

# Equity culture

Theory and cross-country evidence

## SUMMARY

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*We discuss the current state of stockownership among households in major European countries, drawing parallels and contrasts with the US experience. Our analysis of detailed microeconomic data documents increasing stock market participation and persistent differences across countries in our sample: many more US, UK and Swedish households participate in the stock market than is the case in the Netherlands and, especially, in France, Germany, and Italy. At the individual household level, the data indicate that stock market participation correlates robustly with wealth and education, which have only small effects, however, on the asset share invested in stocks by households who do participate. These empirical results point to the relevance of participation costs, and we find that indicators of such costs are consistent with the observed pattern of participation across countries. Over time, higher participation was brought about by lower participation costs. We discuss the possible impact of market entry by households with different characteristics, and outline types of policies that could mitigate any undesirable stock market effects of cheaper and broader participation.*

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# Household stockholding in Europe: where do we stand and where do we go?

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## 1. INTRODUCTION

Only 10 years ago, most of European households' financial wealth was held in the form of liquid, safe, but low-return assets. Participation in the stock market was limited to a relatively small segment of the population, the few households 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 changed considerably over the 1990s, and a much larger proportion of investors now hold stocks in their portfolio. The microeconomic data we analyse in this paper indicate that about 50% of households in the US and Sweden, and over one-third in the UK, invest in the stock market directly or indirectly (through mutual funds and other managed investment accounts). Only 15–25% of households hold stocks in the Netherlands, Italy,

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France and Germany, but in each of these countries that percentage has increased quite significantly, sometimes doubling in the course of the decade. This paper examines the reasons why this has occurred, the possible consequences that increased individual participation in the stock market may have, and the policy actions that may be called for.

The increasing number of stockholders has deserved particular attention, and has potentially much more important implications than an increase in the portfolio share of stocks among existing stockholders. Households that gain direct or indirect access to the stock market, instead of relying mainly on bank savings accounts and perhaps on treasury bills, have more instruments with which to smooth their consumption and manage household risks. Since stocks yield higher expected returns, wider participation tends to reduce inequality if those previously excluded are also relatively less well off. Wider and better investment opportunities, however, bring with them increased risks. Excessive or ill-advised trading of stocks can significantly reduce realized returns, and poor judgement in allocating retirement wealth can create major financial distress at a point in the lifecycle where the potential for offsetting adjustments is quite limited.

At the aggregate level, a larger stockholder base can have important macroeconomic effects. For example, wealth effects on consumption may become more widespread, and the link between stock market fluctuations and fluctuations in real economic variables much tighter. Political economy considerations are also important, in that new stockholders may acquire not only new financial instruments (stocks) but also new attitudes towards capitalism, private property, and reforms that potentially enhance the value of corporations, liberalise labour markets and improve the functioning of the financial sector. Indeed, privatisation initiatives were politically motivated by a wish to enhance the popularity of capitalism and *laissez faire* by allowing more people to own a share of the pie. The expansion in the stockholder base encourages governments to take a closer look at corporate governance mechanisms, and to take strong action in the aftermath of scandals that affect stockholders (for example, in the US following the Enron and Worldcom scandals in the summer of 2002).

In summary, broader stock market participation brings important structural changes to an economy: when the average individuals and the median voter become stockholders, not only transmission mechanisms are affected, but also political processes and government priorities.

The expansion in the stockholder base was encouraged by a variety of developments on both sides of the Atlantic. Some of them were transitory, such as the experience of high stock returns in the 1990s. But many have persistent effects: the privatisation of public utilities, the demographic trends that lead to population aging, and the growth of the mutual funds industry that allowed European investors to hold diversified positions in stocks at much lower costs than through direct acquisition. These may appear to be disparate institutional developments with a 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.

Stock market participation has increased everywhere, but the resulting stockholding patterns differ both across the Atlantic and within Europe. We find in this paper that wide differences in household participation persist even after controlling for differences in such characteristics as household wealth, income, age and education. We argue that the international pattern of entry costs is consistent with the observed pattern of participation across countries, in accordance with theoretical arguments that predicts higher stock market participation where costs are lower, and an increase in participation when costs fall. Costs should be broadly interpreted. They include not only trading costs and management fees, but also investors' information costs in assessing the risk and return characteristics of stocks. We probe into a number of estimates or indicators of such costs, with particular focus on trading costs, management fees, distribution costs of institutional investors, and information costs.

Our findings suggest that lowering of participation costs has brought into the stockholder pool less sophisticated and poorer households. In addition to potential lowering of excess returns on stocks, new entrants with such characteristics may induce greater volatility in stock markets, for example, by reacting excessively to market signals because of poor judgement or because of limited ability to withstand financial pressure. Such concerns lead naturally to a discussion of types of policies that could mitigate the adverse impact of newcomers on the future functioning of the financial market: government action should aim at ensuring that newcomers have access to accurate financial information and sufficient financial education so as to be able to process it.

In Section 2 we use a standard portfolio model to show how the decision to participate in the stock market is affected by 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 descriptive 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 presents international data on entry costs arguing that differences in such costs are a key determinant of differences in stock market participation across countries. Section 7 discusses likely effects from widening the stockholder base and policy concerns arising from the identity of new stockholders. Section 8 concludes by discussing policy implications.

## **2. STOCKHOLDING AND PARTICIPATION COSTS**

One of the most empirically solid and theoretically unsurprising facts from the history of financial markets is that risky assets with uncertain returns, such as traded stocks, have a higher expected return than safe assets, such as Treasury bills. Therefore, in a world without costs of entering the stock market, it would be difficult to explain

why any individual interested in maximising expected lifetime utility should abstain completely from stocks. Classical portfolio analysis postulates that investors 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 correlation between stock returns and labour income, a household should be willing to hold at least some stocks simply because risky assets, on average, yield higher returns than safe assets (Arrow, 1974).

This observation raises three related issues, exemplified by some of the data that will be analysed in the paper:

- (1) *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% of households do not invest in shares, and many more in Italy and Germany.
- (2) *Why does stock market participation differ across countries?* Direct and indirect stock market participation in the US and Sweden is about twice as high as in France, Germany and Italy.
- (3) *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.

The literature, some of it based on large-scale intertemporal models with background labour income risk, has explored many possibilities. Theoretical and empirical work, however, broadly support the idea that households contemplating entry in the stock market face some actual or perceived fixed cost, that can be overcome only if the planned size of stock investment and the perceived magnitude of the equity premium are sufficiently large.<sup>1</sup> This idea offers a guide to interpret cross-country and time patterns of stockownership.

In the absence of entry costs, each investor should hold the riskless asset as well as a portfolio of risky securities that yields the maximum expected return for each level of variance of final wealth. While the riskless portfolio share reflects the investor's risk aversion, with more risk-averse individuals investing more in the safe asset, all investors should hold the same portfolio of risky assets (see Box 1). In the presence of entry costs, however, only relatively wealthy investors will enter the stock market. The poor do not hold risky assets, because the utility loss from abstaining from stock market participation is too small to offset the fixed participation cost. This mechanism can explain why not all invest in stocks. It predicts a strong correlation between stock market participation and investor's wealth, and with other individual characteristics that are correlated with entry costs: for instance, gathering the relevant information is likely to be less costly for better educated individuals. As regards stock market

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<sup>1</sup> 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, 2003; Polkovnichenko, 2000; Paiella, 2001; Vissing-Jorgensen, 2002).

participation across countries and over time, differences in average household wealth and in the distribution of wealth may explain it for similar entry costs; and 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 when securities entail fixed costs is particularly important. Institutional investors can combine and repackage a very large number of existing securities and make them available to individual investors even when the latter do not find it worthwhile or feasible to replicate the market portfolio. Mutual funds, for instance, enjoy economies of scale and can offer funds that replicate the market portfolio. Over time, improvements in the mutual funds industry that allow better diversification (for instance adding foreign securities) lower risk while holding expected return constant, thereby encouraging participation. Across countries, differences in the ability to diversify imply differences in participation.

### 3. MACROECONOMIC TRENDS

We proceed to describe the main demographic, institutional, and policy-related changes that played a role in lowering participation costs over the 1990s. The relevant developments, some of which were already underway in the 1980s, include pension reforms, privatisation of public utilities, increasing competition and cost reduction in the managed fund sector, and wider availability of financial information. All these phenomena played a role in lowering the perceived costs or barriers to stockholding relative to the expected benefits of stock market participation.

Perceptions of increased benefits from stockholding were also 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. The first column of Table 1 shows average yearly stock market returns between 1986 and 1997, measured as the percentage 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 US, the Netherlands, Sweden, and the UK outperformed France, Germany, and Italy by at least five percentage points. To the extent that the expected stock returns were influenced by recent experience in their own country, households' perceived benefits from stockholding were different across countries, and smaller in France, Germany, and Italy than in the rest of Europe and the US.

While 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. A major development of the last two decades has been the *demographic transition*

### Box 1. The classical portfolio theory with entry costs

Consider 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 is one risky security (stocks) and a safe asset, whose gross return is  $R_f$ . Letting  $R_r$  and  $\sigma_r^2$  denote the expected return and variance of the risky assets,  $a$  the consumer's degree of relative risk aversion, and assuming quadratic preferences, the share of wealth invested in the risky asset is

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

Provided  $R_r - R_f > 0$ , all investors participate in the stock market. If instead of only one risky asset there were  $n$ , we know since Tobin (1958) that investors would combine the safe asset with the portfolio of risky assets with the largest Sharpe ratio (the ratio of the average excess return to the portfolio standard deviation) and end up having the same portfolio of risky assets. In reality, access to the stock market is costly due to information and trading costs. In the presence of entry costs it is difficult for a single investor to achieve the best allocation. Suppose, in the two assets example, that investors incur a fixed cost  $K$  to buy stocks (or to obtain the best portfolio in the  $n$  risky assets case). Then, for a consumer it will pay to invest in the risky asset only if  $EU(R_fW + \lambda W(\hat{R}_r - R_f) - K) > U(R_fW)$ , where expectations are taken over the risky assets return  $\hat{R}_r$ . Furthermore, let  $R_fW + \lambda W(\hat{R}_r - R_f)$  denote the certainty equivalent level of final wealth and  $\hat{R}_r$  the certainty equivalent return on stocks, where clearly  $R_f < \hat{R}_r < R_r$ . Then a consumer with wealth  $W$  will invest if  $\lambda W(\hat{R}_r - R_f) > K$ . The left hand side is the (certainty equivalent) extra flow of interest that the investor would obtain if he invested in stocks a share  $\lambda$  of his wealth in case he participates; we call  $\lambda$  the conditional share. It is then clear that the higher the investor's wealth, the more likely is that he invests in stocks. Furthermore, the larger the conditional share, the larger the potential gains from the equity premium and the more likely is participation. More generally, any factor that increases the share invested conditional on participation would also make participation more likely. A higher equity premium affects participation in two ways: because it raises the conditional share and because it increases the certainty equivalent premium. In particular, a lowering of stocks riskiness would increase the conditional share and raise participation; for instance, in the multi securities case this could be brought about by the development of the mutual funds industry and their ability to offer a diversified portfolio. Finally, holding other factors constant, a decline in fixed entry costs, while leaving conditional shares unaffected, would raise participation by lowering the wealth threshold that triggers entry into the stock market. Thus, following a decline in  $K$ , the new entrants will be on average less wealthy than the incumbents.

