Household Stockholding in Europe: Where Do We Stand and Where Do We Go?

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Abstract

We discuss the current state of stockownership among households in major European countries (France, Germany, Italy, the Netherlands, Sweden, and the UK), drawing parallels and contrasts with the US experience. We use detailed microeconomic datasets and explore the extent to which observed international differences in stockholding can be attributed to differences in household characteristics. Statistical analysis finds (1) an increase in stock market participation in all countries; (2) persistent differences across countries, with the US, the UK and Sweden having considerable more participation than France, Germany, Italy; (3) a robust correlation between the participation decision on the one hand, and wealth and education on the other; (4) a relatively small effect of education and wealth on the asset share invested in stocks, conditional on participation. Interestingly, international differences in stock market participation remain large even when we control for household characteristics. As our empirical results point to the relevance of participation costs, we probe into a number of indicators of such costs, and we find that these are consistent with the observed pattern of participation across countries. Since the lowering of such costs brings into the market households with different characteristics than incumbents, we discuss their likely impact, policy concerns, and types of policies that could mitigate their adverse impact on the future workings of the market.

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1. Introduction

Only 10 years ago, the landscape of household stockownership in Europe was quite different than it is today. Few households invested in stocks and most of their financial wealth was held in the form of liquid, safe, but low-return assets. Roughly speaking, participation in the stock market was limited to a small segment of the population, those in the very upper tail of the wealth distribution, relatively well educated and with little exposure to other sources of risk, except possibly entrepreneurial risk.

This picture changes considerably by the end of the 1990s. Although wide differences between countries persist, a much larger proportion of investors now hold stocks in their portfolio. About 50 percent of households in the US and Sweden, and over one third in the UK invest directly or indirectly (through mutual funds and other managed investment accounts) in the stock market. In the Netherlands, Italy, France and Germany the proportion is between 15 and 25 percent, but in each of these countries it has increased quite significantly, sometimes doubling in the course of the decade.

These changes were encouraged by a variety of developments. Some of them were transitory, such as the high stock returns in the 1990s, but many are permanent: the privatization of public utilities, the demographic trends, and the growth of the mutual funds industry that allowed European investors to acquire diversified positions in stocks at much lower costs than through direct acquisition. Such changes have brought into the stockholder pool many households with less financial sophistication and more limited financial means than the incumbents. In addition to lowering excess returns on stocks, new entrants with such characteristics can induce greater volatility in stock markets by reacting excessively to market signals as they perceive them. If economic policy is to help avert stock market downturns and volatility in the new decade, it must address the needs of these newcomers and supervise the practices of mutual funds handling their accounts.

After reviewing briefly who holds stocks in major European countries (France, Germany, Italy, the Netherlands, Sweden, and the UK), the paper discusses the current state of stockownership among households in these countries, drawing parallels and contrasts with the US experience and lessons from modern economic theory, where appropriate. The paper uses detailed microeconomic datasets and explores the extent to which observed international differences in stockholding can be attributed to differences in a number of household characteristics, namely wealth, age, education, and other demographic characteristics. We find that international differences in stock market participation are even greater when we control for such household characteristics than what is suggested by tabulated data. As our empirical results point to the relevance of participation costs, we probe into a number of indicators of such costs and we find that these are consistent with the observed pattern of participation across countries. Since the lowering of such costs brings into the market households with different characteristics than incumbents, we discuss their likely impact, policy concerns, and types of policies that could mitigate the adverse impact on the future workings of the market.

In Section 2, we use a standard portfolio model to show that the decision to participate in the stock market crucially depends on entry costs. Section 3 describes the main demographic, institutional, and policy-related changes that played a role in lowering participation costs over the 1990s. Sections 4 and 5 use data tabulations and regression analysis to identify cross-country differences in stockholding and to uncover the extent to which they can be attributed to demographic factors. Section 6 probes into other factors causing such differences, mainly related to participation costs. Section 7 discusses likely effects from widening the stockholder base and policy concerns arising from the identity of

new stockholders. Section 8 concludes by pointing to policies that can help mitigate or avert the bad consequences of the expanded stockholder base and of the increased riskiness in household portfolios.

2. Stockholding and participation costs

In a world without costs of entering the stock market, it would be difficult to explain why any individual interested in maximizing expected lifetime utility should abstain completely from stocks. Economic analysis postulates that households care about the contribution of each asset to the variability of their utility of consumption over their lifetime. Starting from a portfolio with no stocks, and barring unreasonably high positive correlations between stock returns and labor incomes, a household should be willing to enter the stock market because of the equity premium and would not expect such stockholding to contribute to consumption variability to an extent sufficient to offset the excess return on equity over riskless assets (Arrow, 1974). This raises three related issues, exemplified by some of the data that will be analyzed in the paper.

- *Why don't all households invest in stocks*? Even in the US and Sweden, the two countries with the highest level of stockholding, about 50 percent of households do not invest in stocks, and many more in Italy and Germany.
- *Why does stock market participation differ across countries*? Stock market participation in the US and Sweden is about twice as high as in France, Germany and Italy.
- *Why does stock market participation change over time*? Current participation figures for EU countries and the US indicate a very significant increase in stockholding in the course of the decade.

Although the literature has explored many possibilities, the view that seems to have gained most support is that households contemplating entry in the stock market face some actual or perceived fixed costs of entry that can be overcome only if the planned size of stock investment and the perceived magnitude of the equity premium are sufficiently large relative to the costs.[1] This literature, some of it based on large-scale intertemporal models with background labor income risk, offers a guide to interpret cross-country and time patterns of stockownership.

Consider here the simplest, static mean-variance portfolio model where investors decide how to allocate their wealth on the basis of the expected return and variance of their portfolios. Suppose that there are n risky securities, each characterized by different expected return, variance and covariance with the other securities. There is also a safe asset, whose gross return is R_f.

[1] An important lesson from the literature is that even small costs are sufficient to keep many households out of the stock market, especially since the marginal investor wants to invest limited amounts in the stock market (Haliassos and Michaelides, 1999; Polkovnichenko, 2000; Paiella, 2001; Vissing-Jorgensen, 2002).

Let R_p and σ_p^2 denote the expected return and variance of the portfolio, respectively. Since Tobin (1958), we know that, under the assumptions of the mean-variance model and in the absence of entry costs, investors will choose a combination of the safe asset and the portfolio of risky assets with the largest Sharpe ratio (the ratio of the average excess return to the standard deviation). Figure 1 shows the investor's options. The expected portfolio return is measured on the vertical axis and the standard deviation on the horizontal axis. The curve *AB* is the portfolio possibility frontier in terms of risk-return combinations. The efficient frontier is CB, the upper portion of *AB*. Points closer to *C* correspond to portfolios twisted toward assets that pay higher returns but are riskier, such as shares. Points closer to *B* correspond to portfolios with larger weight in safe assets with lower expected return, such as bonds. When a safe asset is available, the choice set expands and is given by the straight-line tangent to the *AB* locus. The intercept corresponds to the case where all wealth is invested in the safe asset. The tangent point *T* defines the "best" risky portfolio, that is, the risky portfolio that when combined with the safe asset gives the highest expected return for given riskiness.

In the absence of entry costs, each investor combines the best risky portfolio with the riskless asset in proportions that reflect the investor's risk aversion: more risk-averse individuals will invest more in the safe asset relative to less risk averse individuals. However, the portfolio composition of risky assets is the same. For an investor with utility *UU* the portfolio allocation is *P*, at the tangency between the indifference curve and the straight opportunity line. Letting R_r and σ_r^2 denote the expected return and variance of the tangency portfolio, and a the consumer's degree of relative risk aversion, and assuming quadratic preferences, the share invested in the tangency portfolio *P* is

$$\lambda = \frac{R_r - R_f}{a\sigma_r^2}.$$

Under these assumptions, all investors participate in the stock market and have the same portfolio of risky assets.

In reality, access to the stock market is costly due to information and trading costs, including transaction time. In the presence of entry costs it is difficult for a single investor to achieve the best allocation *P*. Suppose now that investors incur a fixed cost *K* to obtain the best portfolio *T*. Then, for a consumer it will pay to invest in the risky assets only if

$$EU(R_f W + \lambda W(\widetilde{R}_r - R_f) - K) > U(R_f W),$$

where expectations are taken over the risky assets return $\widetilde{R}_r$. The higher the investor's wealth and the larger the potential gains from the equity premium $R_r - R_f$, the more likely is the investor to hold risky securities. Furthermore, only relatively wealthy investors will enter the stock market. The poor will not enter, and will therefore suffer a utility loss. Since the loss is lower than if the poor paid the fixed cost, it is rational to stay out of the market. The difference in opportunities between the rich and the poor will reinforce the initial wealth difference.

The model predicts a strong correlation between stock market participation and investor's wealth and can explain why not all invest in stocks. To the extent that they are correlated with entry costs, other individual characteristics may also matter. For instance, educational attainment is likely to be correlated with information costs. The model is also

helpful to understand why average participation differs across countries and changes over time. Differences in average household wealth and in the distribution of wealth across countries may translate in differences in participation. Differences in the efficiency of the financial industry may imply differences in the level of entry costs. Competition between asset managers tends to lower entry costs. A wider market allows asset managers to offer better-diversified portfolios as well as to exploit economies of scale in operating costs, and investors are exposed to lower risk for each level of expected return. At any given level of entry costs, this induces more entry into the market because the equity premium per unit of variance is higher.

The role of institutional investors can be seen clearly in Figure 1. The point *T* is the best portfolio of risky assets that can be obtained by combining all the securities that are available in an economy. In equilibrium this equals the market portfolio. The number of securities to include in the portfolio can be quite large. If each security entails a fixed cost, this implies that individual investors are unlikely to be able to replicate the market portfolio. Mutual funds enjoy economies of scale and can offer funds that replicate the market portfolio.

The line *A'B'* represents the best combination of risk and return when the fund can use only a limited set of risky securities to form the portfolio. The more limited diversification opportunities imply that, for each expected return, this fund is riskier. Over time, improvements in the industry that allow better diversification (for instance adding foreign securities) shift the line *A'B'* to the left, lowering risk while holding expected return constant, thereby encouraging participation. Across countries, differences in the ability to diversify imply differences in participation.

3. Macroeconomic trends

In this Section, we describe the main demographic, institutional, and policy-related changes that played a role in lowering participation costs over the 1990s, some of which were already underway in the 1980s. Pension reforms induced by demographic trends, privatization of public utilities, increasing competition and cost reduction in the managed fund sector, and wider availability of financial information have played a prominent role. At first sight, this may appear as a list of disparate institutional developments with very different impact on the decision as to whether to participate in the stock market or not. Yet, there is a common thread running through them: *all of these developments played at least one, and often multiple roles in lowering the perceived costs or barriers to stockholding relative to the expected benefits of stock market participation*.

A first development has been the *demographic transition* to an aging population in European countries, mirroring trends that were also observed in the United States. The shrinkage of the pool of young workers who contribute to the Social Security fund relative to the elderly who expect to receive benefits means that households can rely progressively less on Social Security for their old age and led them to perceive larger benefits from stockholding through retirement accounts. Governments on both sides of the Atlantic became increasingly aware of this development and lowered the costs of participation by offering tax incentives, e.g. tax deferrals, to households who accumulate specifically for their old age. Old-fashioned defined-benefit pension schemes started to get progressively replaced by defined-contribution pension schemes, often sponsored by employers. Households were given the option to accumulate stocks as part of their own retirement accounts, providing extra incentives for

households to learn about the stock market and for employers and governments to disseminate information on stockholding.

The increase in importance of pension funds differs markedly across European countries and between Europe and the US, mainly because of the dominant role of public pension schemes in some countries.[2] Table 1 documents a remarkable increase in assets of pension funds as a share of GDP, from 38 percent in 1990 to 58 percent in 1997. This share, though increasing, is still very small in European countries with the lowest stockholding rates – France, Germany and Italy, as we will see below – but high in the Netherlands, the UK and Sweden, the European countries with a large stockholding base. This is another way of saying that stock market participation is greatly favored by growth of institutional investors.

