

# Households' Decision on Capital Market Participation— What Are the Drivers? A Multi-Factor Contribution to the Participation Puzzle

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## Abstract

Stock market investments are in the spotlight of the household finance literature, although real-world households make other financial decisions of higher relevance. We widen the scope and include decisions related to voluntary pension plans, whole life insurance contracts, housing, and investments in risky assets other than stocks (e.g., bonds or mutual funds). Further, we provide a methodology that goes beyond regression analysis by employing a structural equation analysis (SEA) and apply it on data from a broad and representative survey of the German Central Bank. Our SEA allows us to investigate and quantitatively estimate complex relationships and to test several hypotheses simultaneously. Our structural equation model captures about 60% of the variation in the capital market participation decision. The results show that although households' financial literacy and risk aversion are most strongly related to investments in risky assets, further factors such as wealth, voluntary pension plans and whole life insurance contracts, financial advice, and investment experience should also be considered. Financial literacy is negatively related to risk aversion (i.e., the higher the financial literacy, the lower is the risk aversion). Age and gender are directly related to capital market participation and indirectly via financial literacy and risk attitude.

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This paper uses data of the Panel on Household Finances (PHF) that is compiled by the German central bank (Deutsche Bundesbank). The results published and the related observations and analyses may not correspond to results or analyses of the data producers. The authors would like to thank German central bank for providing the dataset.

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## Introduction

The participation of households in stock markets is one of the key issues in the literature on empirical financial markets in general and in the emerging field of household finance in particular (Campbell, 2006; Cocco et al., 2005; Guiso & Sodini, 2013; Halko et al., 2012; Kaustia et al., 2023; Oehler & Horn, 2021; Oehler et al., 2022a). Households without stock investments do not receive the equity premium and fail to invest efficiently (see Mehra & Prescott, 1985). Studies have postulated theoretically and empirically that financial literacy, or the lack thereof, is a key driver of whether and to what extent people participate in stock markets (see Chatterjee et al., 2017; Lusardi & Mitchell, 2008; Lusardi & Mitchell, 2014; Oehler et al., 2018b; Oehler et al., 2022a; Van Rooij et al., 2011; von Gaudecker, 2015;).

Although stock market investments are in the spotlight of the household finance literature, real-world households make other financial decisions of higher relevance (Kaustia et al., 2023). Decisions related to housing or human capital investments in earlier stages in the life-cycle are also important as are investments in risky assets other than stocks (e.g., bonds or mutual funds). Kaustia et al. (2019) note that data availability has likely been a factor in the number of studies conducted on stock market participation versus other aspects of household finance.

We contribute to addressing this gap in the literature. More specifically, we widen the scope of previous studies from stock market to capital market investments and provide a multi-factor structural analysis with data from a broad and representative survey of the German Central Bank. Our data allow both a differentiated analysis of capital market participation (i.e., not only equities but also other risky assets such as mutual funds or bonds, and a consideration of financial and non-financial factors of households' capital market participation). Our structural equation analysis (SEA) allows us to investigate and quantitatively estimate complex relationship structures between manifest and/or latent variables. In contrast to a regression analysis, SEA tests complex variable relationships that

reflect causal conjectures about the relationship structures among the variables under consideration. "Complex" in this context means that several causal hypotheses are considered *simultaneously*.

Our structural equation model explains about 60% of the variation in the capital market participation decision. Our results show that although households' financial literacy and risk aversion are the dominant drivers of investments in risky assets, wealth, voluntary pension plans and whole life insurance contracts, financial advice, and investment experience play a remarkable role. Financial literacy has a negative influence on risk aversion (i.e., the higher the financial literacy, the lower is the risk aversion). We do not find significant results of housing on capital market participation, but age and gender play a role, directly, and indirectly via financial literacy and risk attitude.

Our study is organized as follows: In the next section, we review the literature. In the third section, we introduce the dataset and the methodology of our structural equation analysis. We then present the variables of the structural equation analysis, provide descriptive statistics, and outline our hypotheses. The paper concludes with the presentation and discussion of findings.

