample is a highly selected group of investors that own stocks listed at the Milano Stock Exchange. This type of investor is not only more educated and richer than the median investor, but should also be particularly interested in gathering financial information and following stock market developments.

Even more striking is the finding by Filippa and Franzosi that among the selected group of investors with listed stocks only about two thirds know the existence of mutual funds and less than 50 percent the existence of certificates of deposits and of non listed shares. The evidence from the SHIW and from the survey of investors in the Milano Stock Exchange represents therefore strong evidence that Italian investors lack basic financial information, and that informational barriers represent a significant obstacle to stock market participation.

7. Conclusions

In this paper we provide a thorough analysis of the trends in the portfolio of Italian households and of their propensity to invest in stocks. We study the determinants of the decision to invest in the stock market and of the amount invested, and identify the main variables that explain household heterogeneity in the propensity to invest in stocks. Our main source of data is the Survey of Household Income and Wealth. The survey is particularly well suited for the purpose at hand because it collects detailed information on the composition of household financial wealth and on demographic variables.

We find that direct stock market participation is about 8 percent. Including also indirect participation through mutual funds and pension funds raises participation to about 20 percent. The age profile of participation is hump shaped, with a peak around the age of 50, and participation is generally correlated with education. Participation is limited or absent below median financial wealth, and even in the fourth quartile of the wealth distribution it is only slightly above 50 percent. On the other hand, the correlations between the amount invested in stocks and age, education, and financial wealth are generally weak.

The strong correlation between wealth and stock market participation points to the importance of fixed participation costs (minimum investment requirements, transaction costs, and information costs) as a crucial element in understanding the portfolio choice of Italian investors.

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Appendix

In this Appendix we report detailed information on the 1998 Survey of Household Income and Wealth and on the characteristics of portfolio data used in this paper.

The 1998 Survey of Household Income and Wealth

The 1998 Bank of Italy Survey of Household Income and Wealth (SHIW) collects detailed data on demographics, households' consumption, income and balance sheets. The survey covers 7147 households. The SHIW surveys a representative sample of the Italian resident population. Sampling is in two stages, first municipalities and then households. Municipalities are divided into 51 strata defined by 17 regions and 3 classes of population size (more than 40,000, 20,000 to 40,000, less than 20,000). Households are randomly selected from registry office records. The net response rate (ratio of responses to contacted households net of ineligible units) is 43 percent. Households are defined as groups of individuals related by blood, marriage or adoption and sharing the same dwelling. If the head is a female, and the spouse is a male, we define the household head to be the male. A CD-ROM containing the entire historical SHIW archive can be obtained by writing to: The Research Department, Banca d'Italia, Via Nazionale 91, 00186 Roma, Italy.

Stock market participation and amount invested

Respondents report participation in 25 financial assets categories: transaction accounts, 2 categories of saving accounts, certificates of deposit, repurchasement agreements, postal accounts, postal bonds, 5 categories of government bonds (BOT, CCT, BTP, CTZ, other government bonds), corporate bonds, mutual funds, listed stocks, 3 categories of unlisted shares, 3 categories of managed investment accounts, 3 categories of foreign assets (corporate and government bonds, stocks, other foreign assets), loans to cooperative societies. For each of 25 assets, respondents are first asked:

Do you invest in [*this particular asset*]?

If the answer is yes, the interviewer gives the respondent a list of 14 brackets, and asks him to report the interval:

Up to 2 million lire
Between 2 and 4 million
Between 4 and 8 million
Between 8 and 12 million
Between 12 and 16 million
Between 16 and 24 million
Between 24 and 36 million
Between 36 and 70 million
Between 70 and 140 million
Between 140 and 300 million
Between 300 and 600 million
Between 600 million and 1 billion lire
Between 1 and 2 billion
Above 2 billion

The respondent is then asked:

Could you tell me the approximate amount you invest in [*this particular asset*]?

If the respondent refuses to answer, the interviewer asks for each asset:

Could you at least tell me if the amount is closer to the upper interval, to the lower interval, or in the middle of the interval?

Imputation of stock amounts

The problem of bracketing can be handled either by assuming that all households own the mid-point of the interval or by applying more sophisticated imputation procedures, such as that suggested by Stewart (1983). The advantage of the second procedure falls with the number of brackets. Since we have 14 brackets, we proceed with the first alternative.

Financial assets are the sum of the 25 asset categories, plus the cash value of life insurance and the cash values of defined contribution pension funds. These must be imputed separately on the basis of the yearly contribution and on the number of years of contributions and then added to the other financial assets.

