DISCUSSION PAPER SERIES

No. 2549

# HOUSEHOLD PORTFOLIOS IN ITALY

Luigi Guiso and Tullio Jappelli

*INTERNATIONAL MACROECONOMICS*


Centre for Economic Policy Research

www.cepr.org

*ISSN 0265-8003*

# HOUSEHOLD PORTFOLIOS IN ITALY

**Luigi Guiso,** Ente Luigi Einaudi, Roma and CEPR
**Tullio Jappelli,** Università degli Studi di Salerno and CEPR

Discussion Paper No. 2549
September 2000

Centre for Economic Policy Research
90–98 Goswell Rd, London EC1V 7RR, UK
Tel: (44 20) 7878 2900, Fax: (44 20) 7878 2999
Email: cepr@cepr.org, Website: www.cepr.org

CEPR Discussion Paper No. 2549

September 2000

# ABSTRACT

## Household Portfolios in Italy*

We provide a detailed account of the portfolio of Italian households and its evolution, using repeated cross-sectional and panel data drawn from the 1989–95 Bank of Italy Survey of Household Income and Wealth. We offer an in-depth description of the lifetime pattern of asset holdings and their composition, the degree of asset diversification, and the propensity to invest in risky assets. The data also allow us to address some more fundamental issues on the determinants of household portfolios. We look at portfolio mobility and elaborate on the relevance of entry and exit costs. We also provide new evidence on the effect of income risk and information acquisition on portfolio choice.

JEL Classification: D80, E20 and G10
Keywords: diversification, information, portfolio choice and portfolio mobility

Luigi Guiso
Ente Luigi Einaudi for Monetary,
Banking and Financial Studies
Via Due Macelli, 73
00187 Rome
ITALY
Tel: (39 06) 4792 4858
Fax: (39 06) 4792 4872
Email: guiso@tin.it

Tullio Jappelli
CSEF, Department of Economics
Università di Salerno
84084 Fisciano, Salerno
ITALY
Tel: (39 089) 963168
Fax: (39 089) 963169
Email: tulliojj@tin.it

*We thank Angus Deaton, Michalis Haliassos, Raffaele Miniaci, Jim Poterba, Guglielmo Weber and participants at the Conference on *Household Portfolios* organized by the European University Institute, Firenze, 17–18 December 1999. We acknowledge financial support from the European University Institute, the European Training and Mobility of Researchers Network Program (TMR), the Italian Ministry of Universities and Scientific Research (MURST) and the Italian National Research Council (CNR).

Submitted 04 July 2000

# NON-TECHNICAL SUMMARY

This Paper documents aggregate trends in the portfolio of Italian households and uses household-level data to characterize portfolio differences across households, identifying the main variables that explain heterogeneity in the propensity to invest in financial assets. The last decade witnessed significant developments in the composition of the portfolio of Italian households. Some of the changes parallel those in other countries, suggesting that our analysis may be relevant for other countries as well. The most significant changes are the increased participation in the equity market and the sharp increase in the share of stockholding, either directly or through mutual funds, and the parallel decline of transaction accounts and government bonds. Over the 1985 to 1998 period the portfolio share of currency and bank deposits plunged from 45.7% to 25%. The weight of short-term government bonds was more than halved, while that of long-term bonds (government and corporate) has increased. Stocks, mutual funds and other managed investment accounts rose markedly, from 16% of financial wealth in 1985 to 47% in 1998. The importance of foreign assets increased steadily in the 1990s. Virtually non-existent in 1985, they now account for more than 6% of financial wealth. Thus, in 1998 the portfolio of Italian households was much more strongly tilted towards risky assets than it had ever been in the past.

A number of factors contribute to explain the trends observed. First, the nominal yield on transaction accounts and on short-term bonds declined significantly over the 1990s, while the return on equities, mutual funds and managed investment accounts has been substantial. Second, the 1990s witnessed a remarkable development of mutual funds. By offering previously unavailable diversification opportunities and reducing minimum investment requirements, mutual funds have enhanced Italian households' willingness to invest in risky financial assets, domestic and foreign alike. Third, the privatization during the 1990s of over 25 large state corporations, yielding a total revenue of about 71 billion euros, were accompanied by massive publicity, through which households became acquainted with stocks and their return and risk characteristics. It is likely that this dissemination of information has permanently increased stockholding. Fourth, the reform of the social security system and the diminished expectations of pension benefits have prompted households to rely increasingly on their own savings for retirement. As a consequence, life insurance and private pension funds – previously of negligible importance – have started to increase. Finally, the lifting of capital controls, in place until 1989, has improved portfolio diversification through acquisition of foreign assets. With the single currency and the consequent elimination of intra-European exchange rates risk, and with regulatory standardization, we expect a further reduction in the home bias in the coming years.

Macroeconomic aggregates conceal crucial matters concerning household portfolios. For instance, the aggregate accounts cannot establish whether the change in asset shares in the last decade is due to a change in participation or to the amounts invested conditional on participation. Aggregate data are of no use in assessing whether the composition of household portfolios varies systematically with wealth or demographic characteristics (age, education, family size). They also cannot address issues of portfolio transitions. Even when an aggregate asset share is constant over time, there could well be large but reciprocally offsetting movements into and out of the financial markets. Accordingly, we rely on the Survey of Household Income and Wealth for the years 1989 to 1998. This survey is a rich source of data on household portfolios; in addition, it has a panel component that allows us to address issues relevant to portfolio dynamics. We compute that the increase in the aggregate share of risky assets observed between 1989 and 1998 is to be attributed in almost equal parts to higher participation and to larger conditional shares. An increasing number of households have acquired some degree of sophistication in managing financial wealth, resulting in better diversification. Yet, more than a third of the sample still concentrates all of its wealth in a few safe financial instruments with low expected returns. And almost half have absolutely no risky assets, either real or financial.

A closer look at the micro data reveals a number of important features concerning households' portfolio allocations. First, ownership of risky assets is strongly increasing in wealth, exhibits a markedly concave age-profile and rises with education. Second, conditional on participation, the share of risky assets is also concave, but much less so than ownership. Third, the share of risky financial assets increases with wealth. However, when account is taken of the other determinants, wealth exerts a mild effect on the portfolio: moving from low to high wealth raises the predicted share by only a few percentage points. Overall, our findings reveal substantial differences between the determinants of ownership and those of asset shares conditional on participation. Age, wealth and education – some of the main determinants of portfolio choice suggested by theory – affect portfolio decisions at the stage where households have to choose whether or not they should invest in risky assets. Once the decision is taken, the portfolio allocation is little affected by these factors. This suggests that distinguishing between the participation decision and the conditional portfolio allocation choice is of paramount importance.

The finding that the share of risky assets, conditional on participation, is (essentially) independent of age lends support to models that predict that the share of risky assets is constant through life, perhaps because preferences are characterized by linear risk tolerance. The main problem in interpreting the empirical findings is that the theoretical models typically ignore the participation decision and focus on cases in which investors optimally choose to hold both safe and risky assets. As such, these models have nothing to say

about the shape of the age-participation and wealth-participation profiles. Our results suggest instead that we need theoretical explanations for the concave age-profile of participation in risky assets and for the strong positive correlation between wealth and participation and between education and participation.

We argue that the only way to account for the lack of participation and diversification is to bring adoption costs into the picture. When purchasing risky assets, there are essentially three sources of costs: minimum investment requirements, monetary transaction costs and information costs. Since minimum investment requirements act as a barrier to entry at low wealth, they imply that participation increases with wealth. Monetary transaction costs lead to similar predictions, especially if these costs decrease with wealth. We document that in Italy people pay substantial transaction costs when investing in a mutual fund. Entry fees vary with the amount invested, and are generally between 3 and 4% for investment under 5,000 euros but can be as high as 6%. A significant reduction in costs applies only to very large investments, above 500,000 euros. High transaction costs are consistent with the low portfolio mobility of Italian households that we find when we look at the panel component of our survey data.

Adoption costs, broadly interpreted, help also explain the correlation between participation and education. Education proxies for the ability to collect and process information. Adoption costs are therefore lower for better-educated people who will thus be more likely to participate. Information costs may also explain a puzzling feature of the data. If minimum investment requirements or fixed monetary costs were the only adoption costs, we should find that the rich have complete portfolios, because entry costs vanish at high wealth levels. However, we find that portfolios are poorly diversified even for the very rich. In the top 5% or 1% of the wealth distribution only half of the households invest in risky financial assets. The survey offers a unique source of data about people's knowledge of financial assets. We use it to construct an index of financial information and relate it to portfolio choice. Our results strongly support the hypothesis that informational barriers limit households' opportunity set, even when age, education, wealth and other variables that might be correlated with information accumulation are controlled for.

We also explore some additional channels that help reconcile the lack of participation in risky assets. Background risk is one factor that helps to explain a low propensity to invest in risky assets. Recent literature claims, in fact, that an increase in independent risks induces people to follow a more conservative investment strategy. We show that proxies for background risk are negatively correlated with the propensity to invest in risky assets. There is some evidence that background risk also correlates with the amount invested in risky assets, but such evidence is weaker than for participation.

In summary, our findings show that for many households, the main action in portfolio management is the decision to invest in risky assets. Once this decision is taken, the shape of the portfolio does not differ greatly from that predicted by standard models. These models, however, ignore investment costs and do not explain participation decisions and their relationship with age, education, wealth and other household characteristics.

## 1. Introduction

The last decade witnessed significant developments in the composition of the portfolio of Italian households. Some of the changes parallel those in other countries, others are specific to the Italian economy. The most significant changes are the increased participation in the equity market and the sharp increase in the share of stock holding, either directly or through mutual funds, and the parallel decline of transaction accounts and government bonds.

Until recently, the portfolio share of stocks was extremely low by comparison with other industrialized countries; most households held their financial wealth in the form of transaction accounts or government bonds, and portfolios were poorly diversified. Capital controls, in place until 1989, effectively prevented international diversification. The thinness of the Italian stock market and its consequent volatility, even after the introduction of investment funds in the 1980s, discouraged the holding of equities. Other features were the relatively low level of household debt (mainly due to regulation, high enforcement costs and lack of tax incentives to borrow) and the negligible role of life insurance and pension funds. Moreover, most financial assets featured short maturities and long-term saving instruments had little importance. Though some of these features remain, it appears that Italian households are now in the course of a transition that will lead to a configuration more closely resembling other advanced industrial economies.

In this paper we document aggregate trends in the portfolio of Italian households and characterize portfolio differences across households, identifying the main variables that explain heterogeneity in the propensity to invest in financial assets. The Survey of Household Income and Wealth - our main data source - is particularly well suited for the purpose at hand. It is recurrent, so that from 1989 to 1998 we have five different cross-sections; it has a panel component that allows us to address issues relevant to portfolio dynamics. Furthermore, the survey is a rich source of data on household portfolios, and in some years contains sections specifically designed to address selected issues, such as the relation between financial information and portfolio choice.

Section 2, drawing on the aggregate financial accounts, shows that in the last decade Italian households have made a significant move towards riskier financial portfolios, with an

increase in long-term bonds, stock and mutual funds. The increase in the share of risky assets could be due either to an increase in participation in these instruments or to an increase in the amount invested by those who participate, i.e. an increase in the conditional share. In Section 3, using microeconomic data, we calculate that the increase in the aggregate share observed between 1989 and 1998 is to be attributed in almost equal parts to higher participation and to larger conditional shares. An increasing number of households have acquired some degree of sophistication in managing financial wealth, resulting in better diversification. Yet more than 20 percent of the sample still concentrates all of its wealth in a few, safe financial instruments with low expected returns. And almost half have absolutely no risky assets, either real or financial.

In Section 4 we distinguish between safe and risky assets, and characterize the wealth and age distribution of the household portfolio, two variables that are the focus of a large body of recent theoretical literature. We find the distinction between participation and conditional shares of paramount importance. Participation varies considerably with wealth and age, while asset shares, conditional on participation, are little affected by these variables. These results are confirmed by regression analysis in Section 5. Non-participation is obviously inconsistent with the simple two-asset portfolio model without frictions in which risky assets yield a higher expected return than safe assets. To reconcile the models with the evidence, we analyze the potential impact of participation, transaction and information costs.

Section 6 explores different ways of reconciling the lack of participation with the presence of transaction and information costs. We first document the limited number of portfolio transitions of Italian households in panel data, which strongly suggests that adjustment costs are important. This lack of transitions is related to brokerage fees and other transaction costs, which can be quite high in Italian financial markets, particularly at low levels of wealth (they can easily exceed 4 percentage points of the amount invested).

Background risk is another factor helping to explain a low propensity to invest in risky assets. Recent literature claims, in fact, that an increase in independent risks induces people to follow a more conservative investment strategy. We show that proxies for background risk, such as the provincial unemployment rate and self-reported measures of income risk, are negatively correlated with the propensity to invest in risky assets. There is some evidence that background risk also correlates with the amount invested in risky assets, but such evidence is

weaker than for participation.

A third possible explanation for the lack of participation is information costs, which are widely thought to be important determinants of household portfolios, but are hard to measure and are generally neglected. The SHIW offers a unique source of data about people's knowledge of financial assets. We use it to construct an index of financial information and relate it to portfolio choice. The regressions strongly support the hypothesis that informational barriers limit households' opportunity set, even when age, education, wealth and other variables that might be correlated with information accumulation are controlled for. Section 7 summarizes the main findings.

## 2. Macroeconomic trends

Before analyzing household level data, let us briefly describe the aggregate trends of the portfolio of Italian households. Since there are no official figures for aggregate real assets we focus on financial wealth, drawing from the national financial accounts of the household sector. In the next section we will also document the time pattern of real asset holdings in microdata.

Table 1 reports the aggregate shares of financial assets in total financial wealth from 1985 to 1998. The table reveals immediately that the composition of households' financial assets has changed dramatically over the sample period. Currency and bank deposits (checking and saving accounts) plunged from 45.7 percent in 1985 to 25 percent in 1998. The weight of short-term government bonds was more than halved, while that of long-term bonds (government and corporate) has increased. Stocks, mutual funds and other managed investment accounts rose markedly, from 16 percent of financial wealth in 1985 to 47 percent in 1998. The importance of foreign assets increased steadily in the 1990s. Virtually non-existent in 1985, 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 incidence of foreign securities in financial wealth is bound to increase still further. Finally, the

indebtedness of Italian households increases steadily, if slowly. The share of debt (short and long-term) was only 5.4 percent of total financial assets in 1985 but almost 9 percent by 1998.

In analyzing household portfolios we find it useful to group financial assets into three categories according to riskiness: *clearly safe financial assets* include transaction accounts and certificates of deposit, *fairly safe financial assets* include Treasury bills and the cash value of life insurance, and *risky financial assets* include stocks, long-term government bonds, other bonds, mutual funds, managed investment accounts, and defined contribution pension plans. The last rows of Table 1 indicate that the share of clearly safe assets falls substantially, while that of risky assets – particularly stocks and mutual funds – rises sharply (from one third to two thirds of financial wealth). Thus, in 1998 the portfolio of Italian households was much more strongly tilted towards risky assets than it had ever been in the past. A number of factors contribute to explain the trends observed.

First, the nominal yield on transaction accounts and on short-term bonds declined significantly over the 1990s, while the return on equities, mutual funds and managed investment accounts has been substantial. The 1990s also witnessed a remarkable development of mutual funds. Introduced in 1984, when only 10 were operating, they rose in number to 184 in 1990 and 459 in 1995. The market value of the funds increased especially in recent years, from 7.2 percent of GDP in 1995 to 18.9 percent in 1997 (Cesari and Panetta, 1998). Commercial banks have massively entered the sector, increasing competition and reducing entry costs and management fees. Fierce advertising campaigns to acquire market shares have helped to disseminate financial information. Financial innovation in terms of packaging of new financial products has been substantial. By offering previously unavailable diversification opportunities and reducing minimum investment requirements, mutual funds have enhanced Italian households' willingness to invest in risky financial assets, domestic and foreign alike.

A second factor has been the privatization of several large state-owned corporations and public utilities in the 1990s. Since 1992, over 25 state corporations, including public utilities and banks, have been successfully privatized with a total revenue of about 71 billion euros. The privatization process and the number of firms going public have increased stock market capitalization.[1] These privatizations were accompanied by massive publicity, through

[1] 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.

which households got acquainted with stocks and their return and risk characteristics.[2] It is likely that this dissemination of information has permanently increased stockholding.

The reform of the social security system and the diminished expectations of pension benefits have prompted households to rely increasingly on their own savings for retirement. As a consequence, life insurance and private pension funds – historically negligible – have started to increase. Finally, the lifting of capital controls, which were in place until 1989, has improved portfolio diversification through acquisition of foreign assets. The marked fluctuations in the exchange rate following the lira's exit from the ERM in October 1992 slowed the process, which in fact accelerated again with Italy's return to the fixed exchange rate agreement in November 1996. With the single currency and the consequent elimination of intra-European exchange rates risk, and with regulatory standardization, 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 transaction accounts is still high by international standards. Most financial assets have short maturities. Life insurance and pension funds still represent a small fraction. The breadth of the Italian stock market does not yet compare with other industrialized countries. In 1996 the number of listed firms was 3.8 per million inhabitants, against and EU average of 13.5. Stock market capitalization was 21 percent of GDP, against 40 percent in the EU (Cecchetti, 1999). Finally, household debt remains low, despite deregulation, which has prompted an increase in the supply of loans.[3]

---

[2] 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 the request the Government raised the share of ENEL capital on sale from the initial allotment of 24 percent to 34 percent.

[3] The relatively low indebtedness of Italian households reflects mainly supply factors (regulation and high enforcement costs) rather than low demand for credit (Guiso, Jappelli and Terlizzese, 1994). In fact, the consumer credit and mortgage markets have been affected by several factors: regulations requiring minimum downpayments of 50 percent of the value of the house, limited competition between financial intermediaries, severe asymmetric information with lenders. Transaction costs, legal costs and judicial inefficiency further inhibit the functioning of credit and mortgage markets. The process of repossessing collateral is extremely cumbersome in Italy, due to the length of the judicial process and various protections accorded to debtors. On average, it takes 5.5 years for a bank to repossess the collateral. Net of legal costs, the average share of the mortgage repossessed in case of default is less than 60 percent of the value of the loan granted (Generale and Gobbi, 1996). Some of these features have improved in the 1990s. In particular, competition among lenders has increased, resulting in a decline in interest rate spreads and deregulation has eased downpayment ratios. However, creditors' protection remains low. This partly explains why the size of the household credit market is still much smaller than in other industrialized countries.

