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Abstract

This paper examines the influence of both trust and sociability on stock market participation and their implications for international differences in stockholding. Using data from the Survey of Health, Ageing and Retirement in Europe supplemented with information on regional trust from the World Value Survey, we assess the extent to which prevailing trust in the region of residence and household involvement in social activities affect stockholding behavior across ten European countries. We show that trust and sociability have distinct and sizeable effects on stock market participation. We find that more sociable households and those living in areas with higher trust are more likely to invest in stocks. Probing further into various groups of households, we find that sociability can induce stockholding among the less well off in Sweden, Denmark and Switzerland where stock market participation is widespread. On the other hand, the effect of trust is strong in countries with limited participation and low average trust like Austria, Spain and Italy, offering an explanation for the remarkably low participation rates of the wealthy living therein.

JEL classification: A13, D12, D8, G11

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1. Introduction

Literature on the implications of various aspects of social capital on household portfolio decisions has rapidly developed. Guiso, Sapienza and Zingales (2004) show that Italian households tend to invest higher amounts in financial assets and to make less use of informal credit when they live in regions with high blood donation, electoral participation and trust rates. Recently, Guiso, Sapienza and Zingales (2008, henceforth GSZ) have examined the effects of trust on stock market participation. They use Dutch and Italian survey data with information on an individual-specific measure of perceived trust to assess its impact on stockholding. GSZ also associate differences in stock market participation across countries with variation in aggregate levels of trust by regressing the share of stockholders in each country on the average levels of trust and few other country-wide indicators (quality of legal enforcement and existence of a common law system). On the other hand, Hong, Kubik and Stein (2004, henceforth HKS), in an influential paper, provide evidence that sociability, as proxied by relationships with neighbors and church visits, fosters stock market participation. They mainly attribute this effect to the lower participation costs through the word-of-mouth information sharing that the more sociable individuals face. As these authors stress: “While the social-capital variables used by Guiso et al. (2004) are obviously quite different from our social-interaction proxies, one might stretch and argue that our results reflect a similar kind of social-capital mechanism.[...] Although it is hard for us to address this hypothesis fully with our data, we can take a small step by looking at the effect of our social interaction variables on checking account use”. HKS derive an insignificant effect of social interaction indicators on current account ownership that points to a distinct role of sociability from other particular aspects of social capital like trust.

Trust and sociability might be positively correlated but affect stock market participation via two different channels. Sociability serves to reduce fixed participation costs through cheaper information sharing. Mistrust tends to lower the expected return from an investment given that individuals need to take into account the possibility that a contract will not be respected by the counterpart. As it will be shown later the two make independent contributions when we extend the standard portfolio model of GSZ that takes into account mistrust to incorporate sociability coherently with HKS. The discrete

role of trust and sociability is also supported by literature on social capital that will be reviewed in the next section.

The key motivation of our study is to examine under the same model the contributions of trust and sociability on stockholding and evaluate the possible implications for observed differences in households' investment behavior across European countries. To this end we use internationally comparable survey data with information on household sociability and asset holdings, supplemented with information on trust prevailing in each region. A noteworthy observation that one can make out of these data is that while households' median net wealth holdings are roughly comparable across European countries in the sample, stock market participation rates exhibit remarkable differences. For example, in countries with widespread stock market participation (Sweden, Denmark and Switzerland) households with below median wealth exhibit twice as high participation rates relative to their more than median wealth counterparts in low participation countries (Austria, Spain and Italy).

As our study compares to HKS it takes into account, apart from sociability, the trust levels that households experience in the region they reside. With reference to GSZ we extend their cross country investigation on the relevance of trust for aggregate stockholding to the household level by using internationally comparable survey data and exploiting within-country variation in trust levels. In comparison to the part of their analysis that investigates individuals' perceived trust in stockholding decisions within a given country, we allow for an independent role of sociability and we use a contextual rather than an individual-specific measure of trust.

This paper contributes to the existing literature in the following ways. First, it shows that trust and sociability have distinct effects on stockholding and that their relative contribution changes with household wealth holdings as well as with average stock market participation rates and trust levels in the country. Second, it offers novel evidence on international differences in stockholding due to the regional variation in prevailing trust and household heterogeneity in sociability. The issue can be of interest to policy makers who wish to promote stockholding within specific groups of households and to evaluate the prospects of an integrated stock market where all Europeans can trade their stocks.

We use data from the Survey on Health, Ageing and Retirement in Europe (SHARE), that interviews households aged 50 and above across eleven countries. We supplement them with information on trust at regional level that we recover from the World Values Survey (WVS), a cross national survey on values and norms. SHARE data represent a rich source of information on various demographics and asset holdings and contain a series of questions about households' social behavior (participation in voluntary activities, in educational training courses, in sport and political clubs and so on). We use answers to these questions to construct an individualized measure of sociability. WVS asks households whether they think other people should be trusted or not. This information allows us to compute the fraction of people who trust in each region in a given country and subsequently assign this to SHARE respondents who live in the same region. In the same way we supplement SHARE data with information recovered from various aggregate data sources on regional GDP growth rates and participation in EU elections that allows us to perform a number of robustness checks.

We estimate net positive effects of both our trust and sociability indicators on stock market participation. We find that more sociable households are more likely to invest in stocks compared to their less sociable counterparts and this effect is stronger in countries with widespread stock market participation. We also estimate independent positive effects on stockholding due to regional variation in trust levels. In particular, households residing in an area where higher levels of trust prevail are more prone to invest in stocks and this effect is net of the role of sociability and country differences in institutional and macro wide factors that are captured by the country dummies in our model. These effects are particularly strong in countries that have low stock market participation rates and relatively low average trust. For example, we find that if a household living in a low trust region in Austria, Spain and Italy moves to a region of higher trust in these countries can increase, other things equal, by 5 percentage points its probabilities to invest in stocks. We show that this effect primarily concerns the wealthy households in the aforementioned countries offering a possible explanation for the remarkably low participation rates among the better off that live therein. On the other hand, an increase in trust does not contribute to higher stockholding in countries where stock market participation is widespread and average trust level is high, like in Sweden,

Denmark and Switzerland. Yet, higher sociability in these countries can foster direct stock market participation among the less wealthy households.

The rest of the paper is organized as follows. Section 2 reviews the existing literature and provides the theoretical justification in treating trust and sociability as distinct concepts. Section 3 presents the implications of considering both mistrust and sociability in a standard portfolio model. In section 4 we provide details on the data at hand and we present related descriptive statistics. Section 5 discusses the econometric specification, and section 6 reports the results. Section 7 offers concluding remarks.

2. Trust and Sociability in the Existing Literature

Trust and sociability are recurrent concepts in the social capital literature, both in Sociology and in Economics. Durlauf and Fafchamps (2004), after reviewing various definitions of social capital and several related empirical studies, distinguished three common features: “(a) Social capital generates positive externalities for members of a group; (b) these externalities are achieved thanks to shared trust, norms and values and their effect on expectations and behavior; and (c) shared trust, norms and values arise from informal organizations based on social network and associations.” Thus, it is difficult to reduce social capital to a single definition, and it is quite common in empirical applications to focus on particular and measurable aspects of social capital. Islam, Merlo, Kawachi, Lindström and Gerdtham (2006) proposed a distinction into “cognitive” and “structural” social capital which is coherent with Durlauf and Fafchamps (2004) observations: the former is operationalized into people’s perceptions about the level of interpersonal trust, sharing and reciprocity; the latter regards the density of social networks, or patterns of civic engagements. Granovetter (1978) proposed to distinguish between “strong” and “weak” ties: his claim, confirmed by several follow-up empirical validations, is that in order to take an economic decision (searching for a job in the original paper) a single link with someone outside the restricted network of relatives and close friends may be more valuable than a dense but isolated set of relations¹, i.e. what

¹ Such a distinction resembles the one between “bridging” and “bonding” social capital, proposed by Putnam (2000). “Bonding” social capital refers to the relationships within homogenous groups, i.e. the links within a family, among relatives or close friends. “Bridging” social capital refers to the ties among

matters are “weak” ties as contrasted to “strong” ties. With reference to our analysis, the cognitive/structural distinction provides a well-grounded sociological motivation to investigate the potentially distinct contributions of trust and sociability on stockholding, while the importance of “weak” ties will help us to choose proper measures both for trust and sociability.

We now turn to the economic rationale behind the association of trust and sociability with stock market participation. In a nutshell, *ceteris paribus* sociability induces participation because it facilitates information gathering and thus reduces information asymmetries and fixed entry costs. On the other hand, mistrust reduces the expected utility of an investment in stocks, given that individuals have to discount the expected return in order to take into account the possibility that a contract would not be respected by the counterpart. Thus, mistrust relates to non market risk. As GSZ point out, contract enforceability and information asymmetries both contribute to participation costs and thus they are interrelated. For example, if mistrust is deeply rooted in a society, individuals will tend to disregard any information as unreliable; on the other hand, a better informed individual needs to rely less on trust on others in order to take decisions regarding her investments.