**Table 1. Stock market returns, privatisation of state-owned enterprises and growth of pension funds**

	Stock market yearly market return	Total sales from privatisation as a percentage of 1999 GDP	Old age public pension spending as a percentage to GDP	Total assets of pension funds as a percentage of GDP	
				1990	1997
France	11.07	4.6	10.36	0.0	5.6
Germany	10.13	1.2	10.29	3.4	5.8
Italy	4.14	9.0	10.99	0.2	3.0
Netherlands	18.68	3.8	6.75	81.6	87.3
Sweden	16.85	3.8	8.17	31.0	32.6
UK	15.73	5.1	6.73	59.7	74.7
US	17.02	0.0	5.36	38.1	58.2

*Notes and sources:* Yearly market return is the percentage annual change in the corresponding MSCI market return index in US dollars, with dividends reinvested, between 1986 and 1997, year-end-values (Pagano *et al.*, 2002, Table 4; drawn from Elkins/McSherry Co., Inc.). Total sales from privatisation between 1990 and 1999 as a percentage of 1999 GDP are drawn from OECD, *Financial Market Trends*, n. 76, June 2000. Old age public pension spending as a percentage to GDP is drawn from Palacios and Pallarès-Miralles (2000). Data refer to 1995–7. Pension fund assets as a percentage of GDP in 1990 and 1997 are drawn from OECD, *Financial Market Trends*, n. 76, June 2000.

to an ageing population in European countries, mirroring trends that were also observed in the US. As the pool of young workers who contribute to the social security fund shrank, relative to that of elderly citizens who expect to receive benefits, households could rely less on social security for their old age, and saw larger benefits from stockholding through retirement accounts. The perceived need to supplement public pensions with personal retirement accumulations differs across the countries we examine, however. 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 1, this indicator suggests that France, Germany and Italy, the three countries with the lowest stock market returns, were also the ones with the largest public pension systems.

Governments on both sides of the Atlantic became increasingly aware of this development and lowered the costs of participation by offering tax incentives, for example tax deferrals, to households who accumulate specifically for their old age. Defined-benefit pension schemes were often replaced by defined-contribution 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. Because of the dominant role of public pension schemes in some countries, the importance of pension funds also differs markedly across European countries and between Europe and the US.<sup>2</sup> Table 1 documents a remarkable

<sup>2</sup> 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).



increase in assets of pension funds as a share of GDP, from 38% in 1990 to 58% in 1997. This share, though increasing, is still very small in European countries with the largest social security systems – France, Germany and Italy – but high in the Netherlands, the UK and Sweden, the European countries where social security has a more limited role. This is another way of saying that the size and growth of institutional investors, and ultimately of household stockholding, are larger where the social security system is less generous.

*Privatisation programmes* for public utilities, undertaken in most European countries, albeit at an uneven pace and extent, represent a third factor impacting on the stockholder base. In the UK and Italy, for example, revenues have been very substantial and the privatisation process and the number of firms going public have increased stock market capitalisation. In Germany, by contrast, state ownership of public utilities still remains relevant. The relative importance of revenues from privatisation for various countries in the 1990s is documented in Table 1. It shows that the privatisation programme of public utilities and state-owned enterprises has granted Italy the largest revenues from privatisation among European countries. The significant increase in the supply of stocks associated with privatisation 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 UK, where the privatisation process and advertising campaign were already underway since the 1980s. One objection to this argument is that privatisations are endogenous, and may have been triggered by the stock market boom and the increase in the stockholder base. Of course, the stock market boom did speed up privatisations, just as much as the subsequent crash has slowed down the process: stock market developments certainly affect the *timing* of privatisations. But the decision to privatise was determined by other considerations, which in most cases reflected the poor performance of state-owned firms. In fact, the UK privatisation process started and progressed in the 1980s, before the stock market rallies of the 1990s, inspired by Mrs Thatcher's policies and thinking. In these and many other cases, one stated objective of the privatisation of public utilities was the creation of a large and stable stockholder base.

The *European Union directives* on financial integration, financial liberalisation and the 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 co-ordination called for by the Maastricht Treaty and preparations for a common currency, implied easier access for households 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 witnessed an increased tendency of European public corporations to cross-list in foreign exchanges, in other

**Table 2. Stock market capitalisation, 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
<i>Life insurance and pension funds</i>	7.3	4.9	3.7	n.a.	n.a.	41.1	n.a.
<i>Managed investment accounts</i>	0.0	0.0	2.7	n.a.	n.a.	7.0	n.a.
<i>Mutual funds</i>	12.4	4.7	6.8	n.a.	n.a.	2.7	n.a.
Banks	8.9	8.4	6.3	n.a.	n.a.	0.0	n.a.
Holdings	20.8	40.1	23.7	n.a.	10.3	3.5	n.a.
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 capitalisation (billions euro)	1540	1352	818	682	350	2744	12 187

Note: Data refer to December 2000.

Source: Filippa and Franzosi (2001).

European countries and in the US (see Pagano *et al.*, 2001). While these developments have lowered costs and improved opportunities for households to invest in foreign stocks, stockholders still tend to bias their portfolios towards home equity rather than stocks in foreign exchanges (see Lewis, 1999) and attenuation of this 'home equity bias' has not yet been documented.

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 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 is one of the main differences between the US and Europe. Table 2 shows that the share of the stock market held by mutual funds is 54% in the US and larger in the UK, but less than half of that in the other European countries. We will see in Section 6 that conditions in the mutual fund sector are important in explaining international differences in household stockholding patterns.

Table 2 also reports stockholdings by banks, holding companies, and the government. These investors, unlike institutional investors, typically hold stocks to exercise control, thus limiting participation of the general public. In Germany the share of the stock market held by domestic banks, domestic holdings or the government is 55%. In France it is 36.2%, and in Italy it is 44.7%. The corresponding figures are only 0.7% in the US, 3.6% in the UK and zero in the Netherlands.

The overall picture is one of widely held stocks in Anglo-Saxon countries and the Netherlands, and tightly held stocks in Continental European countries. If we focus

**Table 3. Changes in portfolios of European households**

	France		Germany		Italy		Netherlands		Sweden		UK		Europe		US	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
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% of the EU financial assets.

on stocks held by domestic investors, the share held by households directly is 12.1% in France, 19.5% in Germany, 31.3% in Italy, 63.3% 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 household portfolio share of safe assets (cash and transaction accounts, time deposits and short-term government bonds) declined dramatically over the 1990s in all European countries. Table 3 reports the composition of household portfolios based on aggregate financial statistics between 1996 and 2000, recently made available by Eurostat on a comparable basis across countries. On average, transaction accounts declined from 34% to 27% of total financial assets, while investment in stocks increased from 24% to 34%.

Of course, these aggregate trends might reflect an increase in stock market valuation, increased stock issuance and stock market participation, or both. From the policy point of view, as argued in the introduction in Section 7, increased participation raises important issues, for instance a greater need of financial information and transparency. For this purpose, in the next section we turn to microeconomic data.

#### **4. THE NEED FOR MICROECONOMIC DATA**

Aggregate financial accounts conceal crucial matters concerning household portfolios. First, they cannot establish whether the change in asset shares in the last decade is due to a change in participation or to the amounts invested conditional on participation. Second, they cannot tell us 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. Further, they may hide important 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 seven 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 (these countries account for about 90% of overall EU financial wealth in the year 2000, see Bartiloro and De Bonis, 2002). 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. 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; for instance, in Italy there is a survey for 2000, but we use the one for 1998.

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 US, 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 (see Box 2). 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 half of mutual funds in total financial assets. Sensitivity analysis considering a third or three-quarters 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.

#### 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% of households invest in stocks directly, direct stockholding in Europe is not far from that observed in the US. On average, 14.7% of households invest in stocks, compared to 19% in the US. In the UK, 27% of the households participate directly in the stock market, a proportion that exceeds the US number.

**Box 2. The microeconomic data**

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 (Statistische 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 7000 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 2000 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 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. In the Swedish survey 23% 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%. 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).

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 4000 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. It defines total financial assets invested in stocks as (1) directly-held stock, (2) stock mutual funds (full value if described as stock mutual fund, half value of combination mutual funds, (3) individual retirement accounts/Keoghs invested in stocks (full value if mostly invested in stock, half value if split between stocks/bonds or stocks/money market, one-third value if split between stocks/bonds/money market, (4) other managed assets (annuities, trusts, managed investment accounts) (full value if mostly invested in stock, half value if split between stocks/mutual funds and bonds/certificates of deposit, or 'mixed/diversified', one-third value if 'other'), (5) thrift-type retirement accounts invested in stock (full value if mostly invested in stock, half value if split between stocks and interest earning assets).

We have made every possible effort to ensure comparability across countries. For instance, the definition of direct stockholding is strictly the same in all countries. However, some differences remain. For instance, mutual funds, the breakdown of pension funds in defined benefit and defined contribution funds and the overall amount of financial wealth are not available in all countries.