Total financial assets come to only about half of the corresponding financial account aggregate. The items that are more seriously underestimated are corporate bonds, stocks, mutual funds, life insurance, private pension funds and foreign assets. This is partly due to under-sampling and under-reporting by the wealthy, which own a disproportionate share of these financial instruments.

Table 1
Composition of Household Financial Wealth: Aggregate Financial Accounts

The table reports the composition of household financial wealth from the aggregate financial accounts. Transaction accounts include certificate of deposits. Other bonds include bonds issued by private enterprises, Special Credit Institutions and foreign bonds. Cash value of life insurance includes assets held by domestic and foreign insurance companies as a counterpart to life insurance policies sold to residents. The household sector includes also non-profit organizations and unincorporated business.

	Asset shares	
Financial assets	**1990**	**1998**
Currency, transaction and savings accounts	36.80	22.69
Government bonds	27.42	10.35
Other bonds	3.16	9.53
Stocks	20.87	30.53
Mutual funds and managed investment accounts	2.30	16.42
Defined-contribution pension funds	5.93	4.54
Cash value of life insurance	3.09	5.92
Other financial assets	0.43	0.02
Total financial assets	100.0	100.0
Stocks, mutual funds and defined contribution pension funds	29.10	51.49
Total financial asset (billion euro, 1998 prices)	2021	2221
Number of households (million)	18,8	19,7
Financial assets per household (thousand euro)	107	113

Table 2
Sources and Type of Information on Ownership and Amount of Stocks, Mutual Funds and Pension Funds

The table summarizes the available information that is relevant for describing patterns of direct and indirect stockholding. Data refer to 1998.

	Detail on survey questions	
	Ownership	**Amount**
Stocks, of which	Yes	Yes
Listed shares	Yes	Yes
Non-listed shares	Yes	Yes
Employee share	Yes	Yes, available as a share of the total value of stocks
Shares of privatized companies	Yes	Yes, in brackets and amounts
Foreign shares	Yes	Yes, in brackets and amounts
Number of companies in which respondent owns shares	Yes	Not available for individual stocks
Mutual funds and other managed accounts	Yes, but no information on specific funds	Yes, but no information on specific funds
Defined contribution pension funds (individual and employer-sponsored pension plans)	Yes, with distinction between individual and employer-sponsored plan	Contribution in 1998 is available, cash value of pension fund must be imputed
Life insurance	Yes	Contribution in 1998 is available, cash value of life insurance must be imputed

Table 3
Summary Statistics

The table reports means and standard deviations for the main variables used in the study. All statistics are computed using population weights. Income and wealth are reported in thousand euro. Data are drawn from the 1998 SHIW.

Variable	Sample mean	Standard deviation
Age	54.58	15.76
Education: less than high school	0.647	0.48
Education: high school	0.276	0.45
Education: college	0.077	0.27
Married	0.685	0.46
Male	0.725	0.45
Singles	0.195	0.40
Between 2 and 4 household members	0.718	0.45
More than 4 household members	0.087	0.28
One income recipient	0.440	0.50
Two income recipients	0.419	0.49
More than two income recipients	0.140	0.35
Wage earner	0.360	0.48
Self-employed	0.141	0.35
Unemployed	0.041	0.20
Pension recipient	0.413	0.49
Income	24.93	21.59
Financial assets	24.06	72.97
Real assets	126.96	287.64
Participation		
Proportion investing in stocks	0.079	0.27
Proportion investing in mutual funds	0.111	0.31
Proportion investing in pension funds	0.079	0.27
Proportion investing in stocks, mutual funds or pension funds	0.199	0.31
Amount invested		
in stocks, among stockholders (578 households)	25.38	54.18
in mutual funds, among those who invest in mutual funds (844 households)	45.88	107.70
in pension funds, among those who invest in pension funds (570 households)	11.37	10.26
In stocks, mutual funds and pension funds, among those who invest in these assets (1493 households)	39.96	99.99
Memo: Financial assets among those who invest in stocks, mutual funds or pension funds (1493 households)	70.96	131.82
Total number of households	7,147	

Table 4
Participation in Stocks, Mutual Funds and Pension Funds, by Age

The table reports the fraction investing in stocks by age. Data are drawn from the 1998 SHIW. All statistics use population weights.