## Literature Review

According to neoclassical models, capital market participation is only determined by risk attitude and each household should participate to get a share of the equity premium (Guiso & Sodini, 2013, pp. 1424 et sqq.; Merton, 1969). Hence, households' risk attitude is considered as the most important determinant in both theoretical asset pricing models and studies that aim to empirically explain households' investment decisions (Cohn et al., 1975; Dorn & Huberman, 2005). Studies often try to find explanations for solving the equity premium puzzle (i.e., the phenomenon that many households actually do not invest in stocks at all) (Mehra & Prescott, 1985).

It has been well established that further factors in addition to risk attitude are relevant for stock market participation. An explanation for

households' non-participation in the stock market is that they do not know the benefits of an investment. This is backed up by studies that find a significant influence of financial literacy on stock market participation (Beshears et al., 2018; Kaustia et al., 2023; Laurinaityte, 2018; van Rooij et al., 2011; von Gaudecker, 2015). In addition, households with a higher total wealth face lower relative fixed participation costs and are, therefore, more likely to own stocks (Campbell, 2006; Biliassos et al., 2010; Calvet et al., 2007; Haliassos & Bertaut, 1995; Kaustia et al., 2023; Vissing-Jorgensen, 2004). Households' monthly income determines the amount of money a household is able to save. Hence, it is not surprising that households with higher monthly income are more likely to participate in the stock market (Haliassos & Bertaut, 1995; Kaustia et al., 2023; Laurinaityte, 2018; Mankiw & Zeldes, 1991).

However, it is important to notice that these factors are not independent from each other (e.g., households' willingness to take risk increases with wealth) (Calvet & Sodini, 2014; Oehler & Horn, 2021). Moreover, further factors have an influence on households' risk attitude and financial literacy (e.g., higher educated individuals are more likely to be financially literate) (Bucher-Koenen et al., 2021; Bucher-Koenen & Knebel, 2021; Hammer et al., 2022; Kaustia et al., 2023). Regression analyses can hardly cover these complex relations. Hence, we employ SEA. This allows us to include a battery of further factors that have an influence on CMP.

It is evident that the age and gender of a decision maker is related to her risk attitude and financial literacy. According to Calvet et al. (2009) age is negatively related to the sophistication of a household's financial decisions. Korniotis and Kumar (2011) explain this effect with adverse effects of cognitive aging. Hence, we predict that financial literacy will be higher at a lower age. Moreover, older decision makers show a higher degree of risk aversion (Dohmen et al., 2011, 2017; Oehler et al., 2018a, 2022a). Nevertheless, stock market participation increases with age (Athreya et al., 2023; Oehler et al., 2018a). In addition, previous studies find significant gender differences. The financial literacy of men is higher than that of women (Bannier & Schwarz,

2018; Fey et al., 2020; Guiso & Zaccaria, 2023; Hanna et al., 2021). Men show a lower degree of risk aversion and invest more in risky assets (Croson & Gneezy, 2009; Eckel & Grossman, 2008; Halko et al., 2012).

The awareness and use of financial advice and financial planning tools enhance the probability to invest in capital markets (Chien & Morris, 2017; Fey et al., 2020). Von Gaudecker (2015) reports that nearly all households that rely on professional contacts for advice achieve reasonable investment outcomes, particularly because financial advice leads to better diversified portfolios. Financial advice, however, has no influence on the relation between financial literacy and stock market participation (Hermansson et al., 2022). Hence, financial advice is not a substitute for financial literacy.