**Table 4. Microeconomic surveys and stock market participation**

Survey	France	Germany	Italy	Netherlands	Sweden	UK	US
	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 US total participation is defined as households investing in stocks or mutual funds. Data refer to 1998, except for Sweden where they refer to 1999.

However, the table reveals a marked difference between *total* stockownership in the US 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% of stockholders. Taking an unweighted average, stockholding in Europe is undertaken by 24% of households, half of the US proportion. We argue below that 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 UK exhibiting higher participation rates.

It is useful to contrast today's state of household stockownership in Europe with the state of stockownership and the importance of risky assets in household portfolios at the end of the previous decade. Unfortunately, household level data for all the countries we examine are much more difficult to collect for decades previous to the 1990s. However, 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 *et al.*, 2001). In the UK, the proportion of direct stockholders went up from less than 9% in 1983 (the first year for which this information is available) to 22% in 1998. A large part of this development is associated with the massive privatisation 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% in 1989 to 7.3% in 1998, also taking impetus from the privatisation 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% over the same period (no data are available for 1989). In Germany, direct participation was around 10% in 1989 and 17% 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.

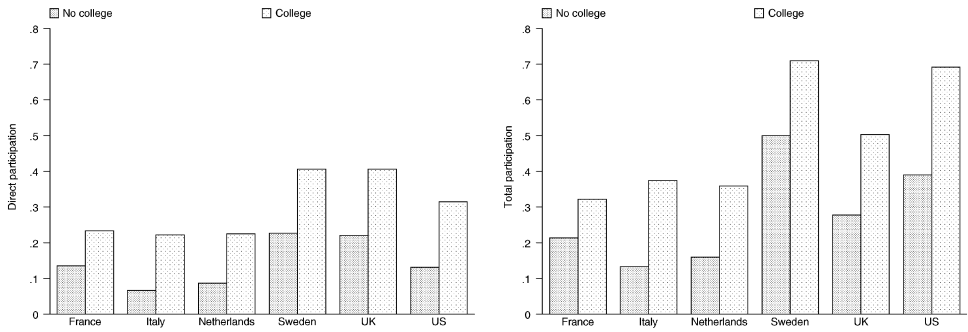
## 5. EXPLORING STOCKHOLDING PATTERNS

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 1 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





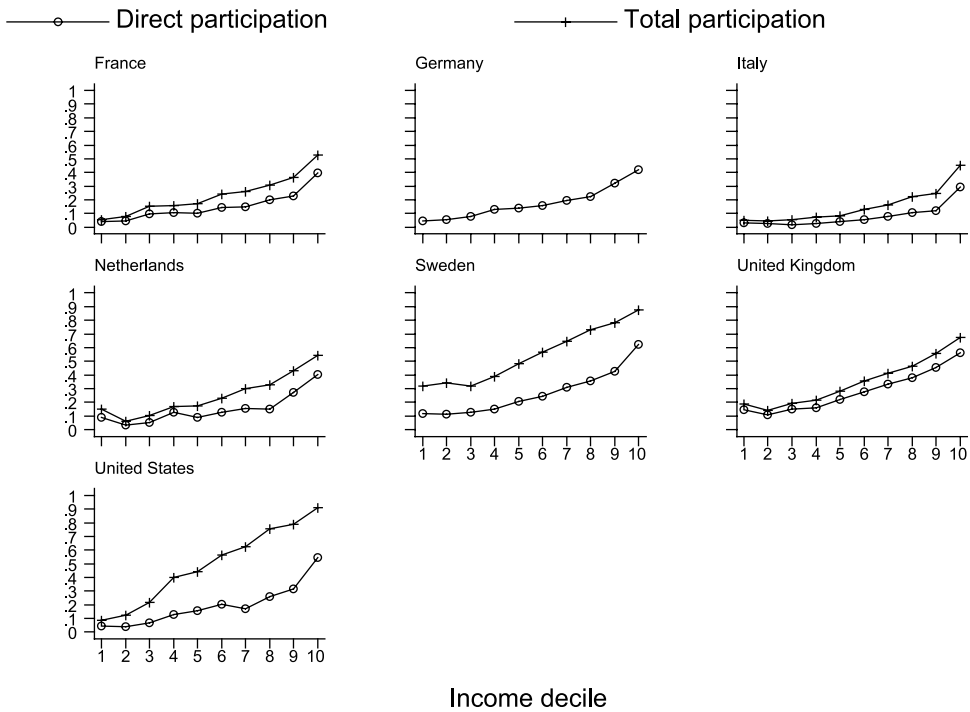
**Figure 1. Stock market participation, by education**

component of the returns to education is overlooked in the literature, but not negligible. A college educated, 45-year old individual who invests half of his or her wealth in stocks (yielding a yearly real expected return of, say, 6.5%) and half in a safe asset with real return of, say, 2.5% per year, can expect to end up at retirement age (say, age 65) with 50% 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.

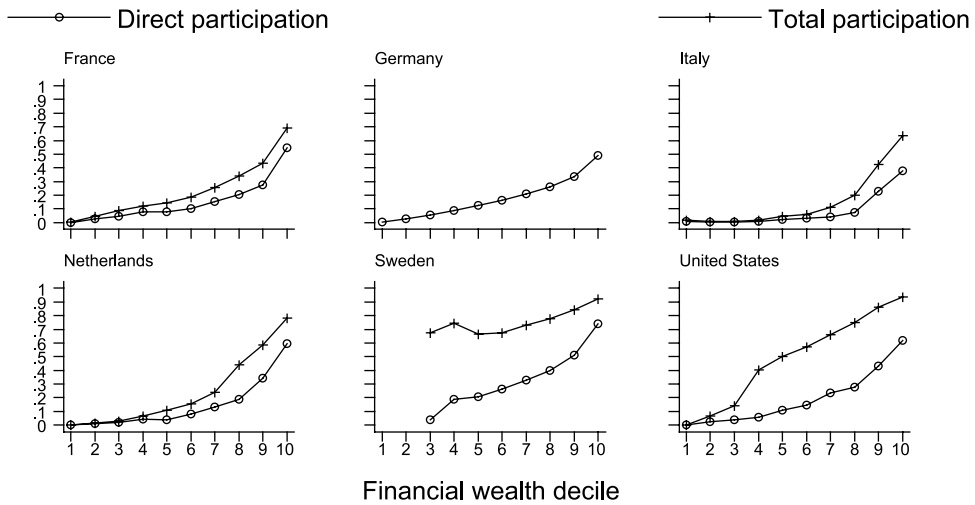
Figures 2 and 3 show the pattern of stockownership by income and financial wealth deciles for all of our countries (since financial wealth information is not available for the UK, this country is omitted in Figure 3). Participation increases with investor resources, measured either by income or wealth. At low levels of income or wealth very few investors hold stock directly, while the fraction increases rapidly and at an increasing rate with income or wealth. The figures show clearly that participation is different across countries: the country effect is generally small at low levels of wealth, but very pronounced 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 4 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.<sup>3</sup> 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 4 also shows that young households have more conservative portfolios than middle-aged households. This contradicts the advice typically given by financial planners, whereby young investors should hold a larger share of risky assets in their financial portfolios, in order to

<sup>3</sup> 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 than 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.

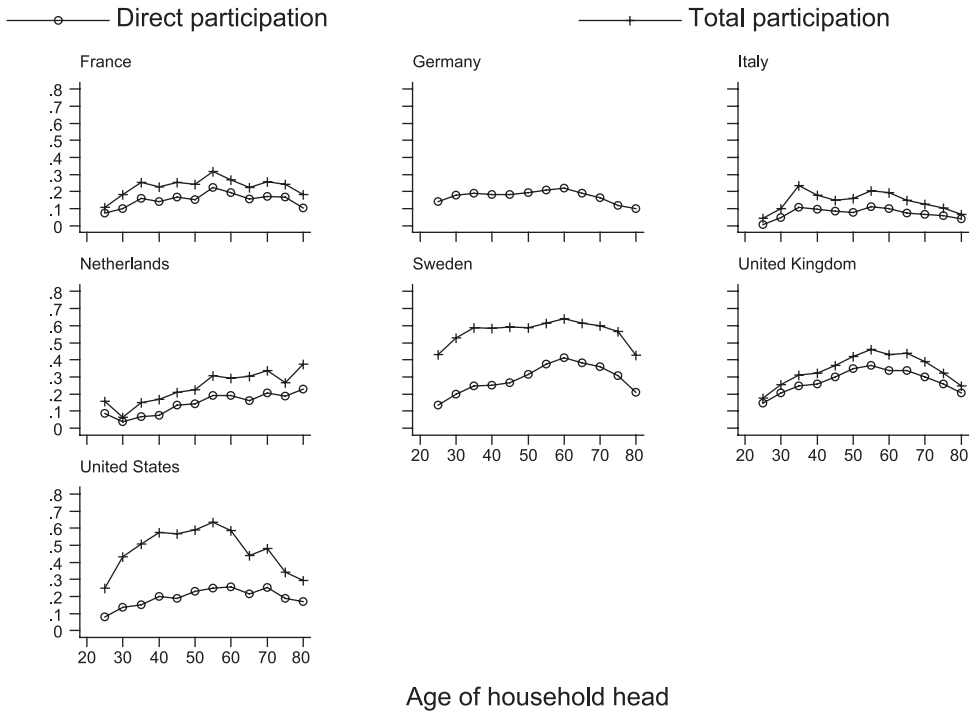


**Figure 2. Stock market participation, by income deciles**



**Figure 3. Stock market participation, by financial wealth deciles**

capture the superior expected return of these assets, and reduce risk exposure as they age. As we shall see, however, the concave shape of the age profile of the asset share disappears when other individual characteristics are controlled for in multivariate regression analysis.



**Figure 4. Stock market participation, by age**

### 5.2. Regression analysis of participation

Education, financial resources, and age are correlated: education is strongly positively correlated with income and wealth, and lifecycle models of savings have sharp predictions regarding the co-variation of wealth and income with age. To account for this correlation and to isolate the contribution of each factor while holding others constant, we report probit regressions for the participation decision and regressions for the portfolio share of stocks conditional on participation. The regressions control not only for income, financial wealth, age and education, but also for family size, and include a dummy variable for whether the household head is married.

Estimates for the determinants of participation decisions 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 US. 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.