Macroeconomic aggregates conceal crucial matters concerning household portfolio. For instance, the aggregate accounts cannot establish whether the change in asset shares in the last decade is due to a change in participation or to the amounts invested conditional on participation. Aggregate data are of no use in assessing whether the composition of household portfolios varies systematically with wealth or demographic characteristics (age, education, family size). They also cannot address issues of portfolio transitions. Even when an aggregate asset share is constant over time, there could well be large but reciprocally offsetting movements into and out of the financial markets. The survey data to which we turn in the rest of this paper provide answers to many of these questions.

## 3. The microeconomic picture

In this section we rely on a sequence of five waves of the Survey of Household Income and Wealth (SHIW), covering the period 1989-98. Since 1987, the SHIW – a survey conducted by the Bank of Italy on a representative sample of about 8,000 households in 1989, 1991, 1993, 1995 and 1998 – has collected detailed information on the composition of Italian households' wealth, both real and financial. But the 1987 survey has information only on highly aggregated asset categories, and the framing of the questions on financial assets was rather different from that of subsequent surveys. Accordingly, we choose to start our analysis with 1989.[4] Portfolio data are particularly rich in the 1995 and in the newly released 1998 SHIW: special sections of the questionnaire address crucial issues in the analysis of household portfolios, such as knowledge of the various financial instruments, exposure to background risk and attitudes towards risk. We use some of this information in Section 6.

Alongside the portfolio data, the 1989-98 SHIW gives demographic characteristics of all household members. It has also a sizable panel component: each time, an increasing fraction of the sample is re-interviewed, and several households are interviewed three or four times. The panel component is particularly useful to address issues of portfolio dynamics and will be

[4] The 1987 survey differs from the others also because it oversamples wealthy households. Given that ownership and investment in risky assets correlate with wealth (see Section 4.1), this feature of the survey is potentially useful to study the portfolio of the rich. However, it complicates the comparison between surveys over time, which is the object of this section.

exploited in Section 6. The Appendix describes the content and sampling properties of the SHIW with particular focus on the variables related to the household portfolio. Brandolini and Cannari (1994) provide ample details on sampling, response rates, processing of results and comparison of survey data with macroeconomic data. Here we summarize the main characteristics of our dataset.

Real asset values are reported at the end of each year and are elicited directly, without use of bracketing. For real assets, the SHIW reports information on primary residence, investment real estate, business wealth, the stock of durable goods, other non-financial assets (jewelry, gold coins, art objects, valuable furniture, and other valuables), and debt. The latter is the sum of mortgage and other real estate debt, consumer credit, personal loans and credit card debt. Each of these items is available separately, but since Italians actually borrow very little, we choose to focus on total indebtedness.

We define investment real estate and business wealth as risky real assets. The residual category of safe real assets thus includes primary residence, the stock of durable goods and other non-financial assets. These definitions allow us to define as *total risky assets* the sum of risky real assets and risky financial assets (stocks, long-term government bonds, other bonds, mutual funds, managed investment accounts, and defined-contribution pension plans).

Calculation of amounts held in financial assets requires a number of imputations and assumptions. First of all, the list of financial assets on which households report lengthens from 13 in 1989 to 28 in 1995 and 1998. We group these assets into 10 categories: (1) currency; (2) transaction and savings accounts; (3) certificates of deposit; (4) Treasury bills; (5) long-term government bonds; (6) other bonds; (7) stocks; (8) mutual funds and investment accounts; (9) cash value of defined-contribution pension plans; (10) cash value of life insurance. This is the only way to make meaningful comparisons across different surveys. It also avoids reporting data for assets with very limited participation and amounts (such as certain types of government bonds).

Second, in none of the surveys are households asked to report actual financial asset amounts. In 1989 asset values are inferred in two steps. Respondents first report the percentage share of financial wealth in each asset. For cash and bank deposits they are then also asked to report the share and the amount.[5] One can then estimate the amount invested in

[5] The validity of this procedure for eliciting asset values rests on the assumption that households are less

each financial asset, given that the portfolio shares add up to one. In 1991, 1993 and 1995 respondents select from a list of 14 possible asset brackets. In 1998 separate information on brackets and actual amounts is available. The problem of bracketing in 1991-95 can be handled by assuming that households own the mid-point of the interval or by applying more sophisticated imputation procedures (as in 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. We thus proceed with the first alternative.

The cash value of life insurance policies and pension funds is not reported in the survey. From 1989 to 1993 we have information only on participation and annual contributions. In 1995 and 1998 we also have information on the year in which the household started to contribute. From this we impute the cash value 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.

It is worth pointing out that, though this study uses the best available sources, survey data are contaminated by reporting and (unavoidable) imputation errors. This makes comparisons between the micro and the aggregate data somewhat problematic. It is for this reason that some of the dramatic developments in assets shares that we observe in the aggregate financial accounts are only partially revealed by the microeconomic data. As we explain, reporting errors and imputation affect asset amounts more than ownership; thus, we feel more confident about statements on the latter than on the former**.**

## 3.1. Participation

Table 2 reports asset ownership from 1989 to 1998 separately for financial assets, non-financial assets, and debt. In the sample period there is relative stability in participation in real assets. Almost all households own durable goods, about 65 percent own their primary residence, and one-third have real estate other than the primary residence. The fraction with business wealth varies from 17 percent in 1989 to 13.6 percent in 1995 and in 1998 and is higher among the self-employed.

---

reluctant to report portfolio shares than amounts, and that they are less reluctant to report small amounts, as with currency.

The fraction of households without transaction accounts (either checking or saving) is about 15 percent, a non-negligible number. Attanasio, Guiso and Jappelli (1998) argue that these households – mainly poor and less well educated – find it convenient to avoid the cost of acquiring and managing an account and only hold currency. The share declines by 4 percentage points between 1989 and 1998. One possible explanation is that the 3-percentage-point reduction in nominal interest rates on transaction accounts in the period has made it less expensive to settle transactions in cash, inducing some households to close the account, saving on fixed cash management costs.

Short-term government bonds and bonds indexed to them are also popular assets, held by about one fourth of the households until 1995. Long-terms bonds are less widespread but show an increasing diffusion. Adding long-term government bonds with bonds issued by private corporations, which are mostly long-term, the share of households holding bonds with longer maturities increases from 3.5 percent in 1989 to 9 percent in 1995. This major portfolio shift was dictated by the increasing spread between the long and the short-term rate over the sample period. The trend reverses in 1998, partly reflecting the fact that direct holding of these assets has been replaced by indirect participation through mutual funds.

By international standards, in Italy the share of households holding stocks directly is fairly low (between 4 and 5 percent, with a peak in 1998 of 7.3 percent). In 1998, over half of the total stockholders held shares of privatized companies. However, some households own stocks indirectly through mutual funds and investment accounts. Unfortunately, the SHIW does not report information on the specific types of mutual funds and investment accounts. On the assumption that at least one of these accounts is invested in the equity market, we place the upper bound of stock market participation (direct or indirect) at 6.4 percent in 1989, 7.7 percent in 1995 and 8.9 percent in 1998.

There are at least two reasons for the low participation in equity markets. First, entry and management costs have been historically high; second, the stock market has been extremely volatile, a consequence of a small and illiquid stock market. In the last four decades the standard deviation of the real growth rate of stock prices was over 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, transaction

costs remain high, particularly at low wealth levels, as we document in Section 5.3.

The sample period also witnesses the growth in life insurance and private pension plan participation, from 17 percent in 1989 to 29 percent in 1998. The increased participation was prompted by two factors. First, the 1992 and 1996 reforms of the social security system reduced expected benefits and increased pension age, raising the incentives to find other instruments for retirement saving. Second, in 1986, up to 2.5 million lire of life insurance premiums and contributions to pension funds were made tax deductible.[6]

On the liability side, only 8.6 percent of the households reported being indebted in 1989. The share increases to 15 percent in 1993 and jumps to 27 percent in 1995. In that year 11.1 percent reported having a housing mortgage, 9.1 percent borrowed to finance a car purchase, 3.9 percent other durable expenditures and only 1 percent had a personal loan.[7] An additional 6.1 percent (33 percent of the self-employed) borrow to finance a family business. Even though in comparison with other industrial countries household indebtedness is low, the increase is noteworthy. Figures for earlier years show that the fraction with housing mortgages has remained fairly stable; the increased participation in credit markets is mainly due to expansion of consumer credit and personal loans.

In summary, in the 1990s the portfolio of Italian households underwent a number of important changes in participation in financial asset markets, while there was little change in the area of non-financial assets. Even though a very large fraction of households holds mainly or exclusively transaction accounts, investment in long-term bonds and stocks (directly or through mutual funds), participation in life insurance and defined-contributions pension plans, and borrowing have increased. Overall, the fraction of households holding fairly safe financial assets increased from 33.6 percent in 1989 to 43.2 percent in 1995, but declines to 33.8 in 1998. Those investing in risky financial assets increased steadily from 12 in 1989 to 23 percent in 1998.

---

[6] Starting in 1993, a flat rate of 27 percent (22 percent in 1995) of life insurance premiums are tax deductible up to 2.5 million lire/year. Previously the entire premium was tax deductible, so that the incentive was proportional to the marginal income tax rate. Jappelli and Pistaferri (2000) study this "natural experiment" and find that the change in the tax regime has significantly reduced the propensity to invest in life insurance of households with high marginal tax rates.

[7] Housing mortgages include loans for home purchase, repairs or additions. Consumer credit includes loans for purchase of valuables, cars, and other durables. Personal loans are loans that finance non-durable consumption. Business loans include mortgage loans for housing or plants, medium and long-term loans for firms' equipment and other investments, and trade credit.

Notice however, that the meaning of our classification of assets into clearly safe, fairly safe and risky securities is likely to have changed in the most recent years. First, while including mutual funds among the risky assets category was probably a fair approximation up until 1995, when most funds where in stocks, the availability of a large number of money market and balanced funds in the late '90s tends to blur our definition. Second, the riskiness of some instruments has very likely undergone important changes in the recent years. Most notably, the inclusion of short-term government bonds among the fairly safe assets rather than into the surely safe group, was because the large and increasing government debt lead investors to attach a non-zero probability of default even on short-term government bonds. But this has changed after the dramatic fiscal stabilization started in 1996. These features should be born in mind in interpreting the portfolio evolution after 1995, especially when, as in the next section, we only rely on the grouped assets categories.

## 3.2. Diversification

The portfolios of Italian households span few assets. A large fraction of the sample hold very few types of financial instruments and tend to concentrate wealth in safe assets. Table 3 documents the allocation of financial wealth in greater detail. For each survey year, it reports the distribution of the eight possible portfolio configurations when financial assets are divided into clearly safe, fairly safe and risky.

The table is interesting in a number of respects. First, the fraction of households holding no asset increases over time (from 11.6 percent in 1989 to 13.2 percent in 1998). Since currency is excluded from all asset categories, and since all households report holding some currency, this is the counterpart of the fall in participation in transaction accounts (Table 2). Second, in each year a large fraction of consumers allocate all of their financial wealth to safe or fairly safe assets. Third, the share of households investing only in clearly safe assets declines from 51.0 percent in 1989 to 42.7 percent in 1998. Fourth, the share with only clearly safe and fairly safe assets increases from 24.6 to 28.3 percent in 1993, and then declines to 20.1 percent in 1998 (reflecting the lower participation in short-term government bonds, which we have considered as fairly safe assets). Fifth, a small but increasing number of investors mixes clearly safe and risky assets (3.4 percent in 1989 and 10.2 percent in 1998), and very

few combine fairly safe and risky assets. Finally, the relative weight of the group with complete portfolios (investing in all three types of assets) increases from 8.7 percent in 1989 to 12.6 in 1998.

The last three rows of Table 3 represent portfolios with at least some degree of diversification, because they include clearly safe and fairly safe assets, or safe and risky assets. Adding up the three rows shows that the fraction of households with diversified portfolios increased by 10 percentage points from 36.7 percent in 1989 to 43 percent in 1995-98. This trend is largely due to increased participation in risky financial assets.

## 3.3. Portfolio composition

Table 4 reports asset shares from 1989 to 1998 again distinguishing between financial assets, non-financial assets and debt. Each type of financial asset is reported as a share of total financial assets, while non-financial assets and debt are reported as shares of total wealth (financial plus non-financial). Each share is computed as the ratio between the sample average value of the asset and the sample average value of the total, and is thus equivalent to a wealth-weighted average share. Table 4 is therefore comparable with the financial accounts data reported in Table 1.

Under reporting of financial assets is more severe for risky financial assets than for transaction accounts or other safe assets. The reason is that the survey is not designed to describe the portfolio of the rich, who are likely to be largely responsible for the portfolio reallocations described in Table 1. For instance, focussing on 1995, it appears that the survey understates stocks (5 percent against 16 percent in the aggregate financial accounts) and long-term government bonds (6.1 and 15.8 percent, respectively), and overstates the share invested in Treasury bills (28.4 and 10.2 percent). Comparisons for other years are qualitatively similar.

Overall, financial assets account for a small fraction of total assets (12 to 15 percent, depending on the survey year); the bulk of wealth is non-financial. Most of the non-financial assets consist of real estate, varying from 62 percent in 1989 (36 in primary residence and 25 in investment real estate) to 66 percent in 1995 (49 and 17 percent, respectively). This increase is largely accounted for by the rise in real estate prices in the early 1990s, not by any increase in home ownership rates. Business wealth accounts for about 10 percent of total assets, and is

relatively concentrated in the population, as suggested by the participation rates in Table 2. Even though the share of financial debt more than doubles between 1989 and 1998, it remains very low.

A closer look at the composition reveals that safe assets dominate financial portfolios. But the shift towards risky financial assets is remarkable, from 12 percent of financial wealth in 1989 to 38 percent in 1998. This shift is compensated by a 12 point decline in the share of fairly safe assets (from 32.5 percent in 1989 to 20.1 percent in 1998) and by a 15 point reduction in the share of clearly safe financial assets (from 55.6 to 41.6 percent). Even though the increase affects all risky financial assets, it is most evident for mutual funds and managed investment accounts (from 3.4 to 19.5 percent) and for direct stockholding (from 2.8 to 7.5).

The increase in the share of risky assets could be due to an increase in participation or to an increase in the relative amount invested by those who participate, i.e. an increase in the conditional share. We thus decompose the change in the aggregate share in the sum of the change in participation, the change in conditional asset share, and a residual term that reflects shifts in the personal distribution of wealth.[8] We calculate that the increase in the aggregate share observed between 1989 to 1998 should be attributed almost equally to higher participation and to higher conditional shares. In fact, 60 percent of the 26.4 point increase in the share of risky assets in Table 4 is explained by an increase in participation (particularly in mutual funds) and 40 percent by an increase in the conditional share. The ratio between the average wealth of investors and average total financial wealth has a negligible role.

## 4. Exploring the portfolio distribution

The previous section shows that in the last decade Italian households have made a significant move towards riskier financial portfolios, with an increase in long-term bonds and mutual funds. More households have acquired some degree of sophistication in managing financial wealth, resulting in better diversification. Yet, more than a third of the sample still

[8] The aggregate portfolio share of risky assets $a$ can be written as $a=Pw_pa_p$, where the three terms denote the participation rate ($P$), the ratio between average financial wealth of participants and average financial wealth in the population ($w_p$), and the participants' share invested in risky assets ($a_p$). The change in the aggregate share is then $da=(Pa_p)dw_p+(w_pa_p)dP+(Pw_p)da_p$.

concentrates all of its wealth in a few, highly safe financial instruments with low expected returns. And almost half the sample has absolutely no risky assets, either real or financial.

Interpretation of the features of the households' portfolio is facilitated by a brief summary of the predictions of the theoretical models. We focus on the relation between the portfolio and transaction costs, information, age and wealth. Where applicable, we distinguish the effect of each on participation from its effect on conditional asset shares.

The descriptive analysis in Sections 2 and 3 makes it clear that the microeconomic data reveal substantial heterogeneity in portfolio choices. The first source of heterogeneity is non-participation and lack of diversification. Moreover there is also considerable portfolio heterogeneity even within the group investing in risky assets, not just in participation.[9] Non-participation is obviously inconsistent with the simple two-asset portfolio model without transaction costs in which risky assets yield a higher expected return. To reconcile theory with the evidence, one must therefore explore the possibility that transaction costs and financial information affect household portfolio choice. Furthermore, these costs vary across households and financial instruments, so that their presence affects portfolio choice much more than would be predicted by standard models in complete market settings and homogeneous agents. Lack of participation also suggests exploring the possibility that some consumers fail to invest in particular assets simply because they are unaware of their existence, hence the importance of variables correlated with financial sophistication, such as education. In fact, households differ considerably in terms of financial information, and education and information spillovers are strong predictors of financial sophistication (Section 6.3).

We document in Section 4.1 that participation varies considerably with wealth while the conditional shares are little affected by this factor . As Gollier (2000) points out , the sign of the wealth-portfolio relation is one of the few cases where the theory offers clear-cut predictions. In Section 4.2 we uncover a distinct pattern of participation over the life cycle. Several factors may affect the age-portfolio profile. King and Leape (1987) note that *learning* is correlated with age and that stock market participation and asset diversification should increase over the life cycle. Another potentially relevant factor is the greater importance of

[9] For instance, there are considerable differences within the group of stockholders. In 1995, the only survey year where this information is available, the average number of stocks in different companies is 2, but 10 percent of stockholders hold equities of more than 4 companies. Most stockholders hold equity of just one company, and almost invariably this is the company where one of the family members is employed.