Guiso, Sapienza and Zingales (2004) state that financial agreements require the investor to trust the issuer, or alternatively an adequate level of transparency: the buyer must believe that the asset issuer i.e. the financial institution or the Government, will be able to repay the agreed-upon yield in the future; she must also be sure that the contract that she is writing is enforceable and covers all the relevant contingencies; moreover she should believe that in case of a litigation the attorney fees are bearable and the judicial process is fair and fast; last but not least, a potential investor must be confident that the issuer is not hiding any relevant information about the fundamentals driving the asset price. Those conditions can be guaranteed by an appropriate set of securities laws: as emphasized by La Porta, Florencio and Shleifer (2006) cross country differences in disclosure requirements, liability standards and sanctions’ enforceability are powerful predictors of financial development. According to the famous result of Coase (1960),

those who belong to different ethnic or religious groups, or among individuals with different educational and occupational background.

public intervention is not needed if bargaining between the issuer and the investor is close to be frictionless: in a high-trust society informal agreement may substitute for costly contracts, litigations are less frequent, costs to protect from property rights violations are lower and institutions, both private and public, are likely to be perceived as more credible. Knack and Keefer (1997) formalize this idea and define trust in terms of beliefs in a game theoretic framework: “[Trust is] the fraction of people in a society who expect that most others will act cooperatively in a prisoner’s dilemma context”. Based on such a definition, they claim economic activities that rely on future actions of others are accomplished at a lower cost in a high-trust society.

As regards the choice of a measure for trust, the significance of “weak” ties induces us to focus on “generalized” trust, i.e. the perceived probability of not being cheated by banks, financial intermediaries, companies and institutions in general, rather than to deal with “specific” trust, i.e. trust on people one has close and repeated interactions with.² Following Knack and Keefer (1997) we stress the “contextual” nature of trust, according to which trust is a feature of the community an individual lives in. What matters in their definition is the fraction of people an individual expects to behave cooperatively. The intuition is that a given individual may be trustworthy towards his peers, but this feeling must be reciprocated by other members and institutions in order to be fruitful. Thus, trust is determined by the aggregate perceptions of all the members, while single individuals are “trust-takers”, meaning that no one can modify the overall level of trust perceived in a community. We then measure the level of trust for individual i as the proportion of people in the region of residence of i who report to trust the others: this is a common approach to measuring generalized trust and it has been used by Guiso, Sapienza and Zingales (2004), Knack and Keefer (1997) and by Rostila (2008) to assess the impact of trust on portfolio decisions, economic growth and health respectively, just to mention three studies with economic applications.

There is a rapidly growing literature on networks employing game-theoretic modeling techniques. Jackson (2006) reviews the recent advances in this literature focusing mainly on the role of social interactions in determining human behavior and

² The distinction between specific and generalized trust is made by both Knack and Keefer (1997) and GSZ.

economic outcomes.³ Particularly relevant to our study is the author’s statement that “the most obvious and perhaps pervasive role of networks is as a conduit of information”. In the context of household investment decisions, social interactions serve as a mean of “word-of-mouth” information diffusion, or of observational learning (HKS). For example, a prospective investor may learn from friends or acquaintances about high-return stocks or how to manage stocks efficiently. “Weak” ties are again what really matters: as HKS point out, if all the people an individual interacts with do not invest in the stock market, social networks do not provide any useful information for investing in stocks. Therefore, “sociability” in our context is a measure of interactions with reliable and potentially informative acquaintances that do not necessarily belong to the family and close friends circle: we chose associational participation, i.e. an index based on survey questions on participation in political parties, sport and cultural clubs, charities and similar activities. This measure, quite popular in the sociology literature (see Granovetter, 1983 and Putman, Leonardi and Nanetti, 1993) has been used by HKS in order to assess the role of social interactions on stock market participation.⁴

3. Trust and Sociability in a Standard Portfolio Model

In order to illustrate in an analytical framework the different roles of trust and sociability, we employ the portfolio model presented by GSZ and we extend it in order to account for sociability in a way coherent with HKS. There are two assets available to investors: a safe asset, which yields return r_f , and a risky asset with an uncertain return $E[r] = \tilde{r} > r_f$. Given an initial wealth W , an individual who invests a positive share of her wealth α in the stock market maximizes the following expected utility function:

$$\max_{\alpha} EU[\alpha\tilde{r}W + (1-\alpha)r_fW] \tag{1}$$

³ There is also a growing literature of peer group effects on various economic decisions. See for example the works of Madrian and Shea (2001) and Duflo and Saez (2002) who show that individuals’ decisions about their retirement investment plans are influenced by the choices of their working colleagues.

⁴ Measures of network centrality as in Calvó-Armengol, Patacchini and Zenou (2005) or network density as in Vega-Redondo (1996), which are usually preferred in economics due to their theoretical link to network theory, do not fit in our setup given that they measure characteristics of strong-ties networks.

Therefore, she will choose to participate in the stock market (i.e., $\alpha > 0$) if

$$EU[\alpha\tilde{r}W + (1-\alpha)r_fW] \geq U[r_fW] \quad (2)$$

Now we assume that there are also non market sources of risk: the stock investment can become worthless if the investor has bought stocks of a firm that defaults, if the contract signed is not enforceable (e.g. because the intermediary goes bankrupt or the broker runs away with money) or if costs are unbearable in case of litigation. Thus, there is a probability p , independent from the probability distribution of the risky asset return, that the value of the investment (initial capital and interest) goes to zero. In the previous section we defined trust as a characteristic of the community an individual is part of. Thus, p is a function of trust that we treat as a characteristic common to individuals living in the same area⁵: it serves as a discount factor that a potential investor applies to her utility function and it is due to the trust prevailing in the area she lives in. It should be noted that we operate in a partial equilibrium framework: individuals are “trust takers” i.e. each of them behave as her choice had no effect on the equilibrium level of p . The new participation condition is then

$$(1-p)EU[\alpha\tilde{r}W + (1-\alpha)r_fW] + pU[(1-\alpha)r_fW] \geq U[r_fW] \quad (3)$$

Similarly to GSZ, we introduce a fixed cost of participation f : if individual i decides to enter the stock market, she has to pay a sunk cost and then allocate the remaining $W-f$ to the safe and the risky asset. At the same time, she can decide not to invest in the market: in this case she will not incur in the sunk cost. The participation condition then becomes

$$(1-p)EU[\alpha\tilde{r}(W-f) + (1-\alpha)r_f(W-f)] + pU[(1-\alpha)r_f(W-f)] \geq U[r_fW] \quad (4)$$

Such a formulation is coherent with the definition of information cost given by Merton (1987). The author distinguishes different types of information-related costs, and he

⁵ GSZ consider p as individual-specific.

states that the first one a potential investor faces is the fixed cost needed to be aware about the existence of a stock: even if every individual understand perfectly how the market works and is able to correctly evaluate stock returns, the fixed cost will cause a subset of them not to invest just because they are not aware of the existence of a given security. Compared to (3) the fixed cost reduces only the left hand side of the inequality (4), for each (mis)trust level represented by p the introduction of f reduces participation.

Sociability allows individuals to reduce the fixed participation costs through cheaper information sharing and effectively augments the disposable wealth, that in turn induces participation: following HKS we assume that the fixed participation cost for an individual can be specified as follows:

$$f = f(\pi) \text{ where } f(0) = \bar{f}, df(\pi)/d\pi < 0, \lim_{\pi \rightarrow \infty} f = \underline{f} \text{ where } \underline{f} \geq 0 \quad (5)$$

f is bounded between \underline{f} and \bar{f} and it is decreasing in π , the number of people who invest in stocks among individual's i acquaintances. This is consistent with the notion that the cost of participation for an individual is reduced when more of her peers participate: as already explained, the network serves as a mean of word-of-mouth information diffusion. A sociable individual is more likely to meet people who have invested in the stock market and thus can convey valuable information about stockholding. Note that π represents the total number of peers who participate, and not the fraction of people who participate: a more sociable individual, even if she takes part to activities that are not directly related to asset management is likely to meet a larger number of people who participate in the stock market than her non-sociable counterparts. Therefore, in a full model that includes both trust and sociability each individual chooses α in order to maximize her expected utility conditional on trust, sociability, wealth and rates of return.

$$\max_{\alpha} EU[\alpha | p, \pi, r_f, \tilde{r}, W]$$

$$\text{where } EU[\alpha] = \begin{cases} (1-p)EU[\alpha\tilde{r}(W-f(\pi))+(1-\alpha)r_f(W-f(\pi))] + & \text{if } \alpha > 0 \\ pU[(1-\alpha)r_f(W-f(\pi))] & \\ U[r_f W] & \text{if } \alpha = 0 \end{cases} \quad (6)$$

Then, the participation condition is written as:

$$(1-p)EU[\alpha\tilde{r}(W-f(\pi))+(1-\alpha)r_f(W-f(\pi))] + pU[(1-\alpha)r_f(W-f(\pi))] \geq U[r_f W] \quad (7)$$

Given that market risk is treated as in standard portfolio models and the introduction of trust and sociability neither affects the properties of the utility function nor the distribution of risky return \tilde{r} , we can abstract from market risk and redefine equation (7) in terms of \hat{r} , the certainty equivalent of \tilde{r} :

$$(1-p)U[\alpha\hat{r}(W-f(\pi))+(1-\alpha)r_f(W-f(\pi))] + pU[(1-\alpha)r_f(W-f(\pi))] \geq U[r_f W] \quad (8)$$

The main difference from GSZ model is the fact that the participation costs f are no longer constant but decreasing in sociability π : more sociable individuals dispose of a higher wealth endowment to invest in the market. More formally, the first empirical implication of the model is that for any value of p , the left hand side of (8) is monotonically increasing in disposable wealth $(W-f(\pi))$ and thus it is monotonically increasing in π . Consequently, probability of participation (i.e. when condition (8) is satisfied) is increasing in π given the level of trust $(1-p)$.