**Table 5. Probit regressions for direct participation**

	France	Germany	Italy	Netherlands	Sweden	UK	US
Married	-0.0088 (0.0084)	0.0024 (0.0060)	0.0143 (0.0049)**	-0.0437 (0.0205)*	0.0390 (0.0120)**	0.0294 (0.0069)**	0.0017 (0.0219)
Family size	-0.0050 (0.0033)	-0.0156 (0.0022)**	-0.0068 (0.0021)**	0.0098 (0.0090)	-0.0257 (0.0049)**	0.0031 (0.0115)	0.0023 (0.0077)
College	0.0555 (0.101)**	0.0422 (0.0046)**	0.0287 (0.0082)**	0.0390 (0.0169)*	0.0800 (0.0093)**	0.0581 (0.0070)**	0.0846 (0.0160)**
Age 31–40	0.2036 (0.0145)	-0.0474 (0.0074)**	0.0216 (0.0160)	0.0055 (0.0509)	0.0053 (0.0137)	0.0218 (0.0120)	-0.0841 (0.0279)**
Age 41–50	0.0066 (0.0137)	-0.0891 (0.0068)**	0.0044 (0.0125)	0.0253 (0.0524)	-0.0033 (0.0135)	0.0419 (0.0126)**	-0.1195 (0.0262)**
Age 51–60	0.0207 (0.0149)	-0.0906 (0.0066)**	0.0123 (0.0136)	0.0528 (0.0580)	0.0372 (0.0139)**	0.0388 (0.0131)**	-0.0612 (0.0289)*
Age 61–70	0.0002 (0.0145)	-0.0839 (0.0069)**	0.0067 (0.0131)	0.0749 (0.0637)	0.0146 (0.0146)	0.0266 (0.0135)*	-0.0646 (0.0300)*
Age > 70	-0.0134 (0.0139)	-0.1101 (0.0063)**	-0.0005 (0.0123)	0.1146 (0.0782)	-0.0453 (0.0121)**	-0.0022 (0.0129)	-0.0529 (0.0310)
II income quartile	0.0396 (0.0127)**	-0.0125 (0.0076)	-0.0082 (0.0071)	0.0010 (0.0285)	0.0699 (0.0141)**	0.0477 (0.0100)**	0.0928 (0.0380)**
III income quartile	0.0643 (0.0132)**	0.0241 (0.0074)**	-0.0012 (0.0073)	-0.0118 (0.0255)	0.1090 (0.0151)*	0.1541 (0.0114)**	0.1032 (0.0386)**
IV income quartile	0.1316 (0.0149)**	0.0966 (0.0076)**	0.0319 (0.0103)**	0.0268 (0.0283)	0.2258 (0.0177)**	0.2200 (0.0128)**	0.2163 (0.0365)**
II wealth quartile	0.1284 (0.0187)**	0.2054 (0.0121)**	0.0362 (0.0177)*	0.1478 (0.0625)**		0.2403 (0.0096)**	0.2094 (0.0508)**
III wealth quartile	0.2224 (0.0199)**	0.3407 (0.0115)**	0.1237 (0.0248)**	0.2975 (0.0662)**	0.3422 (0.0129)**	0.3893 (0.0125)**	0.4121 (0.0493)**
IV wealth quartile	0.4280 (0.0200)**	0.4977 (0.0105)**	0.3132 (0.0347)*	0.5235 (0.0623)**	0.5519 (0.010)**	0.5183 (0.0094)**	0.6331 (0.0322)**
Number of observations	10 207	39 393	7147	1679	17 043	22 858	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 parentheses. \* indicates that the coefficient is statistically different from zero at the 5% level, \*\* at the 10% level.

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.

The strong and positive association between wealth, income and participation, already visible in the figures reviewed above, is confirmed in the controlled experiment provided by the probit regressions. For instance, the probability of direct stockholding in Italy is over 30 percentage points higher in the fourth wealth quartile than in the lowest quartile. In France it is over 40 points higher. In the Netherlands, Sweden, Germany and the UK it is about 50 points higher, and 63 points higher in the US. In all countries the effect of wealth is stronger than the effect of income. In France, Germany, Italy and the Netherlands the probability of direct stockholding increases by at most 13 percentage points, moving from the first to the fourth income quartile, while in Sweden, the UK and the US the increase is of 22 points.

**Table 6. Probit regressions for total participation**

	France	Italy	Netherlands	Sweden	UK	US
Married	-0.0081 (0.0109)	0.0240 (0.0086)**	-0.0075 (0.0277)	0.0010 (0.0157)	0.0296 (0.0079)**	0.0123 (0.0274)
Family size	-0.0112 (0.0042)**	-0.0225 (0.0036)**	-0.0109 (0.0126)	0.0237 (0.0065)**	0.0024 (0.0134)	-0.0161 (0.0099)
College	0.0484 (0.0122)**	0.0489 (0.0131)**	0.0714 (0.0234)**	0.0748 (0.0118)**	0.0868 (0.0080)**	0.0727 (0.0210)**
Age 31-40	0.0178 (0.0174)	0.0478 (0.0243)*	-0.0024 (0.0636)	-0.0882 (0.0175)**	0.0435 (0.0137)**	-0.0272 (0.0357)
Age 41-50	-0.0119 (0.0163)	0.0134 (0.0202)	-0.0268 (0.0607)	-0.1510 (0.0176)**	0.0636 (0.0143)**	-0.1019 (0.0359)**
Age 51-60	-0.0062 (0.0172)	0.0187 (0.0206)	0.0297 (0.0662)	-0.1767 (0.0174)**	0.0820 (0.0150)**	-0.1088 (0.0380)**
Age 61-70	-0.0330 (0.0168)	0.0061 (0.0198)	0.0912 (0.0734)	-0.2139 (0.0186)**	0.0626 (0.0156)**	-0.2453 (0.0417)**
Age > 70	-0.0398 (0.0168)*	-0.0175 (0.0178)	0.1139 (0.0826)	-0.3249 (0.0151)	-0.0169 (0.0145)	-0.3519 (0.0377)
II income quartile	0.0544 (0.0153)**	-0.0019 (0.0126)	0.0075 (0.0392)	0.0919 (0.0139)**	0.0640 (0.0111)**	0.1877 (0.0277)**
III income quartile	0.1184 (0.0160)**	0.0119 (0.0130)	0.0268 (0.0372)	0.1704 (0.0152)**	0.1874 (0.0122)**	0.2460 (0.0271)**
IV income quartile	0.2068 (0.0174)**	0.0889 (0.0170)**	0.0597 (0.0397)	0.2516 (0.0176)**	0.2704 (0.0134)**	0.3415 (0.0333)**
II wealth quartile	0.1724 (0.0196)**	0.0705 (0.0233)**	0.2354 (0.0690)**		0.3069 (0.0096)**	0.3674 (0.0224)**
III wealth quartile	0.3177 (0.0197)**	0.2487 (0.0285)**	0.4608 (0.0633)**	0.5482 (0.0081)**	0.4894 (0.0106)**	0.4857 (0.0180)**
IV wealth quartile	0.5468 (0.0175)**	0.5458 (0.0289)**	0.7219 (0.0449)**	0.6951 (0.0073)**	0.6359 (0.0076)**	0.7713 (0.0193)**
Number of observations	10 207	7147	1679	17 043	22 858	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 parentheses. \* indicates that the coefficient is statistically different from zero at the 5% level, \*\* at the 10% level.

Inspection of Table 6 indicates that these comments apply also to total participation.<sup>4</sup> 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 privatisation, demographic transition, and mutual fund industry developments that took place in the 1990s were fairly complex, and 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.

<sup>4</sup> 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’ (the sum of wealth and labour 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.<sup>5</sup> 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 US 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, are the implications of estimated country dummies (all statistically significant). Compared to average stockholding in the US (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 UK. 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 large or even *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. We discuss such features in Section 6, noting here that the robust relevance of household financial resources for participation points to the relevance of fixed participation costs.

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<sup>5</sup> A recent research report by McKinsey 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.

**Table 7. Cross-country probit regressions for direct and total participation**

	Direct participation	Total participation
Married	0.0145 (0.0035)**	0.0220 (0.0056)**
Family size	-0.0174 (0.0015)**	-0.0220 (0.0029)**
College	0.0450 (0.0030)**	0.0749 (0.0055)**
Age 31-40	-0.0102 (0.0053)	0.0346 (0.0095)**
Age 41-50	-0.0366 (0.0051)**	0.0203 (0.0095)*
Age 51-60	-0.0356 (0.0051)**	0.0310 (0.0099)**
Age 61-70	-0.0408 (0.0052)**	0.0050 (0.0101)
Age > 70	-0.0650 (0.0049)**	-0.0504 (0.0093)**
II income quartile	0.1326 (0.0050)**	0.0618 (0.0080)**
III income quartile	0.0638 (0.0051)**	0.1531 (0.0085)**
IV income quartile	0.1351 (0.0054)**	0.2433 (0.0091)**
II wealth quartile	0.1946 (0.0062)**	0.2776 (0.0079)**
III wealth quartile	0.3258 (0.0066)**	0.4595 (0.0083)**
IV wealth quartile	0.5006 (0.0057)**	0.6670 (0.0060)**
France	-0.0696 (0.0054)**	-0.2450 (0.0058)**
Germany	-0.0565 (0.0058)**	
Italy	-0.1360 (0.0038)**	-0.2868 (0.0044)**
Netherlands	-0.0793 (0.0075)**	-0.2116 (0.0055)**
UK	0.1104 (0.0077)**	-0.0639 (0.0092)**
Number of observations	85 589	46 196

*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 parentheses. \* indicates that the coefficient is statistically different from zero at the 5% level, \*\* at the 10% level.