*committed savings and borrowing constraints* for people in the early stage of the life cycle. Paxson (1990) points out that households exposed to liquidity constraints and facing uncertain liquidity needs will tend to hold relatively liquid and safe assets.[10] The model developed by Gollier and Zeckhauser (1997), with *convex risk tolerance*, predicts instead a negative relation between age and the share of risky assets.[11] Bodie, Merton and Samuelson (1998) predict a decline in risky asset shares in old age. They point out that the young are more willing to invest in risky assets because they enjoy greater *labor supply flexibility* (we present some evidence about this mechanism in section 6.3). Investment in risky assets may decline with age because younger consumers have a better *chance to diversify shocks* over time. Finally, the portfolio also varies systematically with age in the model proposed by Cocco et al. (1998), simulating the choice between a risky and a safe asset in a multi-period life-cycle model. They argue that human capital is a better substitute for safe assets than for risky assets and find a concave profile of the share of risky assets over the life cycle. The intuition is that since the annuity value of labor income is low but increasing at young ages, and high but decreasing at middle ages, consumers substitute risky assets for abundant safe assets when young and rebalance the portfolio in old age, when the annuity value of labor income starts declining.[12]

In the rest of this section we further document portfolio heterogeneity and explore how the propensity to invest in risky assets, financial diversification and risky asset shares vary with household wealth, age and education. A regression approach is taken up in Section 5. In the remaining of the paper we concentrate on the 1989-95 period. As explained in Section 3, the grouping of the various assets in our three categories is somewhat questionable after 1995. Since the analysis that follows is entirely based on the aggregate categories, in order to avoid using inconsistent definitions we do not include the 1998 survey into our reference dataset. In so doing, we gain in comparability and don't loose too much information, as the trends

[10] Guiso, Jappelli and Terlizzese (1996) use a self-reported indicator of credit constrained in the 1989 SHIW and find evidence supporting this contention.

[11] Using a two-period model, Gollier and Pratt (1996) show that convexity of absolute risk tolerance is sufficient to generate a decreasing age profile of risky assets. As they note, the result may not generalize to multi-period models. Guiso and Paiella (1999) find that absolute risk tolerance is concave in wealth.

[12] This model does not require additional ingredients with respect to standard life-cycle consumption models. Furthermore, since the lifetime profile of the annuity value of labor income differs in predictable ways between different population groups, the model suggests that portfolio composition shifts itself in predictable ways. For instance, if for some groups the path of labor income is steeper, then the portfolio composition is also more twisted towards risky assets at younger ages. Of course the validity of this explanation rests on the assumption that human capital is a better substitute for safe than for risky assets.

towards higher investment in risky assets and the increase in diversification is clearly apparent also in 1995. In addition, some crucial variables that we use in the estimation are not available to us for the most recent survey year.[13]

## 4.1. The wealth-portfolio profile

The first four columns of Table 5 report portfolio shares by wealth quartiles: the last two focus on households in the top 5 percent and 1 percent of the wealth distribution. The table refers to an intermediate year of our sample (1995). The qualitative patterns are similar in other survey years. Glancing through Table 5, one sees that portfolio allocations are not independent of wealth. For instance, the relative weight of financial assets in total assets declines with wealth, in favor of investment real estate and business equity,[14] while debt shares are slightly decreasing with wealth. Wealthier households tend to invest a much larger share of their wealth in risky assets, 7.1 percent in the first wealth quartile and 24.6 percent in the fourth. This pattern is stronger still for investment real estate and business equity, whose share in total wealth rises from 5.5 percent in the bottom quartile to 36.8 percent in the top quartile.

The financial portfolio displays additional differences across quartiles as well. With the exception of defined-contribution pension funds, all risky financial assets (stocks, mutual funds, and long-term bonds) increase sharply with wealth. On the other hand, currency and transaction accounts decline from 65 percent in the bottom quartile (where currency represents almost 10 percent of the total) to 27.8 percent in the top quartile (where currency represents only 1 percent of financial wealth).

Households in the top 1 percent or 5 percent of the wealth distribution behave very differently from median households and even from top quartile households as a group . Focussing on the top 5 percent, we find that the rich invest most of their wealth in risky assets (51.8 percent, of which 33 percent in investment real estate and 13 percent in business). Stocks, held directly or through mutual funds and managed investment accounts, represent a

[13] A third reason for excluding the 1998 survey from the reference sample for the following anlysis is that in 1998 the company in charge of collecting the data and the collection methodology have changed. Whether this has had any impact on the quality of the survey is still unclear,since the data have been realised only recently. The only noteworth sign is that the traditional target sample size (8,000 households) has not been hit, and only about 7,000 households have been interviewd.

large component of financial assets (22.8 percent), while transaction and saving accounts represent a relatively small share (17.7 percent). Durable goods account for almost half of the wealth of the bottom quartile but are a tiny portion of the portfolio of the top 5 percent (4.5 percent). Portfolio diversification too increases with wealth. The fraction of those with complete portfolios (holding clearly safe, fairly safe and risky financial assets) or diversified portfolios (holding clearly safe and risky assets) is 0.6 percent in the bottom quartile, 6.0 in the second, 13.7 in the third, 26.3 in the fourth and 40.9 percent in the top 5 percent. These patterns are even more marked for the top 1 percent.

The lower part of Table 5 reports participation, asset shares and asset shares conditional on participation in risky financial assets and in total risky assets. There is a strong association between participation in risky assets and wealth. The relation between the conditional shares and wealth is much weaker, and applies only to the upper 5 or 1 percent of the wealth distribution. This relation is therefore broadly consistent with the standard theory of portfolio selection (Gollier, 2000) as well as with the computational findings surveyed by Haliassos and Michaelides (2000). Otherwise, the conditional share of risky financial assets is between 40 and 50 percent, and that of total risky assets around one third. This implies that the relation between unconditional asset shares and wealth derives from the strong positive association between participation and wealth, rather than from an association between conditional shares and wealth. The relation between conditional risky asset shares and wealth will be discussed further in Section 5, with regression estimates of participation in risky assets and of conditional risky asset shares. At this stage we note only that the strong positive association between participation and wealth is robust to the inclusion of a broad set of controls.

## 4.2. The age-portfolio profile

Table 6 illustrates the age pattern of participation and of the share of risky assets separately for financial wealth and total wealth using pooled 1989-95 data. As with wealth, the distinction between unconditional and conditional shares is quite important. Over the life cycle the unconditional share of risky assets has a hump-shaped profile, resulting from the

[14] One simple explanation is that entering a business involves a fixed cost or a minimum scale of investment.

combination of a concave age-profile of participation and a flat profile of the conditional share. Participation increases early in life (from 15 percent in the first age bracket to almost 20 percent in the 40-49 age bracket) and then falls considerably towards retirement, regardless of the definition of risky assets. By contrast, the conditional share is fairly constant through life at 45 percent, regardless of the definition of risky assets.[15] We also report the age-profile of an index of financial diversification (the number of financial assets in the portfolio), which also exhibits a hump-shaped profile.[16] Overall, Table 6 suggests that entry benefits or costs vary over the life cycle, possibly following the hump shape in wealth, in agreement with simulations of finite horizon consumption-portfolio models, see Haliassos and Michaelides (2000).

The profiles shown in Table 6 are obtained pooling all available cross-sections, and do not take into account the possible contamination of the age profiles by cohort effects. This issue may be of some relevance if, say, the increase in the number of investors in risky assets that we observe is more heavily concentrated in some cohorts. Furthermore, Table 6 pools all observations and disregards time effects.

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 (zero for those born in 1975 and −0.7 for those born in 1910), 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

[15] The virtual irrelevance of age for conditional portfolio shares is inconsistent with financial advice given to older people to limit their exposure to stockholding.

[16] This index of financial diversification is admittedly crude. More sophisticated indicators would take into account the fact that the main scope of financial diversification is to hedge risks.

simply reflects a trend in participation.[17] Financial innovations and increased competition among financial intermediaries (see Section 2) supports such an interpretation of the data, so we conclude that the description in terms of age and time effects is much more plausible.

Accordingly, we aggregate the microeconomic data into 5-year age-cohort cells and compute the average ownership rate and number of assets within each group. We then estimate equations for the ownership rate and for the index of financial diversification using the following specification:

$$P_{a,t} = \sum_{t=1}^{T} b_t d_t + f(a) + u_{a,t}$$

where $P_{at}$ is the proportion of households with risky assets in age group $a$ in year $t$, $b_t$ is a vector of year dummies, $f(a)$ is a fourth order polynomial in age and $u_{at}$ a random component. We run similar regressions for the index of financial diversification, the number of financial assets. This variable ranges from zero to 10 (for households holding each one of the assets listed in Table 2).[18]

In the upper-left graph of Figure 1 the solid line shows the estimated age profile of the participation rate in risky financial assets. The second panel refers to participation in total risky assets, and the graph at the bottom to financial diversification. In each graph the broken lines connect the raw data for each cohort, observed in four years between 1989 and 1995. Time effects are readily visible. For instance, participation and diversification increase for all cohorts from 1993 to 1995.

According to both definitions, participation in risky assets is hump-shaped. Confirming the pattern of Table 6, at early stages of the life cycle only a small fraction of consumers invests in risky assets. The incidence increases sharply and reaches a maximum around age 40. The bottom graph in Figure 1 shows that portfolios are poorly diversified at all ages. The average number of assets never exceeds 2, and exhibits a very marked hump shape. The age

[17] Paxson (1996) also finds it more plausible to describe saving rates in terms of age and time affects, rather than in terms of age effects, cohort effects and restricted time effects. Although the present context is rather different, the basic problem is the same: any description of the data in terms of cohort and age effects is flawed when there is a trend in the data.

[18] Probit regressions for asset participation or regression for the index of financial diversification using the whole sample yield similar results.

profile of participation and diversification again points to significant fixed costs in acquiring risky assets and suggest that people invest in risky assets only after they have accumulated enough wealth. This effect is amplified by the observation that the incentive to hold risky assets is not age-independent. Theory, indeed suggests that the young should have a greater incentive to invest in risky assets than the elderly, yet we observe a humped shape.

Figure 2 plots the age profile of the fraction investing in risky financial assets and in total assets and the index of diversification by education groups. We use compulsory schooling (8 years ) to split the sample into two education groups. Both display a hump shape in the age-profile of ownership of risky assets ownership and of financial diversification. But there are also interesting differences. At all ages participation is about three times larger for the more educated (the gap is smaller but still substantial for ownership of total risky assets). Second, for the high-education group the profile of ownership is steeper early in life and peaks later (around age 50) than for the less well educated (around age 40). Third, at all ages the more educated are also more diversified and the peak of the profile is about 10 years later than for the less well educated.[19]

## 5. Regression analysis

The descriptive analysis of Sections 3 and 4 shows that in Italy the propensity to invest in risky assets and the extent of portfolio diversification vary significantly with wealth, age, and education. Ownership increases strongly with wealth and education, while the age profile is hump-shaped. However, conditional on ownership, risky asset shares are relatively flat over the life cycle and do not vary much with wealth, except at very high wealth levels (the top 5 percent). Since the descriptive analysis looks at the role of each variable in isolation and since there could be other household characteristics that affect portfolio choice, in this section we supplement the evidence by regression analysis for the probability of investing in risky assets,

[19] Since education is strongly correlated with wealth, the differences by education groups that one observes in Figure 2 could simply reflect differences in wealth. Plotting the profiles of participation and diversification for low- wealth (below the median wealth of the corresponding age group) and high-wealth households (above the median) shows that risky assets are largely in the hands of rich households at all ages, as is already apparent in Table 5.

for the share of risky assets and for the index of financial diversification. We present results from pooled cross-sectional data and panel data estimates controlling for the potential impact of fixed effects.

For the regression analysis we concentrate on the 1989-95 period. As explained at the end of Section 3.1, the grouping of the various assets in our three categories is questionable after 1995. Since the analysis that follows is entirely based on the aggregate categories, in order to avoid using inconsistent definitions we do not include the 1998 data into our reference dataset. In so doing, we gain in comparability and don't loose too much information, as the trends towards higher investment in risky assets is clearly apparent already in 1995. In addition, some crucial variables that we use in the estimation are not available to us for the most recent survey year.[20]

## 5.1. Cross-sectional data

We model the demand for risky assets as a two-stage decision process. Households first choose whether or not to hold risky assets, then they decide how to allocate wealth between safe and risky securities. Given that incomplete portfolios are the rule rather than the exception in our sample, the use of OLS in asset shares equations would lead to inconsistent parameter estimates. Accordingly, we rely on a selection model.

The model requires suitable identification restrictions, i.e. variables that affect the participation decision but not the share of risky assets. We thus assume that a series of variables affecting the decision to invest in risky assets are correlated with entry cost and with fixed costs of managing a portfolio but not with asset shares. They are an index of bank diffusion (measured by the average number of ATM points in the city of residence), an index of financial development (the loan-GDP ratio in the province), and dummies for the size of the city of residence (which might be correlated with transaction costs in asset management).

In the participation and asset-share regressions we also control for household income and wealth (linear and quadratic terms), household characteristics (family size, number of

[20] A further reason for excluding the 1998 survey from the reference sample in the regression analysis is that in 1998 the company in charge of collecting the data and the collection methodology have changed. Whether this has had any impact on the quality of the survey is still unclear, since at the time of the writing the 1998 data have just been released. The only noteworth sign is that the traditional target sample size (over 8,000

children and region of residence), and variables related to the household head (age and age square, gender, marital status and education). We also add to the list of the regressors the average unemployment rate in the province of residence as a proxy for background risk (we comment on this variable in Section 6.2). The sample uses the pooled surveys from 1989 to 1995, a total of 30,881 observations. To account for the institutional developments mentioned in Section 2 and for aggregate shocks, each regression includes year dummies.

The results of the participation equation for risky financial assets are reported in column (1) of Table 7. The coefficients of age, wealth and education are not only statistically different from zero, but also economically important and confirm the descriptive evidence. Figure 3 indicates that at sample means the predicted probability of investing in risky financial assets increases by 4 percentage points from age 25 to age 40 and declines by 8 percentage points between age 40 and age 70. Raising wealth from 25,000 to 200,000 euros (equivalent to approximately the $20^{th}$ and the $80^{th}$ percentiles of wealth) raises the predicted probability by 4 percentage points. Increasing education from compulsory schooling (8 years of education) to a university degree (20 years) raises the predicted probability by 10 percentage points.

The regression coefficients also indicate that large households, women and residents of Southern regions are less likely to invest in risky financial assets. The provincial index of bank diffusion correlates positively with risky asset ownership. Dummies for city size have the expected sign, while the loan-GDP ratio is not significantly different from zero (these coefficients are not reported in the table). Time dummies indicate that the probability of owning increases steadily over time.

The second column of Table 7 reports estimates of the share of risky financial assets. In general, we find the share harder to predict than the participation decision. The estimates signal that the conditional share is about constant up to age 60 and then declines during retirement. The relation between wealth and the asset share is positive in the relevant range of wealth. However, the effect is weak: increasing wealth from 25,000 to 200,000 euros raises the share of risky financial assets by only 3 percentage points. Education has a positive and significant coefficient, indicating that each year of education raises the predicted share by one percentage point. Finally, the demographic variables have the same sign as in the participation equation.

---

households) has not been hit in the most recent survey, and that only 7,147 households have been interviewed.

Like most other surveys, the SHIW uses a two-stage sample design, first municipalities (or clusters) and then households. These clusters can induce neighborhood effects. This positive correlation between observations might inflate the standard errors, as is explained by Deaton (1997). The Bank of Italy does not release the individual cluster identification number. As a proxy for the clusters, we use a robust variance-covariance matrix assuming that observations are independent across provinces, but not necessarily within provinces (which might contain several clusters). In all cases the coefficients retain their statistical significance.

Table 7 also reports estimates of the determinants of participation and share of total risky assets, which include business equity and investment real estate. The coefficients confirm several of the patterns uncovered for risky financial assets. In particular, participation is concave in age, and there is a strong positive association between wealth and participation and a small positive correlation between wealth and the share.

There are, however, three important differences between the regressions for risky financial assets and for total risky assets. Education and residency in the South (in the participation equation) change sign, while the index of bank diffusion is not significantly different from zero. The latter finding probably reflects the fact that banks are not a relevant channel of useful information on real estate and business investment, unlike financial assets. One possible explanation for the results concerning the education variable and the South dummy is that managing a financial portfolio is "information intensive" and requires a degree of intellectual ability, which is proxied by education. On the other hand, acquiring and managing non-residential properties or running a small business (the other two components of total risky assets) is less demanding in terms of information and managing abilities.[21] The dummy for the South might also pick up differences in financial development between areas of the country that are not accounted for by our controls.[22]

The last column of Table 7 reports an ordered probit regression for the number of financial assets. The coefficients confirm that the strongest predictors of participation also explain the index of financial diversification. In particular, diversification is concave in age and

[21] The sign switch in education in the participation equation is also consistent with the fact that small entrepreneurs and the self-employed are, on average, less well educated than the rest of the sample.

[22] An alternative explanation relies on the extent to which people trust each other. Guiso, Sapienza and Zingales (2000) show that stockholding is positively affected by the degree of trust in the province of residence. If, as in Putnam (1993), trust is lower in the South than in the North, the geographical variables may be capturing differences in trust.

increases with wealth in the relevant range of the variable. Education, residency in the South, and demographic variables are also strong predictors.

## 5.2. Panel data

In this section we use the panel component of the SHIW to check whether the patterns uncovered by the descriptive and statistical analysis of pooled cross-sectional data are contaminated by unobserved heterogeneity. Each SHIW since 1989 has re-interviewed some respondents from the previous surveys. The fraction re-interviewed has increased, from 15 percent of the previous sample in 1989, to 27 percent in 1991, 43 percent in 1993 and 45 percent in 1995. Some households have been interviewed for more than two consecutive surveys, so the participation length differs across households. As explained, we neglect the newly available 1998 survey to preserve comparability. Dropping observations where the head has changed and those with inconsistent responses for age and education, we are left with an unbalanced sample of 11,549 observations on 4,609 households. Of these, 2,529 households have been interviewed twice (in 1989-91, 1991-93 or 1993-95); 1,515, three times (in 1989-93 or in 1991-1995); and 565 households four times (from 1989 to 1995).

Table 8 reports two probit regressions with random effects for participation in risky financial assets and in total risky assets. Given the reduced sample size and the presence of random effects, the coefficients are generally estimated with larger standard errors than in Table 7, but the results are quite similar, and we find qualitatively and quantitatively comparable effects on the predicted probability. Education has a positive effect on the probability of investing in risky financial assets but no effect on that of investing in total risky assets. The age profile is concave, while that of wealth is positive in the relevant range of this variable. The coefficient of the index of bank diffusion indicates that increases over time in the number of bank points raised households' incentives to invest in risky financial assets. As with the cross-sectional estimates, we find an insignificant effect of the index of bank diffusion on the probability of investing in total risky assets.