Perceptions of increased benefits from stockholding were encouraged significantly in the 1990s by the *good performance of stock markets* relative to bond markets, and by increased financial market liquidity accompanied by improved standards of corporate governance that enhanced transparency.

Significant *privatization programs* for public utilities were undertaken in most European countries, albeit at an uneven pace and extent. In the UK and Italy, for example, revenues have been very substantial and the privatization process and the number of firms going public have increased stock market capitalization. In Germany, by contrast, State ownership of public utilities still remains relevant. The relative importance of revenues from privatization for various countries in the 1990s is documented in Table 1. It shows that the privatization program of public utilities and state-owned enterprises has granted Italy the largest revenues from privatization among European countries. The significant increase in the supply of stocks associated with privatization necessitated a campaign to expand the stockholder base. Households, the vast majority of whom did not previously participate in the stock market, were obvious targets, but their inertia, ignorance, and lack of experience with stockholding had to be overcome through massive campaigns that lowered participation costs by informing households at no cost how to invest in stocks. A prominent example in this context is the United Kingdom, where the privatization process and advertising campaign were already underway since the 1980s.

The *European Union directives* on financial integration, financial liberalization and removal of remaining capital controls further expanded the set of stocks available to households and lowered the costs of investing in them. These, together with the increasing policy coordination necessitated by the Maastricht treaty and preparations for a common currency, have meant that households now have easier access to an international set of stock markets, in which they can invest either directly or through internationally diversified mutual funds. On the supply side, the 1990s have witnessed an increased tendency of European public corporations to cross-list in foreign exchanges, in other European countries and in the United States (see Pagano et al., 2001). Both developments have lowered costs and improved opportunities for households to invest in foreign stocks.[3]

The growth of mutual funds also meant that households faced lower participation costs, especially distribution costs, and were the targets of extensive advertising by an industry

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[2] For a description of legal and institutional provisions regarding social security and occupational pensions in the US, Italy, and the Netherlands, see Kapteyn and Panis (2002).

[3] It is well known that stockholders, whether households or institutions, tend to bias their portfolios towards home equity rather than stocks in foreign exchanges (see, for example, Lewis, 1999). Institutional developments in the 1990s have created the preconditions for attenuation of this "home equity bias", although significant changes in this direction are as yet to be documented.

aiming at expanding its investor base. Going beyond the provision of information, mutual funds offered households the opportunity to hold well-diversified stock portfolios without devoting large sums to buy individual (whole) stocks, and to have professionals manage these portfolios and provide bookkeeping services for account holders.

The importance of mutual funds, pension funds, and institutional investors more generally, as measured by the share of the stock market they hold, is one of the main differences between the US and Europe. Table 2 shows that this comes to 54 percent in the US but less than half of this in European countries, except for the UK where the share of the domestic stock market held by institutional investors is larger than in the US. We will see in what follows that conditions in the mutual fund sector are important in explaining international differences in household stockholding patterns.

By contrast to Anglo-Saxon countries and the Netherlands, banks, holding companies or the government hold a non-negligible share of the stock market in the other European countries. These investors, unlike institutional investors, typically hold stocks to exercise control, thus limiting participation of the general public. For instance, in Germany the share of the stock market held by domestic banks, domestic holdings or the government is 55 percent. In France it is 36.2 percent, and in Italy it is 44.7 percent. The corresponding figures are only 0.7 percent in the US, 3.6 percent in the UK and 0 in the Netherlands. The overall picture is one of widely held stocks in Anglo-Saxon countries, and tightly held stocks in Franco-German countries.

If we focus on stocks held by domestic investors, the share held by households directly is 12.1 percent in France, 19.5 in Germany, 31.3 in Italy, 63.3 percent in the Netherlands and 21.6 in the UK, while US households hold directly about half of the value of domestically held stocks. However, foreigners hold a much larger fraction of the domestic stock market in each European country than in the US. This reflects both the degree of openness of European economies (smaller economies are more likely to need to place stock abroad) as well as the nature of corporate control.

The increase in European stockholding occurred while households were twisting their portfolio composition more generally towards high-return, riskier assets and away from safe and liquid assets, including government bonds, whose returns were declining over the 1990s. According to aggregate financial statistics, the share of safe assets in household portfolios has declined dramatically over the 1990s in all European countries.[4] Table 3 reports the composition of household portfolios based on aggregate financial statistics between 1996 and 2000.[5] On average, transaction accounts declined from 34 to 27 percent of total financial assets, while investment in stocks increased from 24 to 34 percent. This suggests that increased average stockholding is part of a wider process of portfolio rebalancing by households.

4. The need for microeconomic data

Aggregate financial accounts conceal crucial matters concerning household portfolios. For instance, aggregate accounts cannot establish whether the change in asset shares in the

[4] Safe assets are defined here to include cash and transaction accounts, time deposits and short-term government bonds.

[5] Eurostat recently made these available on a comparable basis across countries.

last decade is due to a change in participation or to the amounts invested conditional on participation. Equally importantly for our purposes, aggregate data are of no use in assessing whether international differences in stock market participation and in the composition of household portfolios can be attributed to wealth or demographic characteristics of households (age, education, family size) or are due to other differences across countries. 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. In this section we describe the key features of detailed microeconomic surveys for 7 countries and use them to report average stock market participation and its trends. In Section 5 we use econometric techniques to assess the extent to which the decisions to enter the stock market and how much to invest are influenced by household characteristics, such as education, wealth, income, and age.

4.1 Data sources and definitions

Our analysis is based on the most recent and detailed household level data for six European countries (France, Germany, Italy, the Netherlands, Sweden and the UK).[6] We contrast the state of European stockholding with the US experience, drawing on data from the 1998 Survey of Consumer Finances. In comparing stockholding across countries it is important to keep in mind that the surveys we use have different purposes, sample design, response rates, and ways to elicit household financial assets. We have made every possible effort to ensure comparability across countries, but significant differences remain. In most countries the most recent survey refers to 1998, so we use this year (or the closest available) as reference, even when more recent surveys are available.[7]

The French data are drawn from Patrimoine 97, a survey run by the central statistical office that involves over 10,000 households. Patrimoine 97 over-samples wealthy households, and collects good quality information on many of the socio-economic variables of interest. Data for Germany are drawn from the 1998 Income and Expenditure Survey (EVS) run by the central statistical office (Statistiche Bundesamt) with a very large sample involving over 50,000 households. In Germany there is no information on investment in mutual funds and other managed investment accounts, so indirect stockholding cannot be reported.

The Italian data are drawn from the 1998 Survey on Household Income and Wealth (SHIW), a survey run by the Bank of Italy that involves over 7,000 households. Although there is a certain amount of under-reporting, financial assets are deemed to be of good quality. In the Netherlands we rely on the CentER Saving Survey (CSS) panel, a survey run by CentER (Tilburg University), involving some 2,000 households interviewed online. CSS is targeted at the structure of individual and household wealth. Therefore, unlike all the other surveys used in this paper, CSS collects detailed information also on individual portfolios. The Swedish data are drawn from HEK (Hushallens Ekonomi or the Household Economy), an

[6] These countries account for about 90 percent of overall EU financial wealth in the year 2000 (Bartiloro and De Bonis, 2002).

[7] For instance, in Italy there is a survey for 2000, but we use the one for 1998.

annual survey conducted by statistics Sweden. The most recent survey with information on financial assets was conducted in 1999. The sample size is over 17,000 households.[8]

UK data are drawn from the 1998 Family Resources Survey (FRS), a large survey run by the Central Statistical Office and involving some 23,000 households. Information is of excellent quality, but data on portfolio allocation is limited to ownership information for broad categories of assets and a banded variable on total amount of liquid financial assets. This prevents computation of asset shares. Finally, we use US household portfolio data drawn from the 1998 Survey of Consumer Finances (SCF), a survey run by the Federal Reserve covering over 4,000 households. This is the most detailed survey on household portfolios among all we use, and allows reconstructing the amount invested in stocks with greater precision. The SCF is the only survey where households designate their managed accounts as predominantly stocks or bonds, allowing more precise estimation of indirect stockholding.

Throughout the paper, we rely on two definitions of stock market participation and two definitions of asset share invested in stocks. For stockownership, the first definition is narrow, and considers only traded and non-traded stocks held directly. Since many households hold stocks through mutual funds and other investment accounts, this is an underestimate of total stockholding. The second definition is broader, and includes direct and indirect stockholding (data for this definition are not available for Germany). This definition includes also mutual funds and managed investment accounts (to the extent that these funds invest at least part of their portfolio in stocks). Except for the U.S., data limitations do not allow us to distinguish mutual funds that invest in stocks (or predominantly in stocks) from those that invest in bonds, or that part of the fund that is invested in stocks.[9] Thus, reported direct and indirect stockholding is an upper bound for total stockholding.

The corresponding definitions for asset shares are the ratio of directly held stocks to total financial assets, and the ratio of directly held shares plus 1/2 of mutual funds in total financial assets. Sensitivity analysis considering 1/3 or 3/4 of mutual funds as stocks do not change our qualitative results. Since in the UK we lack data on total financial assets, this country is excluded from the analysis of asset shares.

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[8] In the Swedish survey 23 percent of households report no financial assets. This number is considerably higher than in the HEK surveys at the beginning of the 1990s, where the corresponding figure was about 10 percent. The most common financial assets in Sweden are bank deposits and much of the difference can be traced to this variable. Previously information on bank deposits was taken from income tax returns, which gave poor-quality data for almost every household. In the 1999 HEK, data on bank deposits are collected directly from banks, so the quality is excellent but the figures are reported only for deposits with interest earnings over 100 Swedish kronor (about 11 euro).

[9] The 1998 Survey of Consumer Finances defines total financial assets invested in stocks as (1) directly-held stock, (2) stock mutual funds (full value if described as stock mutual fund, 1/2 value of combination mutual funds, (3) IRAs/Keoghs invested in stocks (full value if mostly invested in stock, 1/2 value if split between stocks/bonds or stocks/money market, 1/3 value if split between stocks/bonds/money market, (4) other managed assets (annuities, trusts, MIAs) (full value if mostly invested in stock, 1/2 value if split between stocks/MFs & bonds/CDs, or "mixed/diversified," 1/3 value if "other"), (5) thrift-type retirement accounts invested in stock (full value if mostly invested in stock, 1/2 value if split between stocks and interest earning assets).

4.2 Comparing patterns of stock market participation

Table 4 reports our two measures of stock market participation: the proportion of households that invest in stocks directly (i.e. without the intermediation of institutional investors); and the proportion that invest in stocks either directly or indirectly through a fund. With the exception of Italy, where only 7 percent of households invest in stocks directly, direct stockholding in Europe is not far from that observed in the United States. On average, 14.7 percent of households invest in stocks, compared to 19 percent in the US. In the UK, 27 percent of the households participate directly in the stock market, a proportion that exceeds the US number.

However, the table reveals a marked difference between *total* stockownership in the U.S. and Europe. As of 1998, almost half of US households participate in the stock market either directly or indirectly. This proportion is much lower in all of the European countries considered, except in Sweden. The closest figure to the US from below is that of the UK, where over one third of households invest in stocks. The farthest is Italy, with only 15 percent of stockholders. Taking an unweighted average, stockholding in Europe is undertaken by 24 percent of households, half of the US proportion. As we will argue the marked difference in total stockholding between Europe and the US is due to the much greater development of institutional investors in the US. But there are also considerable differences within Europe, with Sweden and the U.K. exhibiting higher participation rates.

It is useful to contrast today's state of household stockownership in Europe against the state of stockownership and the importance of risky assets in household portfolios at the end of the previous decade. Although household level data for all the countries we examine are much more difficult to collect for decades previous to the 1990s, available data together with country-level financial statistics suggest that households have made a significant move towards stockownership and more generally towards riskier portfolios over time (see Guiso, Haliassos, and Jappelli, 2001).