	<30	**30-39**	**40-49**	**50-59**	**60-69**	**≥70**	**Total**
Stocks	0.041	0.095	0.083	0.102	0.074	0.050	0.079
Mutual funds	0.055	0.149	0.125	0.139	0.109	0.052	0.111
Pension funds	0.049	0.148	0.112	0.089	0.050	0.009	0.079
Stocks, mutual funds or pension funds	0.121	0.284	0.240	0.243	0.169	0.088	0.199
Proportion of households	0.033	0.161	0.218	0.223	0.187	0.177	1.000

Table 5
Participation in Stocks, Mutual Funds and Pension Funds, by Education

The table reports the fraction investing in stocks by education. Data are drawn from the 1998 SHIW. All statistics use population weights.

	Less than High School	**High School**	**College**	**Average**
Stocks	0.042	0.125	0.222	0.079
Mutual funds	0.063	0.176	0.285	0.111
Pension funds	0.055	0.114	0.151	0.079
Stocks, mutual funds or pension funds	0.127	0.304	0.436	0.199
Proportion of households	0.617	0.295	0.087	1.000

Table 6
Participation in Stocks, Mutual Funds and Pension Funds, by Financial Asset Quartiles

The table reports the proportion of investors by gross financial asset quartiles. Data are drawn from the 1998 SHIW. All statistics use population weights.

	Quartile I	**Quartile II**	**Quartile III**	**Quartile IV**	**Top 5 %**	**Top 1 %**	**Average**
Stocks	0.004	0.013	0.046	0.268	0.505	0.609	0.079
Mutual funds	0.012	0.014	0.082	0.358	0.591	0.671	0.111
Pension funds	0.003	0.027	0.122	0.174	0.206	0.238	0.079
Stocks, mutual funds or pension funds	0.015	0.053	0.224	0.538	0.767	0.783	0.199

Table 7
Demographic Characteristics of Stockholders and Non-stockholders

The table reports demographic characteristics of stockholders and non-stockholders. Data are drawn from the 1998 SHIW. Income and wealth are expressed in thousand euro. All statistics use population weights.

Variable	**Stocks**	**Mutual funds**	**Pension funds**	**Stocks, mutual funds or pension funds**	**Non stock-holders**
Married	0.784	0.771	0.833	0.790	0.659
Male	0.818	0.800	0.821	0.807	0.704
Singles	0.117	0.124	0.073	0.110	0.216
Between 2 and 4 household members	0.816	0.813	0.856	0.817	0.694
More than 4 household members	0.066	0.062	0.071	0.072	0.090
One income recipient	0.270	0.292	0.290	0.294	0.476
Two income recipients	0.483	0.494	0.455	0.485	0.403
More than two income recipients	0.246	0.213	0.254	0.221	0.120
Wage earner	0.373	0.381	0.501	0.422	0.344
Self-employed	0.262	0.255	0.281	0.252	0.114
Unemployed	0.016	0.021	0.011	0.017	0.047
Pension recipient	0.318	0.318	0.175	0.279	0.447
Disposable income	50.850	46.418	37.414	41.362	20.843
Gross financial wealth	103.611	90.335	54.943	68.614	12.970
Real wealth	325.803	260.279	189.753	234.229	100.255
Employed in firms with less than 50 employees	0.492	0.489	0.469	0.494	0.529
Employed in firms with more than 50 employees	0.508	0.511	0.530	0.505	0.471
Number of observations	607	876	586	1542	5605

Table 8
Distribution of Stockholding, by Types of Stocks

The table reports the distribution of stockownership by type of stocks. Proportions do not sum to 1 because multiple holdings are possible. Data are drawn from the 1998 SHIW.

	Proportion of stockholders
Stocks of listed companies	0.447
of which, privatized companies	0.259
Stocks of non-listed companies	0.095
Stocks of limited responsibility companies	0.032
Stocks of other companies	0.009
Foreign stocks	0.028
Direct stockownership	0.512
Indirect stockownership	0.739
Direct plus indirect stockownership	1.000

Table 9
Number of Stocks of Different Companies Held by Direct Stockholders

The table reports the distribution of the number of shares in different companies held by direct stockholders. Data are drawn from the 1998 SHIW. All statistics use population weights. Out of 607 stockholder, 597 report the number of shares.