Probit models with random effects require that the observable characteristics be uncorrelated with the unobservable heterogeneity component of the error term and that they be strictly exogenous. In their survey of econometric techniques, Miniaci and Weber (2000)

note the importance of this point in the estimation of household portfolio models. As an alternative to the probit model with random effects, they experiment the fixed-effect conditional logit estimator. This estimator is consistent even if fixed effects are correlated with observable variables. The drawback is that individuals who do not change participation over the sample period do not contribute to the likelihood function, and so have no effect on the estimation. Thus, with conditional logit one cannot estimate the effect of time-invariant characteristics (i.e. gender). In short panel data the problem is compounded, because it is hard to identify the effect of variables which are almost constant for each individual (such as education, family composition or region of residence). Furthermore, the effect of variables that change in a predictable way at the individual level (such as age) is difficult to estimate because identification relies only on the non-linear terms.

With conditional logit, the sample size drops dramatically (2,266 for ownership of risky financial assets and 3,367 for total risky assets). In these regressions the effect of wealth on participation is qualitatively similar to that discussed in Section 5.1, but the age coefficients and that of most other demographic variables are not statistically different from zero. As explained, in short panel data there is hardly enough information to identify the age effect; in other words, the fixed effects are correlated with age and other individual characteristics.

## 5.3. Summing up

Let us summarize the main features of the data that emerge from the descriptive and regression analysis. First, ownership of risky assets is strongly increasing in wealth, exhibits a markedly concave age-profile and rises with education. Second, the conditional share of risky assets is also concave, but much less so than the ownership. Third, the share of risky financial assets increases with wealth. However, when account is taken of the other determinants, wealth exerts a mild effect on the portfolio: moving from low to high wealth raises the predicted share by only a few percentage points. The predictions are similar, but not identical, for total risky assets.

Overall, our findings reveal substantial differences between the determinants of ownership and those of asset shares conditional on participation. Age, wealth and education – some of the main determinants of portfolio choice suggested by theory – affect portfolio

decisions at the stage where households have to choose whether or not they should invest in risky assets. Once the decision is taken, the portfolio allocation is little affected by these factors.

How do these findings square with theoretical models of portfolio choice? The weak relation between the conditional share of risky assets and wealth suggests that preferences with constant relative risk aversion may not be a bad characterization of reality, except perhaps at very high levels of wealth.[23] The available evidence against this standard hypothesis is still too scanty to dismiss its validity. Barsky et al. (1997) use a self-reported measure of relative risk aversion obtained in a sample of US households and find that it declines only slightly with the level of wealth**.** Guiso and Paiella (2000) construct an indicator of absolute risk aversion from information reported in the 1995 SHIW about willingness to participate in a hypothetical lottery. They find that absolute risk aversion declines with wealth. However, the rate at which this occurs is not sufficient to support decreasing relative risk aversion. Similarly, the finding that the share of risky assets, conditional on participation, is (essentially) independent of age lends support to models that predict that the share of risky assets is constant through life, possibly because preferences are characterized by linear risk tolerance.

The main problem in interpreting the empirical findings is that the theoretical models typically ignore the participation decision and focus on cases in which investors optimally choose to hold both safe and risky assets. As such, these models have nothing to say about the shape of the age-participation and wealth-participation profiles. Our results suggest instead that we need theoretical explanations for the concave age-profile of participation in risky assets and for the strong positive correlations between wealth and participation and between education and participation.

The only way to account for the lack of participation and diversification is to bring

[23] Notice that quite small departures from constant relative risk aversion can explain large differences in the share of risky assets. Suppose that the index of absolute risk aversion is $A(w)=g/w^{d}$, where $d$ measures the speed at which absolute risk aversion declines with wealth $w$. The corresponding index of relative risk aversion is $r(w)=gw^{1-d}$. If $d=1$ preferences are CRRA, while if $d>1$ ($d<1$) relative risk aversion declines (increases) with wealth. If a 10 percent increase in wealth leads to a decline of 0.5 percent in $r(w)$, then $d=1.05$, a relatively small departure from CRRA preferences. In the 1995 SHIW the median wealth of the 4th quartile is about 40 times the median wealth of the 1th quartile, so that the rich would have a degree of relative risk aversion 19.5 times lower than the poor. Assuming lognormal excess returns, the share of risky assets is approximately $a=E(R_s)/r(w)s^2$, where $E(R_s)$ is the excess return and $s^2$ the variance of the return (the approximation is because the optimal share is computed under the assumption of CRRA preferences). The fact that we find approximate constant conditional shares signals that $d$ may not be far from unity, at least below the top 5

participation costs into the picture. When purchasing risky assets, there are essentially three sources of costs: minimum investment requirements, monetary transaction costs, and information costs. Since minimum investment requirements act as a barrier to entry at low wealth, they predict that participation increases with wealth. Monetary transaction costs lead to similar predictions, especially if these costs decrease with wealth.

Table 9 shows that in Italy people pay very substantial transaction costs when investing in a mutual fund. The table reports entry or exit fees for four types of equity funds and two types of balanced funds. Entry fees vary with the amount invested, and are generally between 3 and 4 percent for investment under 5,000 euros but can be as high as 6 percent. A significant reduction in costs applies only to very large investments, above 500,000 euros. Other mutual funds do not charge at entry but impose an exit fee that varies with the amount invested and the timing of disinvestment. These fees are between 2 and 3 percent for investment of 5,000 euros withdrawn after 1 year.[24] 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.

Participation costs, broadly interpreted, help also explain the correlation between participation and education. Education proxies for the ability to collect and process information. Participation costs are therefore lower for better educated people who will thus be more likely to participate. Information costs may also explain a puzzling feature of the data. If minimum investment requirements or fixed monetary costs were the only participation costs, we should find that the rich have complete portfolios, because entry costs vanish at high wealth levels. However, in Table 5 we see that portfolios are poorly diversified even for the very rich. In the top 5 or 1 percent of the wealth distribution only half of the households invests in risky financial assets. Information costs are not necessarily correlated with wealth and might therefore explain why so many rich households do not invest in risky financial assets. This issue is further explored in Section 6.4, where we show that independent proxies for financial information have strong explanatory power for participation in risky financial assets, even after controlling for wealth, age, and education. Interestingly, we find that

---

percent of the wealth distribution.

[24] On top of entry or exit costs, investors pay annual management fees on the order of 1.5 percent of the amount invested. Most funds include over-performance fees ranging from 0.2 to 0.8 percent of the amount invested or a retention of the over-performance ranging from 10 to over 35 percent.

virtually all rich households invest in risky real assets (business or investment real estate) which require less sophistication than risky financial assets.

Explaining why participation varies with age is more difficult because there is no obvious reason why participation costs should change with age.[25] One may then think that, controlling for wealth and other relevant characteristics, the participation profile should be flat. But in reality we observe a concave profile. Calibration models of the sort discussed by Haliassos and Michaelides (2000) shows that participation costs – even when they are unrelated with age – can indeed account for the shape of the age-participation and wealth-participation profiles that we observe in the data and, potentially, for the correlation between education and participation. The reason is that with finite horizons the optimal policy functions evolve with age and this is alone sufficient to generate a hump in stock holding participation. Obviously, if entry costs have themselves a hump (for instance because time is an input in managing one's portfolio and its value is age-dependent) the hump shape in participation would be magnified.

Another way to explain the results is that households differ in their liquidity needs and that these needs are correlated with age. Given the high transaction costs reported in Table 9, it is clear that only investors that expect to hold assets for a relatively long time will acquire them. Those who have a high probability of needing to liquidate the asset will be more reluctant to buy, because the incidence of the costs decreases with the length of the holding period. For instance, if the entry or exit cost is 3 percent, the annual expected cost is only 0.3 percent if one expects to hold the asset for 10 years, but 6 percent if it is liquidated after six months.

This implies that households with short-term liquidity needs are less likely to buy assets that require fixed entry costs. Typically, households with liquidity needs are those who face

[25] Even ignoring the distinction between participation and conditional share, and focusing on the unconditional share, no model provides a full account of the concave age-profile of the share of risky assets. Models in which age proxies for the accumulation of financial information and models with borrowing constraints can account for an increase in the share over the life-cycle but are difficult to reconcile with the declining portion in old age. Models with convex absolute risk tolerance or based on labor market flexibility are consistent with a declining share after retirement but not with its increase at young age. Combining convex risk tolerance or flexibility with liquidity constraints or learning might explain the hump. Suppose that convex risk tolerance alone (or flexibility alone) gives rise to a monotonically declining age profile of risky assets. Let's make the reasonable assumption that the incidence of liquidity constraints and the intensity of learning are particularly great at younger ages and much attenuated (or irrelevant) in middle ages. Then adding either of these factors to the model would explain a hump-shaped profile of risky assets over the life cycle.

liquidity constraints or with high income variability, such as the young, or those that face uninsured health risks, such as the old. They also include households that are accumulating assets to buy a house and are actively seeking for a home purchase. If housing prices are variable, there is a high chance of needing liquidity to take advantage of a good opportunity, and the corresponding incentive to pay the transaction cost to buy risky assets is low. More generally, households with limited access to credit markets (typically, the young) are more reluctant to hold risky assets if these assets entail a liquidation cost. Income and health risk and credit market imperfections thus single out relatively young or relatively old households and are therefore consistent with the hump shape in participation.

In summary, the descriptive and regression results show that for many households the main action in portfolio management is the decision to invest in risky assets. Once this decision is taken, the shape of the portfolio does not differ greatly from that predicted by standard models. These models, however, ignore investment costs and do not explain participation decisions and their relation with age, education, wealth and other household characteristics.

## 6. Portfolio transitions, risk, and financial information

In this section we address a number of specific issues that are relevant for understanding the pattern of wealth allocation and that have recently received attention in the theoretical and empirical literature. We focus on portfolio mobility, background risk, labor market flexibility, and information acquisition. Although each of these issues highlights important features of the behavior of Italian households, they are of broader interest and might be relevant for other countries as well.

### 6.1. Portfolio mobility

At various points, we have cited fixed costs and management costs to interpret some of the patterns of household portfolios. As is shown in Table 9 these costs are indeed substantial, especially at low levels of wealth. One consequence of transaction costs is that they lead to inertia and lumpiness. Fixed costs make it less worthwhile to purchase a new

asset, yet if one chooses to do so it is more convenient to buy a relatively large amount rather than to make frequent small adjustments. The presence of fixed costs induces households to do nothing most of the time and make occasional large portfolio adjustments. So high transaction costs imply a high degree of portfolio persistence.

Vissing-Jorgensen (1999) tests the importance of fixed transaction costs for stock market participation using data on asset holdings from three waves of the PSID. She points out that entry costs, fixed transaction costs and proportional participation costs lead to structural state dependence in the stock market participation decision and in the proportion of financial wealth invested in shares. Using dynamic probit analysis she finds that the lagged participation is a very strong predictor of the conditional probability of participating, providing strong evidence for state dependence. Here we confirm her findings, showing that in Italy portfolio adjustments are the exception rather than the rule especially for the poor and the less well educated.

In Table 10 we report transition matrices of the participation rates in fairly safe and risky financial assets. Recall that assets are grouped into three categories, (safe, fairly safe, and risky). Each household in the transition matrix owns safe assets (which include currency), so the (0,0) cell identifies households with only safe assets, the (1,0) cell those with only safe and fairly safe, the (0,1) cell those with only safe and risky assets, and the (1,1) cell those with all three types of assets. Each cell in the transition matrix reports the 16 possible portfolio transitions. Complete persistence is found when all frequencies lie along the main diagonal, and portfolio transitions entail at least some positive off-diagonal elements.

The first panel of Table 10 refers to the whole sample. We only focus on the 2,926 transitions between 1993 and 1995. A similar picture would emerge using any other two consecutive surveys. The sum of the frequencies on the main diagonal indicates that over 65 percent of households did not change participation, evidence of substantial stickiness. The largest group is the lower left cell: almost 39 percent of households only invested in safe assets in both 1993 and 1995. Note also that the (0,0) group is the one with the least number of transitions: 75 percent did not invest in either fairly safe or risky assets between 1993 and 1995. The second most immobile group is the (1,1) group, where 61 percent did not change configuration. The third is the (1,0) group, where 58 percent experienced no transition. Analysis by education reveals that education correlates also with portfolio transitions. As

noted, lack of portfolio transitions is consistent with the presence of large transaction costs.

Three portfolio shifts appear to be relatively important: 9.5 percent of the sample with (0,0) ended up with (1,0) and, correspondingly, 7.4 percent with (1,0) ended up with (0,0). Comparing the first row total with the first column total, one sees an increase in the frequency of those with more diversified portfolios (1,1) from 11.2 percent in 1993 to 14.1 in 1995. But this results from over 4 percent of households becoming less diversified, and from 7.3 percent becoming more diversified.

The characteristics of movers are rather different from those of stayers. Multinomial logit regressions – not reported for brevity – indicate that those who invest or disinvest from risky financial assets in any year after 1989 are younger, wealthier and better educated than those with immobile portfolios. This more dynamic portion of the sample is also less likely to live in the South or in provinces with high unemployment rates. The pattern is similar for those who move in or out the stock market.

The second and third panel report transition matrices splitting the sample by low and high education. Portfolio mobility requires financial information and information processing costs and these, as we argue in Section 5, are likely to be lower for people with higher education. The evidence is consistent with this hypothesis. First, education correlates with diversification, a fact already revealed by the regressions reported in Table 7: over 60 percent of the households with low education are immobile in the cell (0,0), as opposed to only 20 percent in the high education group. Education correlates also with mobility. For the less well educated, the sum of the diagonal frequencies is 68 percent; in the group with high education, 59 percent. Summing across the elements of the first column, the comparison by education also highlights that 10 percent in the group with high education made a move towards complete portfolios, as opposed to only 6 percent in the group with low education.[26]

Mobility is clearly affected by the time horizon over which it is measured. Since fixed transaction costs lead to infrequent and lumpy adjustment, over the long run one should observe higher mobility. The last panel of Table 10 focuses on long-run mobility by considering the 565 transitions that we observe over the longest time-span covered by our

[26] A similar pattern emerges splitting households according to median wealth. Two thirds of the low-wealth group is in the cell (0,0), as opposed to only 10 percent in the high wealth group. Furthermore, 75 percent of those below median wealth did not move, as opposed to 55.6 percent for those above the median. Also the positive correlation between wealth and mobility is consistent with the existence of fixed transaction costs

data, 1989-1995. In fact, the fraction of immobile households is only slightly reduced when one computes transitions over 6 years (58.6 as opposed to 65 percent for 1993-95).

Dynamic probit analysis performed with our panel data confirms the findings of Table 10. Controlling for wealth and demographic characteristics, past ownership is a very strong predictor of current ownership. However, as pointed out Miniaci and Weber (2000) such state dependence might arise also from unobserved heterogeneity, not just from transaction costs. Disentangling genuine state dependence from unobserved heterogeneity is not easy with short panel data, as in the case at hand.

## 6.2. Background risk

Recent models of portfolio behavior proposed by Kimball (1992) posit that households willingness to invest in risky assets and the amount held are affected not only by rate of return risk, but also by independent sources of uncertainty. They imply that when people face risks that cannot be easily avoided or diversified (such as wage and unemployment risk), they are less willing to invest in risky assets. In order to reduce overall exposure to risk, people react to unavoidable risks by decreasing exposure to avoidable ones, such as a risky asset portfolio.

Guiso, Jappelli and Terlizzese (1996) bring empirical evidence in support of this prediction.[27] They use a self-reported indicator of earnings risk as a proxy for background risk and find that households with lower earnings uncertainty hold riskier portfolios. In this section we supplement the analysis using as an alternative proxy the average unemployment rate in the province of residence. If employed, households in provinces with high unemployment rates face greater risk of losing their jobs; if unemployed, they have less chances of finding a job.[28] We also report results using subjective probabilities of unemployment and of the coefficient of

---

which are more likely to be important for poor households.

[27] Vissing-Jorgensen (1999) also finds evidence that background risk reduces stock market participation in the United States. Hochgurtel's (1998) results for the Netherlands are inconclusive.

[28] The 1995 SHIW collects information on workers perceived probability of losing their job or remaining unemployed and on-the-job earnings uncertainty. Guiso, Jappelli and Pistaferri (1999) show that the self-reported probabilities are strongly correlated with the average unemployment rate in local labor markets. Furthermore, workers with higher perceived probabilities of losing their job also face higher on-the-job wage risk. This suggests that the provincial unemployment rate is a good proxy for perceived employment and labor income risk. While the subjective indicators of income uncertainty are available only in the 1995 SHIW, we can impute the provincial unemployment rates to all surveys. If subjective indicators are measured with error, the provincial unemployment rate provides a good instrument.

variation of future earnings available in the 1995 SHIW.

Figure 4 plots age profiles of the probability of investing in risky financial assets for households living in provinces with low and high unemployment (below or above 9 percent).[29] At all ages, households facing lower unemployment risk are more likely to hold risky assets than those with high risk. To the extent that the average unemployment rate correlates with individual perceived risks, this is consistent with the thesis that households with lower background risk are less reluctant to undertake additional risks. The difference between low and high unemployment provinces is more evident for risky financial assets. The bottom graph highlights that financial asset diversification is also negatively correlated with unemployment rates.[30]

In Table 7 the provincial unemployment rate has a negative and significant effect on the probability of holding risky assets, even controlling for age, wealth and demographics only in the ownership equations. This negative correlation is noteworthy because the regressions also include a full set of city size dummies and a dummy for the South (where the unemployment rate is twice the national average).

The effect of the unemployment rate is also economically significant. Other things equal, moving from Naples (where the average unemployment rate for 1989-95 was 24 percent) to Milan (6.2 percent) increases the probability of investing in risky financial assets by 6.9 percentage points and that of investing in total risky assets by 11.7 points. The proxy for background risk is correlated with participation and the index of diversification, but in the conditional share equation we obtain a negative sign for risky financial assets and a positive sign for total risky assets. If one controls for random effects in the panel data probit regressions of Table 8, the coefficients are negative and significantly different from zero in both ownership equations.

---

[29] Out of a total of 95 provinces, high-unemployment provinces (more then 9 percent) number 40 in 1989, 48 in 1991, 49 in 1993 and 43 in 1995. The average national unemployment rate in 1989-95 was 11.3 percent.

[30] One may find it puzzling that residents in low-unemployment provinces hold riskier portfolios even after retirement, i.e. even when they are not directly exposed to labor market risk. There are two possible explanations. First, some retired heads live with young individuals and are therefore indirectly affected by labor market outcomes. Second, as a reflection of low geographical mobility, in Italy differences in unemployment rates across provinces are highly persistent. Thus, those who retire in low unemployment areas have been less exposed to labor market risk than those who retire in high unemployment areas. They have therefore accumulated more risky assets, which are then decumulated during retirement. This is consistent with the patterns in Figure 4, where the difference in participation is high before retirement and declining during retirement.