In the UK the proportion of direct stockholders went up from less than 9 percent in 1983 (the first year for which this information is available) to 22 percent in 1998. A large part of this development is associated with the massive privatization of public utilities that took place in the UK before other European countries. In Italy – the country with the lowest direct participation – the proportion of households that invest directly in the stock market went up from 4 percent in 1989 to 7.3 percent in 1998, also taking impetus from the privatization process.

Total participation, direct or indirect, rose during the 1990s in all European countries and in the US. Comparison with figures for direct stockholding suggests increases in both direct and indirect stockholding during the 1990s, mostly through mutual funds. In Italy total participation increased by more than 8 percentage points between 1989 and 1998 (compared to an increase of only 3 percentage points in direct stockholding). In the Netherlands direct participation increased from 11.5 to 15.4 between 1995 and 1998 while total participation went up from 29 to 35 percent over the same period (no data are available for 1989). In Germany, direct participation was around 10 percent in 1989 and 17 percent in 1998. Even in the US, "equity culture" is a relatively recent phenomenon. In 1989 little more than a third of Americans held stocks in their portfolio, directly or indirectly, compared to half in 1998. Clearly, most of the increase is due to the growth of indirect stockholding: the fraction holding stock directly shows in fact little change.

5. Exploring stockholding patterns

In this section we relate participation and asset shares to household education, income, wealth, and age. After the descriptive analysis for direct and total stockholding, we present probit regressions for participation and regressions for asset shares invested in stocks, conditional on participation.

5.1. Descriptive analysis

Figure 2 plots the proportion of households that participate in the stock market by country and education level. In all European countries as well as in the US, participation is higher in the group with college education, particularly in Italy and the Netherlands. Thus, higher education entails not only a wage premium, documented by the large empirical literature on the returns to education, but also a higher expected return on saving through increased access to the stock market. This component of the returns to education is overlooked in the literature, but it is worth mentioning and likely to be non-negligible: a college educated, 45 year old individual, with 40,000 euro of financial assets, that invests half of them in stocks (yielding a yearly real expected return of, say, 6.5 percent) and half in a safe asset with real return of, say, 2.5 percent per year, can expect to end up at retirement age (say, age 65) with 50 percent more assets than an individual whose only option is to invest all wealth in the safe asset. We will return to the importance of limited stock market participation for wealth inequality in Section 7.

Figures 3 and 4 show the pattern of stockownership by income and financial wealth deciles.[10] Participation increases with investor resources, measured either by income or wealth. At low levels of income or wealth very few investors hold stock directly, while the fraction increases rapidly with income or wealth. Notice also that the relation is convex, suggesting that the benefits from participation are, at the margin, increasing with investor's resources. The figures show clearly the presence of a country effect on participation. While this is negligible at low levels of wealth, it becomes evident at intermediate and high levels of wealth. In other words, differences across countries in average participation are mainly explained by differences in participation among the relatively affluent segments of the population.

Figure 5 explores the age-participation relation. The profile has a similar hump shape in all countries, though the country effects mentioned above locate the Swedish and UK profile of participation above the profiles for all other European countries at all ages.[11] Differences across countries are rather small for the very young, but increase for middle-aged households who are typically at the peak of their wealth and for whom the portfolio problem is more relevant. Figure 5 also shows that young households have more conservative portfolios than middle-aged households. This contradicts the advice typically given by financial planners,

[10] Since information on financial wealth is missing for the UK, this country is not shown in Figure 4.

[11] In interpreting the effect of age on stockholding, we must be aware of the fact that the age effect may be confounded with time and cohort effects. For instance, if older cohorts are more reluctant then younger cohorts to enter the stock market, in the cross section this creates the impression of a negatively sloped age-stockownership profile. It is not possible to control for such an effect in the absence of panel or repeated cross-sectional data.

because young investors are typically advised to hold a larger share of risky assets in their financial portfolios in order to capture the superior expected return of these assets, and to reduce it as they age. As we shall see, however, the concave shape of the age profile of the asset share does not survive multivariate regression analysis.

5.2. Regression analysis of participation

Education, financial resources, and age are correlated: education level and income or wealth are notoriously positively correlated, while wealth and income vary in predictable ways with age, as implied by life cycle models of consumption. To account for this correlation and to isolate the contribution of each one factor while holding others constant, we report probit regressions for the participation decision and regressions for the portfolio share of stocks conditional on participation. Besides controlling simultaneously for income, financial wealth, age and education, we also allow for family size and include a dummy variable for whether the household head is married.

Results for the participation decision are shown in Table 5 (for direct participation) and in Table 6 (for total participation). To allow for possible non-linearity in the effect of age, income and wealth, we use a set of age-bracket dummies, income-quartile and wealth-quartile dummies. We report results for each European country and for the United States. The excluded age dummy is for the youngest group of consumers below age 31. For income and financial wealth, the excluded dummy is the first quartile of the respective distribution.

Even allowing for differences in income and wealth, education has a positive and significant effect in all countries, with similar impact among the European countries. However, in the US, being college-educated has an effect on participation that is twice as large as in Europe. In most countries, the coefficients of the age dummies are not statistically different from zero, in contrast to the descriptive analysis indicating generally concave age-participation profiles.

Income and financial wealth exert a positive effect on stockownership in all countries. The convex pattern, already visible in the figures reviewed above, is confirmed in the controlled experiment provided by the probits. Moving from the third to the fourth quartile of financial wealth has a much stronger effect on the probability of becoming a stockholder than moving from the second to the third, and even stronger than moving from the first to the second. Furthermore the convex pattern is more pronounced for financial wealth than for income.

As results in Table 6 show, these comments apply also to total participation.[12] In all countries, education has a strong positive effect on the probability of entering the stock market either directly or indirectly. More educated households are not only more likely to have heard of stocks, but also to learn easily about how to invest in stocks and to estimate more precisely the costs and benefits this entails. Indeed, the nature of institutional developments that took place in the 1990s, namely privatization, the demographic transition, and the workings of the mutual fund industry, was so involved that they were more likely to be understood by the educated population.

The coefficients of the age dummies are not significantly different from zero in France and the Netherlands. In the UK the coefficients for the middle-aged are positive and significantly different from zero, while in the US we obtain the opposite sign.

[12] Since for Germany we only have information on direct participation, it does not appear in the tables.

Income and wealth have a strong, positive effect on total participation. This strong effect has a straightforward interpretation in terms of participation costs. In the presence of such costs, the investor perceives a net benefit from being in the market if the optimal amount to be invested in stock is sufficiently large, that is if the investor has sufficient large amounts of "cash on hand" (consisting of the sum of wealth and labor income). This would be true even if all potential investors faced the same fixed cost. In fact, the financial services sector offers better terms to large investors than to smaller ones, further amplifying the relevance of income and wealth in the participation decision.[13] The importance of income and wealth can be further amplified if there are peer effects. Since each member of the more affluent groups is more likely to invest in stocks, any given affluent household is likely to have more peers that invest in the stock market. This may provide further impetus for affluent households to enter the stock market themselves.

In Table 7, we pool all European countries and the United States and run a joint regression allowing for country effects. The main interest in this regression stems from the fact that one can read differences across countries while controlling for differences across citizens in portfolio-relevant characteristics. The first column reports results for direct participation, the second for total participation (with Germany excluded). The pooled regressions confirm the increasing, convex relation between participation and financial wealth. The coefficients of the age dummies are negative and statically different from zero in the regression for direct participation, and positive in that for total participation.

Most striking, however, is the implication of country dummies (all statistically significant) that, compared to average stockholding in the United States (the excluded dummy), average direct stockholding is lower by 7 percentage points in France, by 5.7 points in Germany, by 13.6 points in Italy, and by 7.9 points in the Netherlands. It is higher by 11 percentage points in the United Kingdom. In terms of total stockholding, France, Italy, the Netherlands and the UK are all below the US by 24.5, 28.7, 21.2 and 6.4 percentage points, respectively. These controlled calculations reveal that the distance in direct and in total participation between Europe (except for the UK) and the US is actually *greater* than suggested by the participation averages reported in Table 4. Instead, the US and the UK appear closer in terms of total stockownership.

These international differences in participation are not accounted for by demographic characteristics of households but by features of the country in which they live. Pointing to such features will be a major focus of Section 6. An important tip for that analysis is provided by our finding here that household financial resources matter for participation in the presence of fixed participation costs.

5.3. Regression analysis of conditional portfolio shares

Economic theory goes beyond analysis of the participation decision to the study of optimal portfolio shares of stocks, conditional on participation by the household. These are called *conditional asset shares* for short. As shown in Section 2, in simple static portfolio

[13]A recent research report by McKinsey[13] provides an example for an affluent investor (75,000 euro invested over a 3 year period) and a retail investor (10,000 euro invested for 3 years, plus 100 euro per month). On average, European funds charge 30 basis points more to the retail sector.

models with investors characterized by constant relative risk aversion, the share of wealth invested in the stock market is independent of investor's wealth.[14]

Tables 8 and 9 show country level regressions for the share of financial assets invested in stocks, conditional on participation. These are second-stage regressions, adjusted for selection using the Heckman procedure. To identify the model, we assume that income and wealth enter linearly in the share equation and non-linearly in the first-stage selection equation. This is consistent with the strong non-linearity in the relation between stockownership and financial wealth documented in Figure 4. In general, we find the conditional portfolio share harder to predict on the basis of demographic variables and household resources than the decision to participate.

Having a college degree tends to be associated with a higher share of wealth invested in stocks. However, the education effect is high only in Sweden for directly held shares (9 percentage points). In all other regressions for direct and total participation the coefficient is only about 3 or 4 percent, and in the Netherlands and in the US the coefficient it is not statistically different from zero.

The coefficients of age dummies are positive in France, Italy and the Netherlands and negative in Germany and the United States. However, the age coefficients are almost invariably not statistically different from zero. And when they are significant, the coefficients are rather small, indicating that portfolio shares tend to be rather constant through life.

Finally, in all countries the coefficients of income and wealth are positive and precisely estimated. However, from an economic point of view, the estimates imply a rather flat relation between income or wealth and the share invested in the stock market. Since the variables are measured in million of euro, increasing financial wealth from 0 to 100,000 euro (well above the third financial wealth quartile for each country considered) increases the total share by less than 1 percentage point in the US, only 1 point in France and Sweden, 2 points in Italy, and 4 in the Netherlands (Table 9). Similarly, increasing income from 0 to 100,000 euro increases the total share by 1 to 6 percentage points, depending on the country. Results for the share invested directly in stocks indicate even lower responses to household wealth.

Our empirical findings regarding a flat profile of portfolio shares against age, income, and wealth are consistent with available panel-data evidence on the infrequency of portfolio adjustments during life. Perhaps the strongest available evidence comes from observing rebalancing practices of the same people over a ten-year period using the recently available TIAA-CREF database of retirement accounts of academics and other educators. Ameriks and Zeldes (2001) find that 47 percent of these highly educated account holders made no changes in how the flow of their contributions gets allocated to alternative investment accounts, while

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[14] Departures from the simple model can produce a correlation between wealth and the share invested. For instance, in an intertemporal model with risky labor income, more affluent households could devote smaller fractions of their financial wealth to holdings of stock because at high levels of resources most of future consumption is financed through portfolio holdings rather than through labor income. High-wealth households may also have less of a reason to undertake the risks of stockholding in order to benefit from the wealth-generating potential of the equity premium, namely from the higher expected return offered by stocks compared to relatively riskless assets. Finally, if low-wealth households are concerned at all about holding reasonably diversified portfolios, indivisibilities in stocks (i.e. the fact that they cannot buy fractions of each stock) may induce them to invest larger amounts in directly held stocks than in the absence of a diversification objective. This factor, of course, does not apply to holdings of stocks through mutual funds.

another 14 percent made only one change. Account holders also have the option of changing their portfolio allocation by moving accumulated funds from one account to the other, but roughly 73 percent made no such change in the ten-year period, while another 14 percent made only one change.