The second empirical implication of the model derives from a slight modification of theorem 3 of GSZ. Let's define $A = \alpha\hat{r}(W-f) + (1-\alpha)r_f(W-f(\underline{\pi}))$ and $B = (1-\alpha)r_f(W-f(\underline{\pi}))$. Then, since we assumed that there is a market risk premium (i.e. $\hat{r} > r_f$),

$$[\alpha\hat{r}(W-f(\pi))+(1-\alpha)r_f(W-f(\pi))] > U[(1-\alpha)r_f(W-f(\pi))] \quad (9)$$

Therefore, for a given π , $pU[A]+(1-p)U[B]$ is decreasing in p : the probability of participation is increasing in the level of trust $(1-p)$.

The above suggest that trust and sociability can have distinct effects on stock market participation when the standard portfolio model of GSZ that takes into account trust is extended to incorporate sociability coherently with HKS. This is not the only implication we can obtain from the ‘extended’ model: the left hand side of equation (8) is a linear combination of continuous utility functions, thus if there exists a solution α^* to the maximization problem with $p>0$ and $0 < \pi < \infty$, then it must exist a triplet $(W=\underline{W}, p = \bar{p}, \pi = \underline{\pi})$ such that (8) holds with equality:

$$(1 - \bar{p})U[\alpha\hat{r}(\underline{W} - f(\underline{\pi})) + (1 - \alpha)r_f(\underline{W} - f(\underline{\pi}))] + \bar{p}U[(1 - \alpha)r_f(\underline{W} - f(\underline{\pi}))] = U[r_f \underline{W}] \quad (10)$$

Equation (10) implies that there exists a minimum value of wealth \underline{W} , a maximum value of mis-trust \bar{p} and a minimum value of sociability $\underline{\pi}$ for which a potential investor is indifferent between paying the fixed cost upfront and investing a fraction α (such that $0 < \alpha \leq \alpha^*$) of the disposable wealth $W-f$ in stocks on the one hand, and staying out of the market avoiding the fixed cost and investing all her wealth W in the safe asset on the other hand. We can now study the interrelationship among \bar{p} , $\underline{\pi}$ and \underline{W} , the values of (mis)trust, sociability and wealth that trigger participation. Provided that the utility function is well behaved, the following proposition holds:

Proposition 1: Given $\alpha > 0$ and $W=\underline{W}$, the level of trust $(1-\bar{p})$ and the minimum sociability level $\underline{\pi}$ which trigger participation are inversely related.

This is proved in appendix I using the implicit function theorem. Moreover, once sociability is fixed, proposition 4 by GSZ holds: “for any probability [...] p there exists a wealth threshold $W(p)$ that triggers participation and $W(p)$ is increasing on p ”⁶.

⁶ For a formal proof refer to appendix I and to GSZ.

Based on the above, we perform a series of comparative statics exercises and the implications we draw can be summarized as follows:

- i. As HKS suggest, in areas where a minority of people hold stocks even the sociable individuals will have few informative acquaintances that can induce stockholding i.e. π is likely to correlate with the average level of stockholding. The same applies to our setup: given trust p and wealth W , the probability of participation is higher in high stockholding countries rather than in low stockholding countries.
- ii. Given α^* and π , the higher wealth is the lower is the trust threshold $(1 - \bar{p})$ that triggers participation, and vice versa. Thus, among the wealthy, even in low trust communities a marginal increase in trust can induce participation.
- iii. Given α^* and wealth W , a reduction in trust $(1 - p)$ can be counterbalanced by an increase in sociability π and vice versa.

In our empirical investigation we find evidence in favor of i and ii. As regards iii, our findings based on the pooled sample of countries suggest that sociability has a stronger effect on stockholding in low trust regions compared to its effect in high trust regions. Yet, the intensity of the relative effects of trust and sociability varies across different countries or groups of households (e.g. sociability is more effective in countries with high stockownership; trust can be more relevant for the wealthy). Thus, we attempt to assess empirically their relative impact on stockholding by examining various population subgroups.

4. Data sources and descriptive statistics

We use data from the first wave of SHARE which took place in 2004.⁷ SHARE is a multi-disciplinary, cross-national survey that is representative to the population aged 50 and over. The first wave involved eleven European countries, namely Sweden (SE),

⁷ This paper uses data from SHARE 2004 wave 1, release 2.0.1. SHARE data collection in 2004-2007 was primarily funded by the European Commission through its 5th and 6th framework programmes (project numbers QLK6-CT-2001- 00360; RII-CT- 2006-062193; CIT5-CT-2005-028857). Additional funding by the US National Institute on Aging (grant numbers U01 AG09740-13S2; P01 AG005842; P01 AG08291; P30 AG12815; Y1-AG-4553-01; OGHA 04-064; R21 AG025169) as well as by various national sources is gratefully acknowledged (see <http://www.share-project.org> for a full list of funding institutions).

Denmark (DK), Germany (DE), the Netherlands (NL), Belgium (BE), France (FR), Switzerland (CH), Austria (AT), Italy (IT), Spain (ES) and Greece⁸. The unit of analysis is the household, given that most of the asset questions are asked at household level.⁹ The common design of the survey has enabled international comparisons of household wealth holdings (see Christelis, Georgarakos and Haliassos, 2008).

SHARE contains all the necessary information to construct a sociability indicator similar to the one proposed by HKS: a household is classified as sociable if at least one of the partners took part to one (or more) of the following social activities the month preceding the interview: voluntary or charity work; educational or training course; a sport, social or other kind of club; political or community organization.¹⁰

The measure for trust is obtained from the WVS using the same question that GSZ employ to calculate country wide trust rates. WVS is a collection of surveys across more than 60 countries that provide information about social norms and peoples' beliefs.¹¹ Respondents are asked the following question:

“Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”

1. 'Most people can be trusted'

0. 'Can't be too careful'

In both SHARE and WVS we know the area of residence of respondents. Thus, we first calculate region-level averages based on responses to the above trust indicator from WVS and then assign the relevant average to every SHARE respondent who lives in the same region. It should be noted that the regional average trust is computed over the

⁸ Greece is not included in the analysis due to difficulties in merging with WVS data. More details on data issues are provided in appendix II.

⁹ The raw data consist of about 17,000 households, either couples or singles. We exclude households with non-responding partners.

¹⁰ The survey also asks about participation in activities organized by religious organizations. However, in some countries, due to differences in translation, the question was asked with reference to participation in church services. Given the inconsistent way that this question was asked, we do not consider it in the list of the social activities.

¹¹ We used the European and World Values Surveys four-wave integrated data file, 1981-2004, v.20060423, 2006. Surveys designed and executed by the European Values Study Group and World Values Survey Association. File Producers: ASEP/JDS, Madrid, Spain and Tilburg University, Tilburg, the Netherlands. File Distributors: ASEP/JDS and GESIS, Cologne, Germany.

sample of all adults in WVS, and it is not restricted to those aged 50 and above. This is consistent with the contextual nature of our trust indicator: a more than 50 years old individual (represented in the SHARE sample) interacts with adults of any age in her area of residence. Therefore, merging the two datasets allows us to employ a trust indicator that is fully coherent with the characterization of the trust concept discussed in Section 2.¹² In the same way we supplement SHARE data with information on regional GDP growth rates and participation in EU elections that we employ in a number of robustness checks.¹³

The different nature of our trust and sociability indicators (contextual versus household-specific) implies a different interpretation of an assumed “marginal increase” in the underlying variables. As regards the former, the hypothetical experiment corresponds to moving an individual, given her characteristics, from an area with trust equal to the country-wide average into another area with relatively higher trust. For sociability, the comparison is between an individual who is engaged in social activities and her non-social counterpart living in a region with the same prevailing trust.