For half of the sample the 1995 SHIW collects direct information on the subjective probability of losing one's job (or remaining unemployed) and on the probability distribution of on-the-job earnings. As is detailed in the Appendix, this information can be used to construct individual measures of the perceived variance of labor income and of employment risk with variation at the individual level. The advantage is that one uses truly subjective measures of income risk, which are the proper determinants of portfolio choices. The problem is that this measure is only available in 1995.[31] The 1995 data are useful to contrast the results obtained so far with the provincial unemployment rate.

In Figure 5 we relate the probability of unemployment and the coefficient of variation of future income to the fraction of households with risky financial assets and the conditional share of risky financial assets. Data are grouped by increasing unemployment probabilities and coefficients of variation. For participation we find a negative correlation between exposure to portfolio risk and the perceived risk of unemployment or the variability of on-the-job wages. For the conditional asset share there is a negative relation with the coefficient of variation and a slightly positive relation with the probability of unemployment.

The relation between individual income risk and portfolio choice might be spurious, because current perceived income risk might be correlated with past unemployment and earnings. In this respect the aggregate (provincial) unemployment rate might be a better indicator of income risk, and the results in Table 7 should be more reliable than the descriptive evidence in Figure 5.

Overall, the evidence in this section supports the thesis that background risk is one determinant of households' portfolio allocation. There is strong evidence that participation depends on background risk. The evidence is weaker for asset shares, possibly because entry costs prevent poorer households from investing in risky assets while the rich background risk is unimportant. Response to background risk is one further reason for the observed lack of participation in risky assets. Furthermore, since income and employment risk change over the life cycle, background risk can also help explain the age portfolio profile.[32]

---

[31] Individual subjective distributions were also collected in 1989 and 1991. However the framing of the questions is different; and only in 1995 do respondents report the subjective probabilities of unemployment.

[32] Pistaferri (1999) uses PSID data to estimate the conditional variance of income shocks and finds that uncertainty related to permanent income shocks is U-shaped. Guiso, Jappelli and Pistaferri (1999) measure earnings uncertainty in the 1995 SHIW using subjective expectations on the probability distribution of future earnings. This indicator of background risk is also U-shaped, consistent with a hump shape in risky assets, at

## 6.3. Labor supply flexibility

Labor supply flexibility should offer insurance against adverse investment outcomes. Thus, people who have flexibility in choosing how much to work may prefer to invest more of their wealth in risky assets than if they had no such flexibility (Bodie, Merton, and Samuelson, 1991). Labor supply flexibility may explain why the young are more willing to bear risk than the old: the option of working harder in the future makes it easier for them to recover from possible portfolio losses. The validity of this hypothesis can be tested directly exploiting the fact that flexibility varies greatly by occupation.

We focus on employed workers, using a dummy of overtime work as a proxy for labor supply flexibility. Even though some workers are allowed to work overtime but never use this opportunity, we regard the proxy as a reasonable indicator of labor flexibility. In fact, in the 1995 SHIW there is separate information on the possibility of working overtime and on actual overtime work, and only 2 percent of those with jobs that allow overtime report not working overtime.

We use the same 1989-95 cross-section described in Section 4, dropping the self-employed and the retired (for whom the indicator does not apply). We add a dummy for overtime to the specification in Table 7, and find that its coefficient is not significantly different from zero in either the participation or the share equation for risky financial assets. The coefficient is negative and significantly different from zero in the equations estimated for total risky assets. In short, the evidence does not support the hypothesis that people who have flexibility in choosing how much to work invest more in risky assets.

## 6.4. Financial information

Managing a portfolio requires effort and knowledge of transaction costs, asset returns, volatility, and covariance with other assets. Many people do not have this information and thus lack the sophistication necessary to manage a portfolio. As we shall see, it is quite possible that people do not invest in particular assets simply because they are ignorant of their existence!

---

least over the working career.

Yet people can learn by experience. Looking at the behavior of other investors is one fairly cheap way of filling information gaps. If information accumulates slowly over time, one should expect the portfolio strategy to change with age, an argument used by King and Leape (1987) to interpret the slowly increasing pattern of asset diversification over the life-cycle.

The SHIW is a unique source of data on knowledge of financial assets and of current and past participation in financial markets. Here we use this information to provide insights into households' ignorance of basic facts of financial markets, and on the determinants of financial information and sophistication.

Table 11 reports data on knowledge of 17 financial assets, ownership over the entire lifetime, and end-of-1995 ownership for household heads only.[33] The answers must be mutually consistent. For each asset currently or previously held, households must report that the asset is known. This consistency requirement applies not only to the aggregate shares reported in Table 11, but also to each individual in the sample and for each asset. Very few observations with inconsistent responses are dropped from the analysis (less than 1 percent of the sample is discarded).

Many households know of the existence of certain assets even if they do not invest in them. The most popular assets are checking accounts, savings accounts and safe bonds (short-term government and postal bonds). However, 5 percent of the sample not know of checking accounts, and 25 percent have never had one. Part of the reason is that some households use postal accounts, a close substitute, About half of the sample are unaware of the existence of certificates of deposit, and corporate bonds. Repurchase agreements, recently introduced, are known to 32 percent but only a very small fraction (3.3 percent) have ever had one. About one third of the sample do not know of the existence of equities; over 50 percent are ignorant of the existence of mutual funds; 10 percent, of all risky financial assets. Data for 1998 are similar, indicating that the privatization process has increased participation, but not financial information per se, at least at the crude level recorded in the survey.

Data on asset knowledge can be used to construct two synthetic indices of financial information. The first is simply the number of assets that each household head knows about, divided by the number of potential assets known (17 in total). As an alternative, we experiment

[33] In 1995 the number of financial assets on which respondents report information is higher than in other survey years, and allows a more detailed picture of the household portfolio.

with an index that gives less weight to very common assets (such as checking accounts) and more to more "sophisticated" assets that are less widely known (such as customer repos). In particular, we weight assets by the inverse of the aggregate share of people that know about the asset, and scale the index by the sum of the weights. For instance, checking accounts have a weight of 1.046 and equities a weight of 1.64. The sample averages of the two indexes of financial information are reported in the last two rows of Table 11. They indicate that the average household knows of the existence of only half of the financial assets in the available menu.

It is very instructive to correlate the index with economic and demographic variables. In Figure 6 we plot the relation between the unweighted index, age and education (pictures for the weighted index are quite similar). The index is relatively constant over the life cycle and falls slightly around retirement. The decline during retirement could be due to cohort effects, for which we cannot control with our cross-sectional data, but it could also be that financial information falls after a certain age. The elderly might not follow recent financial developments or may simply tend to decumulate previous knowledge. The relatively flat age-information profile contrasts with the relatively steep age profile of ownership; and it invalidates the hypothesis that the hump in participation in risky assets and in financial diversification is due only to the correlation between age and knowledge.

The relation between education and information is quite strong, as is illustrated in the second panel of Figure 6. The index ranges from 25 percent for those with no more than elementary schooling to over 75 percent for those with a university degree. It is therefore likely that the strong association between participation, diversification and education found in the previous sections is explained by the correlation between education and financial information, rather than education reflecting other factors (such as, for instance, the association of education with different earnings profiles).

The descriptive evidence can be supplemented by regression analysis on the determinants of financial information and of the effect of financial information on portfolio allocations. In Table 12 we relate the index of financial information to the same variables that we have uses to explain participation decisions in Table 7. The only difference in specification is that we add the average index of financial information in the city of residence as a proxy for information spillovers. The hypothesis is that people acquire information on financial assets

more easily if their neighbors are well informed.

The regression results confirm the pattern described in Figure 6. Education is a very strong predictor of financial information. Other things equal, the index is 32 percentage points higher for one with a university degree (20 years) than for someone with only compulsory education (8 years). The age profile is concave, peaks at age 40 and from then declines by 10 points to age 70. Although the wealth coefficients are both significantly different from zero, wealth does not contribute much to explaining the variability of the index. Increasing wealth from 25,000 euros to 200,000 euros raises the index by only 2 percentage points. The number of ATM points is a proxy for the number of bank branches – an indicator of the easiness in obtaining financial information from intermediaries. Increasing the number of ATM points from 100 to 300 (about the difference between Naples and Florence ) raises the index by 4 percentage points. Finally, the coefficient of the proxy for information spillovers shows that a 10 point increase in the average index raises the individual index by 4.4 points. The coefficients in column (2) of Table 12 are quite close to those in column (1), showing that the particular weight used to calculate the index is irrelevant for assessing the effect of the independent variables on information acquisition.

The most interesting step is relating the index of financial information to portfolio choice. We tabulate ownership, asset shares and conditional asset shares by financial information in Table 13. Investment in risky financial assets and financial diversification are strongly correlated with financial information, while conditional asset shares are relatively flat across the distribution of the index. This suggests that lack of financial information is an obstacle to entry into financial markets but that once people start investing in risky assets, financial information plays no major role in shaping the portfolio.

This descriptive pattern is corroborated by the statistical analysis in Table 14. Controlling for the same set of regressors used in Table 7, we find that the index of financial information positively affects the participation equation but not the share equation. By construction, those who are ignorant of risky assets cannot purchase them, generating a potential spurious correlation between the index and the participation decision.

To tackle this endogeneity problem we replace the index of financial information with an index that is constructed only on the basis of knowledge of safe or fairly safe assets. Since we want to explain participation in risky assets, this alternative measure is free of spurious

correlation. The effect of financial information is somewhat attenuated (from 1.019 to 0.851) but the coefficient remains large and highly significant.

Our results strongly support the hypothesis that information is important in shaping households' portfolios. They also highlight the way in which financial information is obtained and how it spreads. Information externalities (and therefore contacts with neighbors and friends) are of paramount importance in explaining the individual's information set. Furthermore, the better educated have a comparative advantage in obtaining information and are thus better informed. As a result, when the index of financial information is introduced as an explanatory variable in the participation regressions, the coefficients of education and of the index of bank diffusion are halved with respect to the regressions in Table 7. They still retain explanatory power, however, signaling that improvements in asset knowledge is not all they are capturing. Since the index of financial information is only weakly correlated with age and since participation depends on age even controlling for financial information, we conclude that one cannot rely on information accumulation over the life cycle to explain the age-portfolio relation.

## 7. Conclusions

In this paper we analyze the structure of the portfolio of Italian households and uncover several empirical regularities. The descriptive and regression analysis reveals substantial differences between the determinants of participation and those of asset shares conditional on participation. Participation in risky assets is strongly increasing in wealth, exhibits a marked concave age profile and rises with education; on the other hand the conditional share is quite flat at least until retirement, while the effect of wealth is relatively modest, as would be predicted by standard portfolio models with constant relative risk aversion preferences such as those in Gollier (2000). In short, this paper shows that most of the action in portfolio management concerns the decision to invest in risky assets. Once the decision is taken, the portfolio distribution accords reasonably well with that predicted by standard models. These models, however, largely ignore participation costs and their relation with age, education, wealth and other household characteristics.

It is precisely the difference between participation decisions and conditional shares that calls for a close scrutiny of the relevance of participation costs. Minimum investment requirements act as a barrier to entry at low wealth and imply that participation increases with wealth. Monetary transaction costs imply similar predictions, especially if these costs decrease with wealth. Information costs, broadly interpreted, also help explain the correlation between participation and education. Furthermore, information costs are not necessarily correlated with wealth, and might therefore explain why so many wealthy households do not invest in risky financial assets. The extremely low number of portfolio transitions of Italian households supports models with large switching costs.

Further support for the importance of participation costs comes from a detailed analysis of the potential impact of background risk and financial information. We find strong evidence that participation depends on background risk. The evidence is weaker for asset shares, possibly because entry costs prevent poor households from investing in risky assets and because for the rich (who are more likely to participate) background risk is unimportant. Direct indicators of financial asset knowledge suggest that information and information externalities are of paramount importance in shaping households' portfolios.

## References


Attanasio, Orazio, Luigi Guiso, and Tullio Jappelli (1998), "The demand for money, financial innovation and the welfare cost of inflation," NBER Working Paper n. 6593.

Barsky, Robert, B., Thomas F. Juster, Miles S. Kimball and Matthew D. Shapiro (1997), "Preference parameters and behavioral heterogeneity: an experimental approach in the Health and Retirement Study," *Quarterly Journal of Economics* 112, 537-580.

Bertaut, Carol and Michalis Haliassos (1997), "Precautionary portfolio behavior from a life-cycle perspective," *Journal of Economic Dynamics and Control* 21, 1511-42.

Bodie, Zvi, Robert Miller and William Samuelson (1991), "Labor supply flexibility and portfolio choice in a life-cycle model," *Journal of Economic Dynamics and Control* 16, 427-49.

Brandolini, Andrea (1999), "The personal distribution of income in post-war Italy: source description, data quality, and the time pattern of income inequality", Bank of Italy: Temi di Discussione 350, Rome: Italy.

Brandolini, Andrea and Luigi Cannari (1994), "Methodological appendix: the Bank of Italy's Survey of Household Income and Wealth", in *Saving and the accumulation of wealth: essays on Italian households and government behavior*, Albert Ando, Luigi Guiso and Ignazio Visco (eds.). Cambridge: Cambridge University Press.

Brugiavini, Agar, and Franco Peracchi (1999), "Reforming Italian social security: should we switch from PAYG to fully funded?" Università di Venezia, mimeo.

Cecchetti, Steven, G. (1999), "Legal structure, financial structure, and the monetary policy transmission mechanism", NBER Working Paper 7151.

Cesari Riccardo and Fabio Panetta (1998), "Style, fees and performance of Italian equity funds", Bank of Italy, Temi di Discussione n. 325.

Cocco, Joao, Francisco Gomes and Pascal Maenhout (1998), "Consumption and portfolio choice over the life-cycle." Harvard University, mimeo.

Deaton, Angus, and Christina Paxson (1994), "Saving, growth and aging in Taiwan", in Studies in the Economics of Aging, David Wise ed. Chicago: University of Chicago Press.

Generale, Andrea, and Giorgio Gobbi (1996), "Il recupero dei crediti: costi, tempi e comportamenti delle banche," Temi di Discussione n. 265. Rome: Bank of Italy.

Gollier, Christian (2000), "What does the classical theory have to say about household portfolios?" in *Household Portfolios*, Luigi Guiso, Tullio Jappelli and Michalis Haliassos eds. Cambridge: MIT Press (forthcoming).

Gollier Christian, and John W. Pratt (1996), "Weak proper risk aversion and the tempering effect of background risk," *Econometrica* 5, 64, 1109-1123.

Gollier Christian, and Richard Zeckhauser (1997), "Horizon length and portfolio risk," NBER Technical Working Paper n. 216.

Guiso, Luigi, Tullio Jappelli and Daniele Terlizzese (1994), "Why is Italy's saving rate so high?", in S*avings and the Accumulation of Wealth. Essays on Italian Households and Government Saving Behavior*, Albert Ando, Luigi Guiso and Ignazio Visco eds. Cambridge: Cambridge University Press.

Guiso, Luigi, Tullio Jappelli, and Daniele Terlizzese (1996), "Income risk, borrowing constraints and portfolio choice," *American Economic Review* 86, 158-72.

Guiso, Luigi, Tullio Jappelli, and Luigi Pistaferri (1999), "What determines earnings and employment risk?" Università di Salerno, CSEF Working Paper n. 8.

Guiso, Luigi, and Monica Paiella (2000), "Risk aversion, wealth, and financial market imperfections." Rome: Ente Luigi Einaudi, mimeo.

Guiso Luigi, Paola Sapienza and Luigi Zingales (2000), "The role of social capital in financial development," NBER Working n. 7563.

Haliassos, Michael and Alexander Michaelides (2000), "Calibration and computation of household portfolio models", in *Household Portfolios*, Luigi Guiso, Tullio Jappelli and Michalis Haliassos eds. Cambridge: MIT Press (forthcoming).

Hochgurtel, Stefan (1998), "Household portfolio choice". Ph.D. Dissertation, CentER, Tilburg University.

Kimball, Miles (1992), "Precautionary motives for holding assets," in *The New Palgrave Dictionary of Money and Finance*, John Eatwell, Murray Milgate and Peter Newman eds. London: MacMillan.

Kimball, Miles (1993), "Standard risk aversion," *Econometrica* 61, 589-611.

King, Mervin, and Jonathan Leape (1987), "Asset accumulation, information, and the life-cycle", NBER Working Paper n. 2392.

Jappelli, Tullio and Luigi Pistaferri (2000), "Tax incentives and life insurance: evidence from Italy." University of Salerno: mimeo.

Miniaci, Raffaele and Guglielmo Weber (2000), "The econometrics of household portfolios," in *Household Portfolios*, Luigi Guiso, Tullio Jappelli and Michalis Haliassos eds. Cambridge: MIT Press (forthcoming).

Panetta, Fabio and Roberto Violi (1999), “Is there an equity premium puzzle in Italy? A look at assets returns, consumption and financial structure data over the last century”, Bank of Italy, Temi di Discussione n. 353.

Paxson, Cristina (1990), “Borrowing constraints and portfolio choice,” *Quarterly Journal of Economics* 105, 535-43.

Paxson, Cristina (1996), “Saving and growth: evidence from micro data,” *European Economic Review* 40255-288.

Pistaferri, Luigi (1999), “Income risk dynamics and heterogeneity”, University College London, mimeo.

Poterba, James, and Andrew Samwick (1997), “Household portfolio allocation over the life-cycle,” NBER Working Paper n. 6185.

Putnam (1993), “Making democracy work”. Princeton: Princeton University Press.

Stewart, M. B. (1983), “On least squares estimation when the dependent variable is grouped,” *Review of Economic Studies* 50, 737-53.

# Appendix

## 1. Estimates of equity share in Table 1 for 1985

In 1990 financial accounts have been subject to major revisions, which led to a marked revaluation of the value of shares. Data for 1985 are imputed by rescaling the old series with the revised series (available from 1990). We compute the value of shares in 1989 using information on the value of stocks at the end of 1990 and the flow in the same year available in the new financial accounts. We then compute the ratio between this estimate and the old estimate of the value of stocks in 1989, rescale the 1985 figure with this ratio (2.64) and change the value of total financial wealth accordingly. The other components of financial wealth in Table 1 are unaffected.