### 5.3. Regression analysis of conditional portfolio shares

Economic theory offers predictions not only for participation decisions, but also for the optimal shares of stocks in the portfolios of households who do participate (the *conditional asset shares* for short). As shown above (see Box 1), the share invested in the

**Table 8. Regressions for asset share invested in directly held stocks**

	France	Germany	Italy	Netherlands	Sweden	US
Married	-0.0065 (0.0142)	-0.0342 (0.0076)**	0.0534 (0.0348)	-0.0549 (0.0436)	0.0017 (0.0155)	-0.0493 (0.0263)
Family size	-0.0049 (0.0055)	-0.0155 (0.0028)**	-0.0031 (0.0117)	-0.0563 (0.0199)**	-0.0290 (0.0067)**	0.0069 (0.010)
College	0.0351 (0.0137)**	0.0425 (0.0054)**	0.0576 (0.0277)*	-0.0187 (0.0379)	0.0919 (0.0114)**	-0.0009 (0.0207)
Age 31–40	0.0537 (0.0250)*	-0.0257 (0.0105)**	0.0772 (0.0741)	0.0716 (0.1283)	-0.0300 (0.0195)**	-0.0257 (0.0389)
Age 41–50	0.0482 (0.0247)*	-0.0669 (0.0109)**	0.0640 (0.0737)	0.0236 (0.1238)	-0.0518 (0.0192)**	-0.0452 (0.0376)
Age 51–60	0.0415 (0.0254)	-0.0769 (0.0111)**	0.0897 (0.0733)	0.0573 (0.1237)	-0.0347 (0.0182)	-0.0473 (0.0379)
Age 61–70	0.0641 (0.0265)*	-0.0366 (0.0117)**	0.0769 (0.0747)	0.1037 (0.1256)	-0.0970 (0.0196)**	-0.001 (0.0419)
Age > 70	0.0614 (0.0272)*	-0.0027 (0.0132)	0.0329 (0.0784)	0.0894 (0.1298)	-0.159 (0.0183)**	0.0478 (0.0416)
Income	0.4363 (0.2489)	0.5028 (0.1273)**	0.1216 (0.4212)	0.0205 (0.7999)	0.1420 (0.0202)**	-0.2257 (0.1871)
Financial wealth	0.0644 (0.0217)**	0.2358 (0.0252)**	-0.0046 (0.0688)	0.3961 (0.0763)**	0.1212 (0.0163)**	0.1037 (0.0196)**
Constant	-0.0056 (0.0362)	0.0749 (0.0160)**	-0.0998 (0.0935)	0.3440 (0.1605)*	0.0461 (0.0253)	0.1941 (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 millions of euro. Standard errors are reported in parentheses. \* indicates that the coefficient is statistically different from zero at the 5% level, \*\* at the 10% level.

stock market is independent of investor's wealth in simple static portfolio models with constant relative risk aversion investors.<sup>6</sup>

Tables 8 and 9 show country level regressions for the share of financial assets invested in stocks, conditional on participation.<sup>7</sup> 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

<sup>6</sup> Departures from the simple model can produce a correlation between wealth and the share invested. For instance, in an intertemporal model with risky labour 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 labour 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.

<sup>7</sup> We model the demand for stocks as a two-stage decision process. Households first choose whether or not to hold stocks, and then they decide how to allocate their wealth. Given that incomplete portfolios are the rule rather than the exception in each of the countries examined, the use of OLS in asset shares equations would lead to inconsistent parameter estimates. Accordingly, we rely on a two-step selection model. The probit regressions for participation represent our first step and are used to generate the Mills ratio. In the second step we add the Mills ratio to the list of regressors in the asset share equation to adjust for selection bias.



**Table 9. Regressions for asset share of stocks held directly or indirectly**

	France	Italy	Netherlands	Sweden	US
Married	-0.0000 (0.0105)	0.0306 (0.0183)	-0.0589 (0.0296)*	-0.0253 (0.0078)**	-0.0270 (0.0193)
Family size	-0.0070 (0.0042)	-0.0051 (0.0067)	-0.0212 (0.0142)	0.0082 (0.0033)**	-0.0050 (0.0071)
College	0.0258 (0.0103)**	0.0391 (0.0157)**	-0.0040 (0.0257)	0.0441 (0.0059)**	0.0150 (0.0145)
Age 31-40	0.0401 (0.0180)*	0.0571 (0.0383)	0.0046 (0.0856)	-0.0301 (0.0091)**	0.0183 (0.0262)
Age 41-50	0.0507 (0.0177)**	0.0578 (0.0380)	0.0331 (0.0837)	-0.0518 (0.0091)	-0.0023 (0.0255)
Age 51-60	0.0421 (0.0183)*	0.0939 (0.0378)**	0.0530 (0.0836)	-0.0509 (0.0089)**	-0.0091 (0.0262)
Age 61-70	0.0535 (0.0190)**	0.1076 (0.0386)**	0.0915 (0.0847)	-0.1018 (0.0097)**	-0.0174 (0.0300)
Age > 70	0.0581 (0.0194)**	0.0740 (0.0408)	0.1280 (0.0877)	-0.1600 (0.0088)**	-0.0563 (0.0309)
Income	0.6261 (0.2062)**	0.0985 (0.2922)	0.3318 (0.6367)	0.4707 (0.1387)**	0.4798 (0.1621)**
Financial wealth	0.1101 (0.0196)**	0.1980 (0.0450)**	0.4327 (0.0641)**	0.1099 (0.1222)**	0.0635 (0.0185)**
Constant	0.0545 (0.0239)*	0.1204 (0.0435)**	0.2259 (0.0979)*	0.3307 (0.0091)**	0.4909 (0.0312)**
Number of uncensored observations	2556	1144	455	10 055	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 millions of euro. Standard errors are reported in parentheses. \* indicates that the coefficient is statistically different from zero at the 5% level, \*\* at the 10% level.

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 US. However, the age coefficients are most often statistically insignificant, and even when significantly different from zero they are rather small, indicating that portfolio shares are roughly 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 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 in the US. Ameriks and Zeldes (2001) find that 47% of these highly educated account holders made no changes in how the flow of their contributions gets allocated to alternative investment accounts, while another 14% 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% made no such change in the ten-year period, while another 14% 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?

Several institutional developments (pension reform, privatisation, and growth of mutual funds and retirement accounts) were observed in the 1990s across most of the countries examined. However, they do not appear to have ironed out international differences in household stock market participation, even after we control for household

**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	11 578

*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 millions of euro. Standard errors are reported in parentheses. \* indicates that the coefficient is statistically different from zero at the 5% level, \*\* at the 10% level.

demographics. Our statistical analysis indicates that direct and indirect holding of stocks is much smaller in France, Germany and Italy than in the rest of Europe and in the US. In this section, we examine whether cross-country differences in participation can be explained by the pattern of benefits from participation in stocks – the excess (flow) return of equities – relative to perceived participation costs. We first consider expected returns and tax provisions across the various countries, then argue that participation costs appear more relevant as determinants of cross-country differences in household stockholding.

### 6.1. Benefits: stockholding returns and tax provisions

Table 1 shows that realised stock market returns differed widely across the countries we examined. To the extent that realised home-market returns during the late 1980s and

early 1990s are a good gauge for the returns that households were expecting when they decided to enter the stock market in the 1990s, it is interesting to find that the country with the highest (pre-tax) stock market return over the period 1986–97 (the US) also features a very high stock market participation rate. And, at the other end of the spectrum, Italy features the lowest return and participation rate of all countries examined.

More generally, differences in pre-tax stock market returns across countries seem quite consistent with observed differences in participation. Consideration of the relevant tax provisions, however, casts doubt on the validity of an explanation based mainly on returns.<sup>8</sup> In Germany and in the Netherlands capital gains were effectively untaxed in the 1990s. In the other countries (except for Sweden, which is not discussed), capital gains were taxed at realisation. The US had the most complicated system of taxing such gains. The UK featured the highest statutory rate on capital gains (40% on gains above some threshold), while Italy had a very favourable tax treatment that effectively limited the tax rate on capital gains to 1%. If anything, the tax treatment of capital gains appears to reduce differences in pre-tax returns and their relevance for participation decisions.

Dividend taxation provisions reinforce this conclusion. The US was levying the highest tax burden on dividend payments, taxing dividends first as part of corporate earnings and then as part of investor income. The UK, Germany, and France provided investors with tax credits for corporate taxes already paid, while the other countries were somewhere in between. Thus, capital gains and dividend taxation appear to have been less favourable in high-participation countries and more favourable in those exhibiting the lowest participation levels.

A consistent picture emerges from looking at interest taxation. High rates of interest taxation should provide a disincentive for holding fixed-income assets and an incentive for holding stocks if after-tax returns are important for participation. Yet, similar participation rates were observed in France and Italy, despite a top marginal tax rate on interest income of 56.2% in France and of only 16.2% in Italy (on most types of interest income).

A different and much less direct mechanism whereby the tax code could encourage participation in stockholding is the availability of tax-deferred saving instruments for retirement. Although our data do not allow us to consider stockholding in retirement accounts in countries other than the US, familiarity of households with stockholding through such accounts may have encouraged them to hold stocks also through mutual funds. It does appear that limited tax deferral provisions were observed in countries that also exhibit limited stockholding participation. French households did not have access to tax-deferred saving vehicles. Italian and German households did have access, but with tighter contribution limits than in the UK and in the US. To

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<sup>8</sup> International comparison of tax provisions is a complicated task, due to the substantial heterogeneity in tax codes. An excellent reference for such comparisons and their likely implications for a variety of investor choices can be found in Poterba (2001), from which we draw the tax code details used in our current discussion.

the extent that such tax code effects were important, however, they must have operated primarily through information spill-over: introduction of tax-deferred retirement accounts and the advertising and training programmes that accompanied it familiarised households with stockholding and encouraged them to try other forms of stockholding.

Finally, one may suspect that more generous mortgage interest deductibility provisions in certain countries may have encouraged households to take bigger mortgages, commit to larger monthly mortgage payments, and thus be less willing to undertake stockholding risk. Yet, a clear link between mortgage deductibility provisions and stockholding participation does not seem to exist. Deductibility provisions were more generous in the US, France and the Netherlands than in other countries, but these three countries span the entire spectrum of participation rates, as we saw.