Number of stocks	**Number of investors**	**As a proportion of those investing in stocks directly**	**Cumulative frequency**
1 stocks	256	0.429	0.429
2 stocks	149	0.250	0.678
3 stocks	69	0.116	0.794
4 stocks	49	0.082	0.876
5 stocks	36	0.060	0.936
More than 5	38	0.064	1.000
Total stockholding	597	1.000	-

Table 10
Investing in the Employer's Company

The first panel reports the number of investors that, among all stockholders, invest in the employer's business. It is obtained from the following question in the 1998 SHIW: ***"****Among the listed stocks of your family, are there stocks of companies where one member of your household is an employee?"* The second panel reports stocks of the employer's company as a proportion of total stocks. Data are drawn from the 1998 SHIW. Out of 607 stockholder, 599 reply to the question.

Proportion investing in one's employer company			
Owns employer's stock	**Number of investors**	**Proportion of investors**	**Cumulative frequency**
Yes	98	0.164	0.164
No	501	0.836	1.000
Total	599	1.000	-

Stocks in one's employer business as a fraction of total investment in stocks			
Own employer's stock	**Number of investors**	**Fraction of investors**	**Cumulative frequency**
Less than 10 percent	8	0.082	0.082
10 – 30 percent	14	0.143	0.225
30 – 50 percent	13	0.133	0.358
50 – 75 percent	12	0.122	0.480
75 – 99 percent	9	0.092	0.572
100 percent	42	0.428	1.000
Total	98	1.000	-

Table 11
Probit Regressions for Participation in Stocks, Mutual Funds and Pension Funds

The table reports probit regressions for direct stockholding, mutual funds and pension funds. Income and financial wealth brackets are based on income and gross financial wealth quartiles. Demographic variables refer to the head of the household. The index of financial development is the ratio of loans to GDP in the province of residence. The regressions also include three dummies for city size (between 20,000 and 40,000 inhabitants, between 40,000 and 500,000 inhabitants, and over 500,000 inhabitants). Excluded attributes are: age less than 35, less than high school, non married, female, singles, non self-employed, non pension recipient, first income bracket, first wealth bracket. Data are drawn from the 1998 SHIW (7,145 households). *z*-values are reported in parenthesis.

Variable	**Stocks**	**Mutual funds**	**Pension funds**	**Stocks, mutual funds or pension funds**
Age 30-39	0.033 (2.21)	0.019 (1.56)	0.035 (2.73)	0.085 (3.27)
Age 40-49	0.016 (1.27)	0.009 (0.84)	0.020 (1.81)	0.048 (2.08)
Age 50-59	0.025 (1.88)	0.009 (0.79)	0.007 (0.74)	0.038 (1.68)
Age 60-69	0.022 (1.62)	0.011 (0.95)	-0.001 (-0.76)	0.022 (0.99)
Age 70+	0.019 (1.37)	-0.003 (-0.25)	-0.023 (-3.19)	-0.023 (-1.11)
High School	0.019 (5.31)	0.016 (4.29)	-0.001 (-0.02)	0.033 (4.26)
College	0.041 (6.49)	0.036 (5.66)	0.007 (1.42)	0.079 (6.00)
Married	0.006 (1.60)	-0.001 (-0.08)	0.010 (2.69)	0.017 (1.84)
Male	0.003 (0.69)	-0.001 (-0.15)	-0.004 (-0.96)	-0.007 (-0.77)
II financial wealth quartile	0.050 (2.77)	0.093 (2.98)	0.100 (4.33)	0.217 (6.20)
III financial wealth quartile	0.125 (5.39)	0.263 (5.87)	0.253 (7.75)	0.487 (12.01)
IV financial wealth quartile	0.305 (9.02)	0509 (8.69)	0.286 (8.28)	0.689 (0.033)
II real wealth quartile	0.010 (1.70)	0.004 (0.68)	0.001 (0.19)	0.013 (1.17)
III real wealth quartile	0.023 (3.82)	0.014 (2.59)	0.001 (0.25)	0.035 (3.27)
IV real wealth quartile	0.034 (5.36)	0.023 (4.07)	0.001 (0.33)	0.059 (5.23)
Resident in the South	-0.005 (-0.91)	-0.024 (-3.95)	-0.021 (-3.60)	-0.072 (-5.68)
Number of bank branches in the province of residence	-0.011 (-0.69)	0.008 (0.49)	0.041 (2.58)	0.036 (0.99)
Index of financial development	0.009 (2.34)	0.001 (0.49)	0.001 (1.85)	0.020 (2.15)
Unemployment rate in the province of residence	-0.067 (-1.92)	-0.088 (-2.25)	-0.022 (-0.61)	-0.107 (-1.34)

Table 12
Asset Shares Invested in Stocks, Mutual Funds and Pension Funds, by Age

The asset shares are computed in the group of households that reports investing in stocks, mutual funds or pension funds (1,493 observations).