## 2. The cross-sectional data

The Bank of Italy Survey of Household Income and Wealth (SHIW) collects detailed data on demographics, households' consumption, income and balance sheets. The data set used in this study includes five independent cross-sections of Italian households (1989, 1991, 1993, 1995 and 1998). As explained in Section 3, the regression analysis is performed using only data up to 1995. Each survey covers more than 8,000 households (with the exception of the 1998 survey, covering 7,147), for a total of 39,795 household-year observations. While real wealth data are available also for 1984, 1986 and 1987, we choose to focus on the last five waves because financial wealth is not available prior to 1987. Furthermore, in 1987 the SHIW has information only on highly aggregated asset categories and the framing of the questions on financial assets was rather different from that of subsequent surveys. 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. Households are defined as groups of individuals related by blood, marriage or adoption and sharing the same dwelling. The net response rate (ratio of responses to contacted households net of ineligible units) is 38 percent in 1989, 33 percent in 1991, 58 percent in 1993, 57 percent in 1995, and 43 percent in 1998. The abrupt changes in the response rates in 1993 and 1998 could be partly due to the change in the firm collecting data in those years. A CD-ROM containing the entire historical SHIW can be obtained by writing to The Research Department, Banca d'Italia, Via Nazionale 91, 00186 Roma, Italy.

## 3. The panel data

Starting in 1989, each SHIW has re-interviewed some households from the previous surveys. The panel component has increased over time: 15 percent of the sample was re-interviewed in 1989, 27 percent in 1991, 43 percent in 1993, and 45 percent in 1995 (the 1998 survey is excluded from the panel estimation). Response rates increase in 1991 because in that year households included in the panel were chosen among those that had previously expressed their willingness to being re-interviewed. In the panel component, the sampling procedure is also determined in two stages: selection of municipalities (among those sampled in the previous survey), and then selection of households re-interviewed. This implies that there is a fixed component in the panel (for instance, households interviewed 5 times between 1987 to 1995, or 4 times from 1991 to 1995) and a new component every survey (for instance, households re-interviewed only in 1989. Brandolini and Cannari (1994) include a detailed discussion of sample design, attrition, and other measurement issues. Although both income and wealth are under-reported with

respect to the national account data, the survey data match reasonably well the time series of the aggregate wealth-income ratio.

## 4. Financial assets

Financial assets are the sum of transaction and saving accounts, certificates of deposit, government bonds, corporate bonds, stocks, mutual funds and management investment accounts, cash values of life insurance, cash values of defined contribution pension funds, and foreign assets. In 1989 financial wealth is inferred with an accounting trick: households report fractions of financial wealth in total wealth, and then are asked to report the amount of checking accounts. Starting in 1991 respondents report each financial asset choosing one of 14 brackets. 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. Asset categories become more detailed over the years, from 13 in 1989 to 17 in 1995 and 1998. 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 pensions and foreign assets. This is partly due to under-reporting by the wealthy, which own a disproportionate share of the more sophisticated financial instruments.

## 5. Pension funds

In contrast with the universal coverage of the social security system, private pension funds in Italy have always been minuscule, despite favorable tax treatment. Participation in a private pension fund is possible only by explicit contractual arrangement between a group of workers or a union and a firm or group of firms. All the Italian major pension funds are of the defined-contribution rather than of the defined-benefit type. In 1998 the total outstanding value of pension funds is only 3 percent of GDP. Workers' and employers' contributions to private pensions are fully tax deductible, regardless of amount. Taxes are levied when the pension is cashed, either as an annuity or as a lump sum payment. In the former case, only 60 percent of the pension are considered as part of the recipient's taxable income for income tax purposes. In the latter case, the lump sum payment is subject to separate taxation. Since 1988 the tax base has been the difference between the lump sum payment and the sum of the workers' contributions, up to contributions of 4 percent of yearly earnings. Pension funds are allowed to set their own rules on investment policy, the age at which benefits are payable, withdrawal, death of the employee, layoffs and resignation. Early withdrawal is generally possible, sometimes at a penalty.

## 7. Real assets

Net real assets include real estate, business, valuables, and the stock of durable goods, minus liabilities. Liabilities are the sum of mortgage and other real estate debt, consumer credit, personal loans and credit card debt. Respondents report a self-assessed value for each real asset and debt category.

## 8. Income risk

In a special section of the 1995 and 1998 SHIW all employed and unemployed are asked the following five questions:

1. Do you expect to retire in the next 12 months?

2. What are the chances that in the next 12 months you will keep your job (if employed) or find one (if unemployed)? In other words, if you were to assign a score between 0 and 100 to the chance of keeping your job or finding a new one, what score would you assign? ("0" if you are certain not to work, "100" if you are certain to work).
3. Suppose you will keep your job or find a new one. What is the minimum annual income ($y_m$), net of taxes and contributions that you expect to earn from this job?
4. Again, suppose you will keep your job or find one. What is the maximum annual income ($y_M$), net of taxes and contributions that you expect to earn from this job?
5. What are the chances that you will earn less than X (where X is computed by the interviewer as $(y_m+y_M)/2$? In other words, if you were to assign a score between 0 and 100 to the chance of earning less than X, what score would you assign? ("0" if you are certain to earn more than X, "100" if you are certain to earn less than X).

The first question delivers direct information on the probability of unemployment. The other questions can be combined to estimate expected earnings and their variance for each individual. Let $f(y)$ be the probability of earning income $y$ if the individual is employed in the year following the interview. We assume that $f(y)$ is triangular over the two intervals $[y_m, (y_m+y_M)/2]$ and $((y_m+y_M)/2, y_M]$. The probability mass to the left of the midpoint $(y_m+y_M)/2$ is constrained to be equal to $p$. Further details are reported in Guiso, Jappelli and Pistaferri (1999).

## 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. Government bonds are classified by maturity, up to one year or indexed to one-year maturity bonds and more than one-year maturity. 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. Financial assets are reported as a share of total financial assets. Total financial assets, real assets and debt are reported as a share of total assets (financial plus non-financial assets). Clearly safe financial assets include currency, transaction accounts and certificates of deposits. Fairly safe financial assets include short-term government bonds and the cash value of life insurance. Risky financial assets include stocks, long-term government bonds, other bonds, mutual funds and defined contribution pensions. Data are drawn from the Annual Report of the Bank of Italy, various issues. In 1990 financial accounts have been subject to major revisions, which led to a revaluation of the value of shares. The imputation procedure for 1985 is described in the Appendix.

| | **Assets shares** | | | |
|---|---|---|---|---|
| | **1985** | **1990** | **1995** | **1998** |
| **Financial assets** | | | | |
| Currency | 3.86 | 2.68 | 2.57 | 2.15 |
| Transaction and savings accounts | 41.83 | 34.12 | 34.00 | 20.54 |
| Short term government bonds (T-bills) | 12.77 | 12.37 | 10.16 | 2.13 |
| Long-term government bonds | 11.50 | 15.05 | 15.76 | 8.22 |
| Other bonds | 2.82 | 3.16 | 5.85 | 9.53 |
| Stocks | 15.30 | 20.87 | 16.62 | 30.53 |
| Mutual funds and managed investment accounts | 0.85 | 2.30 | 4.07 | 16.42 |
| Defined-contribution pension funds | 6.74 | 5.93 | 5.74 | 4.54 |
| Cash value of life insurance | 4.66 | 3.09 | 4.85 | 5.92 |
| Other financial assets | 0.22 | 0.43 | 0.37 | 0.02 |
| Total financial assets, of which: | 100.0 | 100.0 | 100.0 | 100.0 |
| foreign assets | 0.32 | 2.32 | 2.08 | 5.80 |
| | | | | |
| **Debt** | | | | |
| Mortgage and real estate debt | 3.73 | 4.65 | 4.86 | 6.12 |
| Consumer credit | 1.55 | 1.45 | 1.17 | 1.77 |
| Other debt | 0.15 | 0.31 | 0.80 | 0.82 |
| Total debt | 5.43 | 6.41 | 6.83 | 8.71 |
| | | | | |
| **Clearly safe financial assets** | 41.83 | 34.12 | 34.00 | 22.69 |
| **Fairly safe financial assets** | 17.43 | 15.46 | 15.01 | 8.05 |
| **Risky financial assets, of which** | 37.21 | 47.31 | 48.04 | 69.24 |
| Shares, mutual funds and managed accounts | 16.15 | 23.17 | 20.69 | 46.95 |

## Table 2
## Asset Participation: Survey Data

The table reports the fraction of households owning specific financial assets, non-financial assets and debt. Data are drawn from the SHIW. All statistics use sample weights. Transaction and savings accounts include checking and saving accounts. Government bonds are classified by maturity, up to one year or indexed to one-year maturity bonds and more than one-year maturity. Other bonds consist of corporate, foreign and other types of bonds. Defined contribution plans include employer-sponsored plans and personal retirement accounts. Cash value of life insurance refers to the cash value of whole life policies. Other non-financial assets consist of non-financial assets that could not be classified in any other category. Debt is the sum of mortgage and other real estate debt, consumer credit, personal loans and credit card debt. Clearly safe financial assets include transaction accounts and certificates of deposits. Fairly safe financial assets include short-term government bonds and the cash value of life insurance. Risky financial assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. Total risky assets include risky financial assets, business equity and investment real estate. All statistics use sample weights and are drawn from the 1989-98 SHIW.

| | **1989** | **1991** | **1993** | **1995** | **1998** |
|---|---|---|---|---|---|
| **Financial assets** | | | | | |
| Transaction and savings accounts | 87.94 | 86.44 | 83.11 | 82.68 | 82.50 |
| Certificates of deposits | 2.55 | 4.44 | 4.64 | 5.25 | 3.16 |
| Short term government bonds (T-bills) | 25.16 | 27.31 | 25.72 | 29.92 | 14.64 |
| Long-term government bonds | 2.44 | 2.94 | 3.14 | 5.14 | 2.80 |
| Other bonds | 1.06 | 1.59 | 2.12 | 3.93 | 6.04 |
| Stocks | 4.48 | 4.24 | 4.72 | 3.95 | 7.29 |
| Mutual funds and managed investment accounts | 2.84 | 3.25 | 5.29 | 4.93 | 10.60 |
| Defined-contribution pension funds | 5.43 | 6.07 | 7.31 | 7.77 | 7.72 |
| Life insurance | 13.68 | 17.09 | 18.53 | 21.54 | 22.63 |
| | | | | | |
| **Non-financial assets** | | | | | |
| Primary residence | 63.34 | 65.41 | 63.44 | 65.49 | 65.93 |
| Investment real estate | 33.74 | 25.82 | 32.27 | 32.03 | 26.12 |
| Business | 17.35 | 13.24 | 13.99 | 13.64 | 12.43 |
| Stock of durable goods | 100.00 | 99.96 | 98.84 | 99.07 | 100.00 |
| Other non-financial assets | 75.59 | 99.84 | 84.79 | 87.14 | 78.86 |
| | | | | | |
| **Debt** | 8.55 | 12.75 | 15.09 | 27.16 | 21.16 |
| | | | | | |
| **Clearly safe financial assets** | 87.94 | 86.48 | 83.14 | 82.72 | 85.57 |
| **Fairly safe financial assets** | 33.56 | 38.54 | 37.56 | 43.23 | 33.79 |
| **Risky financial assets** | 11.95 | 13.77 | 16.32 | 18.49 | 22.96 |
| **Total risky assets** | 46.97 | 39.67 | 45.93 | 46.87 | 44.78 |

## Table 3

## Diversification of Household Financial Portfolios

The table reports the fraction of households owning specific combinations of financial assets in the SHIW. Clearly safe financial assets include transaction accounts and certificates of deposits. Fairly safe financial assets include short-term government bonds and the cash value of life insurance. Risky financial assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. 1 denotes that the asset is owned, 0 that it is not owned. All statistics use sample weights and are drawn from the 1989-98 SHIW.

| **Financial Asset Combination** | | | **1989** | **1991** | **1993** | **1995** | **1998** |
|---|---|---|---|---|---|---|---|
| **Clearly safe** | **Fairly safe** | **Risky** | | | | | |
| 0 | 0 | 0 | 11.64 | 12.18 | 14.63 | 14.86 | 13.17 |
| 0 | 0 | 1 | 0.11 | 0.08 | 0.35 | 0.22 | 0.15 |
| 0 | 1 | 0 | 0.52 | 1.16 | 2.15 | 1.61 | 1.08 |
| 0 | 1 | 1 | 0.01 | 0.05 | 0.14 | 0.09 | 0.03 |
| 1 | 0 | 0 | 50.96 | 44.83 | 36.47 | 41.33 | 42.71 |
| 1 | 0 | 1 | 3.44 | 4.10 | 5.32 | 5.83 | 10.17 |
| 1 | 1 | 0 | 24.65 | 27.70 | 28.26 | 25.77 | 20.08 |
| 1 | 1 | 1 | 8.65 | 9.90 | 12.67 | 10.28 | 12.61 |
| Total | | | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

## Table 4

## Composition of Household Wealth: Survey Data

The table reports the composition of household financial assets in the SHIW. Financial assets are reported as a share of total financial assets. Total financial assets, non-financial assets and debt are reported as a share of total assets (financial plus non-financial assets). Clearly safe financial assets (as a percentage of total financial assets) include transaction accounts and certificates of deposits. Fairly safe financial assets (as a percentage of total financial assets) include short-term government bonds and the cash value of life insurance. Risky financial assets (as a percentage of total financial assets) include stocks, long term government bonds, other bonds, mutual funds and defined contribution pension funds. Total risky assets (as a percentage of total assets) include risky financial assets, business equity and investment real estate. Asset shares are computed as ratio of averages. All statistics use sample weights and are drawn from the 1989-98 SHIW.

| | **1989** | **1991** | **1993** | **1995** | **1998** |
|---|---|---|---|---|---|
| **Financial assets** | | | | | |
| Currency | 2.95 | 3.04 | 1.77 | 1.90 | 1.41 |
| Transaction and savings accounts | 50.15 | 41.46 | 34.52 | 29.23 | 38.08 |
| Certificates of deposits | 2.48 | 3.35 | 3.26 | 4.57 | 2.15 |
| Short term government bonds (T-bills) | 27.80 | 26.84 | 26.13 | 28.35 | 9.70 |
| Long-term government bonds | 2.60 | 2.38 | 3.33 | 6.08 | 2.48 |
| Other bonds | 0.90 | 1.39 | 1.98 | 3.36 | 5.36 |
| Stocks | 2.78 | 6.17 | 9.52 | 4.96 | 7.45 |
| Mutual funds and managed investment accounts | 3.36 | 3.54 | 7.89 | 7.24 | 19.47 |
| Defined-contribution pension funds | 2.27 | 3.52 | 3.44 | 4.05 | 3.49 |
| Cash value of life insurance | 4.69 | 8.31 | 8.16 | 10.25 | 10.41 |
| Total financial assets | 15.51 | 11.70 | 12.53 | 12.95 | 14.59 |
| | | | | | |
| **Non-financial assets** | | | | | |
| Primary residence | 36.03 | 50.11 | 46.51 | 47.26 | 48.84 |
| Investment real estate | 25.80 | 16.80 | 19.95 | 21.22 | 16.97 |
| Business | 7.28 | 9.12 | 11.07 | 8.23 | 8.95 |
| Stock of durable goods | 12.82 | 9.64 | 8.24 | 8.42 | 8.87 |
| Other non-financial assets | 2.55 | 2.62 | 1.70 | 1.92 | 1.77 |
| Total non-financial assets | 84.49 | 88.30 | 87.47 | 87.05 | 85.41 |
| | | | | | |
| **Debt** | 1.42 | 2.00 | 2.35 | 3.40 | 4.07 |
| | | | | | |
| **Clearly safe financial assets** | 55.59 | 47.85 | 39.55 | 35.70 | 41.64 |
| **Fairly safe financial assets** | 32.49 | 35.15 | 34.28 | 38.60 | 20.11 |
| **Risky financial assets** | 11.91 | 17.00 | 26.16 | 25.69 | 38.25 |
| **Total risky assets** | 34.93 | 27.91 | 34.29 | 32.78 | 31.50 |

## Table 5

## Composition of Household Wealth by Wealth Quartiles

The table reports average of the distribution of wealth (financial plus non-financial assets) by wealth quartiles and for the top 1 and 5 percent of the sample. Risky financial assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. Total risky assets include risky financial assets, business equity and investment real estate. The shares of risky financial assets and of total risky assets are scaled by financial wealth and total wealth, respectively. Conditional shares are computed in the group of those holding risky assets. Data are drawn from the 1995 SHIW. Asset shares are computed as ratio of averages. All statistics use sample weights.

| | **Below I quartile** | **Between I and II quartile** | **Between II and III quartile** | **Above III quartile** | **Top 5%** | **Top 1%** |
|---|---|---|---|---|---|---|
| **Financial assets** | | | | | | |
| Currency | 9.39 | 3.45 | 2.33 | 1.09 | 0.52 | 0.35 |
| Transaction and savings accounts | 55.25 | 42.52 | 35.58 | 26.67 | 17.69 | 10.37 |
| Certificates of deposits | 1.34 | 3.30 | 5.81 | 5.58 | 4.04 | 1.84 |
| Short term government bonds (T-bills) | 15.09 | 26.98 | 29.69 | 30.45 | 29.01 | 23.87 |
| Long-term government bonds | 1.01 | 2.57 | 2.50 | 7.39 | 7.19 | 15.75 |
| Other bonds | 1.08 | 3.12 | 1.59 | 2.58 | 8.32 | 3.48 |
| Stocks | 1.13 | 1.00 | 2.01 | 2.73 | 10.89 | 19.51 |
| Mutual funds and managed investment accounts | 0.46 | 2.22 | 3.78 | 7.70 | 11.92 | 17.05 |
| Defined-contribution pension funds | 3.37 | 3.50 | 5.44 | 4.21 | 3.21 | 2.70 |
| Cash value of life insurance | 11.84 | 11.33 | 11.28 | 11.57 | 7.19 | 5.07 |
| Total financial assets | 31.33 | 16.92 | 11.77 | 12.38 | 12.84 | 10.51 |
| | | | | | | |
| **Non-financial assets** | | | | | | |
| Primary residence | 11.87 | 53.75 | 60.52 | 51.55 | 34.38 | 21.13 |
| Investment real estate | 1.84 | 9.19 | 12.26 | 20.04 | 33.18 | 43.11 |
| Business | 1.44 | 2.21 | 3.95 | 7.48 | 13.29 | 20.22 |
| Stock of durable goods | 46.91 | 15.66 | 9.90 | 6.90 | 4.49 | 2.43 |
| Other non-financial assets | 6.60 | 2.26 | 1.60 | 1.65 | 1.82 | 2.59 |
| Total non-financial assets | 68.67 | 83.08 | 88.23 | 87.62 | 87.16 | 89.49 |
| | | | | | | |
| **Debt** | 5.87 | 3.18 | 4.07 | 3.39 | 3.27 | 1.73 |
| | | | | | | |
| **Risky financial assets** | | | | | | |
| Participation | 3.53 | 11.81 | 20.25 | 36.46 | 53.98 | 57.23 |
| Share | 7.07 | 12.41 | 15.32 | 24.62 | 51.80 | 58.49 |
| Conditional share | 61.97 | 44.72 | 41.09 | 43.50 | 53.37 | 74.04 |
| | | | | | | |
| **Total risky assets** | | | | | | |
| Participation | 9.87 | 38.04 | 57.07 | 82.07 | 98.64 | 97.46 |
| Share | 5.50 | 13.50 | 18.01 | 36.79 | 41.54 | 69.48 |
| Conditional Share | 36.24 | 33.70 | 30.87 | 36.37 | 52.35 | 70.65 |