Although tax provisions are unlikely to have strengthened the relationship between the patterns of pre-tax returns and stockholding participation, one may still suspect that they were insufficient to render this relationship unimportant. Upon closer inspection, however, an explanation of the participation pattern based entirely or even primarily on differences in expected returns (pre- or after-tax) is not consistent with the empirical evidence in Section 5. If country differences in expected stock market returns (proxied by *ex post* observed returns) were the key explanation for the documented differences in participation, then they should operate by influencing the portfolio share that the household would like to invest in stocks once it entered. Under this explanation, one should observe *both* higher participation and larger conditional shares invested in stocks in countries with higher returns (see the model in Box 1). If instead the pattern of participation costs is key for stockholding decisions, one should observe strong country effects in participation regressions (consistent with the cost pattern) but insignificant country effects on the level of portfolio shares conditional on having paid the participation cost (see Box 1). Our empirical findings support the latter interpretation. As shown in Table 10, the country effects that pick up systematic differences in expected returns, are virtually absent in conditional share estimates: predicted portfolio shares are basically the same in countries where *ex post* stock market returns differ markedly. The unequal pattern of participation rates remains to be explained by factors other than returns.

Observed changes over time in aggregate portfolio shares invested in stocks in the various countries, shown in Table 3 above, provide further support for this argument. If changes in participation over the 1990s were driven by increased stock market returns, we should observe more marked increases in the conditional portfolio shares of stocks in the countries that experienced the largest increases in stock market returns. But this is not the case. Between 1996 and 2000, the share in stocks rises most in Italy (24 percentage points) and least in the US (1 percentage point); but as shown in Table 1, Italy is the country with the lowest stock market return and the US that with the highest return. Thus, neither the cross-sectional pattern nor the time variation of returns during the 1990s appear consistent with the pattern of conditional portfolio shares across countries.

To explain country differences in stockholding, it is necessary to consider factors that generate differences in participation without creating differences in conditional portfolio shares. Participation costs, to which we turn next, can play precisely this role, and can also explain the considerable inertia in adjusting portfolios over time apparent in our estimates.

## 6.2. Transaction costs

A major component of participation costs has to do with transactions costs charged by the financial services industry, and especially by the 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 and imperfect information can be important determinants of household inertia and non-participation. In this and in the next section, we examine indicators relevant for these two types of costs and we relate them to international differences in stockholding.

Constructing a comprehensive measure of stock market participation costs is difficult even for a single country, let alone when international comparability is desirable. Transaction costs are somewhat easier to compare when dealing with indirect stockholding through mutual funds. Presumably, their pattern is also indicative of the pattern of costs facing households that engage in direct stockholding. Participation costs in indirect stockholding include production costs and distribution costs of mutual funds. Estimates of the former exist for the US and for Europe. Only indicators of distribution costs exist for European countries, and we report such indicators below. We also rely on estimates of the time trend of transaction costs for US mutual funds, where such figures exist.

Consider first the production costs of mutual funds. Estimates of trading costs for an institutional investor are presented in the first 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.<sup>9</sup> Column 2 reports 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 alone can explain differences in stockholding across the countries examined. Indeed, management fees provide only a 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

<sup>9</sup> These costs are incurred by professional market makers and affect household stockholding only insofar as they are passed on to customers.

**Table 11. Trading costs and characteristics of the mutual funds industry**

	Stock market trading costs (basis points)	Management fees (%)	Number of funds	Average size	Concentration ratio (%)	Asset allocation in equity (%)
France	27.63	1.2	5836	87	62	13.6
Germany	29.70	0.8	717	207	62	37.9
Italy	29.84	2.0	626	337	43	20.4
Netherlands	34.56	0.5	179	440	60	53.8
Sweden	32.26	—	—	—	—	—
United Kingdom	51.88	1.2	1455	163	20	85.8
US (Nasdaq/NYSE)	30.64/24.57	1.4	6900	647	18	53.0

*Notes and sources:* 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 (Pagano *et al.*, 2002, Table 4; drawn from Elkins/McSherry Co., Inc.). Management fees are percentages charged by the individual mutual funds in 1997 (FEFSI and Otten and Schweitzer, 2002). Concentration ratio is the market value of the five largest fund groups as part of the total mutual fund market. Data on number of funds, concentration ratio and asset allocation in equity refer to 31 December 1997 (Otten and Schweitzer, 2002).

and legal fees), not just the basic annual management charge. The *Wall Street Journal Europe* reports that TER is 1.46% in Europe and 0.98% in the US.<sup>10</sup> This augmented measure of production costs seems consistent with the more limited development of indirect stockholding in Europe relative to the US.

Distribution costs tend to be higher in Europe than in the US 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 11 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: in Europe funds are smaller, and operate in more concentrated industries, than in the US. Both factors suggest that distribution costs are higher in Europe than in the US.

The US industry is large relative to its European counterparts not only in terms of assets, but also in the range of choices it affords households among alternative mutual funds (Table 11, column 3). A striking outlier in Europe is France, where the number of available funds is close to 6000. Regardless of their number, European funds are of very small size compared to US funds (Table 11, column 4). 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.<sup>11</sup> This suggests that US funds are in a position to pass on to their customers significant cost savings arising from their larger scale compared to European funds. Column 5 of Table 11 shows that the mutual fund industry is much more heavily concentrated in

<sup>10</sup> 'US funds giants arrive in Europe but leave their low fees behind', 21 January 2001.

<sup>11</sup> See, for example, Rea and Reid (1998) and references therein (n. 40).

**Table 12. 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	–	–	–	–
UK	17.3	54.7	19.9	8.1
US	32.0	40.0	8.0	20.0

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

European countries (other than the UK) than in the US. Concentration here is measured by the market value of the five largest fund groups as part of the total mutual fund market.

Also relevant for distribution costs is the nature of distribution channels. Table 12 shows that countries with broad stockholding also tend to feature direct sales or contacts with brokers, rather than 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 very important in the UK, while banks are about as important for distribution of mutual funds as direct sale.

In summary, 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. During the 1980s and 1990s, when indirect stockholding spread, participation costs in equity mutual funds dropped significantly (Rea and Reid, 1998). US data for ‘total shareholder cost’ as a percentage of the amount invested in the fund,<sup>12</sup> on a sales-weighted average basis, declined from 2.25 in 1980, to 2.17 in 1988, and to 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% in 1980 to 2.11% in 1997). These resulted in a significant decline in the distribution cost ratio, from 1.49 in 1980 to 0.61 in 1997.<sup>13</sup> Indeed, the operating expense ratio rose modestly from

<sup>12</sup> Including fund operating expenses (for managing portfolio investments, servicing shareholder accounts, and distributing or marketing shares) and distribution costs: annuitized values of one-time sale charges for load funds incurred by buyers of a fund during a given year augmented by ‘12b-1 fees’ (which include fees for advertising, marketing, investor assistance, and account servicing). 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; imputation is based on estimates of holding periods by investors based on past behaviour.

<sup>13</sup> The distribution costs of load funds fell from 2.28% to 1.23%, due to a decline in loads that dominated increases in 12b-1 fees.



0.76% in 1980 to 0.88% 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. Information costs

Decisions to participate and to rebalance portfolios are not governed only by actual participation costs, but also by how these are perceived by investors. Inaccurate information 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.

Our results support the hypothesis that there are information-related barriers to entry into stockholding. Educational dummies are strongly significant in stock market participation regressions reported in this paper and elsewhere (see the contributions in Guiso *et al.*, 2001). More educated individuals are less likely to face information barriers, including those that arise from total ignorance about the availability of stocks, as analysed by Merton (1987) and documented empirically in Guiso and Jappelli (2003). Investing in the stock market either directly or indirectly through a fund involves a substantial amount of delegation. Delegation, in turn, requires monitoring by investors of appropriate behaviour by intermediaries. If more educated households have lower monitoring costs, they are more likely to participate. In addition to the role played by general education, participation can be encouraged by seminars targeted at potential participants and focused on providing information about new stockholding opportunities. This conjecture is corroborated by empirical studies documenting that US households were aided in gaining understanding of and participating in defined-contribution retirement accounts through high-impact, employer-sponsored seminars (Bayer *et al.*, 1996).<sup>14</sup>

Table 13 reports 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.<sup>15</sup> Column 1 shows that transparency of financial institutions is highest in the US; intermediate in the Netherlands, the UK, Sweden and Germany; and attains its lowest values in France and in Italy. This is consistent with the international ranking of stockholding uncovered by our empirical analysis of microeconomic data. Looking at trends over time from the same source

<sup>14</sup> A data set on asset allocation by participants in TIAA-CREF in the US, a large non-profit organisation that handles self-directed retirement funds for the staff of about 6000 universities, secondary schools and other non-profit organisations, shows that respondents on average invest their retirement accounts predominantly in equities and longer-term fixed income securities (Bodie and Crane, 1997).

<sup>15</sup> 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 enterprises in the country. The surveys are sent in December and returned in March. In 2002, the overall sample size was 3532.

**Table 13. Financial transparency and investor literacy**

	Financial institutions' transparency	Economic literacy	Computers per thousand people	Internet users per thousand people
France	6.10	4.64	419	209
Germany	7.22	5.11	436	308
Italy	5.01	3.98	347	307
Netherlands	7.66	7.21	510	448
Sweden	7.50	7.21	626	554
UK	6.89	4.44	492	402
US	8.06	6.35	639	522

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

(not reported here), we find that the US and the UK register significant improvements in financial transparency in recent years, whereas Italy, France and Germany exhibit a downward trend. This indicates that households in Italy, France and Germany face greater difficulty in evaluating and comparing stockholding funds compared to Americans, consistent with their lower participation rates.

The second column in Table 13 refers to the ability of households to evaluate whatever information is made available. It reports opinions of managers on whether economic literacy is generally high among the population. Again, France, Germany, and Italy – the countries with the lowest participation rates – appear low on the list, while managers in Sweden, the Netherlands, and the US have a more positive outlook on economic literacy. Looking at trends, the US has registered the most significant increase, from 4.8 in 1996 to 6.3 in 2002.

The last two columns of Table 13 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 (the US and Sweden) 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 picture from these indicators is that the countries with low stockholding, such as Italy and France, are also those with relatively low financial and computer literacy and financial transparency. Conversely, countries with high stockholding, such as Sweden and the US, also feature relatively high in terms of the indicators. Combined with the findings on transactions costs, this suggests that country differences in transaction and information costs play an important role in reconciling

international differences in stockholding participation observed after we control for household demographic characteristics.