Our analysis mainly focuses on households’ decision to participate directly in the stock market. SHARE offers straight information on direct stock ownership that enables international comparisons, abstracting from country differences in the availability of financial products that allow indirect investments in stocks. It also makes possible comparisons with GSZ who examine the association between average trust rates and the fraction of individuals owning stocks directly across countries. SHARE asks households who own mutual funds whether they are mostly invested in stocks, bonds or split between the two. Based on this information we have constructed a proxy of indirect stockholding by classifying each mutual fund holder as a stock owner. In section 6.2, apart from our baseline findings on direct stockholding, we discuss the quantitative implications of our trust and sociability indicators with respect to this broader form of stockholding across various groups of households.

Figure 1 reports ownership rates of directly held stocks by country. It is immediately evident that there is significant variation across Europe: more than one out

¹² As a robustness check, we have experimented with regional trust averages computed across WVS respondents more than 40 and 50 years old and the results are qualitatively similar to those we report.

¹³ More details about the data sources and the construction of the trust measure can be found in appendix II.

of three Swedish and Danish households invest in stocks directly, while this fraction goes down to 5% in Spain. Figure 2 illustrates country averages of sociability and trust. The two measures, display considerable heterogeneity across countries and there is not an obvious trend that suggests some systematic relationship between the two.

Figure 3 uses a map to depict differences in regional trust levels across Europe. Areas are divided into 6 classes: the light blue regions have an average trust below 20%, while in the darkest ones trust rates exceed 60% (each class in between has a 10% range). Trust levels display a significant within-country variation.¹⁴

5. Econometric Specification

Household portfolio decisions have recently received considerable attention (for an extensive discussion on all major developments in household finance see Campbell, 2006). In this context, special attention has been paid to the factors that influence investments in stocks. This is also due to the puzzling behavior of many households who do not participate in the stock market despite the existence of a historical equity premium that in the US is of the order of 6 percentage points (Mankiw and Zeldes, 1991, Haliassos and Bertaut, 1995).

We examine household participation in direct stockholding by estimating probit models that condition on a rich array of characteristics described below. Given that our measure of trust is regional invariant, the estimated standard errors are corrected for clustering at regional level (see Moulton, 1990). In addition, we take into account the fact that missing values have been imputed in SHARE using a multiple imputation method. To this end, we perform the estimation and compute standard errors corrected for clustering within each implicate, and then combine the estimates and standard errors across implicates using the rules described in Rubin (1987). The estimated coefficients from binary choice models are not directly interpretable, thus we calculate and report marginal effects averaged across individuals using survey weights.

All our specifications control apart from sociability and trust indicators (the construction of which has been already discussed) for a rich set of household

¹⁴ Such heterogeneity has been justified for Italy in the seminal work of Putnam (1993).

demographic and pecuniary characteristics. More specifically, we take into account a broad set of demographics like age, gender, marital status, and the number of children. Given that bequest planning can affect portfolio allocations we condition on the self-reported probability to leave a sizeable bequest.

We take into account labor status by distinguishing among those working, retired and unemployed. In addition, we allow for an independent role of resources including separate controls for net wealth and income through an inverse hyperbolic sine transformation that allows for non-linear effects of these variables (see Burbidge, Magee, and Robb, 1988). Controlling for resources is dictated both by theory, with its emphasis on ‘cash on hand’ as a key determinant of asset investments, and by the need to avoid confounding the role of other determinants with that of wealth, when the latter is not controlled for in the regression.¹⁵

Households with health problems are discouraged from investing in stocks according to Rosen and Wu (2004). To take into account the effect of adverse health conditions we account for a subjective (self-reported health) and for an objective (number of limitations in activities of daily living - ADL) health indicator. Christelis, Jappelli and Padula (2008) using SHARE data have found a significant role of cognitive abilities for stockholding. In our specification we include their cognitive indicator, namely the respondents’ ability to recall words correctly out of a list that is read to them by the interviewer. On top of cognitive indicators we control for depression as a measure of pessimism.¹⁶

Finally, we include country dummies to capture country-specific factors that may affect stockholding. Country dummies can account for cross country differences in the level of financial development, in legal environment, in market transparency as well as in companies’ failure risks. Country dummies will also capture differences in the average levels of trust across countries. This implies that our trust indicator which measures

¹⁵ In each specification we exclude from total net wealth the value of the asset in question in order to avoid endogeneity issues.

¹⁶ Characteristics in the case of couples represent a combination of the information from the two partners. In particular we use average age, worse reported health status, total number of limitations in daily activities and the maximum of: educational level, recall abilities and depression. Furthermore, the household is determined to be in the labor force if any of the two partners is working.

differences in the regional levels of trust represents a conservative estimate of the overall effect of trust on stockholding.¹⁷

6. Empirical results

In what follows we first discuss empirical results from regressions on the full sample at hand as well as from a series of robustness checks that examine the sensitivity of our baseline findings. Next we examine the relative contribution of trust and sociability to stockholding across countries with different participation rates and households with different wealth holdings.

6.1. The Effects of Trust and Sociability on Stock market Participation

We estimate a series of probit regressions that model the probability of direct stocks investments as a function of a broad set of household socioeconomic characteristics and of combinations of our trust and sociability indicators. Marginal effects are presented in Table 1. In specification 1 we control for trust without taking into account the influence of sociability and vice versa in specification 2. In specification 3 we control for both, while in specification 4 marginal effects have been computed from a model that includes an interaction term between trust and sociability.¹⁸

Marginal effects from the above specifications suggest an independent and economically important role for trust and sociability and they are also precisely estimated. More social households are 3.1 percentage points (pp) more likely to invest in stocks and this effect remains unchanged when regional trust is taken into account (it slightly increases to 3.6 pp when interactions with trust are allowed). On the other hand, living in a region where a higher fraction of people trust (we assume a 15 pp increase in regional trust which roughly corresponds to one standard deviation of this variable) is associated with a 2.1 pp increase in the probability to own stocks directly. The above effects are net of various demographics, household resources and country wide

¹⁷ Given that country dummies absorb average cross-country differences in trust, our indicator can be also interpreted as measuring deviations in regional levels of trust from the country average.

¹⁸ Brambor, Clark and Golder (2005) point to frequent problems in empirical literature due to misspecification of models that include interaction terms and to the calculation of meaningless marginal effects. We follow their notion in calculating marginal effects for the two indicators of interest.

differences and are economically important given that the average participation rate in our sample does not exceed 13%.

Based on specification 4 that allows for an interaction between our trust and sociability indicators we have also calculated the marginal effect of sociability within low and high trust regions.¹⁹ In low trust regions sociability increases by 5.1 pp (s.e. .01) the probability to invest in stocks, while in high trust regions by 3.4 pp (s.e. .007). This suggests that sociability can partly balance the negative effects on stockholding that are associated with living in a low trust region. Yet, the relative contribution of trust and sociability will be examined in detail in the next section where we investigate the stockholding choices across specific groups of countries and households.

The estimated effects on other covariates (education, health, financial resources, recall ability) display the expected signs and are in line with findings from existing literature on determinants of stockholding behavior. Effects of country dummies that capture country wide differences, are sizeable and consistent with patterns of stock holding rates across countries suggested by summary statistics.²⁰

In Table 2 we present marginal effects from various probit regressions in order to examine the sensitivity of our findings on trust and sociability. To ease comparisons specification 1 in Table 1 repeats estimated marginal effects from our baseline model that controls for both sociability and trust (specification 3, Table 1). We first examine the possibility that our regional-based trust indicator reflects regional differences in development. Our baseline model already controls for ppp-adjusted income, financial and real wealth per household and has taken into account average country differences in development through the country dummies. Yet, it may be argued that regional differences in development rates are not fully captured and are partly picked up by our measure of trust. To rule out such a possibility we computed annual GDP growth rate between 2000 and 2004 by region and we include it as an additional regressor. This inclusion does not alter our findings on trust. The implied effect of regional differences in GDP growth rates, net of ppp-adjusted household resources and average cross-country

¹⁹ We define as low (high) trust regions those where the fraction of people who trust the others is below (above) 24% (37%). These roughly correspond to the bottom and the top quartile of the distribution of regional trust rates.

²⁰ Country marginal effects are in comparison with Germany.

differences in development, is negative. This may suggest that the fast development of some European regions the five years preceding the survey was not accompanied by an increase in household investment in stocks.

Due to data limitations our baseline specification does not include any control on households' attitudes towards risk and our estimates on trust and sociability may partly reflect such omitted information. The relevant information is surveyed in the 2006 SHARE wave for the first time and given the panel nature of the survey we retrospectively assign it to households interviewed in 2004.²¹ Then in our baseline specification we include a dummy variable representing households who are willing to assume more than average financial risks in anticipation of higher returns. The estimated effect on this dummy has the expected sign, it is very precisely estimated and suggests a sizeable impact. Yet, our estimated effects on trust and sociability remain unaffected when households' risk attitudes are taken into account. Next, in specification 4 we control for both regional GDP growth rates and households' willingness to assume more than average financial risks and the results remain unchanged.