Table 10 shows results for the pooled sample but only for the portfolio share of directly held stocks, since indirect holdings are measured differently across countries. The qualitative results are similar to the individual country regressions. The effect of education is positive and statistically significant, but rather small. The conditional shares are rather flat in the relevant range of income and financial wealth. Most age coefficients are small and not statistically different from zero. But the most interesting result is, again, in the country dummies, which should be interpreted relative to the excluded country, namely the US. The country effect on the share of directly held stock does not reveal any particular difference between Europe and the US. The effect is negative in France and Germany, but the difference, even if statistically significant, is only 2 percentage points. In Italy and the Netherlands, instead, the effect is positive (although it is not statistically different from zero in Italy). This lack of pattern in country dummies signals that any differences in portfolio shares of directly held stocks between US and Europe are largely explained by demographic characteristics of households, leaving only differences in participation to be explained with reference to other factors.

Comparison of our findings for participation to those for portfolio shares reinforces our view regarding the importance of entry barriers to the stock market in the form of participation costs, both pecuniary costs and obstacles in information acquisition. The weak relation between the conditional asset share and wealth, income, and education suggests that once these variables have affected the decisions whether to buy stocks or not, they have no additional impact on portfolio composition. In the next Section, we probe into possible sources of stockholding differences across countries that are not related primarily to demographic characteristics of households but to perceived benefits and, especially, to participation costs affecting their stockholding choices.

6. What brought us here?

6.1. Perceived Benefits from Stockholding

Although several of the institutional developments in the 1990s, such as privatization, and growth of mutual funds and retirement accounts, were observed to varying degrees in most of the countries examined, they do not appear to have ironed out international differences in expected returns and other benefits to stockholding perceived by potential stockholders.

The first column of Table 11 shows average yearly stock market returns between 1986 and 1997, measured as the percent annual change (between year-end values) in the corresponding market return index in US dollars with dividends reinvested. Average stock market returns differed considerably across countries over this period. The United States, Netherlands, Sweden, and the United Kingdom outperformed France, Germany, and Italy by at least 5 percentage points. To the extent that expected returns, as perceived by households contemplating stockholding, were influenced by recent experience, it seems that households did not perceive the same benefits from stockholding in all of our countries. The impetus to

consider stockholding appears to have been much smaller in France, Germany, and Italy than in the rest of Europe and the United States.

Although perceived stock market returns provide a "carrot", benefits from stockholding can also come from avoiding the "stick" of inadequate social security pensions in the future. The realization that social security can no longer be relied upon to provide adequate living standards for the elderly, combined with generous tax incentives for establishing individual retirement accounts, have contributed to overcoming household inertia in learning about stock investments. In the United States, households were aided in gaining understanding about defined-contribution retirement accounts through high-impact, employer-sponsored seminars (Bayer, Bernheim and Scholz, 1996). Information on how stocks could contribute to retirement planning was disseminated to households in the course of public debate and extensive news coverage of the problems facing Social Security in major European countries. Households now devote to stocks a large part of their retirement accumulation.[15]

The perceived need to supplement public pensions with personal retirement accumulations is likely to be different across the countries we examine. The share of old age public pension spending relative to GDP can serve as an indicator of the importance of public pensions in the economy. As shown in column 2 of Table 11, this indicator suggests that the three countries with the lowest stock market returns were also the ones with the largest public pension systems. Looking at participation rates reported in Table 4, we confirm that these three countries had much lower participation than Sweden, the US, and the UK.

In deciding participation, households need to set any perceived benefits from participation in stocks against participation costs, as they perceive them. A major component of participation costs has to do with actual transactions costs imposed by the financial services industry, and especially by mutual funds that have provided a major impetus for the spread of equity culture in the 1990s. An important second component has to do with how these costs, augmented by the value of investors' time, are perceived by households. Lack of financial education, investor ignorance, but also lack of mechanisms for spreading information relevant for stockholders can seriously contribute to household misperceptions and ultimately to household inertia and non-participation. We now examine indicators relevant for these two types of costs.

6.2. Actual Participation costs

Constructing a comprehensive measure of stock market participation costs is difficult even for a single country, let alone when international comparability is desirable. When we focus on indirect stockholding where most of the international differences are observed, actual participation costs include production costs (trading costs, management fees and all annual operating costs) of mutual funds but also distribution costs. Other costs, such as the value of investors' time spent on obtaining information and trading stocks, are indirect and virtually unobservable to researchers.

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[15] A unique data set on asset allocation by participants in TIAA-CREF in the United States, a large non-profit organization that handles self-directed retirement funds for the staff of about 6,000 universities, secondary schools and other non-profit organizations, shows that respondents on average invest their retirement accounts predominantly in equities and longer-term fixed income securities (Bodie and Crane, 1997).

Production costs of mutual funds do not seem sufficient to explain the pattern of indirect stockholding in European countries. Estimates of trading costs for an institutional investor are presented in the third column of Table 11. The reported numbers represent the sum of commissions, fees and market impact in a given market based on global trading data of 135 institutional investors.[16] Column 4 presents management fees of mutual funds, reported as percentages charged by individual mutual funds. It is apparent that neither trading costs of institutional investors nor management fees of mutual funds can explain differences in stockholding across the countries examined. Indeed, management fees provide only partial indication of costs paid by final investors.

An augmented measure of production costs is the "Total Expenditure Ratio" (TER). The *Fitzrovia* TER represents the drag on fund performance caused by all annual operating costs (including administration/share registration, trustee/custody, audit and legal fees), not just the basic annual management charge. The *Wall Street Journal Europe* reports that TER is 1.46 percent in Europe and 0.98 in the US.[17] This augmented measure of production costs seems consistent with the more limited development of indirect stockholding in Europe relative to the US.

Distribution costs are higher in Europe than in the United States and they can exert considerable influence on household participation decisions. Entry fees, switch fees, plus other "hidden" fees, such as opening an account can often more than double TER. On top of this, there are performance fees and brokerage costs.

In lieu of direct estimates of distribution costs, we present in Table 12 data on characteristics of the mutual funds industry in the various countries, which are likely to exert a strong influence on such costs. Two characteristics stand out: European funds are smaller and comprise more concentrated industries in Europe than in the United States. Both factors suggest that distribution costs are higher in Europe than in the US.

The United States industry is large relative to European industries not only in terms of assets, but also in the range of choices it affords households among alternative mutual funds (col. 1). A striking outlier in Europe is France, where the number of available funds is close to 6,000. Regardless of their number, European funds are of very small size compared to US funds (col. 2). A consistent message from existing econometric research is that large funds enjoy economies of scale and exhibit lower ratios of operating expenses to fund assets compared to smaller funds.[18] This suggests that US funds are in a position to pass on to their customer's significant cost savings arising from larger scale compared to European funds.

Column 3 shows that the mutual fund industry is much more heavily concentrated in European countries (other than the UK) as compared to the United States. Concentration here is measured by the market value of the 5 largest fund groups as part of the total mutual fund market.

Also relevant for distribution costs is the nature of distribution channels. Table 13 shows that there is a notable correlation between stockholding and direct sales or contacts with brokers as opposed to distributions via banks. In France, Germany, and Italy where participation is more limited, mutual funds are distributed primarily by banks. By contrast, in the US, it is brokers and direct sale that dominate mutual fund distribution. Brokers are also

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[16] These costs are incurred by professional market makers and affect household stockholding only insofar as they are passed on to households.

[17] "US funds giants arrive in Europe but leave their low fees behind", 21 January 2001.

[18] See, for example, Rea and Reid (1998) and references therein (footnote 40).

very important in the UK, while banks are about as important for distribution of mutual funds as direct sale.

All in all, available data on transactions costs and on characteristics of mutual funds suggest that European households are likely to be facing fewer choices, less competition, and higher production and distribution costs of investing in mutual funds compared to their US counterparts.

The importance of participation and especially of distribution costs in shaping patterns of indirect stockholding is reinforced by examination of trends in such costs for the US where such data are available. This reveals that during the 1980s and 1990s when indirect stockholding spread, participation costs in equity mutual funds dropped significantly (Rea and Reid, 1998). US data are available for "total shareholder cost" that includes fund operating expenses (for managing portfolio investments, servicing shareholder accounts, and distributing or marketing shares) plus distribution costs (annuitized values of one-time sale charges for load funds incurred by buyers of a fund during a given year augmented by certain fees[19]), all expressed as a percentage of the amount invested in the fund.[20] The sales-weighted average of such cost ratios for different equity funds was 2.25 in 1980, 2.17 in 1988, and only 1.49 by 1997. This drop was partly due to an increase in sales of no-load funds relative to load-funds, and partly to a sharp downward movement in the cost ratio of load funds (from 3.02 percent in 1980 to 2.11 percent in 1997). These resulted in a significant decline in the distribution cost ratio, from 1.49 in 1980 to 0.61 in 1997.[21] Indeed, the operating expense ratio rose modestly from 0.76 percent in 1980 to 0.88 percent in 1997, despite the presence of significant economies of scale among individual equity funds. These trends suggest that drops in actual participation costs, but particularly in distribution costs, have played an important role in encouraging household participation in equity mutual funds.

6.3. Perceived Participation costs

Decisions to participate and to rebalance portfolios are not governed simply by actual participation costs, but also by how these are perceived by investors. Inaccurate perceptions can be induced either by lack of transparency as regards financial practitioners or by limited knowledge or information-processing ability on the part of potential investors. There is empirical support for the idea that there are information-related barriers to entry into stockholding. Educational dummies exhibit strong statistical significance in stock market participation regressions reported in this paper and elsewhere (see the contributions in Guiso, Haliassos, and Jappelli, 2001). More educated individuals are less likely to face information barriers, including those that arise from total ignorance about the availability of stock, as analyzed by Merton (1987) and documented empirically in Guiso and Jappelli (2002). Investing in the stock market either directly or indirectly through a fund involves a substantial amount of delegation. Delegation, in turn, requires monitoring on the side of the investor that

[19] These are known as "12b-1 fees" and include fees for advertising, marketing, investor assistance, and account servicing.

[20] For front-load funds, these are charged at the time of purchase, while for deferred-load funds, they are incurred at the time of sale. Costs are based on estimates of holding periods by investors based on past behavior.

[21] The distribution costs of load funds fell from 2.28 percent to 1.23 percent, due to a decline in loads that dominated increases in 12b-1 fees.

intermediaries or firms make an appropriate use of the funds. More educated households are likely to face lower monitoring costs and thus to be more likely to participate.

Table 14 presents indicators of financial transparency of institutions and of investor literacy in the countries we examine. The first three columns are obtained from the 2002 *World Competitiveness Yearbook* and they reflect declared opinions of top and middle management in the respective countries.[22] Column 1 shows that operations of European funds are perceived to be less transparent than their US counterparts. US managers are the most positive regarding the transparency of financial institutions in their country, whereas Italian and French managers appear at the bottom of the list. Sweden, another country with considerable participation in stockholding, is also high on the list. Looking at trends over time from the same source (not reported here), we find that the US and the UK register significant improvements in perceptions regarding financial transparency since 1999, whereas Italy, France, and Germany exhibit a downward trend. To the extent that managers' perceptions are accurate, European households face greater difficulty in evaluating and comparing stockholding funds compared to Americans, and this is consistent with lower participation rates among Europeans.

The remaining columns refer to the ability of households to evaluate whatever information is made available. The second column reports opinions of managers on whether economic literacy is generally high among the population. Again, France, Germany, and Italy appear low on the list, while managers in Sweden, the Netherlands, and the US have a more positive outlook on economic literacy in their country. Looking at trends, the US has registered the most significant increase, from 4.8 in 1996 to 6.3 in 2002. A similar picture is given by column 3, regarding education in Finance. The tendency of managers in the UK to have such a pessimistic assessment of economic and financial literacy seems hard to reconcile with the well-known tradition of the UK in Economics and Finance education, as well as with observed stockholding patterns. Trends (not reported here) reveal that Germany and Italy exhibit noticeable declines in assessment, with little movement in the rest of the countries.