	<30	**30-39**	**40-49**	**50-59**	**60-69**	**≥70**	**Total**
Stocks	0.062	0.082	0.101	0.116	0.127	0.146	0.107
Mutual funds	0.175	0.201	0.197	0.254	0.338	0.304	0.242
Pension funds	0.203	0.246	0.197	0.146	0.100	0.046	0.169
Stock, mutual funds or pension funds	0.441	0.529	0.495	0.516	0.564	0.496	0.518

Table 13
Asset Shares Invested in Stocks, Mutual Funds and Pension Funds, by Education

The asset shares are computed in the group of households that reports investing in stocks, mutual funds or pension funds (1,493 observations).

	Less than High School	**High School**	**College**	**Total**
Stocks	0.090	0.115	0.132	0.107
Mutual funds	0.230	0.247	0.263	0.242
Pension funds	0.199	0.158	0.120	0.169
Stocks, mutual funds or pension funds	0.519	0.519	0.514	0.518

Table 14
Asset Shares Invested in Stocks, Mutual Funds and Pension Funds, by Financial Asset Quartiles

The asset shares are computed in the group of households that reports investing in stocks, mutual funds or pension funds (1,493 observations).

	Quartile I	**Quartile II**	**Quartile III**	**Quartile IV**	**Top 5 %**	**Top 1 %**	**Total**
Stocks	0.149	0.108	0.069	0.123	0.154	0.187	0.107
Mutual funds	0.058	0.104	0.167	0.288	0.367	0.481	0.242
Pension funds	0.257	0.384	0.314	0.087	0.032	0.018	0.169
Stocks, mutual funds or pension funds	0.465	0.596	0.550	0.498	0.553	0.687	0.518

Table 15
Regressions for the Asset Shares Invested in Stocks, Mutual Funds and Pension Funds

The table reports second stage regressions for the asset share invested in stocks, mutual funds and pension funds. Data refer to 1998. *t*-statistics are reported in parenthesis. Income and financial wealth brackets are based on income and gross financial wealth quartiles.

Variable	**Stocks**	**Mutual funds**	**Pension funds**	**Stocks, mutual funds or pension funds**
Age 30-39	0.143 (1.39)	0.037 (0.14)	-0.047 (-0.63)	0.054 (0.96)
Age 40-49	0.148 (1.49)	0.069 (0.26)	-0.059 (-0.81)	0.052 (0.94)
Age 50-59	0.162 (1.60)	0.113 (0.43)	-0.048 (-0.65)	0.088 (1.60)
Age 60-69	0.172 (1.69)	0.194 (0.72)	-0.066 (-0.86)	0.124 (2.21)
Age 70+	0.107 (1.04)	0.190 (0.56)	-0.005 (-0.06)	0.116 (1.97)
High School	0.070 (1.99)	-0.013 (-0.14)	-0.021 (-0.95)	0.007 (0.43)
College	0.112 (2.32)	-0.014 (-0.10)	0.009 (0.31)	0.032 (1.39)
Married	0.062 (1.78)	-0.005 (-0.06)	-0.036 (-1.14)	0.011 (0.49)
Male	-0.051 (-1.46)	-0.012 (-0.12)	-0.028 (-0.97)	-0.027 (-1.22)
II financial wealth bracket	0.029 (0.17)	0.145 (0.01)	0.211 (1.26)	0.054 (0.42)
III financial wealth bracket	0.049 (0.26)	0.140 (0.01)	0.113 (0.65)	-0.046 (-0.34)
IV financial wealth bracket	0.048 (0.21)	0.072 (0.01)	-0.177 (-1.01)	-0.165 (-1.15)
II real wealth bracket	0.041 (0.78)	-0.037 (-0.19)	-0.052 (-1.57)	-0.046 (-1.61)
III real wealth bracket	0.057 (1.08)	-0.051 (-0.33)	-0.064 (-2.09)	-0.065 (-2.51)
IV real wealth bracket	0.109 (1.88)	-0.021 (-0.13)	-0.058 (-1.93)	-0.030 (-1.15)
Number of uncensored observations	578	844	570	1493

Figure 1
Participation in Stocks, Mutual Funds and Pension Funds, by Age

The figure plots the actual and estimated age profiles of the fraction of households that invest in stocks, mutual funds or defined contribution pension funds. Data are drawn from the 1998 SHIW. The estimated profile is obtained by a probit on a third order age polynomial.