## Table 6

## Cross-sectional Age Profile of Participation and of the Share of Risky Assets

The table reports the cross-sectional age distribution of risky asset ownership, of the share of risky assets and of the index of financial diversification. Risky financial assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. Total risky assets include risky financial assets, business equity and investment real estate. The shares of risky financial assets and of total risky assets are scaled by financial wealth and total wealth, respectively. Conditional shares are computed in the group of those holding risky assets. The index of financial diversification is defined as the number of financial assets in the portfolio. All statistics use sample weights and pooled 1989-95 data.

| **Age group** | **Risky financial assets** | | | **Total risky assets** | | | **Financial diversification** |
|---|---|---|---|---|---|---|---|
| | Participation | Share | Conditional share | Participation | Share | Conditional share | |
| | | | | | | | |
| <30 | 15.12 | 18.95 | 43.69 | 35.93 | 37.90 | 55.48 | 1.51 |
| 30-39 | 19.07 | 21.49 | 47.50 | 47.21 | 30.79 | 42.74 | 1.68 |
| 40-49 | 19.89 | 21.42 | 45.15 | 52.28 | 31.45 | 41.96 | 1.79 |
| 50-59 | 17.30 | 22.06 | 44.47 | 53.07 | 35.62 | 45.92 | 1.69 |
| 60-69 | 10.52 | 18.27 | 44.83 | 41.46 | 31.67 | 44.50 | 1.38 |
| >70 | 6.90 | 16.24 | 46.81 | 28.75 | 28.61 | 48.49 | 1.09 |

## Table 7
## Cross-Sectional Regressions for Participation, Share of Risky Assets, and Financial Diversification

The table reports selection models for participation and asset shares, and ordered probit estimates for the index of financial diversification. Risky financial assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. Total risky assets include risky financial assets, business equity and investment real estate. Financial diversification is the number of financial assets in the portfolio. The index of bank diffusion is the ratio between the number of ATM points and population in each province. The sample uses the pooled 1989-1995 SHIW. Income and wealth are deflated by the consumer price index (1995 base) and then expressed in Euro. All regressions also include year dummies. The first-stage equations and the ordered probit also include dummies for city size (between 20,000 and 40,000 residents, between 40,000 and 500,000, more than 500,000) and for the loan-GDP ratio in the province of residence. T-statistics are reported in parenthesis.

| **Variable** | **Risky financial assets** | | **Total risky assets** | | **Financial diversification** |
|---|---|---|---|---|---|
| | **Participation** | **Share** | **Participation** | **Share** | |
| Age | 0.032<br>(6.22) | 0.009<br>(3.29) | 0.018<br>(4.49) | -0.007<br>(-5.57) | 0.029<br>(9.94) |
| Age square / 1000 | -0.364<br>(-7.53) | -0.112<br>(-4.41) | -0.234<br>(-6.49) | 0.065<br>(-5.68) | -0.315<br>(-11.60) |
| Income | 0.029<br>(24.40) | 0.008<br>(8.89) | 0.015<br>(12.01) | -0.004<br>(12.97) | 0.040<br>(45.57) |
| Income square / 1000 | -0.093<br>(-15.24) | -0.022<br>(-6.23) | -0.088<br>(-8.91) | 0.014<br>(9.17) | -0.148<br>(-28.44) |
| Wealth | 0.0007<br>(11.50) | 0.0002<br>(7.52) | 0.006<br>(58.11) | 0.0004<br>(24.82) | 0.0009<br>(19.75) |
| Wealth square / 1000 | -0.0001<br>(-7.94) | -0.00003<br>(-5.04) | -0.0006<br>(-28.24) | -0.00005<br>(-15.37) | -0.0001<br>(-11.09) |
| Family size | -0.102<br>(-7.94) | -0.038<br>(-6.09) | -0.004<br>(-0.39) | -0.008<br>(-3.03) | -0.091<br>(-11.53) |
| Number of children | 0.047<br>(2.90) | 0.018<br>(2.37) | -0.001<br>(-0.09) | 0.009<br>(2.68) | 0.057<br>(5.51) |
| Married | -0.037<br>(-1.13) | -0.020<br>(-1.24) | -0.109<br>(-3.85) | -0.016<br>(-2.04) | 0.104<br>(4.83) |
| Male | 0.204<br>(6.17) | 0.075<br>(4.60) | 0.229<br>(8.38) | -0.038<br>(-4.73) | 0.107<br>(5.13) |
| Resident in the South | -0.356<br>(-8.34) | -0.202<br>(-9.21) | 0.231<br>(6.75) | -0.036<br>(-4.58) | -0.285<br>(-10.76) |
| Education | 0.044<br>(17.60) | 0.013<br>(7.83) | -0.005<br>(-2.47) | -0.005<br>(-8.52) | 0.044<br>(26.63) |
| Average unemployment rate in the province | -2.298<br>(-8.16) | -0.470<br>(-3.06) | -1.639<br>(-8.09) | 0.527<br>(9.17) | -2.159<br>(-13.69) |
| Index of bank diffusion | 0.331<br>(3.13) | | -0.032<br>(-0.29) | | 0.443<br>(5.20) |
| Mills ratio | | 0.409 | | 0.027 | |
| Observations | 30,834 | 4,558 | 30,834 | 13,489 | 30,834 |

## Table 8

## Panel Data Regressions for Participation

The table reports probit regressions with random effects for participation. Risky financial assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. Total risky assets include risky financial assets, business equity and investment real estate. The sample uses the panel section of the 1989-1995 SHIW. Some households are interviewed from 1989 to 1995, others from 1989 to 1993 or from 1991 to 1995, and others two years only. The regressions pool all data, a total of 11,549 observations on 4,609 households. Income and wealth are deflated by the consumer price index (1995 base) and then expressed in Euro. Each regression includes also dummies for city size (between 20,000 and 40,000 residents, between 40,000 and 500,000, more than 500,000) and the loan-GDP ratio in the province of residence and year dummies. T-statistics are reported in parenthesis.

| Variable | Risky financial assets | Total risky assets |
|---|---|---|
| Age | 0.052<br>(3.29) | 0.065<br>(4.42) |
| Age square / 1000 | -0.599<br>(-3.99) | -0.680<br>(-4.98) |
| Income | 0.038<br>(13.07) | 0.028<br>(8.29) |
| Income square / 1000 | -0.105<br>(-7.80) | -0.150<br>(-7.71) |
| Wealth | 0.001<br>(11.78) | 0.009<br>(26.75) |
| Wealth square / 1000 | -0.0001<br>(-5.46) | -0.001<br>(-19.00) |
| Family size | -0.135<br>(-3.74) | -0.033<br>(-0.98) |
| Number of children | 0.091<br>(2.08) | 0.015<br>(0.36) |
| Married | -0.153<br>(-1.39) | -0.169<br>(-1.58) |
| Education | 0.079<br>(9.99) | 0.001<br>(0.15) |
| Average unemployment rate in the province | -3.244<br>(-4.14) | -3.941<br>(-5.99) |
| Index of bank diffusion | 1.855<br>(5.23) | -0.107<br>(-0.29) |
| Observations | 11,549 | 11,549 |

## Table 9

## Transaction Costs by Selected Categories of Mutual Funds

The table reports the average percentage entry and exit fees for selected categories of Italian mutual funds in 1999. We report in brackets the minimum and the maximum fees. Fees are reported for four categories of equity funds and two categories of balanced funds. Each category includes about 30 funds. Load funds are funds that require an entry fee, which varies according to the amount invested. No-load funds don't charge entry costs but the investor pays a fee upon exit. Amounts invested are expressed in thousands euro and management fees are on an annual basis. The source is *Milano finanza: l'annuario dell'investitore* (1999, p. 214-241).

| **Type of fund** | **Load funds: entry and management fee** | | | | | **No-load funds: exit and management fees** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Amount invested (thousands euro) | | | | Fee | Year at exit | | | Fee |
| | 5 | 25 | 50 | 500 | | 1 | 2 | 3 | |
| Equity International | 3.4 [1-5.5] | 2.7 [1-5] | 2.0 [1-4] | 0.9 [.25-1.5] | 1.7 | 2.7 [2.5-3.5] | 2.0 [1.8-2.7] | 1.2 [1-2.1] | 1.9 |
| Equity US | 3.9 [1.7-6] | 3.4 [1.3-5] | 2.8 [1-4] | 0.9 [.25-1] | 1.6 | 2.6 [2.5-3.5] | 2.1 [1.8-2.7] | 1.2 [1-2.1] | 2.4 |
| Equity Europe | 3.5 [1.7-6] | 3.3 [1.3-5] | 2.6 [1-4] | 0.9 [.25-1.7] | 1.6 | 3.0 [2.5-3.5] | 2.1 [1.8-2.7] | 1.2 [1-2.1] | 1.7 |
| Equity Emerging countries | 3.6 [1-6] | 3.3 [1-5.5] | 2.8 [1-4.5] | 1.0 [.25-1.7] | 1.9 | 2.7 [2-3.5] | 2.0 [1.5-2.5] | 1.1 [1-1.5] | 2.3 |
| Balanced international | 3.9 [1.8-6.5] | 3.0 [1.3-4.5] | 2.4 [1-4] | 0.8 [.25-1.5] | 1.3 | 2.7 [1-3.5] | 2.1 [1-2.75] | 0.7 [1-2.1] | 1.6 |
| Balanced Italian | 3.1 [1.5-5] | 2.75 [1-4] | 1.7 [.75-3] | 0.8 [.2-1.75] | 1.3 | 2.8 [2-3.5] | 2.1 [1.5-2.75 | 1.3 [1-2.1] | 1.4 |

## Table 10
## Financial Portfolio Transitions

Portfolio transitions between period *t* and period *t*+1 is computed on the basis of the panel section of the SHIW. Fairly safe assets include short-term government bonds and life insurance. Risky assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. The first panel is based on 2,926 households interviewed in 1993 and 1995. The second panel is based on 1,960 households with heads that attended up to compulsory schooling (low education) interviewed in 1993 and in 1995. The third panel is based on 966 households with heads that attended junior high school or college interviewed in 1993 and 1995. The last panel is based on 565 households interviewed in 1989 and 1995.

| **Period *t*** | | **Period *t*+1** | | | | |
|---|---|---|---|---|---|---|
| **Total sample** | | | | | | |
| **Fairly safe** | **Risky** | **1 1** | **1 0** | **0 1** | **0 0** | **Total** |
| 1 | 1 | 6.87 | 2.80 | 0.96 | 0.55 | 11.18 |
| 1 | 0 | 4.10 | 17.67 | 1.50 | 7.38 | 30.65 |
| 0 | 1 | 1.81 | 1.81 | 1.95 | 1.13 | 6.70 |
| 0 | 0 | 1.37 | 9.54 | 1.91 | 38.65 | 51.47 |
| **Total** | | 14.15 | 31.82 | 6.32 | 47.71 | 100 |
| **Low education** | | | | | | |
| **Fairly safe** | **Risky** | **1 1** | **1 0** | **0 1** | **0 0** | **Total** |
| 1 | 1 | 3.42 | 1.94 | 0.51 | 0.26 | 6.13 |
| 1 | 0 | 3.42 | 15.61 | 1.28 | 8.42 | 28.73 |
| 0 | 1 | 1.28 | 1.07 | 1.38 | 0.92 | 4.65 |
| 0 | 0 | 1.22 | 9.69 | 1.94 | 47.64 | 60.49 |
| **Total** | | 9.34 | 28.31 | 5.11 | 57.24 | 100 |
| **High education** | | | | | | |
| **Fairly safe** | **Risky** | **1 1** | **1 0** | **0 1** | **0 0** | **Total** |
| 1 | 1 | 13.87 | 4.55 | 1.86 | 1.14 | 21.42 |
| 1 | 0 | 5.49 | 21.84 | 1.97 | 5.28 | 34.58 |
| 0 | 1 | 2.90 | 3.31 | 3.11 | 1.55 | 10.87 |
| 0 | 0 | 1.66 | 9.21 | 1.86 | 20.40 | 33.13 |
| **Total** | | 23.92 | 38.91 | 8.80 | 28.37 | 100 |
| **Long-run transitions** | | | | | | |
| **Fairly safe** | **Risky** | **1 1** | **1 0** | **0 1** | **0 0** | **Total** |
| 1 | 1 | 5.31 | 1.77 | 1.06 | 0.88 | 9.02 |
| 1 | 0 | 4.07 | 16.46 | 1.06 | 6.55 | 28.14 |
| 0 | 1 | 1.24 | 1.06 | 0.71 | 1.77 | 4.78 |
| 0 | 0 | 4.42 | 14.51 | 3.01 | 36.12 | 58.06 |
| **Total** | | 15.04 | 33.80 | 5.84 | 45.32 | 100 |

## Table 11
## Information and Participation

The table is based on questions asked in the 1995 SHIW about asset knowledge, participation over the life cycle and current participation. The sample includes 8,124 observations drawn from the 1995 SHIW. All statistics use sample weights. BOT are Treasury Bills up to one-year maturity. CCT are floating-rates Treasury credit certificates, 2-4 years in maturity indexed to BOT. BTP are long-term, fixed interest rates government bonds. CTZ are zero-coupon Treasury credit certificates. The unweighted index of financial information is the sum of the financial assets known divided by the number of potential assets known. The weighted index uses as weights the inverse of the aggregate fraction of people knowing the asset.

| **Financial asset** | **Fraction reporting knowing the asset** | **Fraction reporting having invested in the asset at least once** | **Fraction currently investing in the asset** |
|---|---|---|---|
| | | | |
| Checking accounts | 94.61 | 74.73 | 68.91 |
| Saving accounts | 92.05 | 49.23 | 26.73 |
| Postal accounts | 87.61 | 17.56 | 9.58 |
| Certificates of deposit | 57.91 | 10.46 | 5.27 |
| Repurchase agreements | 32.61 | 3.29 | 1.17 |
| Government bonds: BOT | 89.59 | 38.19 | 22.44 |
| Government bonds: CCT | 77.47 | 13.86 | 7.78 |
| Government bonds: BTP | 52.89 | 6.95 | 4.40 |
| Government bonds: CTZ | 24.87 | 1.47 | 0.85 |
| Other government bonds | 25.44 | 1.25 | 0.47 |
| Postal bonds | 82.88 | 15.51 | 7.36 |
| Private bonds | 49.41 | 4.70 | 2.64 |
| Mutual funds | 48.39 | 6.97 | 4.17 |
| Managed assets | 31.46 | 1.54 | 0.98 |
| Loans to cooperative societies | 34.99 | 1.83 | 1.37 |
| Stocks | 64.96 | 7.33 | 4.98 |
| Foreign assets | 33.81 | 0.91 | 0.41 |
| **Index of financial information:** | | | |
| Unweighted | 0.57 | | |
| Weighted | 0.47 | | |

## Table 12

## The Determinants of Financial Information

The unweighted index of financial information is the sum of the financial assets known divided by the number of potential assets known. The weighted index uses as weights the inverse of the aggregate fraction of people knowing the asset. The index of bank diffusion is the ratio between the number of ATM points and population in each province. Information externalities is the average of the index (weighted index in the second regression) of financial information in the city of residence. The two regressions are estimated by ordinary least squares. Each regression also includes dummies for city size (between 20,000 and 40,000 residents, between 40,000 and 500,000, more than 500,000) and for the aggregate loan-GDP ratio in the province of residence. Observations were the number of households interviewed is less than 30 are excluded. The sample size is 7,228.

| Variable | Unweighted index of financial information | Weighted index of financial information |
|---|---|---|
| Age | 0.007<br>(6.27) | 0.007<br>(5.08) |
| Age square / 1000 | -0.087<br>(-8.48) | -0.083<br>(-7.08) |
| Income | 0.004<br>(13.50) | 0.005<br>(14.03) |
| Income square / 1000 | -0.016<br>(-8.53) | -0.017<br>(-8.45) |
| Wealth | 0.0001<br>(6.68) | 0.0001<br>(6.83) |
| Wealth square / 1000 | 0.83E-05<br>(-2.53) | -0.95E-05<br>(-2.57) |
| Family size | -0.003<br>(-0.86) | -0.007<br>(-1.97) |
| Number of children | -0.004<br>(0.99) | -0.001<br>(-0.27) |
| Married | -0.009<br>(-1.13) | -0.007<br>(-0.85) |
| Male | 0.059<br>(8.21) | 0.063<br>(7.73) |
| Resident in the South | -0.073<br>(-7.30) | -0.063<br>(-5.58) |
| Education | 0.016<br>(24.96) | 0.017<br>(23.12) |
| Average unemployment rate in the province | -0.084<br>(-1.52) | -0.106<br>(-1.71) |
| Index of bank diffusion | 0.212<br>(8.05) | 7.775<br>(7.66) |
| Information externalities | 0.406<br>(13.34) | 0.453<br>(14.14) |
| Adjusted R square | 0.476 | 0.439 |

## Table 13

## Financial Information and Risky Financial Assets

The index of financial information is the sum of the financial assets known weighted by the inverse of the aggregate fraction of people knowing the asset. Statistics use sample weights and are based on 8,124 observations in the 1995 SHIW.

| Weighted Index of Financial Information | Participation | Share | Conditional share | Financial diversification |
|---|---|---|---|---|
| | | | | |
| 0.0-0.2 | 1.88 | 0.92 | 49.17 | 0.79 |
| 0.2-0.4 | 7.75 | 3.02 | 38.93 | 1.36 |
| 0.4-0.6 | 20.86 | 9.54 | 45.71 | 1.83 |
| 0.6-0.8 | 28.69 | 13.03 | 45.42 | 2.11 |
| 0.8-1.0 | 40.96 | 19.27 | 47.04 | 2.46 |