The last two columns of Table 14 are indicators of computer literacy in 2001, and are obtained from the *Computer Industry Almanac*. Given the considerable volume of information on stockholding that is available on the internet, and the variety of available computer tools for tracking portfolio performance, one expects that computer literacy makes it easier for households to handle stock transactions and to perceive costs and benefits of stockholding. Indeed, we see that both the number of computers per thousand people and the number of internet users are higher in countries displaying more pronounced stockholding participation than in France, Germany, and Italy, where stockholding is more limited. All countries exhibit significant upward trends in both indicators in recent years.

The overall impression from indicators of financial transparency and of investor financial and computer literacy is that all tend to correlate with participation in stockholding. Combined with the findings on actual transactions costs, this suggests that country differences in actual and perceived transactions costs play an important role in reconciling international differences in stockholding participation observed after we control for household demographic characteristics.

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[22] The Surveys are annual and are conducted as follows. Each year, the Institute for Management Development (Lausanne, Switzerland), sends a questionnaire to top and middle management in 49 countries. The sample size from each country is proportional to the GDP of that country. The respondents are nationals or expatriates, located in local and foreign entrerprises in the country. The surveys are sent in December and returned in March. In 2002, the overall sample size was 3532.

7. Where do we go?

The microeconomic data presented in this paper document an expansion of the stockholder base in the 1990s, and increased availability of more involved financial assets to less sophisticated investors. We showed that education, and financial resources in the form of income or wealth enhance the tendency to participate in stockholding. We have also argued that institutional developments have lowered the cost of participating in the stock market. Putting the two together suggests that new entrants are likely to be of lower education than experienced stockholders and to have fewer financial means at their disposal to withstand the ups and downs of the stock market. Since education tends to correlate negatively with risk aversion, the new entrants are also likely to be more risk averse. The presence of new entrants can influence the behavior of excess returns on equity. In this Section, we discuss likely future implications of this change in the pool of stockholders.

7.1 Effects of Increased Stock Market Participation

Increased stock market participation has several potential effects on the behavior of new entrants and on the characteristics of stock markets and the economy as a whole. Among the most important is that a larger subset of the population obtains access to financial instruments bearing higher expected returns and enhances its ability to build diversified portfolios. This greater equality of financial opportunities can be expected to contribute to a reduction in wealth inequality. Indeed, Guvenen (2002) shows that introducing limited stock market participation in an otherwise frictionless economy can have so powerful effects as to replicate the wealth inequality observed in the United States! In other words, heterogeneity in access to the stock market is likely to be a powerful reason for observed wealth inequality.

Lower costs of gathering information on the properties of assets can lower wealth inequality further. As initially shown by Arrow (1987) in partial equilibrium and recently by Peress (2001) in a general equilibrium framework, reductions in costs of gathering financial information lower the threshold of wealth that triggers investment in information acquisition. The now better-informed households in the lower quartiles of the wealth distribution obtain higher expected returns per unit variance, resulting in a less unequal distribution of expected final wealth.

The behavior of new entrants is likely to be affected by access to stocks for a given equity premium.[23] However, there are very important concerns regarding likely general equilibrium consequences of the wider stockholder base on stock market volatility and on the size of equity premia themselves. General equilibrium consequences of increased stock market participation have only recently started to be discussed and conclusions from this literature can only be tentative. One effect of the enlargement in the pool of stockholders is to increase market liquidity by bringing previously untapped funds into the stock market. In equilibrium, higher liquidity implies that sellers who are short of cash can more easily trade with buyers in excess of cash. This tends to reduce market volatility, attracting more investors with welfare enhancing consequences (Pagano, 1989; Allen and Gale, 1994). Still, uniqueness

[23] Haliassos and Hassapis (2002) find that equity culture is likely to encourage households to increase current consumption and their demand for loans, both for asset purchase and for consumption. Faced with exogenous increases in earnings risk, they are also likely to make larger precautionary adjustments to consumption, financial wealth holding, and borrowing.

of participation equilibrium is not always guaranteed. For example, as shown by Allen and Gale (1994), multiple equilibria exist when asset market volatility declines with household participation in the stock market: the expectation of high (low) volatility discourages (encourages) participation, confirming the expectation.

There is some empirical evidence that stock market volatility has increased alongside market participation.[24] Indeed, the recent turmoil in stock markets suggests that positive effects of the increase in overall liquidity may be tempered or reversed by differences in characteristics of new entrants relative to long-time investors. Herrera (2001) advances the hypothesis that new stockholders are more risk averse than previous stockholders, an argument quite consistent with our empirical findings. Because of this higher risk aversion, their stock demand is less responsive to current stock prices, and this can lead to higher price volatility.[25]

Peress (2002) offers a different mechanism whereby increased participation can lead to greater volatility. He distinguishes between fixed costs paid to trade the asset, and information costs paid in order to purchase private informative signals about the payoff. When new investors enter the market, they unload some of the risk from existing investors and enhance risk sharing. Although enhanced risk sharing by itself tends to lower volatility, it also reduces incentives to acquire costly information, which exerts upward pressure on volatility. The net effect ultimately depends on the number of shareholders. For widely held shares, new traders choose not to collect information, and they may also discourage some incumbents from doing

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[24] Campbell et al. (2001) find that the idiosyncratic volatility of single stocks in the United States has increased significantly over the past 30 years. Over the same time span, also the volatility of the price/earnings ratio of the Standard&Poor 500 index has increased (Herrera, 2001).

[25] The mechanism can be illustrated as follows. Recall from Section 2 that the investor's asset share in stocks is

$$\lambda = \frac{R_r - R_f}{a\sigma_r^2}.$$

Multiplying by wealth and letting $\tau = w\frac{1}{a}$ denote the degree of absolute risk tolerance, the demand for stocks is

$$S = \tau \frac{R_r - R_f}{\sigma_r^2}.$$

Thus, less (absolute) risk tolerant investors are less responsive to stock market prices (and market riskiness). Suppose that absolute risk aversion is decreasing with wealth and that consumers differ in their wealth endowment. Then, when entry costs fall, the new entrants are consumers with lower than average wealth than existing stockholders, and lower risk tolerance. As a consequence, the price elasticity of the demand for stocks falls and, in equilibrium, stock prices are more volatile.

so.[26] Thus, the information content of prices is reduced and volatility rises.[27] Interestingly, if there is an exogenously generated reduction in the entry cost to the market for widely held stocks, then new entrants do not purchase information and reduce the incentives of incumbents to purchase information making them also uninformed. Stock prices, noise, and volatility soar in this case that is most relevant for our discussion. In all cases, the average risk premium declines with the number of shareholders.

Increased participation can lower the equity premium in some models (e.g, in the Peress model), but this is not always true. For one thing, the effect on the premium might be tempered if stock supply itself increases with stockownership, as is typically the case with privatizations. Furthermore, new entrants are likely to differ from incumbents in terms of risk aversion and wealth, as we found above. If marginal stockholders are on average more risk averse than incumbents, then this heterogeneity by itself tends to raise the equity premium. Because of higher risk aversion, more limited wealth and related factors, marginal stockholders tend to invest less in stocks than incumbents. To the extent that they invest little, they are unlikely to have big effects on the equity premium (Polkovnichenko, 2000).

Indeed, there is a class of general equilibrium models that compare steady states with limited participation against those with full participation in the stock market and have shown that asset returns are not likely to change much in response to more extensive participation.[28] They typically specify exogenously fixed asset supplies and a fixed percentage of households who are assumed to have no access to stocks, and then they either impose that the rest hold stocks or they give them the option to hold stocks. The overall conclusion from this class of models is that changes in stock market participation are not the key to matching the historically observed equity premium or to explaining the recent behavior of stock prices.

A recent paper by Calvet et al. (2001) focuses on the likely effects of financial innovation on participation in risky assets, the riskless interest rate, and the equity premium. Financial innovation encourages households to participate in the risky asset market for hedging and diversification purposes. At the same time, the existence of new assets reduces the precautionary motive of market participants, thus raising the riskless interest rate. This increase in the riskless rate militates against increased participation in risky assets, but it is often dominated by the hedging effect and participation rises. Under some conditions on the cross-sectional distribution of risks, new financial instruments encourage participation and reduce the covariance between stock returns and mean consumption of participants, lowering the equity premium.

Overall, these papers seem to imply that the effect of increased participation on the equity premium may be negative, but is unlikely to be sizeable given the limited investment of new entrants. There are ways in which the spread of equity culture can enhance stock market volatility and ways in which it can reduce it, but the net effect appears to be ambiguous on the basis of existing theoretical literature.

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[26] If stock supply is so inelastic that incumbents are forced to hold sufficiently smaller positions.

[27] The result is not unambiguous for narrowly-held stocks. In this case, all entrants choose to acquire some information but, if the demand for information by incumbents is sensitive enough, aggregate information falls, and noise and volatility rise.

[28] These include Allen and Gale (1994), Saito (1995), Basak and Cuoco (1998), Heaton and Lucas (1999), and Polkovnichenko (2000).

7.2 Concerns

While the move towards more widespread access to the stock market widens the opportunity set of previously excluded investors, it also raises concerns mostly related to the fact that lower entry costs change the composition of stockholders. Investors that entered the stock market after the reduction in entry costs are significantly different from the preexisting ones; otherwise they would have entered earlier. They tend to be less wealthy, more risk averse and less educated. As a result, they are likely to be less "sophisticated" and more vulnerable to the swings of stock market prices.

A prominent concern is the ability of new stockholders to assess the riskiness of their portfolios and to respond optimally to changes in the financial environment given their limited experience with stockholding. Many households entered attracted by the massive increase in stock prices during the late 1990s. As a consequence, some of these investors may have incurred significant losses in the subsequent crash. Poor financial education may have led them to overestimate expected returns during the boom as well as losses during the crash. In some instances losses may be irreversible, as those incurred by persons close to retirement. All these considerations raise the possibility of massive and premature exodus from the stock market due to poor assessment and limited ability to withstand financial pressure.

Even if new entrants remain in the market, they may be induced by lack of sophistication or by frustration with market performance to trade more frequently than is warranted and to be more susceptible to "tips" or "fads" not based on fundamentals. The lowering of transactions costs can perversely contribute to such phenomena. In an interesting paper, Barber and Odean (2000) argue that the recent easy access to trading stock through the Internet has induced a sense of over-confidence that has led investors to trade too often, incurring significant losses relative to market returns.[29]

Countries in which stockholding is mostly in indirect form (especially, passive stockholding through pension and insurance funds) are likely to be less susceptible to such problems. Future data will enable researchers to study stockholding after the stock market decline of 2001-02, and to understand if the increase in European stockholding is a permanent feature that cannot be reversed by even sharp fluctuations in stock market prices.

8. Conclusions for Policy

We argued above that concerns for the future of household stockholding in Europe arise mostly because of the limited sophistication of new entrants to the stockholder pool and its interaction with their limited ability to withstand financial pressure. It is, therefore, natural to ask whether there is room for policies to alleviate the root of the problem.

One important unsettled issue is whether the role of providing financial education should be left to the market or whether governments should intervene with specific financial education programs. Merton (1987) argued that limited information about financial assets limits the demand for these assets, so issuers do have an incentive to communicate financial

[29] They report that, of 66,465 households with direct holdings of common stock and accounts at a large discount broker during 1991 to 1996, those that trade most earn annually 11.4 percent, instead of the market return of 17.9 percent.

information. There is in fact evidence that financial intermediaries and fund managers disseminate financial information and contribute to some extent to educate investors. Guiso and Jappelli (2002) find that in Italy local financial market development is actually correlated with consumers' knowledge of the existence of a broader asset menu. In this respect, the market seems to spread information.

In addition to information provided by financial practitioners, there are financial information spillovers from informed to uninformed consumers in the same social circle. Hong, Kubik and Stein (2001) show that stock market participation is higher among individuals that entertain intense social interactions. Furthermore, this effect is stronger among individuals living in communities with a higher participation rate to begin with, implying that social learning interacts positively with learning induced by market development. Similarly, Duflo and Saez (2002) show that in the US the decision to participate in Tax Deferred Accounts is significantly affected by a similar decision of employees in the same department. Thus, the experience of peers about the performance of their investments is passed on to others. Whether this provides the efficient amount of information is, of course, hard to say. The finding of Bayer et al. (1996) that employer-sponsored seminars were most effective in enlisting employers for individual retirement accounts in the United States, along with the success of government advertising campaigns during UK privatizations, suggest that the State has a role to play in disseminating information, especially for stockholding opportunities relating to its own policies and programs.