Results from Table 1 already suggest that including both indicators on trust and sociability under the same specification does not alter their magnitude and significance. Although the two appear quite independent it may be argued that our measure of trust partly reflects regional differences in sociability rather than an underlying social capital mechanism. As a first check, we use our sociability dummy to calculate the fraction of sociable households in the region that a household lives. We add this regional sociability indicator in our baseline specification as an independent regressor and its estimated coefficient (not reported), whether we controlled for regional trust or not, was always insignificant. Moreover, the inclusion of this indicator did not affect the significance of the variables of interest.

As an additional robustness check we also experiment with a completely different indicator of social capital. If indeed sociability affects stockholding through an independent channel then it should not be affected by the use of an alternative social capital indicator, while the latter should have an independent positive influence on

²¹ The variable takes the value 1 if one of the partners in the households reports to be risk averse. Due to attrition between the two waves our sample drops to 9,919 observations.

stockholding. In particular, we use information on voters' participation in 2004 EU elections by region that represents a broader - compared to trust - indicator of social capital.²² Results are shown in specification 5 of Table 2. Living in a region where a higher share of people participate in voting (we assume a 20 pp increase in participation rates which roughly corresponds to one standard deviation of this variable) implies a 4.7 pp increase to the probability of holding stocks directly. Notably the effect of sociability remains unchanged.

The above results provide us with confidence that trust and sociability have quite distinct and significant influence on stockholding behavior. However, their relative importance may vary across different groups of countries and/or households. We probe further into the relative contributions of trust and sociability in stockholding across various groups of households in the following section.

6.2. The effects of Trust and Sociability across Countries with Different Participation rates and Households with Different Wealth holdings

As we pointed out in section 2.1, sociability acts as a word-of-mouth information transmission mechanism. A sociable household is more likely - other things equal - to acquire information about properties and efficient management of stocks in areas where a critical mass of people has invested in the stock market.²³ Thus, we anticipate sociability to have a stronger impact on stockholding in countries with higher participation rates. HKS find supporting evidence for this premise by estimating the effects of their sociability indicators in US states with low, medium and high participation rates. We examine this notion across European countries with different participation rates and by taking into account the influence of trust. The group of high participation countries consists of Sweden, Denmark and Switzerland where more than 25% of households have invested in stocks directly. At the other extreme, we consider Austria, Spain and Italy where participation rates are about 5%. France, Germany, Netherlands and Belgium

²² For Switzerland regional participation rates in 2003 national elections are considered.

²³ Sociability is exogenous to stock market participation, as long as we assume that a stockholder does not decide to participate in social activities in order to acquire information about the stock market. Given the type of activities we consider (going to the gym, taking part to activities organized by the community, political organizations, doing charity work and taking part to training courses) this seems a plausible assumption.

represent the intermediate group with stock ownership rates around 15%. The same country classification holds when one considers ownership of stocks held directly and through mutual funds.²⁴ Thus, in what follows we discuss apart from the baseline findings on direct stock ownership, the quantitative importance of our trust and sociability indicators with reference to this broader form of stockholding.

In our analysis we do not only consider groups of countries with different spread of stockholding, but we also explore differences in our trust and sociability indicators between more than median and less than median wealth households. According to GSZ low trust can offer an explanation for the limited stock market participation of wealthy households given that they face relatively small participation costs.

Given that our model takes into account both trust and sociability indicators we further look at above and below median wealth households within a group of countries of given stock market participation. Figure 4 illustrates stockholding rates across the relevant subsamples. It becomes apparent that there are remarkable differences across Europe. For example, in high participation countries (Sweden, Denmark and Switzerland) households with below median wealth exhibit twice as high participation rates, reaching 20%, relative to their more than median wealth counterparts in low participation countries (Austria, Spain and Italy). This difference is even more striking if one takes into account the fact that households' median net wealth holdings are comparable – as it will be shown below - across the three groups of countries.

We estimate our baseline model in various subsamples of households across the high, medium, low participation countries and below and above median wealth groups. In order to ease comparisons Table 3 summarizes marginal effects on sociability and trust indicators from twelve probit models estimated in different subsamples. Model D3 presents again results from our baseline specification that has been estimated over the full sample of households.

Results from models C3, B3 and A3 suggest that sociability has a proportionally stronger effect on stockholding when we consider groups of countries with a higher fraction of people participating in the stock market (the effect raises from 2.4 pp in low

²⁴ The average participation rates in stocks held directly or through mutual funds are 47%, 23% and 7% in the high, medium and low participation countries, respectively.

participation countries to 4.6 pp in high stock participation countries). The relevant effects for stocks held directly and through mutual funds (not reported) are 3.4 pp and 8.2 pp (both significant at 1%) in low and high participation countries, respectively.²⁵ As already discussed, in countries with higher participation rates more households are aware about stocks and therefore a prospective investor who is more sociable has higher chances to find a stockholder in her social circle.

As regards the role of trust, it significantly contributes to stockholding only in low participation countries (C3). The results suggest a 5.1 pp higher probability to invest in stocks directly due to an assumed 15 pp increase in the regional trust rates. We obtain the same picture as regards ownership of stocks and stock mutual funds with the estimated effect of trust in low participation countries being 8.2 pp (significant at 1%). It should be noted that the median regional trust rates are .32, .35 and .58 in the low, medium and high participation groups of countries, respectively.²⁶ Thus, our findings imply that living in a region with higher trust levels can induce stockownership when the average trust level in the country is relatively low. Yet, differences in trust levels by region do not seem to matter when the prevailing level of trust in the country is generally high.

When we split the sample by median wealth levels, we find significant effects of trust only among households with more than median wealth (D1). On the other hand, the effect of sociability is positive and significant in both wealth subgroups (D1 and D2).

In order to probe further into the relative contribution of trust and sociability in stock market participation we split our sample in each of the three country groups into households with more than median and less than median wealth holdings. Median (non-stock) net wealth holdings are roughly 140,000, 150,000 and 130,000 euro (ppp-adjusted) for groups of high, medium and low participation countries respectively. These amounts are comparable across the three country groups making more puzzling the significant gap in stockholding rates between the below median wealth households in high participation countries and their affluent counterparts in low participation countries.

²⁵ The complete set of estimates on stocks held directly or through mutual funds are available from the authors upon request.

²⁶ The standard deviations of the regional trust rates in our sample are .07, .10 and .13 for the low, medium and high participation groups of countries, respectively.

We estimate a very strong effect of trust among households with more than median wealth in low participation countries (C1). Our results suggest that a wealthy household in Austria, Italy and Spain that will move to a region where trust rates are 15 pp higher relative to the region in which they currently live would increase - other things equal - by 7.3 pp the probability to invest in stocks directly. Given that participation rates among the more than median wealth households in these countries are around 8%, living in a high trust region can nearly double the probability to invest in the stock market. The respective estimated effect for stocks held directly and through mutual funds is 10.2 pp (significant at 1%) that corresponds to an 80% increase relative to the existing ownership rates among the wealthy in low participation countries. On the other hand, trust does not affect stockholding in high stock participation and medium stock participation countries regardless of households' wealth holdings. Thus, our estimated effects on trust in the full sample (D3) or in the low participation countries (C3) are mainly driven by the influence of trust on the stockholding decisions of wealthy households in low participation countries.

The strongest effect of sociability is estimated for the less than median wealth households in high participation countries (A2). A sociable household with below median wealth in Sweden, Denmark and Switzerland is 5.3 pp more likely to invest in stocks compared to a non-social counterpart. On the other hand, sociability does not influence stockholding among wealthy households in high participation countries. Finally, we estimate significant effects of sociability in medium participation countries for both wealth groups (B1 and B2) and in low participation countries only among the wealthy (C1). When we examine ownership of stocks and stock mutual funds we find a similar pattern in the effects of sociability with the exceptions that the estimated effects on this variable among the wealthy in high participation countries and the less wealthy in low participation countries turn to be significant.²⁷ Sociability may be more effective for the ownership of stocks and stock mutual funds given the higher - relative to direct stocks - prevalence of these investments.

²⁷ The estimated effect of sociability in the former group is 8.4 pp, and in the latter 2.8 pp, both significant at 1%.

All in all, results from this section suggest that the relative contribution of trust and sociability on stockholding can vary across different groups of prospective investors. Sociability can induce stockholding among the less wealthy prospective investors in Sweden, Denmark and Switzerland where a significant part of the population participates in the stock market. Yet, neither trust nor sociability can explain what triggers non participation in direct stocks among the wealthy in these countries. On the other hand, the effects of trust are strong in countries with limited participation and low average levels of trust like Austria, Spain and Italy and regard in particular the wealthy households. Thus, low prevailing trust is likely to offer an explanation for the remarkably low participation rates among the wealthy living therein. Finally, both indicators do not matter for direct stockholding among the less wealthy in low participation countries. These households may not even consider the option to invest in the stock market due to their ignorance about the existence of stocks (for example, Guiso and Jappelli, 2005 document such ignorance over a significant fraction of Italian households).