## 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 (see Guiso and Paiella, 2001), the new entrants are also likely to be more risk averse. The presence of new entrants can influence the behaviour of excess returns on equity. In this section, we discuss possible consequences of this change in the pool of stockholders.

### 7.1. Equilibrium effects of increased stock market participation

Increased stock market participation has several potential effects on the behaviour 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. Since heterogeneity in access to the stock market can account for a large portion of observed wealth inequality (Güvenen, 2002), greater equality of financial opportunities can reduce long-run wealth inequality, and lower costs of gathering information on the properties of assets can lower it further. As initially shown by Arrow (1987) in partial equilibrium and recently by Peress (2002) 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.

For a given asset returns, household behaviour is certainly influenced by the access to stocks.<sup>16</sup> But a wider stockholder base can have important equilibrium effects on stock market volatility and on expected return differentials. General equilibrium consequences of increased stock market participation have only recently started to be

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<sup>16</sup> Haliassos and Hassapis (2002) find that equity culture encourages households to increase current consumption and loan demand, and to respond to higher earnings risk by larger precautionary adjustments to consumption, financial wealth holding, and borrowing.

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 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.

Empirically, stock market volatility appears to have increased along with market participation,<sup>17</sup> and stock market turmoil in the early years of the new millennium may have something to do with differences in characteristics of new entrants relative to long-time investors. We review the relevant mechanisms in Box 3. Overall, recent research suggests that the effect of increased participation on the equity premium may be negative, but 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, and unlikely to have substantial feedback effects on participation.

## 7.2. Welfare concerns

While the move towards more widespread access to the stock market widens the opportunity set of previously excluded investors, it also raises concerns regarding the welfare of new stockholders. Investors that enter the stock market after the reduction in entry costs are significantly different from incumbents, 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.

New stockholders may not be fully equipped 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 because they were attracted by the massive increase in stock prices during the late 1990s. As a consequence, some of these investors 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. Losses may be irreversible when 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, however, they may be

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<sup>17</sup> Campbell *et al.* (2001) find that the idiosyncratic volatility of single stocks in the US 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).

### **Box 3. General equilibrium effects of increased stock market participation**

Herrera (2001) shows that if new stockholders are more risk averse than previous stockholders, their stock demand is less responsive to current stock prices, and this can lead to higher price volatility. The mechanism is fully consistent with our theoretical perspective and empirical findings: as in Box 2, if the investor's asset share in stocks is  $\lambda = (R_r - R_f)/a\sigma_r^2$  then (multiplying by wealth and letting  $\tau = w/a$  denote the degree of absolute risk tolerance) the demand for stocks is  $S = \tau(R_r - R_f)/\sigma_r^2$ . Thus, less (absolute) risk tolerant investors are less responsive to stock market prices (and market riskiness). If absolute risk aversion is decreasing with wealth, 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.

Peress (2002) 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 offer better risk sharing opportunities, which tends to lower volatility but also diminishes incentives to acquire costly information: the latter effect leads to higher volatility. The net effect is ambiguous in general, and depends on whether shares are widely or narrowly held. An exogenous reduction in the entry cost for widely held stocks reduces the incentives of incumbents to purchase information, leading to higher stock prices and higher volatility soar.

In the Peress model increased participation lowers the equity premium, but this need not be the case if stock supply increases along with stockownership (as in the case of privatisation) or if marginal stockholders are more risk averse than incumbents. In any case, marginal stockholders with higher risk aversion and smaller wealth tend to invest less in stocks than incumbents, and are unlikely to have big effects on the equity premium (Polkovnichenko, 2000); see also Allen and Gale (1994), Saito (1995), Basak and Cuoco (1998), Heaton and Lucas (1999) for general equilibrium models showing that limited participation is not likely to have large effects on asset prices and returns.

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, and better consumption smoothing reduces precautionary savings. The resulting higher riskless rate reduces incentives to hold risky assets, but participation increases if the hedging effect dominates: the resulting higher covariance between stock returns and mean consumption of participants lowers the equity premium.

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.<sup>18</sup>

Countries where 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 2001–2, 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. However, indirect stockholding creates a different policy concern. Mutual funds are often complicated instruments with contractual provisions that are not easy to grasp even for relatively well-educated investors. As entry costs decrease and less informed investors enter and rely on fund managers for information and for management of their investments, serious delegation problems arise. 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 being cheated.<sup>19</sup> Fund managers may have incentives to provide untruthful information, abuse their role as financial advisors, and profit from their information advantage vis-à-vis less sophisticated investors. Since the sellers of these instruments very often provide financial advice also, they can manipulate the information they transmit in their own interest. This can be accomplished by understating the riskiness of the instrument and by hiding or simply not mentioning exit costs or more profitable alternative financial instruments.

Actions of this sort are not hypothetical, and often clearly linked to the sellers’ own interests when distribution occurs via banks. There is some anecdotal evidence that banks do tend to rebalance their portfolio by advising customers to buy the securities they want to unload, and that such advice is more likely to be heeded by unsophisticated investors when the issuing firms (however poor their financial situation) have well-known household brand names.<sup>20</sup>

<sup>18</sup> 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%, instead of the market return of 17.9%.

<sup>19</sup> Guiso *et al.* (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.

<sup>20</sup> Before the summer of 2002, when the FIAT distressed situation was not yet known to the public, customers of certain banks were strongly advised by their bank to buy car industry bonds and in particular FIAT bonds. Similarly Cirio, one of the largest food manufacturers in Italy, issued in the spring of 2002 bonds in the amount of 175 million euro. This money was mostly used to pay back loans extended by a small group of leading banks. The banks at the same time acquired a large chunk of the newly issued bonds, which were then placed with the depositors of these banks. Thus, bank depositors de facto replaced the banks as lenders of Cirio. In November 2002, Cirio announced that it was in distress and unable to pay back part of the bonds. When customers protested, the banks involved claimed they sold Cirio bonds to customers who wanted to buy them, denying that they advised them to do so.

## 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 possible problems.

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 programmes. Merton (1987) argued that limited information about financial assets limits the demand for these assets, so issuers do have an incentive to communicate financial 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 (2003) 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. Empirically, stock market participation is higher among individuals who entertain intense social interactions, and the effect is stronger among individuals living in communities with a higher participation rate to begin with (Hong *et al.*, 2001). More generally, the experience of peers about the performance of their investments appears to be passed on to others, and social learning interacts positively with learning induced by market development: whether this provides the efficient amount of information is, of course, hard to tell.<sup>21</sup>

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. 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. Conflicts of interest arise and are amplified by the fact that the main mutual fund distribution channel in European countries (except for the UK) is through banks. The predominance of this channel can interact with universal banking provisions in a way that is highly detrimental for uninformed investors. Banks typically have private information on firms they lend to and are in a better position to foresee future distress than the market. At the same time, banks, particularly universal banks, place new issues of stocks and bonds and act as main advisors for households, over which they also enjoy an informational advantage.

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<sup>21</sup> 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. The finding of Bayer *et al.* (1996) that employer-sponsored seminars were most effective in enlisting employers for individual retirement accounts in the US, along with the success of government advertising campaigns during UK privatisations, suggests that the state has a role to play in disseminating information, especially for stockholding opportunities relating to its own policies and programmes.

It may be tempting for banks to exploit this double informational privilege. For instance, a bank may have an incentive to unload upon its customers bonds issued by firms that owe to the bank and are likely to run into distress. This dilutes the bank's stake in these firms before the deterioration in the quality of the firms becomes publicly known. The risk is shifted to unaware customers who buy those securities in good faith. Alternatively, a mutual fund directly controlled by a bank may over-invest in the (new) securities issued by a firm that borrows from the controlling bank, thus freeing part of the money invested in the firm.

One might think that competition, the spread of information and self-regulation tend to correct abuses, obviating the need for government intervention. A strand of literature in law and economics dating back to Coase (1960) and Stigler (1964) argues that as long as securities transactions take place between sophisticated sellers and buyers, the threat of reputation loss should deter sellers from cheating and create sufficient incentives for truthful information revelation. Buyers would have incentives to acquire information and buy only from highly reputable sellers. Even if this mechanism were valid for sophisticated investors, however, it is unlikely to apply to unsophisticated households. It is difficult for consumers to find out whether bad financial returns were the consequence of bad advice, outright fraud, or an adverse market outcome. And even if they were able to discriminate between these alternatives, exit costs tend to slow down migration to other funds and intermediaries, hampering the effectiveness of competition as a punishment mechanism for the cheaters. And litigation costs are typically too high to act as a powerful deterrent against cheating small investors.

The typical regulatory response consists in imposing disclosure of detailed information prospects to final investors (see Mahoney, 1995 and the discussion in La Porta *et al.*, 2002). While this may help, particularly with respect to retail investors, one has to recognise that information disclosure is ineffective when investors are inexperienced. Prospects are often difficult to read and understand, especially for the unsophisticated savers that form the typical clientele of a bank, who need to rely on explanations by bank clerks (or fund sellers) to understand them. The problem may no longer be biased advice, but biased interpretation of the information prospect. This is particularly important in countries where education in general and financial education in particular is relatively poor.

We thus see little alternative to public monitoring and supervision of intermediaries and sellers of securities to the general public. However, this should also be accompanied by serious attempts to raise the public level of financial education. This can be accomplished with ad hoc campaigns aimed at endowing the median saver with a minimum amount of financial knowledge that helps protect him against abuses and lowers the need to delegate decisions to non-neutral intermediaries. A better-informed pool of retail investors would also enhance the working of competition as a punishment device for cheating behaviour. Governments should also punish collusive behaviour and discourage practices aimed at limiting customer mobility across



intermediaries. All in all, we strongly believe that public provision of financial information, along with public monitoring and supervision, should accompany the growth of indirect stockholding.

## Discussion

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This is an interesting and important paper. The share of holdings of stock (equity) by households has increased in the 1990s in most continental European countries, bringing it closer in line with the US and the UK. From a narrow perspective, it is important to know what affects households' participation, and how participation may affect household wealth and income distribution over time. In a broader sense, the determinants of household participation can lead to insights into what drives financial market development and functioning and, in turn, highlight desirable policy interventions regarding disclosure rules and on how to educate investors to foster durable participation. Finally, the analysis can shed some light on asset prices behaviour. Was the 1990s run-up in prices a one-time shift triggered by increased households' participation or did asset price changes lead to the increased participation? What are its macroeconomic and general equilibrium effects, and are they relevant to the sharp correction in the early 2000s? Is there now a permanent reduction in the equity premium?