A related but distinct issue is whether there is need for government control of the quality of information being disseminated to investors by the market. As entry costs decrease and less informed investors enter the market, fund managers may have incentives to provide untruthful information, profit from their information advantage, and abuse their role as financial advisors. Mutual funds are often complicated instruments with contractual provisions that are not easy to grasp even for relatively well-educated investors. Very often the sellers of these instruments provide also financial advice and can therefore manipulate the information they transmit in their own interest, whether by understating the riskiness of the instrument, hiding or simply not mentioning exit costs or more profitable alternative financial instruments.

More generally, the growth in managed investment accounts and the fact that they typically sell to investors with little or no financial information implies a sharp increase in delegation to manage one's portfolio. Delegation and limited information imply that professional investors and individual investors may not share the same objectives. Increased delegation creates preconditions for the possible emergence of fraud, which in turn can threaten or even block the further development of stockownership if consumers perceive a risk of fraud.[30]

It may be tempting to argue that competition and information transmission tend to correct abuses, obviating the need for government intervention. Yet, it is often difficult for a consumer to find out whether a bad financial return was the consequence of bad advice or the result of an adverse market outcome. Furthermore, exit costs tend to slow down migration to other funds. All in all, it seems that public provision of financial information, along with public monitoring and supervision, should accompany the growth of indirect stockholding.

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[30] Guiso, Sapienza and Zingales (2000) find that in Italian provinces with relatively high social trust (which can be associated with a higher level of delegation), the proportion of stockholders is higher, other things equal.

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Figure 1

Portfolio choice in the mean variance model

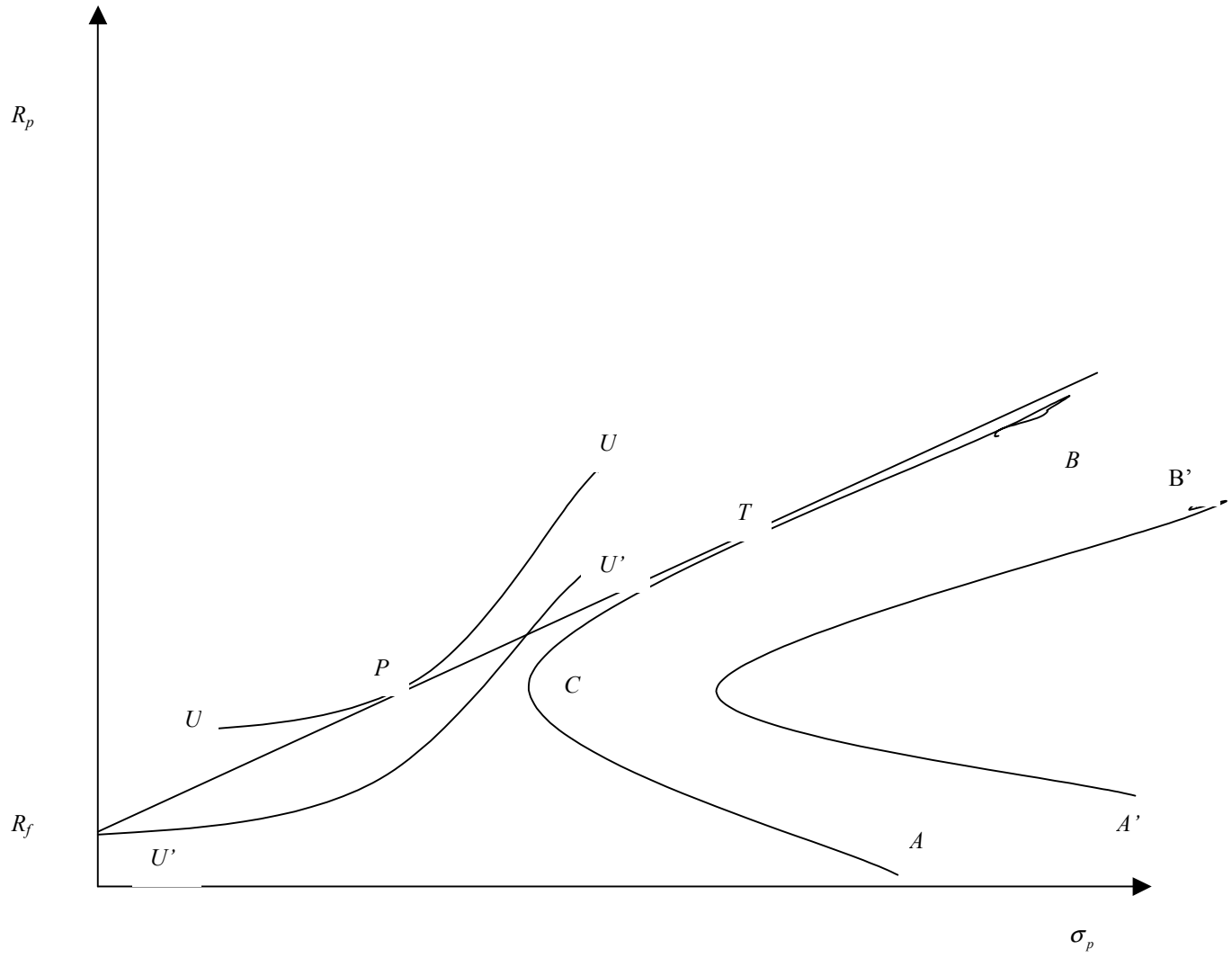


Figure 2
Stock Market Participation, by Education

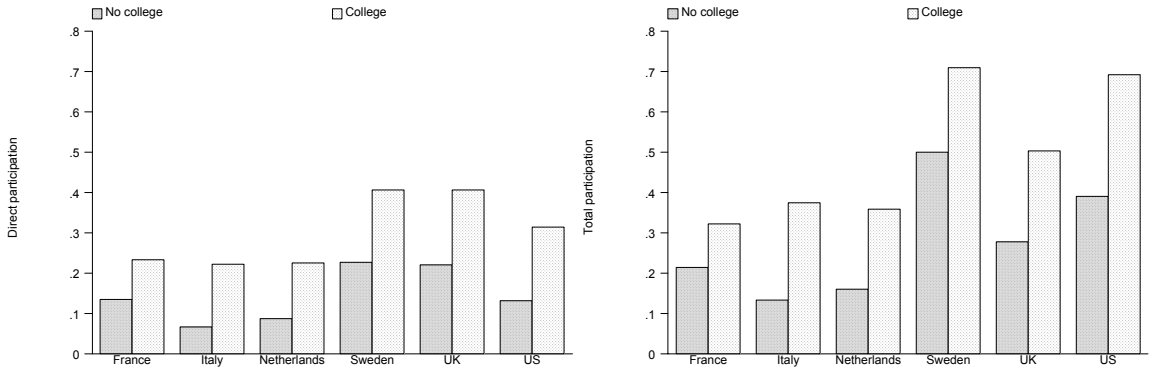


Figure 3
Stock Market Participation, by Income Deciles

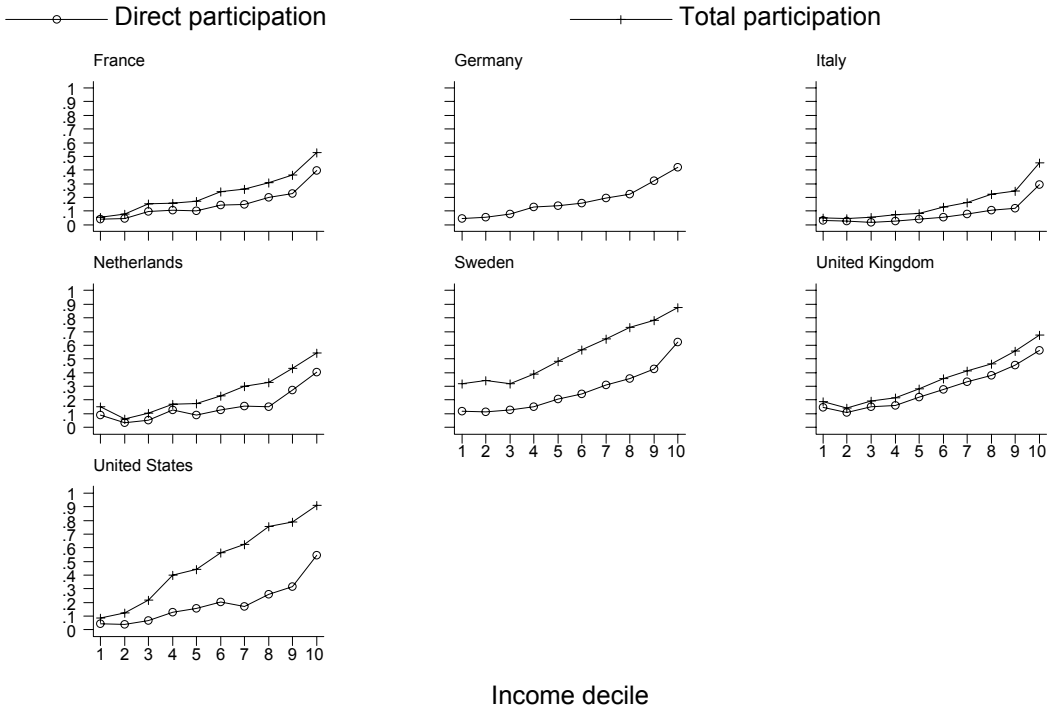
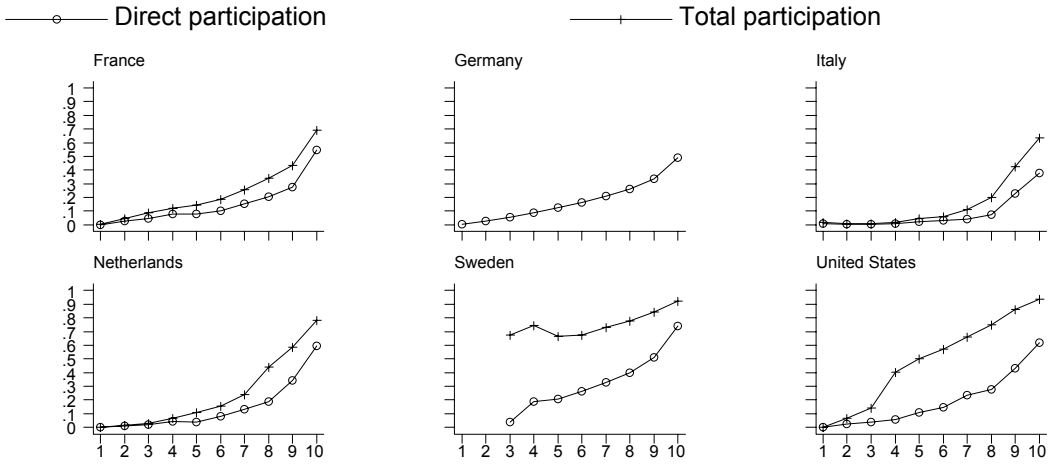