7. Conclusions

We use survey data from SHARE supplemented with regional information on trust that we recover from WVS, to investigate differences in stockholding across ten European countries due to regional variation in levels of trust and household heterogeneity in sociability. This paper aims to assess the implications of both trust and sociability on stock market participation, the role of which has been examined separately by the existing literature. HKS have established the independent role of sociability on stockholding, while GSZ have associated cross country differences in aggregate stock market participation with average trust levels.

We provide new empirical evidence on differences in households' stockholding behavior across Europe and we link them to both trust and sociability measures. We show that trust and sociability can play distinct roles for stock market participation. Furthermore, in the full sample of data, we find some evidence that sociability can partly balance the negative effects on stockholding that are associated with living in a low trust region.

We probe further into the relative contributions of trust and sociability by looking at groups of countries with different stock ownership rates and households with different wealth holdings. Their relevance changes across different subgroups in the population that comprise different prospective investors. Sociability found to induce stockholding mainly in Sweden, Denmark and Switzerland where a significant part of the population participates in the stock market. On the other hand, the effects of trust are particularly strong among the better off households in countries with limited participation and low average trust levels like Austria, Spain and Italy offering a novel explanation for the remarkably low participation rates among the wealthy living therein. In addition, our findings imply that regional variation in prevailing trust can foster stockownership mainly in countries with low average trust rates.

Results from this study are likely to be of interest to policy makers who wish to promote stockholding among specific groups of households. For example, adoption of policies that improve stock market's transparency and programs that promote financial literacy can mitigate the negative effects of low trust and induce stockholding among wealthier households in European countries where stockholding is not widespread.

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Table 1: The effects of trust and sociability on direct stock ownership

| | (1) | | | (2) | | | (3) | | | (4) | | |
|----------------------------|---------------|-----------|-----|---------------|-----------|-----|---------------|-----------|-----|---------------|-----------|-----|
| | Marg. Eff | Std Error | | Marg. Eff | Std Error | | Marg. Eff | Std Error | | Marg. Eff | Std Error | |
| Trust | 0.0211 | 0.0084 | ** | | | | 0.0206 | 0.0085 | ** | 0.0206 | 0.0086 | ** |
| Sociability | | | | 0.0311 | 0.0055 | *** | 0.0309 | 0.0054 | *** | 0.0358 | 0.0060 | *** |
| Age | 0.0002 | 0.0005 | | 0.0002 | 0.0005 | | 0.0002 | 0.0005 | | 0.0003 | 0.0005 | |
| High School | 0.0277 | 0.0068 | *** | 0.0265 | 0.0071 | *** | 0.0264 | 0.0069 | *** | 0.0265 | 0.0070 | *** |
| College Graduate | 0.0889 | 0.0086 | *** | 0.0832 | 0.0088 | *** | 0.0838 | 0.0083 | *** | 0.0835 | 0.0084 | *** |
| Recall Ability | 0.0071 | 0.0009 | *** | 0.0067 | 0.0010 | *** | 0.0068 | 0.0009 | *** | 0.0068 | 0.0009 | *** |
| Poor Health | -0.0338 | 0.0062 | *** | -0.0321 | 0.0061 | *** | -0.0315 | 0.0061 | *** | -0.0313 | 0.0061 | *** |
| Pr(leave a bequest) | 0.0079 | 0.0009 | *** | 0.0078 | 0.0009 | *** | 0.0077 | 0.0009 | *** | 0.0077 | 0.0009 | *** |
| Depression | 0.0048 | 0.0052 | | 0.0043 | 0.0052 | | 0.0047 | 0.0052 | | 0.0047 | 0.0052 | |
| Total Net Wealth | 0.0021 | 0.0002 | *** | 0.0020 | 0.0002 | *** | 0.0020 | 0.0002 | *** | 0.0020 | 0.0002 | *** |
| Total Income | 0.0051 | 0.0006 | *** | 0.0051 | 0.0006 | *** | 0.0050 | 0.0006 | *** | 0.0050 | 0.0006 | *** |
| SE | 0.1649 | 0.0286 | *** | 0.2366 | 0.0133 | *** | 0.1619 | 0.0288 | *** | 0.1622 | 0.0287 | *** |
| DK | 0.0976 | 0.0218 | *** | 0.1470 | 0.0142 | *** | 0.0940 | 0.0218 | *** | 0.0951 | 0.0214 | *** |
| NL | 0.0180 | 0.0160 | | 0.0390 | 0.0141 | *** | 0.0151 | 0.0161 | | 0.0160 | 0.0156 | |
| BE | 0.0361 | 0.0142 | ** | 0.0293 | 0.0133 | ** | 0.0343 | 0.0141 | ** | 0.0339 | 0.0142 | ** |
| FR | 0.0530 | 0.0218 | ** | 0.0316 | 0.0186 | * | 0.0533 | 0.0217 | ** | 0.0536 | 0.0216 | ** |
| CH | 0.0820 | 0.0177 | *** | 0.0833 | 0.0171 | *** | 0.0760 | 0.0171 | *** | 0.0754 | 0.0173 | *** |
| AT | -0.0583 | 0.0111 | *** | -0.0596 | 0.0114 | *** | -0.0559 | 0.0109 | *** | -0.0550 | 0.0108 | *** |
| IT | -0.0464 | 0.0158 | *** | -0.0455 | 0.0163 | *** | -0.0419 | 0.0158 | *** | -0.0404 | 0.0158 | ** |
| ES | -0.0374 | 0.0141 | *** | -0.0373 | 0.0144 | *** | -0.0325 | 0.0142 | ** | -0.0306 | 0.0138 | ** |
| Observations | 15,023 | | | 15,023 | | | 15,023 | | | 15,023 | | |

Probit regressions. The specification accounts for age through a 2nd order polynomial, for net wealth and income through an inverse hyperbolic sine transformation and also controls for gender, number of children, number of ADL the household has difficulties with, marital and labor status. Marginal effects are averaged across households using survey weights. The marginal effects for trust are based on a 15 pp increase in the regional trust rate, for income and net wealth on a 5000 euro increase in the underlying variables, for bequest on a 10 pp increase in the reported probability and for age on a one year increase. Standard errors are clustered at the regional level. Reported estimates are corrected for multiple imputation. ***, **, * denote significance at 1%, 5% and 10% respectively.

Table 2: The effects of trust, sociability and electoral participation on direct stock ownership: various specifications

