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# Stockholding in France: the role of financial literacy and information

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We use an original household survey to study the links between stockholding, financial literacy and acquisition of financial information within the French population. Controlling for subjective expectations on stock market returns and for risk aversion, we find that stock market participation is positively related to basic financial literacy and financial information acquisition through the press reading and the family financial context during childhood. We also find that basic financial literacy is not correlated with the share of stocks in financial assets conditionally on stock-ownership, while the correlation with information acquisition is significant.

**Keywords:** financial literacy; information acquisition; stockholding puzzle

**JEL Classification:** G11; D83

## 1. Introduction

Limited stock market participation is known as one of the ‘investment mistakes’ in household finance (Campbell, 2006). A significant fraction of households do not hold risky assets despite historical excess average returns over riskless assets, known as the ‘stock market participation puzzle’ (Haliassos and Bertaut, 1995). This empirical fact works against the predictions of the standard theory. Indeed, expected utility models of portfolio choice predict that all investors should hold a diversified portfolio including risky assets (Merton, 1969). Information and transaction costs are put forward as the main factors explaining why so few people hold stocks (Haliassos and Michaelides, 2003). While the conventional approaches to analyse

households’ portfolio choices consider a fully rational and well-informed investor, the key role of financial information costs is now widely pointed out. Stock market participation has been found to be explained by various factors reflecting these costs such as cognitive ability (Christelis *et al.*, 2010; Grinblatt *et al.*, 2011), trust (Guiso *et al.*, 2008), ‘financial awareness’ (Guiso and Jappelli, 2005), time spent in acquiring financial information (Guiso and Jappelli, 2007), social interactions (Hong *et al.*, 2004) or financial literacy (van Rooij *et al.*, 2011). These factors are also deemed to influence the household portfolio diversification and explain under-diversification mistakes (Balloch *et al.*, 2014; Gaudecker, 2015).

Relying on an original survey, we contribute to this empirical literature. We study the links between

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stockholding, financial literacy and acquisition of financial information within the French population. We provide new insights on the channel through which financial literacy and financial information acquisition affect portfolio choices by analysing both the decision to participate in the stock market and the portfolio share invested in stocks.

Controlling for subjective expectations on stock market returns and for risk aversion, we find that individuals with basic financial knowledge on inflation, interest compounding and risk diversification are more likely to hold stocks, in line with the existing literature. In addition, we do not obtain any significant effect of basic financial knowledge on the share of portfolio invested in stocks when conditioning on participation. This result is coherent with the idea that basic financial literacy helps to overcome information costs that hamper individuals from holding stocks. Moreover, the probability to hold stocks and the share of portfolio invested in stocks are both positively related to the capacity to acquire information by reading the press or through the family financial context during childhood. These results show that basic financial knowledge and information acquisition are crucial to explain portfolio choices beyond financial resources, risk aversion and subjective expectations on stock market returns.

## II. Data

We use the 2011 household survey PATER (Arrondel *et al.* 2013, 2014). The questionnaire was sent to a representative sample of 5000 individuals and 3616 sent it back. Among those respondents, 2172 answered all the questions needed for our analysis (econometric sample).<sup>1</sup>

Stock market participation and the share of portfolio invested in stocks are self-declared. Financial literacy is elicited by asking questions on basic financial concepts (interest, inflation and risk diversification), following the benchmark proposed by Lusardi and Mitchell (2014).<sup>2</sup> As a proxy for information acquisition, we consider two qualitative indicators. One indicator reflects whether the respondent reads frequently the economic and financial press. The second indicator deals with the portfolio composition

of respondent's parents (whether it includes/has included stocks).

Respondent's expectations on stock market returns are measured with a dummy variable indicating whether the respondent expects a positive average return of the stock market in the next 2 years (computed from questions about the expected distribution of returns over seven brackets of potential outcomes, see Arrondel *et al.*, 2012). We also use the variance in expected returns which provides a proxy for respondent's risk expectations. Risk aversion is taken into account using an ordered qualitative indicator based on lotteries (Barsky *et al.*, 1997).