Figure 4
Stock Market Participation, by Financial Wealth Deciles



Financial wealth decile

Figure 5
Stock Market Participation, by Age

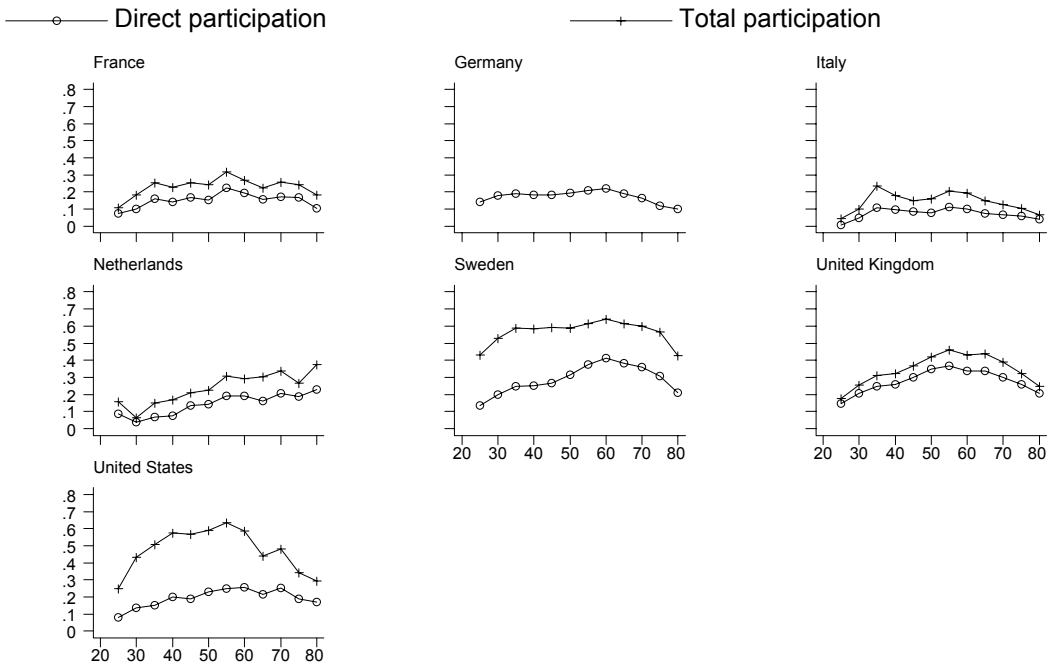


Table 1
Privatization of State-owned Enterprises and Growth of Pension Funds

	Total amount raised from privatization 1990-1999 total as a % of 1999 GDP	*Total assets of pension funds as Percent of GDP*	
		1990	1997
France	4.6	0.0	5.6
Germany	1.2	3.4	5.8
Italy	9.0	0.2	3.0
Netherlands	3.8	81.6	87.3
Sweden	3.8	31.0	32.6
United Kingdom	5.1	59.7	74.7
United States	0.0	38.1	58.2

Note. The table reports total pension fund assets as a percent of GDP in 1990 and 1997 and total sales from privatization between 1990 and 1999 as a percentage of 1999 GDP. Source: OECD, *Financial Market Trends*, n. 76, June 2000.

Table 2

Stock Market Capitalization, by Type of Investor

	France	*Germany*	*Italy*	*Netherlands*	*Sweden*	*UK*	*US (NYSE)*
Foreign	36.5	19.9	15.7	43.6	38.9	29.3	6.4
Home	63.5	80.1	84.3	56.4	61.1	70.7	93.6
Institutional investors, of which	19.6	9.6	13.2	20.7	28.3	50.8	50.5
Life insurance and pension funds	7.3	4.9	3.7	n.a.	n.a.	41.1	n.a.
Managed investment accountss	0.0	0.0	2.7	n.a.	n.a.	7.0	n.a.
Mutual funds	12.4	4.7	6.8	n.a.	n.a.	2.7	n.a.
Banks	8.9	8.4	6.3	0.0	n.a.	0.0	0.0
Holdings	20.8	40.1	23.7	0.0	10.3	3.5	0.0
Households	7.7	15.6	26.4	35.7	13.1	15.3	42.4
Public sector	6.5	6.4	14.7	0.0	9.4	0.1	0.7
Market capitalization (billions euro)	1540	1352	818	682	350	2744	12187

Note. Data refer to December 2000. Source: Filippa and Franzosi (2001).

Table 3

Changes in Portfolios of European Households

	France		*Germany*		*Italy*		*Nether.*		*Sweden*		*UK*		*Europe*		*US*	
	'96	*'00*	*96*	*'00*	*96*	*'00*	*96*	*'00*	*96*	*'00*	*96*	*'00*	*96*	*'00*	*96*	*'00*
Transaction accounts	34	25	41	34	38	25	21	19	23	15	24	22	34	27	16	14
Shares and other equity	36	46	19	27	19	43	20	23	31	44	20	23	24	34	32	33
Securities (other than shares)	4	2	13	10	31	19	3	2	8	3	1	1	11	7	9	6
Insurance technical reserves	22	23	26	28	11	13	53	56	25	29	51	50	29	30	7	7

Note. The table is based on aggregate financial statistics reconstructed from Eurostat and the US Flow of Funds Accounts (Massaro and Laakari, 2002). The European average refers to the EU countries. The six European countries examined account for over 90 percent of the EU financial assets.

Table 4

Microeconomic Surveys and Stock Market Participation

	France	*Germany*	*Italy*	*Nether.*	*Sweden*	*UK*	*US*
Survey	INSEE Survey on Wealth	Income and Expenditure Survey	Survey of Household Income and Wealth	Center Saving Survey	HEK-Household Economy	Family Resources Survey	Survey of Consumer Finance
Direct participation	0.15	0.17	0.07	0.14	0.27	0.27	0.19
Total participation	0.23	-.-	0.15	0.24	0.54	0.34	0.48

Note. In all countries except the United States total participation is defined as households investing in stocks or mutual funds. Data refer to 1998, except for Sweden where they refer to 1999.

Table 5

Probit Regressions for Direct Participation

	France	*Germany*	*Italy*	*Netherlands*	*Sweden*	*UK*	*US*
Married	-0.0088	0.0024	0.0143	-0.0437	0.0390	0.0294	0.0017
	(0.0084)	(0.0060)	(0.0049)**	(0.0205)*	(0.0120)**	(0.0069)**	(0.0219)
Family size	-0.0050	-0.0156	-0.0068	0.0098	-0.0257	0.0031	0.0023
	(0.0033)	(0.0022)**	(0.0021)**	(0.0090)	(0.0049)**	(0.0115)	(0.0077)
College	0.0555	0.0422	0.0287	0.0390	0.0800	0.0581	0.0846
	(0.101)**	(0.0046)**	(0.0082)**	(0.0169)*	(0.0093)**	(0.0070)**	(0.0160)**
Age 31-40	0.2036	-0.0474	0.0216	0.0055	0.0053	0.0218	-0.0841
	(0.0145)	(0.0074)**	(0.0160)	(0.0509)	(0.0137)	(0.0120)	(0.0279)**
Age 41-50	0.0066	-0.0891	0.0044	0.0253	-0.0033	0.0419	-0.1195
	(0.0137)	(0.0068)**	(0.0125)	(0.0524)	(0.0135)	(0.0126)**	(0.0262)**
Age 51-60	0.0207	-0.0906	0.0123	0.0528	0.0372	0.0388	-0.0612
	(0.0149)	(0.0066)**	(0.0136)	(0.0580)	(0.0139)**	(0.0131)**	(0.0289)*
Age 61-70	0.0002	-0.0839	0.0067	0.0749	0.0146	0.0266	-0.0646
	(0.0145)	(0.0069)**	(0.0131)	(0.0637)	(0.0146)	(0.0135)*	(0.0300)*
Age > 70	-0.0134	-0.1101	-0.0005	0.1146	-0.0453	-0.0022	-0.0529
	(0.0139)	(0.0063)**	(0.0123)	(0.0782)	(0.0121)**	(0.0129)	(0.0310)
II income	0.0396	-0.0125	-0.0082	0.0010	0.0699	0.0477	0.0928
quartile	(0.0127)**	(0.0076)	(0.0071)	(0.0285)	(0.0141)**	(0.0100)**	(0.0380)**
III income	0.0643	0.0241	-0.0012	-0.0118	0.1090	0.1541	0.1032
quartile	(0.0132)**	(0.0074)**	(0.0073)	(0.0255)	(0.0151)*	(0.0114)**	(0.0386)**
IV income	0.1316	0.0966	0.0319	0.0268	0.2258	0.2200	0.2163
quartile	(0.0149)**	(0.0076)**	(0.0103)**	(0.0283)	(0.0177)**	(0.0128)**	(0.0365)**
II wealth	0.1284	0.2054	0.0362	0.1478		0.2403	0.2094
quartile	(0.0187)**	(0.0121)**	(0.0177)*	(0.0625)**		(0.0096)**	(0.0508)**
III wealth	0.2224	0.3407	0.1237	0.2975	0.3422	0.3893	0.4121
quartile	(0.0199)**	(0.0115)**	(0.0248)**	(0.0662)**	(0.0129)**	(0.0125)**	(0.0493)**
IV wealth	0.4280	0.4977	0.3132	0.5235	0.5519	0.5183	0.6331
quartile	(0.0200)**	(0.0105)**	(0.0347)**	(0.0623)**	(0.010)**	(0.0094)**	(0.0322)**
Number of observations	10207	39393	7147	1679	17043	22858	4305

Note. In Sweden very few households in the first wealth quartile have stocks. The regression therefore uses financial wealth tertiles. The coefficients in the table indicate the effect of the independent variable on the probability of stockownership. Standard errors are reported in parenthesis. One star indicates that the coefficient is statistically different from zero at the 5 percent level, two stars at the 10 percent level.

Table 6

Probit Regressions for Total Participation

	France	*Italy*	*Netherlands*	*Sweden*	*UK*	*US*
Married	-0.0081	0.0240	-0.0075	0.0010	0.0296	0.0123
	(0.0109)	(0.0086)**	(0.0277)	(0.0157)	(0.0079)**	(0.0274)
Family size	-0.0112	-0.0225	-0.0109	0.0237	0.0024	-0.0161
	(0.0042)**	(0.0036)**	(0.0126)	(0.0065)**	(0.0134)	(0.0099)
College	0.0484	0.0489	0.0714	0.0748	0.0868	0.0727
	(0.0122)**	(0.0131)**	(0.0234)**	(0.0118)**	(0.0080)**	(0.0210)**
Age 31-40	0.0178	0.0478	-0.0024	-0.0882	0.0435	-0.0272
	(0.0174)	(0.0243)*	(0.0636)	(0.0175)**	(0.0137)**	(0.0357)
Age 41-50	-0.0119	0.0134	-0.0268	-0.1510	0.0636	-0.1019
	(0.0163)	(0.0202)	(0.0607)	(0.0176)**	(0.0143)**	(0.0359)**
Age 51-60	-0.0062	0.0187	0.0297	-0.1767	0.0820	-0.1088
	(0.0172)	(0.0206)	(0.0662)	(0.0174)**	(0.0150)**	(0.0380)**
Age 61-70	-0.0330	0.0061	0.0912	-0.2139	0.0626	-0.2453
	(0.0168)	(0.0198)	(0.0734)	(0.0186)**	(0.0156)**	(0.0417)**
Age > 70	-0.0398	-0.0175	0.1139	-0.3249	-0.0169	-0.3519
	(0.0168)*	(0.0178)	(0.0826)	(0.0151)	(0.0145)	(0.0377)
II income quartile	0.0544	-0.0019	0.0075	0.0919	0.0640	0.1877
	(0.0153)**	(0.0126)	(0.0392)	(0.0139)**	(0.0111)**	(0.0277)**
III income quartile	0.1184	0.0119	0.0268	0.1704	0.1874	0.2460
	(0.0160)**	(0.0130)	(0.0372)	(0.0152)**	(0.0122)**	(0.0271)**
IV income quartile	0.2068	0.0889	0.0597	0.2516	0.2704	0.3415
	(0.0174)**	(0.0170)**	(0.0397)	(0.0176)**	(0.0134)**	(0.0333)**
II wealth quartile	0.1724	0.0705	0.2354		0.3069	0.3674
	(0.0196)**	(0.0233)**	(0.0690)**		(0.0096)**	(0.0224)**
III wealth quartile	0.3177	0.2487	0.4608	0.5482	0.4894	0.4857
	(0.0197)**	(0.0285)**	(0.0633)**	(0.0081)**	(0.0106)**	(0.0180)**
IV wealth quartile	0.5468	0.5458	0.7219	0.6951	0.6359	0.7713
	(0.0175)**	(0.0289)**	(0.0449)**	(0.0073)**	(0.0076)**	(0.0193)**
Number of observations	10207	7147	1679	17043	22858	4305

Note. In Sweden very few households in the first wealth quartile have stocks. The regression therefore uses financial wealth tertiles. The coefficients in the table indicate the effect of the independent variable on the probability of stockownership. Standard errors are reported in parenthesis. One star indicates that the coefficient is statistically different from zero at the 5 percent level, two stars at the 10 percent level.