The simple theoretical perspective of the paper is based on the notion that some financial or information costs may deter households from investing in stocks. With a fixed cost, the barrier is higher for lower wealth individuals, and any reform that lowers costs can entice some new class of investors to participate in stock markets. Explaining household investment patterns is complex, however, involving many aspects, including demographics, existing structure of financial markets, asset price behaviour and relative rates of return, financial sector liberalisation, privatisation, role of institutional investors, etc. All these facets are hard to cover well in one paper. An overview paper raises many new questions which can probably only be answered in more detailed work, much of which will have to be more micro-based.

### Facts

The aggregate data of Table 3 are important as they show the trends in each country over time. At the same time, the aggregate data highlight some of the weaknesses of available data, like the large share of 'insurance and technical reserves' for some countries (50% in the UK and 56% in the Netherlands), an odd assets class for households. And some of the increase in the shares of stocks has been due to an increase in stock prices and some due to new flows into stocks (note that the data

stopped in 2000 and thus include much of the run up in prices in the 1990s). A doubling of prices of stocks relative to other asset classes could easily explain the increase in household shares in stocks. It would be interesting to compute explicitly how much of the aggregate shift in shares was due to the large run up in prices during this period (the data underlying the micro-based regression results would allow this, but the authors do not have a panel for all countries). In terms of the overall trends, and the paper acknowledges it, it is useful to stress the potential endogeneity of some of the relationships being analysed. Rates of return, for example, may have been high just because more savings flowed to the stock market. Privatisation may not have been exogenous either as higher prices may have triggered more privatisation, creating possibly a virtuous cycle of higher prices, more liquidity, and greater interest among individuals. And a package of liberalisation and institutional reform lowering costs of accessing stock markets often accompanied waves of privatisation. The reader, aware of these relationships, may wonder what truly exogenous factors ultimately drove the increased interests of households in stock markets.

The aggregate data can provide only limited insights, most importantly as they confound wealth and demographic factors. For this reason, the paper concentrates its empirical analysis on household data. Like the aggregate data, the micro data have limitations. They come from various sources, raising comparability issues, and lack some detail in assets composition for some countries. A major weakness common to many countries is that data on the composition of indirect ownership, that is, through mutual fund and other institutional investor vehicles, are not available. This paper, like others, relies on simple imputation percentages and performs some sensitivity tests. As mutual funds are still relatively small this need not introduce major distortions when comparing shares invested in stocks across countries, but incomplete coverage of indirect ownership through pension fund and other institutional investors is a potentially important issue. Incomplete data on indirect ownership may matter not only because stockownership is imperfectly comparable across countries with differently important pension funds, but also because indirect ownership is not as tightly related to key explanatory variables. Pension funds do not allocate assets according to household characteristics, but individuals may respond to their indirect holdings by altering their direct holdings: if they know that their mandatory funded pension assets are largely invested in stocks, for example, they may choose not to hold stocks directly. Household data that do not account for such indirect assets may therefore lead to misleading comparisons and regressions.

Another data weakness is the lack of a time-series on households' stockholdings for any of the countries. Much of the hypotheses the paper develops, and the qualitative analysis of the paper, relate to changes in household behaviour over the 1990s but only a cross-section analysis of 1998–9 data is performed. Comparisons for a few countries with household data in the late 1980s or early 1990s confirm the general trends, but a future paper might fruitfully paint a dynamic picture at the household level for a particular country where data are available in more detail.

The cross-sectional regressions do not test any specific model, which is wise given the limitations of the data and the many complementary and competing hypotheses, but the results are consistent with the paper's theoretical perspective. The share regressions do, however, suggest that conditional on participation, the shares of stockholding have flat profiles against age, income and wealth. This seems consistent with other empirical work, although it contradicts many theoretical models.

The most interesting results in my opinion are the pooled regressions, though I am left wishing for different techniques (random rather than fixed effects, or weighting to control for different sample sizes) and wondering whether it might be possible to control for some definitional and institutional differences directly rather than through country dummies. When simply pooling all observations, it would be interesting to control for income distribution across all countries, rather than within each country as in the paper's specification. If only the absolute rich (the top quartile across all countries) participate in stocks, as may be theoretically reasonable, in a richer country more households will fall in that quartile, and this could explain in part the country-specific coefficients found. The pooled regression on the shares invested in stocks, conditional on participation, shows that country effects are no longer important, and even household characteristics do not matter much. This result suggests that fixed costs play a key role in determining stockownership patterns, though of course a direct proof of this remains elusive and, as the authors recognise, reverse causality through increased skewness of the wealth distribution as participation rise can explain some of the empirical results.

### **What brought us here**

As regards the determinants of stock market participation, the large cross-country difference in taxation of different financial instruments and the realised rates of return (which may or may not have been expected *ex ante* and may be endogenous to funds inflows) do not fit time and cross-country patterns. Concerns on old age could be another reason for greater participation, but the key factor explored is a lowering of entry costs due to a variety of factors documented in the paper. Of course financial liberalisation, greater supply of securities, and reduced barriers to international investment are not unrelated, and all depend on deeper causes. The one exogenous trend is clearly demographics, at least if uncertain pension liabilities do not affect birth rates. Political economy factors were important in triggering the privatisation wave, though politicians may have endogenously reacted to demographically unsustainable pension liabilities, and the development of European financial services industries. Overall, I am not sure that the underlying common cause of increased participation is the lowering of the perceived costs of or barriers to stockholdings. Rather, the lowering of costs followed from other trends, including the tight public finance and political ideology reasons that led politicians to engage in privatisation. These deeper causes and consequences have some implications. As the wave of privatisation now

may have passed, politicians may be less interested in further lowering costs, and while financial liberalisation will not be reversed easily the speed of future reforms may be slower.

### **Where do we go**

The paper raises a number of issues as to what this increase in household ownership may mean for policy. Some of it has to be speculative, as the trends are recent and the data limited. As regards past experience, I am not sure the increased participation has involved more risk-averse individuals, since the new, less educated entrants may have been less educated, less informed, more subject to being influenced by fads and noise, and more inclined to take more risk. As regards future trends, it remains to be seen whether stock supply (after the end of the privatisation wave) will be sustained by listing of smaller firms; whether equity culture will continue to be fostered by demographic trends, and whether the stock market losses of the early 2000s will lead to exit of some of the new investors.

As regards financial markets regulation, one wonders whether the participation costs of households are one-off, leading to hysteresis effects once they have been paid, or instead whether further efforts to provide useful information are still warranted in the future. Can there be specific forms of regulations that mitigate problems associated with less informed household behaviour? Many countries, for example, are moving to mandatory, funded pension schemes. I wonder what rules should be imposed on switching among funds, whether advertising by such funds should be limited in some way, and more generally whether explicit guidelines should be given to institutional investors in order to match household needs with instruments offered as well as to prevent misbehaviour.

## **Panel discussion**

Marcel Thum wondered whether observed portfolio home bias suffices to imply that national returns matter for stock market participation. Jean-Marie Viaene thought that it would be interesting to know more about the correlation of participation and the business cycle. Jan van Ours remarked that the authors could not control for a lot of factors in the regression analysis. For example, unemployment might matter for stock market participation. Given the limitations of the data, controlling for interactions of the available regressors could be advisable. He agreed with the discussant in thinking that pooled regressions should be weighted by the number of observations, and remarked that an explicit test could be provided for legitimacy of the pooled specification (if pooling is rejected, the estimates of the country-fixed effects are biased, and the analysis should be based on country-specific estimated coefficients).

Christian Dustmann asked for a structural model motivating why education should matter for stock market participation conditioning on income. He conjectured that the more educated might be better informed. He found the coefficients of income and wealth in the regressions hard to interpret because participation and income or wealth are jointly determined. Michael Haliassos replied that structural models cannot be solved analytically and cannot be easily estimated structurally. The authors had chosen to use the mean-variance model because more realistic and complicated portfolio choice models have implications that are at variance with empirical evidence.

Christian Dustmann suggested using panel data for some countries such as the Netherlands to get further insights about which groups of the population participate more in the stock market. Michael Haliassos replied that existing empirical evidence on the Netherlands, by Rob Alessie and Arthur van Soest, is consistent with the results of the presented empirical analysis.

Stefano Scarpetta praised the tremendous effort the authors had undertaken to gather the data. He wondered about the comparability of the data across countries, and thought that lack of significance of country fixed effects conditional on participation might be resulting from the sample becoming more homogenous.

Philip Lane and Thomas Piketty wanted more discussion of intermediation, to disentangle further differences between households and institutional investors. Thomas Piketty added that this would be particularly desirable because direct participation seems to be fairly similar across countries whereas indirect participation is not. He wondered whether there is a large difference between a savings account in a bank that invests in the stock market and indirect stock market participation through a pension fund. Gilles Saint Paul and George de M enil disagreed, and pointed out the large differences in stock market capitalisation in Europe compared with the US. Gilles Saint Paul suggested that these differences might be rooted in differences in risk-attitude across countries. Paul Seabright wondered whether these attitudes are endogenous. He mentioned the example of the UK, which suggests that the increase in stock market participation in the 1980s has changed the preferences for the regulatory environment. The endogenous interactions jointly determine stock market participation, attitudes toward risk and thus preference for the regulatory environment.

Erik Bergl of wondered about irreversible effects of equity culture on the regulatory environment. He referred to the example of Enron and thought that it would be interesting to investigate the political economy of the problem further. Luigi Guiso agreed that political implications of stock market participation are important. He stressed that the paper puts forward an explanation for differences in participation: participation costs can explain differences in stock market participation across countries, within countries and over time. Although proxies for the participation costs need to be used, the empirical evidence is consistent with this simple story.

Anders Christensen remarked that the quality of information provided by market analysts is generally poor. Hence, stock market participants should be educated and informed about conflicts of interest by financial advisors. George de M enil added that

it would be hard to get managers to tell the public that portfolios mimicking stock market indices often outperform managed mutual funds.

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