Of course, the individual situation of a household, which is usually linked to the status in the life-cycle, has a major impact on investment decisions. Oehler and Horn (2021) build on the Behavioral Portfolio Theory of Shefrin and Statman (2000) and show that households assign their assets into different mental accounts. The mental accounts build up on each other in a hierarchical structure (i.e., as layers of a pyramid). Direct investments in financial markets such as stocks or bonds are in the highest layer, whereas residential property, pension plans, and whole life insurance contracts are in the layer below. This means that most households will only invest in stocks when they have financed their residential property and/or their pension plan. Studies with a focus on housing decisions support this pyramid structure and real estate is by far the most popular investment vehicle for households in Europe (EFAMA, 2020, p. 29; Kaustia et al., 2023). Cocco et al. (2005) and Gomes et al. (2021) argue that house ownership discourages saving in financial assets as households usually want to first repay their mortgage loan (see Guiso & Zaccaria, 2023; Calvet & Sodini, 2014). However, the influence of voluntary pension plans and whole life insurance contracts is understudied. Our study caters to this gap in the literature. We assess investments in voluntary pension plans and whole life insurance contracts as a quasi-safe addition to a household portfolio. Hence, households could spend further free

budget for riskier investments in the next higher layer instead of investing in additional risk-free assets. Consequently we expect higher capital market participation when households already have a voluntary pension plans and/or a whole life insurance contract.

Investment decisions are always linked to a planning horizon, an assessment of the current situation, and expectations for the future. If applicable, past experiences additionally have an influence as households learn from their last decisions. Households with a longer planning horizon and more positive expectations for the future are more likely to invest in stocks as they can better bear the short-term crash risk (Ameriks & Zeldes, 2004; Barberis, 2000; Calvet et al., 2007). Households that are more satisfied with their current lifestyle should have more financial resources available for investments in risky assets and be less risk averse (Xiao, 2016). Investors with positive past investment outcomes usually get more confident and subsequently invest higher amounts and trade at higher frequency (Choi et al., 2009; De et al., 2010). Further, Malmendier and Nagel (2011) show that investors who have experienced higher stock market returns throughout their lives are less risk averse and more likely to invest in stocks.

## Data and Methodology

### *PHF Survey Data*

The Panel on Household Finances (PHF) by the German central bank (Deutsche Bundesbank) covers data for all the influential factors mentioned in the previous literature review. We use the dataset of the third wave. The dataset covers a variety of financial and behavioral variables at the household level and personal data on all household members. Each household is represented by a financially knowledgeable person (FKP) who can provide the necessary information about the household and is assumed to be mainly responsible for the household's financial decisions (see Altmann et al., 2020; PHF Survey Team, 2019a, 2019b; von Kalckreuth et al., 2012). Information about the FKP comprises age, gender, graduation, professional qualification, and financial literacy.

The third wave of the PHF started in March 2017, and the collection process ended in November 2017. The total number of households that participated was 4,962. Following von Gaudecker (2015), we exclude households with less than 1,000 Euros in financial assets, which yields an initial sample of 4,538 households.

### *Methodology*

We use structural equation analysis (SEA), which allows us to investigate and quantitatively estimate complex relationship structures between manifest and/or latent variables (Byrne, 2016; Hair et al., 2010). The aim of SEA is to represent the a priori formulated relationships in a system of equations and to estimate the model parameters in such a way that the initial data collected on the variables are reproduced as well as possible. Structural equation modeling has been used in many disciplines and has become an important method of analysis in academic research (e.g., Byrne, 2001; Hair et al., 2010; Kline, 2005; Savalei & Bentler, 2006).

In contrast to regression analysis (RA, OLS), SEA tests complex variable relationships that reflect causal conjectures about the relationship structures among the variables under consideration. "Complex" in this context means that several causal hypotheses are considered *simultaneously*. In this context, individual variables in the different hypotheses may represent both independent and dependent variables. Furthermore, bilateral relationships (interrelationships) between variables are also possible. Thus, multi-equation systems are used, which represent the presumed effect relationships in several regression equations, which are estimated simultaneously (i.e., a non-recursive model) (Weiber & Mühlhaus, 2014).

While a RA makes a clear distinction between a dependent and one or more independent variables, SEA does not require such a clear distinction. Another key difference from RA is that a RA considers only empirically directly measurable variables (manifest variables), whereas SEA can analyze relationships between manifest variables as well as between latent variables (i.e., variables that are not directly observable). Latent variables are also referred to as hypothetical constructs (e.g., risk attitude,

competence, financial literacy, trust, reputation). We use AMOS 29 and thus a covariance structure analysis based on confirmatory factor analysis. The latent variables are interpreted as factors that are “behind” the measurement variables and are assigned to the different measurement variables according to the formulated hypothesis system. Factor analysis is then used to estimate the factor loadings (i.e., correlations between measured variables and factors) in such a way that the empirical variance-covariance matrix or correlation matrix can be reproduced as accurately as possible (Weiber & Mühlhaus, 2014).