| | (1) | | | (2) | | | (3) | | | (4) | | | (5) | | |
|------------------------------|---------------|-----------|-----|---------------|-----------|-----|--------------|-----------|-----|--------------|-----------|-----|---------------|-----------|-----|
| | Marg. Eff | Std Error | | Marg. Eff | Std Error | | Marg. Eff | Std Error | | Marg. Eff | Std Error | | Marg. Eff | Std Error | |
| Trust | 0.0206 | 0.0085 | ** | 0.0227 | 0.0087 | *** | 0.0241 | 0.0091 | *** | 0.0259 | 0.0096 | *** | | | |
| Sociability | 0.0309 | 0.0054 | *** | 0.0307 | 0.0054 | *** | 0.0322 | 0.0062 | *** | 0.0320 | 0.0061 | *** | 0.0311 | 0.0055 | *** |
| Voters' Participation | | | | | | | | | | | | | 0.0473 | 0.0200 | ** |
| Risk Aversion | | | | | | | 0.1200 | 0.0165 | *** | 0.1203 | 0.0161 | *** | | | |
| GDP Growth | | | | -0.0164 | 0.0077 | ** | | | | -0.0145 | 0.0081 | * | | | |
| Age | 0.0002 | 0.0005 | | 0.0002 | 0.0005 | | 0.0003 | 0.0006 | | 0.0003 | 0.0006 | | 0.0003 | 0.0005 | |
| High School | 0.0264 | 0.0069 | *** | 0.0263 | 0.0070 | *** | 0.0237 | 0.0082 | *** | 0.0239 | 0.0082 | *** | 0.0264 | 0.0071 | *** |
| College Graduate | 0.0838 | 0.0083 | *** | 0.0839 | 0.0081 | *** | 0.0721 | 0.0090 | *** | 0.0723 | 0.0093 | *** | 0.0832 | 0.0088 | *** |
| Recall Ability | 0.0068 | 0.0009 | *** | 0.0067 | 0.0009 | *** | 0.0064 | 0.0014 | *** | 0.0064 | 0.0014 | *** | 0.0067 | 0.0010 | *** |
| Poor Health | -0.0315 | 0.0061 | *** | -0.0313 | 0.0060 | *** | -0.0316 | 0.0071 | *** | -0.0314 | 0.0069 | *** | -0.0318 | 0.0059 | *** |
| Pr(leave a bequest) | 0.0077 | 0.0009 | *** | 0.0078 | 0.0009 | *** | 0.0073 | 0.0012 | *** | 0.0073 | 0.0012 | *** | 0.0078 | 0.0009 | *** |
| Depression | 0.0047 | 0.0052 | | 0.0046 | 0.0052 | | 0.0050 | 0.0058 | | 0.0050 | 0.0057 | | 0.0040 | 0.0049 | |
| Total Net Wealth | 0.0020 | 0.0002 | *** | 0.0020 | 0.0002 | *** | 0.0022 | 0.0003 | *** | 0.0022 | 0.0003 | *** | 0.0020 | 0.0002 | *** |
| Total Income | 0.0050 | 0.0006 | *** | 0.0050 | 0.0006 | *** | 0.0053 | 0.0009 | *** | 0.0053 | 0.0008 | *** | 0.0051 | 0.0006 | *** |
| SE | 0.1619 | 0.0288 | *** | 0.1609 | 0.0289 | *** | 0.1135 | 0.0289 | *** | 0.1122 | 0.0291 | *** | 0.2714 | 0.0189 | *** |
| DK | 0.0940 | 0.0218 | *** | 0.0834 | 0.0222 | *** | 0.0858 | 0.0242 | *** | 0.0762 | 0.0248 | *** | 0.1405 | 0.0162 | *** |
| NL | 0.0151 | 0.0161 | | 0.0125 | 0.0149 | | 0.0038 | 0.0187 | | 0.0011 | 0.0171 | | 0.0517 | 0.0165 | *** |
| BE | 0.0343 | 0.0141 | ** | 0.0307 | 0.0142 | ** | 0.0246 | 0.0160 | | 0.0208 | 0.0158 | | -0.0651 | 0.0297 | ** |
| FR | 0.0533 | 0.0217 | ** | 0.0562 | 0.0191 | *** | 0.0495 | 0.0192 | | 0.0518 | 0.0183 | *** | 0.0307 | 0.0193 | |
| CH | 0.0760 | 0.0171 | *** | 0.0598 | 0.0169 | *** | 0.0801 | 0.0220 | *** | 0.0654 | 0.0207 | *** | 0.0831 | 0.0174 | *** |
| AT | -0.0559 | 0.0109 | *** | -0.0556 | 0.0109 | *** | -0.0768 | 0.0143 | *** | -0.0773 | 0.0142 | *** | -0.0682 | 0.0155 | *** |
| IT | -0.0419 | 0.0158 | *** | -0.0512 | 0.0139 | *** | -0.0647 | 0.0170 | *** | -0.0728 | 0.0161 | *** | -0.0905 | 0.0188 | *** |
| ES | -0.0325 | 0.0142 | ** | -0.0070 | 0.0207 | | -0.0471 | 0.0164 | *** | -0.0257 | 0.0227 | | -0.0468 | 0.0152 | |
| Observations | 15,023 | | | 15,023 | | | 9,919 | | | 9,919 | | | 15,023 | | |

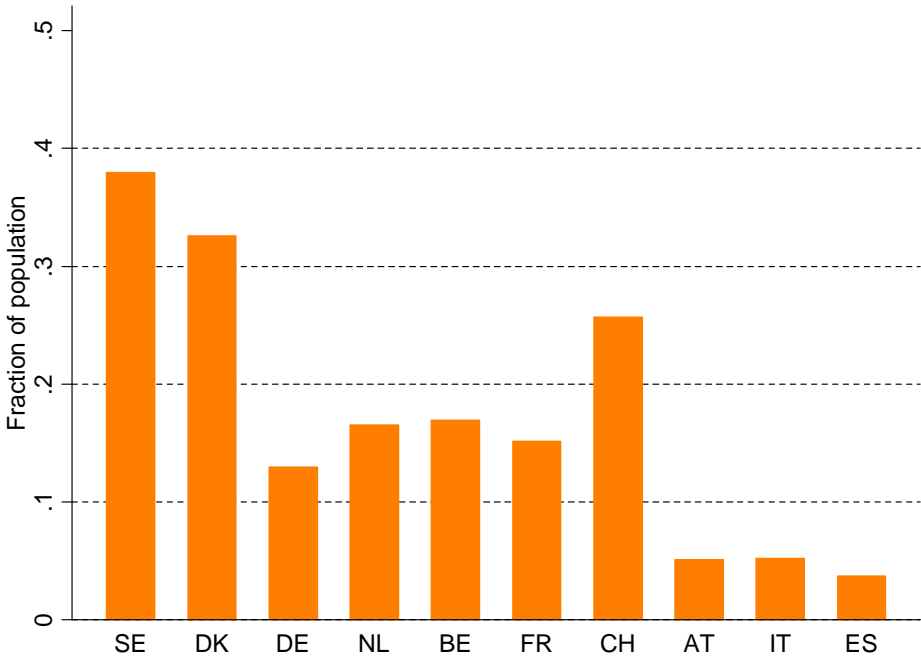
See note in Table 1. The marginal effects for voters' participation are based on a 20 pp increase in the regional participation rates and for GDP growth on a 1.3 pp.

Table 3: The effects of trust and sociability on direct stock ownership across countries with high, medium, low stock market participation and by above/ below median household wealth

| | | Variable | (1) | | (2) | | (3) | |
|-----|---|--------------------|-------------------------|--------------|-------------------------|--------------|-------------|--------------|
| | | | Wealth More than Median | | Wealth Less than Median | | Full Sample | |
| | | | Marg. Eff. | (Std. Error) | Marg. Eff. | (Std. Error) | Marg. Eff. | (Std. Error) |
| (A) | High Stock Participation (SE, DK, CH) | Trust | 0.0316 | (0.0419) | -0.0154 | (0.0237) | 0.0101 | (0.0207) |
| | | Sociability | 0.0389 | (0.0270) | 0.0534 | (0.0185) *** | 0.0461 | (0.0169) *** |
| (B) | Medium Stock Participation (DE, NL, BE, FR) | Trust | 0.0118 | (0.0177) | 0.0053 | (0.0079) | 0.0154 | (0.0118) |
| | | Sociability | 0.0373 | (0.0142) *** | 0.0253 | (0.0089) *** | 0.0361 | (0.0086) *** |
| (C) | Low Stock Participation (AT, IT, ES) | Trust | 0.0728 | (0.0293) ** | 0.0249 | (0.0198) | 0.0513 | (0.0198) *** |
| | | Sociability | 0.0339 | (0.0113) *** | 0.0149 | (0.0115) | 0.0242 | (0.0070) *** |
| (D) | Full Sample | Trust | 0.0284 | (0.0142) ** | 0.0048 | (0.0049) | 0.0206 | (0.0085) ** |
| | | Sociability | 0.0345 | (0.0089) *** | 0.0216 | (0.0055) *** | 0.0309 | (0.0054) *** |

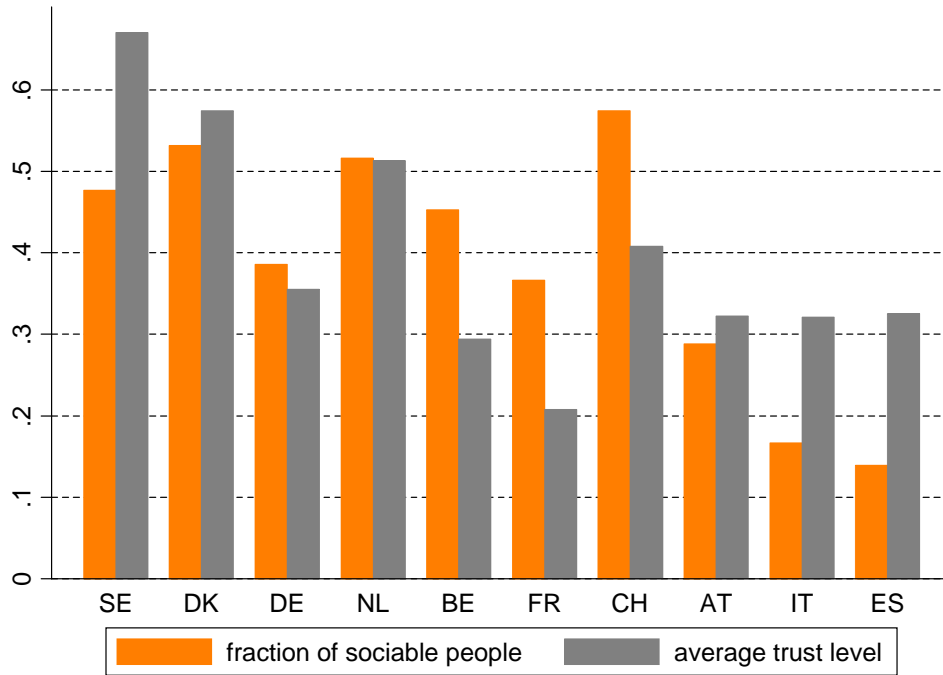
Each model conditions on the same set of regressors as the baseline model 3 in Table 1 including the relevant country dummies. See note in Table 1.