## Table 14

## The Effect of Financial Information on Participation, Share of Risky Assets and Financial Diversification

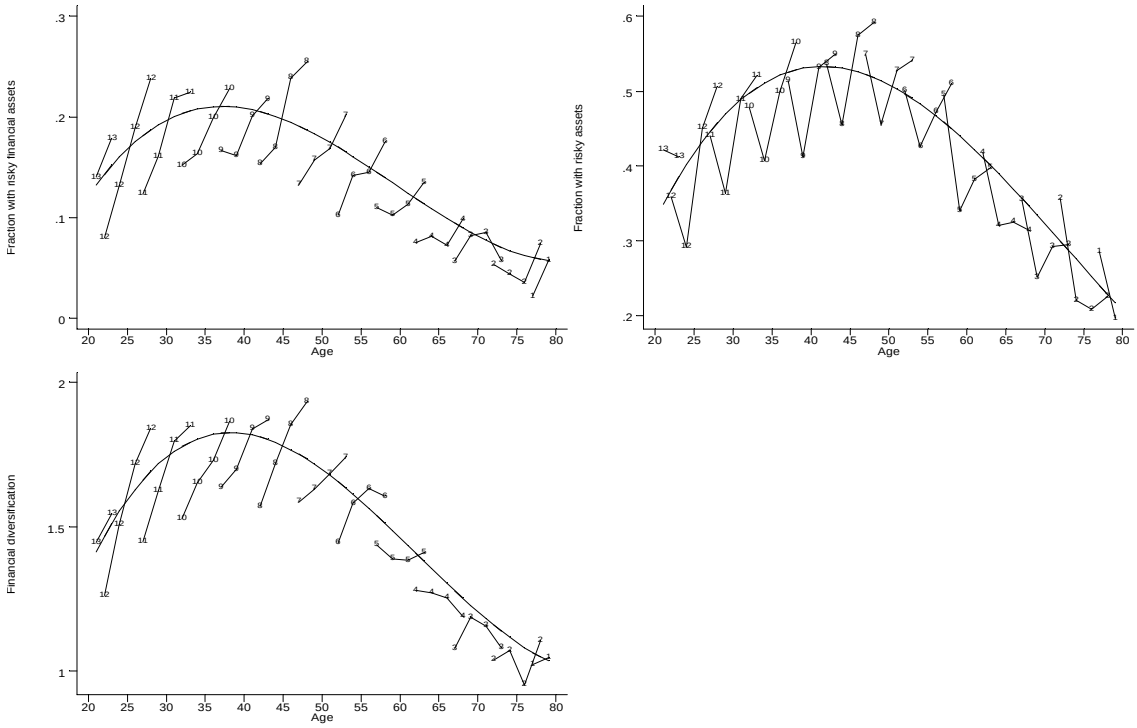
The table reports a probit regression for participation, the second stage of a selection model for financial asset shares, and ordered probit estimates for financial diversification. Risky financial assets include stocks, long term government bonds, other bonds, mutual funds and defined contribution pensions. Financial diversification is the number of financial assets in the portfolio. The weighted index of financial information is the sum of the financial assets known weighted by the inverse of the aggregate fraction of people knowing the asset. The index of bank diffusion is the ratio between the number of ATM points and population in each province. The probit and ordered probit regressions also include dummies for city size (between 20,000 and 40,000 residents, between 40,000 and 500,000, more than 500,000) and for the aggregate loan-GDP ratio in the province of residence. Data are drawn from the 1995 SHIW. T-statistics are reported in parenthesis.

| **Variable** | **Participation** | **Share** | **Financial diversification** |
|---|---|---|---|
| Index of financial information | 1.019<br>(12.49) | 0.040<br>(0.79) | 0.876<br>(15.87) |
| Age | 0.023<br>(2.21) | 0.003<br>(0.63) | 0.019<br>(3.07) |
| Age square / 1000 | -0.307<br>(-3.08) | -0.020<br>(-0.53) | -0.231<br>(-4.10) |
| Income | 0.027<br>(10.97) | -0.002<br>(-1.42) | 0.037<br>(20.92) |
| Income square / 1000 | -0.084<br>(-6.79) | 0.012<br>(2.44) | -0.132<br>(-13.69) |
| Wealth | 0.0004<br>(3.79) | 0.0001<br>(2.49) | 0.0007<br>(7.99) |
| Wealth square / 1000 | -0.00004<br>(-2.30) | -0.00001<br>(-1.98) | -0.00007<br>(-4.13) |
| Family size | -0.099<br>(-3.73) | -0.024<br>(-2.32) | -0.057<br>(-3.49) |
| Number of children | 0.002<br>(0.05) | 0.027<br>(2.20) | 0.029<br>(1.34) |
| Married | 0.073<br>(1.09) | -0.006<br>(-0.24) | 0.078<br>(1.86) |
| Male | 0.203<br>(3.27) | 0.018<br>(0.76) | 0.125<br>(3.22) |
| Resident in the South | -0.333<br>(-3.62) | -0.006<br>(-0.16) | -0.221<br>(-4.08) |
| Education | 0.021<br>(3.75) | 0.001<br>(0.17) | 0.026<br>(6.97) |
| Average unemployment rate in the province | -0.018<br>(-3.15) | 0.002<br>(0.92) | -0.019<br>(-6.39) |
| Index of bank diffusion | 0.491<br>(2.26) | | 0.123<br>(0.89) |
| Mills ratio | | -0.005 | |
| Observations | 7,228 | 1,321 | 7,228 |

## Figure 1

## Participation and Diversification by Age and Cohort

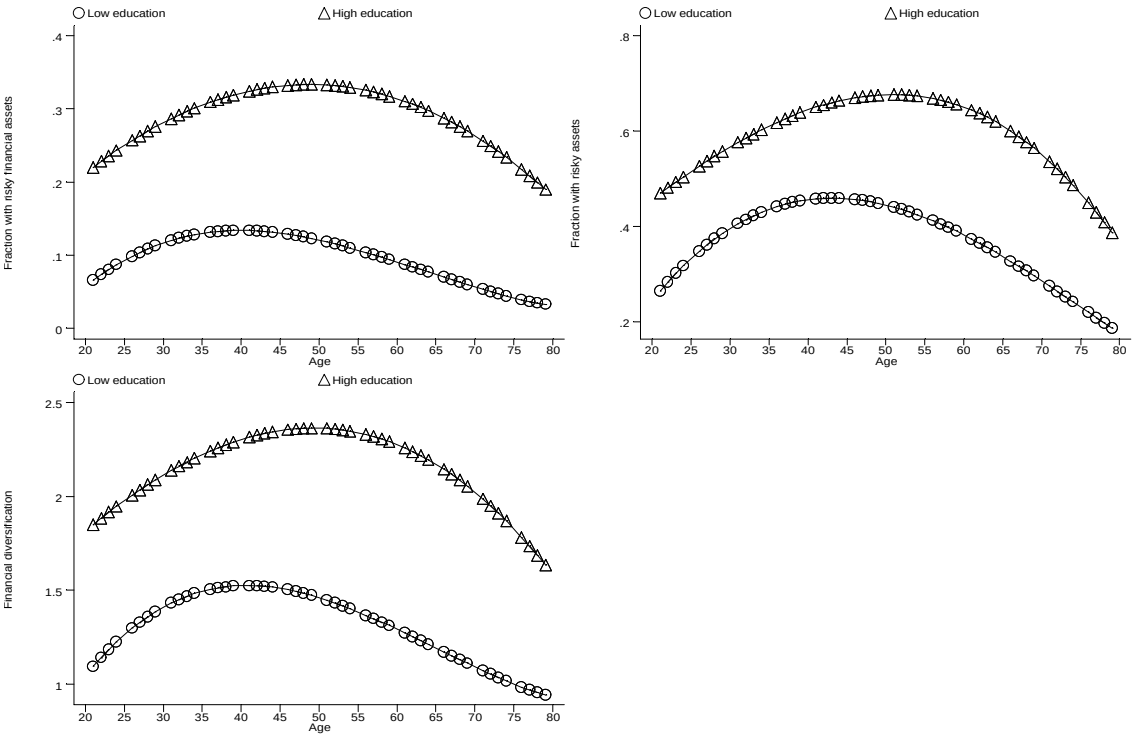
The figure plots the actual and estimated age profiles of the fraction investing in risky financial assets, the fraction investing in total risky assets and the index of financial diversification. The latter is defined as the number of financial assets in the portfolio.



## Figure 2

## Participation and Diversification by Education

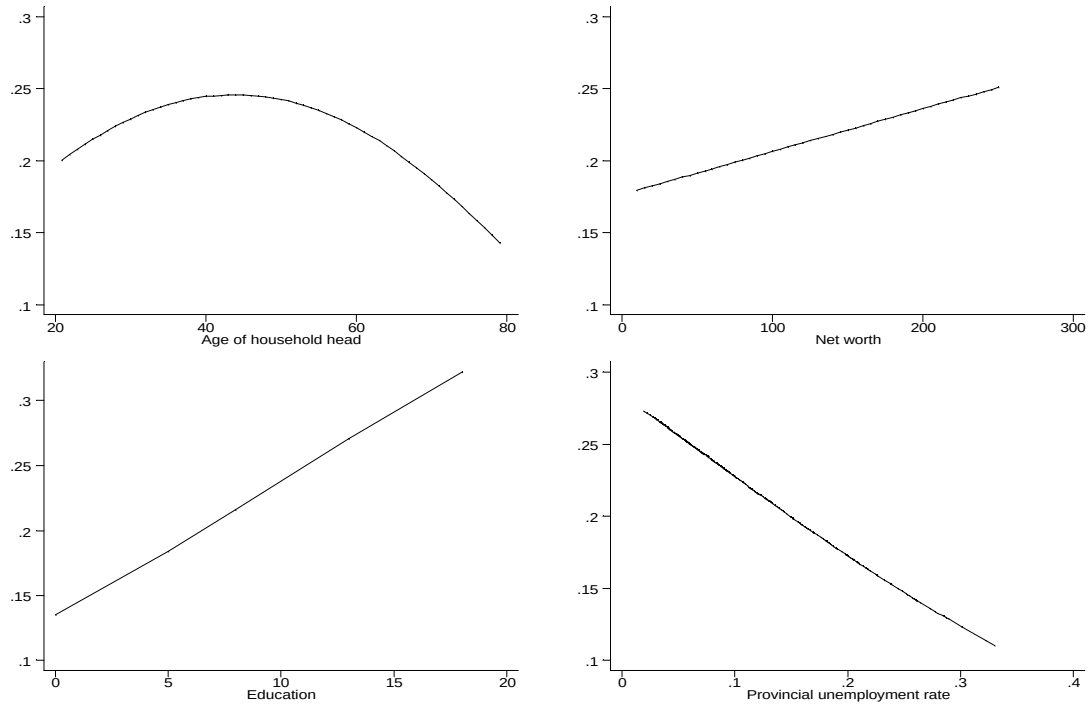
The figure plots by education the estimated age profiles of the fraction investing in risky financial assets, the fraction investing in total risky assets and the index of financial diversification. The latter is defined as the number of financial assets in the portfolio. “Low education” refers to household heads up to compulsory schooling (up to 8 years). “High education” refers to household heads with more than compulsory education (more than 8 years).



## Figure 3

## The Effect of Age, Wealth, Education and Provincial Unemployment on the Probability of Investing in Risky Assets

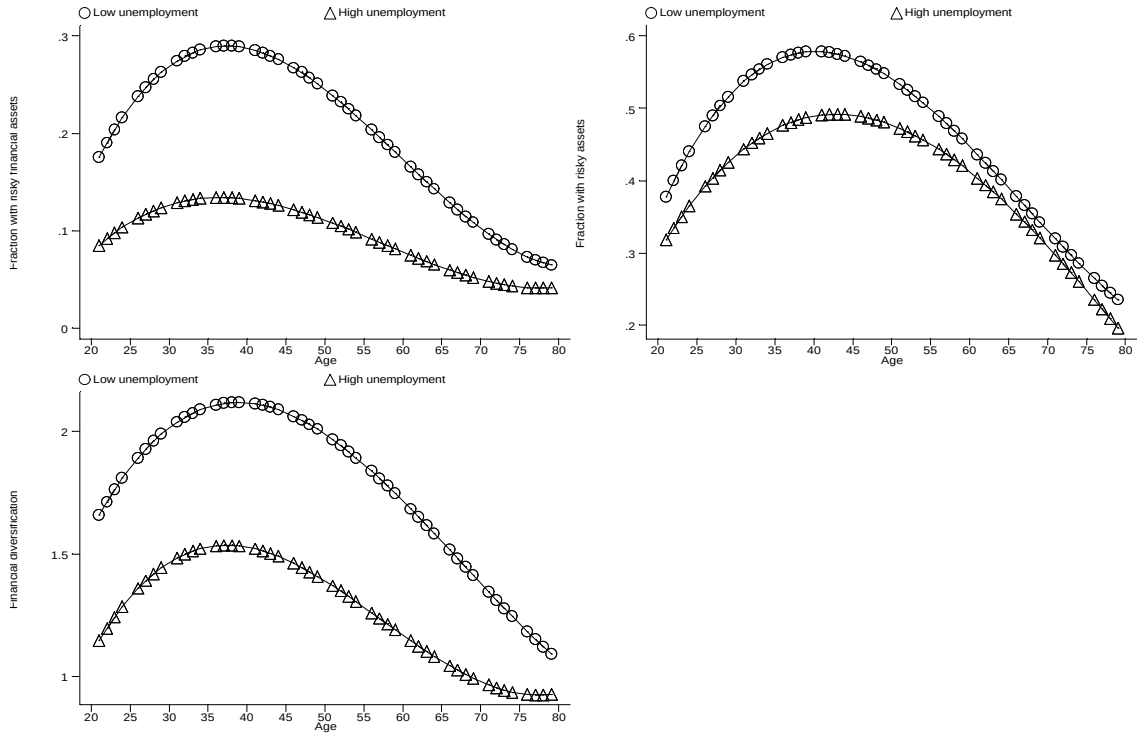
Each graph reports the effect on the probability of investing in risky financial assets based on the coefficients of the first regression in Table 7. Net worth is expressed in thousands euro. The probabilities are evaluated at sample means.



## Figure 4

## Participation and Diversification by Unemployment Rates

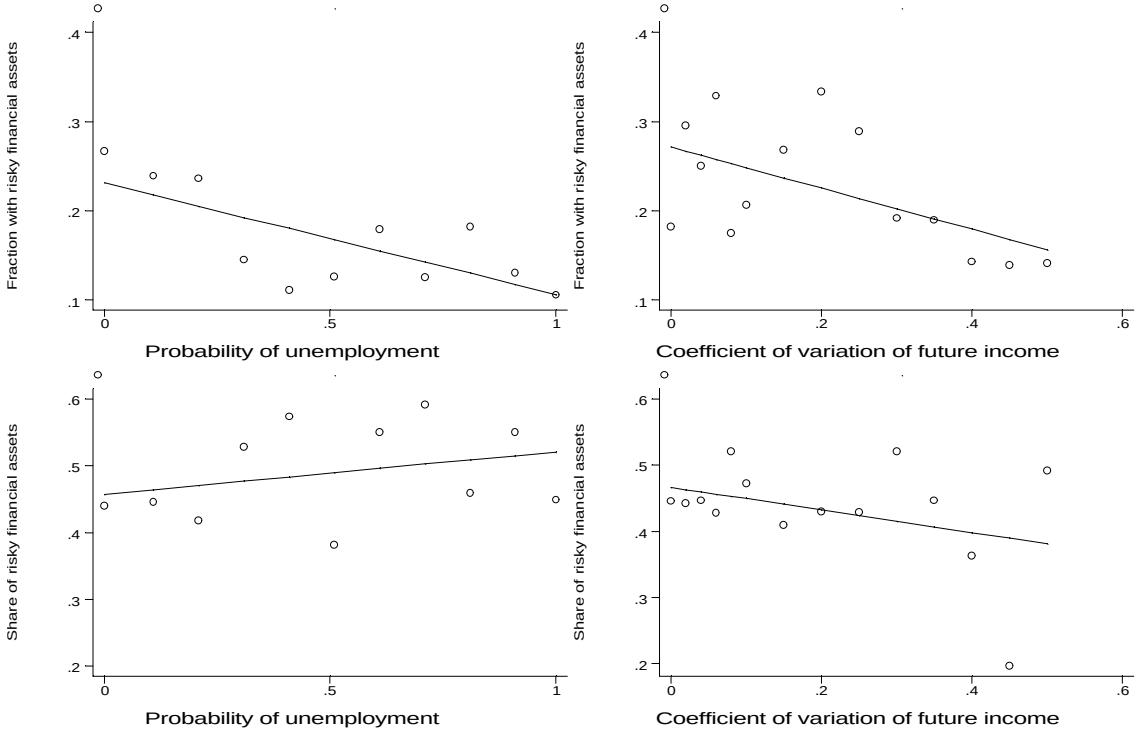
The figure plots by the average unemployment rate the estimated age profiles of the fraction investing in risky financial assets, the fraction investing in total risky assets and the index of financial diversification. The latter is defined as the number of financial assets in the portfolio. “Low unemployment” and “high unemployment” refer to households resident in provinces where the average unemployment rate is below and above 9 percent, respectively.



## Figure 5

## Background Risk and Financial Risk

The figure plots the fraction investing in risky financial assets and the conditional share of risky financial assets against the probability of unemployment and the coefficient of variation of future income. The coefficient of variation is defined as $E(y)/Sd(y)$, where $E(y)$ is the expected value of income in the year following the interview and $Sd(y)$ is the standard deviation of the future income distribution in the year following the survey. Both variables are derived from survey questions available in the 1995 SHIW. See the Appendix and Guiso, Jappelli and Pistaferri (1999) for a description of these risk indicators.



## Figure 6

## Age, Schooling and Financial Information

The two graphs plot the index of financial information by age and education. The index is the sum of the financial assets known weighted by the inverse of the aggregate fraction of people knowing the asset. The left graph is obtained by the fitted values of a regression of the weighted index of financial information on a full set of age dummies. The right-graph is obtained by the fitted values of a regression of the weighted index of financial information on years of education and years of education squared. Data are drawn from the 1995 SHIW.