Table 7

Cross-country Probit Regressions for Direct and Total Participation

	Direct participation	*Total participation*
Married	0.0145	0.0220
	(0.0035)**	(0.0056)**
Family size	-0.0174	-0.0220
	(0.0015)**	(0.0029)**
College	0.0450	0.0749
	(0.0030)**	(0.0055)**
Age 31-40	-0.0102	0.0346
	(0.0053)	(0.0095)**
Age 41-50	-0.0366	0.0203
	(0.0051)**	(0.0095)*
Age 51-60	-0.0356	0.0310
	(0.0051)**	(0.0099)**
Age 61-70	-0.0408	0.0050
	(0.0052)**	(0.0101)
Age > 70	-0.0650	-0.0504
	(0.0049)**	(0.0093)**
II income quartile	0.1326	0.0618
	(0.0050)**	(0.0080)**
III income quartile	0.0638	0.1531
	(0.0051)**	(0.0085)**
IV income quartile	0.1351	0.2433
	(0.0054)**	(0.0091)**
II wealth quartile	0.1946	0.2776
	(0.0062)**	(0.0079)**
III wealth quartile	0.3258	0.4595
	(0.0066)**	(0.0083)**
IV wealth quartile	0.5006	0.6670
	(0.0057)**	(0.0060)**
France	-0.0696	-0.2450
	(0.0054)**	(0.0058)**
Germany	-0.0565	
	(0.0058)**	
Italy	-0.1360	-0.2868
	(0.0038)**	(0.0044)**
Netherlands	-0.0793	-0.2116
	(0.0075)**	(0.0055)**
United Kingdom	0.1104	-0.0639
	(0.0077)**	(0.0092)**
Number of observations	85589	46196

Note. The coefficients in the table indicate the effect of the independent variable on the probability of stockownership. Germany is not included in the regression for total participation. Standard errors are reported in parenthesis. One star indicates that the coefficient is statistically different from zero at the 5 percent level, two stars at the 10 percent level.

Table 8

Regressions for Asset Share Invested in Directly Held Stocks

	France	*Germany*	*Italy*	*Netherlands*	*Sweden*	*US*
Married	-0.0065	-0.0342	0.0534	-0.0549	0.0017	-0.0493
	(0.0142)	(0.0076)**	(0.0348)	(0.0436)	(0.0155)	(0.0263)
Family size	-0.0049	-0.0155	-0.0031	-0.0563	-0.0290	0.0069
	(0.0055)	(0.0028)**	(0.0117)	(0.0199)**	(0.0067)**	(0.010)
College	0.0351	0.0425	0.0576	-0.0187	0.0919	-0.0009
	(0.0137)**	(0.0054)**	(0.0277)*	(0.0379)	(0.0114)**	(0.0207)
Age 31-40	0.0537	-0.0257	0.0772	0.0716	-0.0300	-0.0257
	(0.0250)*	(0.0105)**	(0.0741)	(0.1283)	(0.0195)**	(0.0389)
Age 41-50	0.0482	-0.0669	0.0640	0.0236	-0.0518	-0.0452
	(0.0247)*	(0.0109)**	(0.0737)	(0.1238)	(0.0192)**	(0.0376)
Age 51-60	0.0415	-0.0769	0.0897	0.0573	-0.0347	-0.0473
	(0.0254)	(0.0111)**	(0.0733)	(0.1237)	(0.0182)	(0.0379)
Age 61-70	0.0641	-0.0366	0.0769	0.1037	-0.0970	-0.001
	(0.0265)*	(0.0117)**	(0.0747)	(0.1256)	(0.0196)**	(0.0419)
Age > 70	0.0614	-0.0027	0.0329	0.0894	-0.159	0.0478
	(0.0272)*	(0.0132)	(0.0784)	(0.1298)	(0.0183)**	(0.0416)
Income	0.4363	0.5028	0.1216	0.0205	0.1420	-0.2257
	(0.2489)	(0.1273)**	(0.4212)	(0.7999)	(0.0202)**	(0.1871)
Financial wealth	0.0644	0.2358	-0.0046	0.3961	0.1212	0.1037
	(0.0217)**	(0.0252)**	(0.0688)	(0.0763)**	(0.0163)**	(0.0196)**
Constant	-0.0056	0.0749	-0.0998	0.3440	0.0461	0.1941
	(0.0362)	(0.0160)**	(0.0935)	(0.1605)*	(0.0253)	(0.0569)**
Number of uncensored observations	1702	8247	578	276	5036	775

Note. The first stage regression includes dummies for married and college degree, family size, and dummies for income and financial wealth quartiles. Income and wealth are measured in million of euro. Standard errors are reported in parenthesis. One star indicates that the coefficient is statistically different from zero at the 5 percent level, two stars at the 10 percent level.

Table 9

Regressions for Asset Share of Stocks Held Directly or Indirectly

	France	*Italy*	*Netherlands*	*Sweden*	*US*
Married	-0.0000	0.0306	-0.0589	-0.0253	-0.0270
	(0.0105)	(0.0183)	(0.0296)*	(0.0078)**	(0.0193)
Family size	-0.0070	-0.0051	-0.0212	0.0082	-0.0050
	(0.0042)	(0.0067)	(0.0142)	(0.0033)**	(0.0071)
College	0.0258	0.0391	-0.0040	0.0441	0.0150
	(0.0103)**	(0.0157)**	(0.0257)	(0.0059)**	(0.0145)
Age 31-40	0.0401	0.0571	0.0046	-0-0301	0.0183
	(0.0180)*	(0.0383)	(0.0856)	(0.0091)**	(0.0262)
Age 41-50	0.0507	0.0578	0.0331	-0.0518	-0.0023
	(0.0177)**	(0.0380)	(0.0837)	(0.0091)	(0.0255)
Age 51-60	0.0421	0.0939	0.0530	-0.0509	-0.0091
	(0.0183)*	(0.0378)**	(0.0836)	(0.0089)**	(0.0262)
Age 61-70	0.0535	0.1076	0.0915	-0.1018	-0.0174
	(0.0190)**	(0.0386)**	(0.0847)	(0.0097)**	(0.0300)
Age > 70	0.0581	0.0740	0.1280	-0.1600	-0.0563
	(0.0194)**	(0.0408)	(0.0877)	(0.0088)**	(0.0309)
Income	0.6261	0.0985	0.3318	0.4707	0.4798
	(0.2062)**	(0.2922)	(0.6367)	(0.1387)**	(0.1621)**
Financial wealth	0.1101	0.1980	0.4327	0.1099	0.0635
	(0.0196)**	(0.0450)**	(0.0641)**	(0.1222)**	(0.0185)**
Constant	0.0545	0.1204	0.2259	0.3307	0.4909
	(0.0239)*	(0.0435)**	(0.0979)*	(0.0091)**	(0.0312)**
Number of uncensored observations	2556	1144	455	10055	1845

Note. The first stage regression includes dummies for married and college degree, family size, and dummies for income and financial wealth quartiles. Income and wealth are measured in million of euro. Standard errors are reported in parenthesis. One star indicates that the coefficient is statistically different from zero at the 5 percent level, two stars at the 10 percent level.

Table 10

Cross-country Regression for Asset Shares of Directly Held Stocks

	Directly held stocks
Married	-0.0305
	(0.0063)**
Family size	-0.0103
	(0.0023)
College	0.0375
	(0.0047)**
Age 31-40	-0.0102
	(0.0092)
Age 41-50	-0.0410
	(0.0095)**
Age 51-60	-0.0420
	(0.0095)**
Age 61-70	-0.0066
	(0.0101)
Age > 70	0.0161
	(0.0110)
Income	0.2425
	(0.0893)**
Financial wealth	0.1160
	(0.0113)**
France	-0.0249
	(0.0111)**
Germany	-0.0134
	(0.0098)**
Italy	0.0232
	(0.0136)
Netherlands	0.0773
	(0.0168)**
Constant	0.1007
	(0.0173)
Number of uncensored observations	11578

Note. The first stage regression includes dummies for married and college degree, family size, and dummies for income and financial wealth quartiles. Income and wealth are measured in million of euro. Standard errors are reported in parentheses. One star indicates that the coefficient is statistically different from zero at the 5 percent level, two stars at the 10 percent level.

Table 11
Indicators of Benefits and Costs from Stockholding

	Yearly market return	*Old age public pension spending as a percentage to GDP*	*Stock market trading costs (basis points)*	*Management fees (%)*
France	11.07	10.36	27.63	1.2
Germany	10.13	10.29	29.70	0.8
Italy	4.14	10.99	29.84	2.0
Netherlands	18.68	6.75	34.56	0.5
Sweden	16.85	8.17	32.26	-.-
United Kingdom	15.73	6.73	51.88	1.2
United States (Nasdaq / NYSE)	17.02	5.36	30.64 / 24.57	1.4

Note. *Yearly market return* is the percent annual change in the corresponding MSCI market return index in US dollars, with dividends reinvested, between 1986 and 1997, year-end-values. Source: Pagano et al., Table 4 (drawn from Elkins/McSherry Co., Inc.). *Old age public pension spending as a percentage to GDP* is drawn from Palacios and Pallarès-Miralles (2000). Data refer to 1995-97. *Stock market trading costs* is the sum of commission, fees and market impact in a given market based on global trading data of 135 institutional investors. It refers to the 3rd quarter of 1998 and is expressed in basis points. Source: Pagano et al., Table 4 (drawn from Elkins/McSherry Co., Inc.). *Management fees* are percentages charged by the individual mutual funds in 1997. Source: FEFSI and Otten and Schweitzer (2002).

Table 12
Characteristics of the Mutual Funds Industry

	Number of funds	*Average size*	*Concentration ratio (%)*	*Asset allocation in equity (%)*
France	5836	87	62	13.6
Germany	717	207	62	37.9
Italy	626	337	43	20.4
Netherlands	179	440	60	53.8
Sweden	-.-	-.-	-.-	-.-
United Kingdom	1455	163	20	85.8
United States	6,900	647	18	53.0

Note. Concentration ratio is the market value of the 5 largest fund groups as part of the total mutual fund market. All data refer to 31 December 1997. Source: Otten and Scweitzer (2002).

Table 13
Distribution Channels of Mutual Funds

	Direct sale	*Brokers*	*Banks*	*Other*
France	1.0	13.5	73.7	11.8
Germany	9.8	11.7	72.5	6.0
Italy	0.6	15.6	83.7	0.1
Netherlands	-.-	-.-	-.-	-.-
Sweden	-.-	-.-	-.-	-.-
United Kingdom	17.3	54.7	19.9	8.1
United States	32.0	40.0	8.0	20.0

Note. Data are drawn from Otten and Schweitzer (2002) and McKinsey (*Mutual funds: a European comparative study*, 2001).

Table 14
Financial Transparency and Investor Literacy

	Financial institutions' transparency	*Economic literacy*	*Education in finance*	*Computers per thousand people*	*Internet users per thousand people*
France	6.10	4.64	5.28	419	209
Germany	7.22	5.11	5.19	436	308
Italy	5.01	3.98	3.73	347	307
Netherlands	7.66	7.21	7.56	510	448
Sweden	7.50	7.21	7.28	626	554
United Kingdom	6.89	4.44	4.58	492	402
United States	8.06	6.35	6.25	639	522

Note. *Financial institutions' transparency* is widely developed in your country? (refers to 2002). *Source: World Competitiveness Yearbook 2002.Economic literacy* is generally high among the population? (refers to 2002). *Source: World Competitiveness Yearbook 2002.Education in finance* is sufficient in your country? (refers to 2002). *Source: World Competitiveness Yearbook 2002.Number of computers* per 1000 people (refers to 2001). Source: Computer Industry Almanac. *Numer of internet users* in per 1000 people in 2001. Source: Computer Industry Almanac.