In our econometric sample, 30.4% of households hold stocks directly or indirectly and the conditional average share of stocks in financial wealth is 20.4%. Stockholders are more likely to provide correct answers to the basic financial literacy questions and to read the economic and financial press (Table 1). Stockholders also tend to have more financial resources (wealth and income), to be older and more educated than nonstockholders. Higher proportions of stockholders are found in the low or medium categories of risk aversion. These individuals are also more optimistic concerning future stock market returns (more likely to expect both positive returns and lower risk).

## III. Empirical Approach

We estimate a Heckman model in which the portfolio share invested in stocks (value of stocks and mutual funds divided by financial wealth, *share*) is estimated (second step equation) by taking into account the participation decision (first step equation). The latent variable for the first step equation is the net utility gain from stock market participation, and we observe whether respondent *h* participates or not:

$$\begin{aligned} Participation_h = & \beta + \beta_1 \cdot FinLit_h + \beta_2 \cdot Info_h \\ & + \beta_3 \cdot Resources_h + \beta_4 \cdot RiskAversion_h \\ & + \beta_5 \cdot Expectations_h + \beta_6 \cdot SocioDem_h + \varepsilon_h \end{aligned}$$

$$\begin{aligned} Share_h = & \delta + \delta_1 \cdot FinLit_h + \delta_2 \cdot Info_h + \delta_3 \cdot Resources_h \\ & + \delta_4 \cdot RiskAversion_h + \delta_5 \cdot Expectations_h \\ & + \delta_6 \cdot SocioDem_h + \delta_7 \lambda + \mu_h \end{aligned}$$

<sup>1</sup> Most of the missing values come from the probabilistic expectations questions which are the less easy to answer.

<sup>2</sup> See Arrondel *et al.* (2013) for detailed information on the financial literacy measure in the PATER survey.

**Table 1. Sample statistics for nonstockholders and stockholders**

	Nonstockholders		Stockholders	
	Mean	SD	Mean	SD
Share of stocks in financial assets	–	–	20.413	21.453
Basic financial literacy	0.318	0.466	0.637	0.481
Read press	0.289	0.453	0.551	0.498
<i>Annual income (euros)</i>				
Less than 8000	0.215	0.411	0.098	0.289
8000–16 000	0.285	0.452	0.166	0.373
16 000–30 000	0.393	0.489	0.454	0.489
More than 30 000	0.097	0.296	0.272	0.445
DK	0.010	0.099	0.009	0.094
<i>Total gross wealth (euros)</i>				
Less than 75 000	0.304	0.460	0.107	0.310
75 000–225 000	0.305	0.461	0.218	0.413
225 000–450 000	0.232	0.422	0.352	0.478
More than 450 000	0.064	0.244	0.278	0.449
DK	0.096	0.295	0.044	0.205
<i>Education</i>				
Primary (Isced 1)	0.126	0.332	0.091	0.288
Secondary (Isced 2)	0.255	0.436	0.179	0.383
Upper Secondary (Isced 3–4)	0.269	0.444	0.238	0.426
First stage Tertiary (Isced 5)	0.134	0.340	0.174	0.379
Second stage of Tertiary (Isced 6)	0.216	0.411	0.319	0.467
<i>Age</i>				
Under 30	0.158	0.364	0.070	0.255
30–40	0.202	0.402	0.182	0.386
40–50	0.185	0.389	0.171	0.377
50–60	0.179	0.383	0.241	0.428
Above 60	0.277	0.447	0.337	0.473
<i>Risk aversion</i>				
High	0.571	0.495	0.484	0.500
Medium-high	0.224	0.417	0.227	0.419
Low-medium	0.126	0.332	0.179	0.383
Low-medium	0.044	0.204	0.068	0.252
<i>Expectations</i>				
Positive returns	0.275	0.446	0.460	0.499
Variance of expected returns	14.294	22.934	16.389	23.310
Stocks (parents)	0.205	0.403	0.449	0.498
Inheritances received	0.387	0.487	0.558	0.497
Number of observations	1511		661	

This specification accounts for possible differences in the determinants of stock market participation and the share of risky assets. Participation is supposed to be mainly explained by the subjective expected risk premium, the capacity to overcome fixed and entry costs, given the household resources (income, wealth and inheritances) and given the financial knowledge and capacity to acquire information. The portfolio share invested in risky assets is more likely to be driven by subjective expectations on stock market returns and risk aversion. Socio-demographic variables are included to control for age, education and occupation of the respondent. As we obtain a significant effect of the income variable in the participation equation only, we decide to drop this variable from the share equation<sup>3</sup> (see our main results in Table 2).