Figure 1: Direct stock ownership rates by country



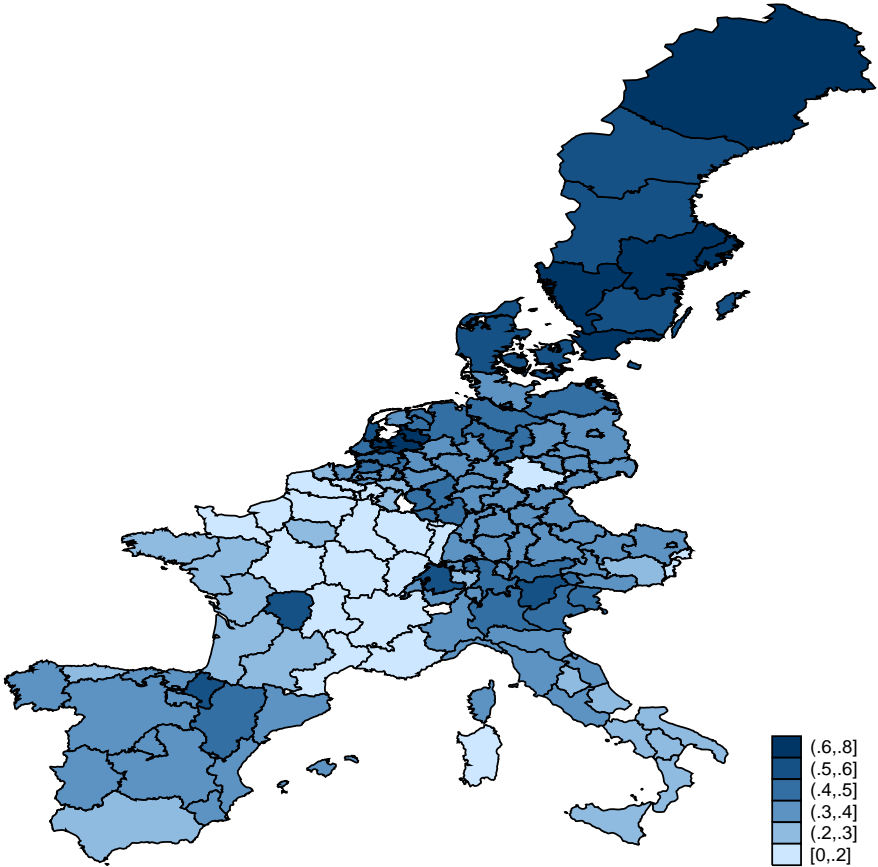
Weighted data from SHARE 2004.

Figure 2: Average Sociability and Trust by country



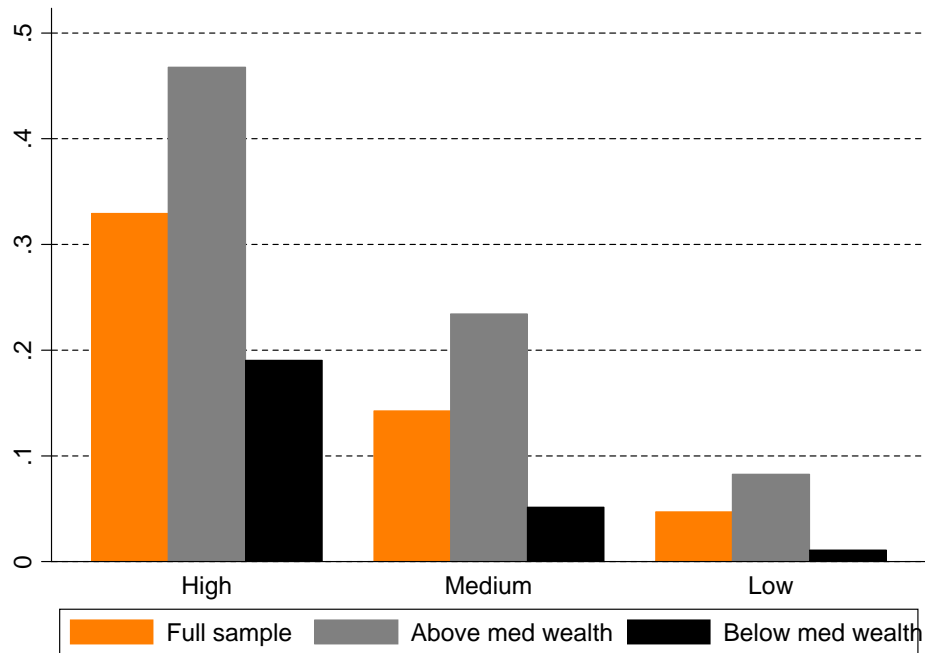
Weighted data on trust from WVS (1990-2005) and on sociability from SHARE 2004.

Figure 3: Trust rates by region



Weighted data from WVS (1990-2005).

Figure 4: Direct stock ownership rates across countries with high, medium, low stock market participation and by above/ below median household wealth



Weighted data from SHARE 2004. Countries are divided according to the average stock market participation into 'high' (SE, DK, CH), 'medium' (DE, NL, BE, FR) and 'low' (AT, IT, ES).

Appendix I: proof of proposition 1

Condition (10) can be rewritten as

$$\begin{aligned} (1-\bar{p})U[\alpha\hat{\alpha}(W-f(\underline{\pi}))+(1-\alpha)r_f(W-f(\underline{\pi}))]+ \bar{p}U[(1-\alpha)r_f(W-f(\underline{\pi}))]-U[r_f W]=0 \\ F[\bar{p}, \underline{\pi}, \alpha]=0 \end{aligned} \quad (\text{A1})$$

Equation (11) defines two implicit conditional relationships:

$$\begin{aligned} \bar{p} &= g(\underline{\pi} | \alpha, W) \\ \bar{p} &= f(W | \alpha^*, \underline{\pi}) \end{aligned} \quad (\text{A2})$$

The relation described by $\bar{p} = g(\underline{\pi} | \alpha, W)$ can be described using the implicit function theorem which states that $\frac{dp}{d\pi} = -\frac{\partial F/\partial \pi}{\partial F/\partial p}$.

Recall that $\alpha\hat{\alpha}(W-f) + (1-\alpha)r_f(W-f(\underline{\pi})) = A$ and $(1-\alpha)r_f(W-f(\underline{\pi})) = B$: by equation (9), $A > B$. Thus, given that U is monotonically non decreasing, $A > B \Rightarrow U[A] \geq U[B]$ and $dU[x]/dx \geq 0$. We can sign the following partial derivatives:

$$\begin{aligned} \partial F/\partial p &= -U[A] + U[B] < 0 \\ \partial F/\partial \pi &= -(1-\bar{p})\frac{dU}{dA}\left(\alpha\hat{\alpha}\frac{\partial f}{\partial \pi} + (1-\alpha)r_f\frac{\partial f}{\partial \pi}\right) > 0 \end{aligned} \quad (\text{A3})$$

Therefore $\frac{dp}{d\pi} > 0$, which means that given $\alpha > 0$ and $W = \underline{W}$, the level of trust $(1-\bar{p})$ and minimum sociability level $\underline{\pi}$ which trigger participation are inversely related.

About $\bar{p} = f(W | \alpha^*, \underline{\pi})$, once sociability is fixed the relation between trust and wealth is exactly the same to that described by GSZ and thus their proposition 4 holds.

Appendix II: data descriptions

As it was discussed in section 4, we first compute the trust indicator as the region-level average of responses to the trust question contained in the WVS. We then assign the relevant average to every SHARE respondent who lives in the same region. Regional information on SHARE is not homogenous across countries due to different disclosure rules in Europe: for most countries in the sample it corresponds to the NUTS2 statistical regions (as defined by Eurostat), to the NUTS3 regions in Denmark, Sweden and Spain, while in France and Germany the regional disaggregation is at NUTS1 level. As a general rule we use the most disaggregated regional definition available in SHARE to merge with regional data collected from other sources.

We have to drop Greece from our analysis, since it was not feasible to match all NUTS2 Greek regions in SHARE with regions available in WVS. Ekinici, Kalemli-Ozcan and Sorensen (2007), who use regional data from WVS to examine financial integration among European regions, also exclude Greece on the ground that it is less economically developed compared to other countries in the sample and thus has the character of an outlier. The WVS did not take place in the same year in all the countries we are interested in. Moreover, the number of waves available for each country varies as well: WVS took place just once in the last 25 years in Switzerland, while there were four surveys in Spain during the same period. In order to facilitate a significant number of observations in each region that we use to merge with SHARE, we pooled data from all available WVS waves since 1990.

Data on regional GDP growth rates were collected from Swiss statistics for Switzerland and from Eurostat for all the other countries in the sample. Data on voters' participation rates by region in 2004 EU Elections (and 2003 National Elections for Switzerland) were collected from various national statistical sources.