**Table 2. Probability to hold stocks and share of financial assets invested in stocks (Heckman model)**

	Stockholding (yes/no)		Portfolio share invested in stocks	
	Coeff.	Std.	Coeff.	Std.
Basic financial literacy	0.262***	0.067	0.288	2.282
Read press	0.565***	0.066	9.605***	3.671
Stocks (Parents)	0.383***	0.1	1.651	3.381
Inheritance received	0.022	0.081	–2.498	2.405
Stocks (Parents) *Inheritance	0.204	0.137	10.735***	3.613
Positive stocks returns expectations	0.303***	0.067	7.594***	2.287
Variance of expected return	excl.		0.006	0.036
<i>Risk aversion</i>				
High	ref.		ref.	
Medium-high	0.078	0.082	8.189***	2.279
Low-medium	0.348***	0.094	9.426***	2.905
Low	0.355**	0.141	17.584***	3.991
Income category	incl.		excl.	
Age, education, employment status, total wealth	incl.		incl.	
Inv. Mills ratio			17.34**	7.8
Number of observations	2172		661	

Note: \*\* and \*\*\* indicate significance at the 5% and 1% levels, respectively.

<sup>3</sup> It does not affect the other estimated coefficients.

## IV. Discussion

### Main results

Concerning stock market participation, financial literacy plays a positive and significant role in addition to other explanatory variables, in particular risk preferences and subjective expectations on stock market returns. Everything else being equal, people who answer correctly the three basic questions are 7.1 percentage points more likely to hold stocks than others. When turning to the share equation, basic financial literacy is not significant to explain the portfolio share invested in stocks: it helps overcome entry costs that hamper individuals from holding stocks, but does not affect portfolio allocation once the decision to participate in the stock market has been made.

Information acquisition through press reading is positively associated with both the probability to hold stocks (+15.3 percentage points) and the share of portfolio invested in risky assets.

Individuals whose parents were stockholders are more likely to hold stocks themselves (+10.3 percentage points). This coefficient is unlikely to reveal any 'inherited' portfolio effect given that we also control for both having received inheritances and having parents that were stockholders. Rather, it could reflect another source of information acquisition, the transmission of parents' experience with stocks. This result is in line with the literature about the role of social capital and financial experience during childhood for financial behaviours (Guiso *et al.* (2004), Malmendier and Nagel (2011)). Regarding the portfolio share invested in stocks, the determinants may be different. While we cannot exclude that the significant coefficient obtained for the interaction term for having received inheritances and having stockholder parents is partly due to information transmission, it is more likely to reflect the existence of an inherited portfolio.

### Endogeneity issues

The question whether the financial literacy and information have a causal effect on financial behaviour is a well-debated question. These endogeneity issues

arise mainly from the use of proxies (which may induce nonrandom measurement errors) and from reverse causality (i.e. stockholding may enhance financial knowledge with learning-by-doing and encourage people to acquire information).<sup>4</sup> To deal with this issue, instrumental variables related to the financial knowledge and behaviours of respondent's parents<sup>5</sup> have been used to estimate instrumental variables regressions considering probit and tobit models. In our case, the Wald test does not reject the exogeneity assumption.

## V. Conclusion

A growing literature aims at evaluating the potential impact of financial literacy on financial behaviours (Lusardi and Mitchell, 2014). We find that stockholding is positively related to basic financial literacy and financial information acquisition through the press reading and the family financial context. Basic financial literacy is crucial to overcome entry costs on the stock market. However, it does not affect the share of financial assets invested in stocks, while information acquisition, expectations on stock market returns and risk aversion impact significantly the demand for risky assets.

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<sup>4</sup> The reverse causality issue between our basic financial literacy variable and stockholding is likely to be limited because our financial literacy indicator is mainly related to cognitive and numeracy capabilities (Christelis *et al.*, 2010).

<sup>5</sup> Jappelli and Padula (2013) argue that the stock of financial literacy early in life is a valid instrument in the regression of wealth on financial literacy.



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