Accordingly, manifest and latent variables are to be distinguished in SEA. Manifest variables are directly observable, and their manifestations can be recorded directly with the help of suitable measurement instruments. Latent variables (i.e., hypothetical constructs) are characterized by the fact that they elude direct observability. Therefore, suitable measurement models are needed to capture the manifestations of a latent variable in reality.

If a structural model consists only of manifest variables and if there were no interactions between the variables, RA would be the classical method of analysis. If, on the other hand, there are interactions between the manifest variables, then path analysis is used. It allows complex structural models to be tested using multiple RA. For structural models that formulate relationships between latent variables, suitable measurement models are first required, which can be used to obtain empirical observed values for the latent variables. Using these measurement values, the presumed structure between the latent variables can then be empirically tested, analogous to the case of manifest variables. For structural models with latent variables, the term causal analysis is also common in the literature (Weiber & Mühlhaus, 2014).

The SEA with latent variables thus consists of three sub-models.

(1) The core is the *structural model*, which represents the theoretically assumed relationships between the latent variables. Here, the endogenous variables are explained by the causal relationships assumed in the model, with the exogenous variables serving as explanatory variables, but not themselves explained by the causal model.

(2) The measurement model of the *latent exogenous variables* contains the empirical measurements from the operationalization of the exogenous variables and reflects the assumed relationships between the measurements and the exogenous variables.

(3) The measurement model of the *latent endogenous variables* contains the empirical measurements from the operationalization of the endogenous variables and reflects the presumed relationships between these measurements and the endogenous variables.

Accordingly, the relationships discussed in the literature review are the basis for our structural model. The two associated measurement models and the variables within them are discussed in the following section.

We use AMOS 29 (Arbuckle, 2019; Byrne, 2016) to apply the structural equation model. As widely recommended in the literature, we apply the maximum-likelihood (ML) method (e.g., Backhaus et al., 2015; Weiber & Mühlhaus, 2014; Weston & Gore, 2006). Byrne (2001) notes that AMOS automatically imposes the value of one to the first of each set of factor loadings and to the regression coefficients associated with each error term. Accordingly, they do not estimate these values. Byrne (2001) explains that the factor loadings set to a value of one address the issues of model identification and the scaling of the unobserved factors, while those associated with the error terms represent values that are considered to be known (see Backhaus et al., 2015; Weston & Gore, 2006).<sup>3</sup>

<sup>3</sup> A second possibility is to fix the variance of a latent variable to 1. In our analysis both types of metric determination lead to at least similar parameter estimates. Hence, it can be assumed that the

parameter estimates also provide reliable measurements of the unobservable variables (Byrne, 2001; Weiber and Mühlhaus, 2014). For the single-item constructs it is assumed that the

As recommended in the literature, we examine the standardized estimates as they are considered most informative. Because different variables may have different scales, determining which variable has the greatest effect can only be done by comparing the standardized parameter estimates (Backhaus et al., 2015; Weston & Gore, 2006). We use the standardized total effects in general and differentiate between the direct and the indirect effects for some variables.

To evaluate the goodness-of-fit between the hypothesized model and the sample data, we calculate several fit indexes. As recommended in the literature, we use the root mean square error of approximation (RMSEA); the standardized root mean square residual (SRMR); the adjusted goodness-of-fit index (AGFI), the incremental-fit index (IFI), and the comparative-fit index (CFI) for baseline comparisons between the default model and independence model (see Backhaus et al., 2015; Browne & Cudeck, 1993; Byrne, 1989; Byrne, 2016; Hair et al., 2010; Haughton et al., 1997; Hu & Bentler, 1999; MacCallum et al., 1996; Schermelleh-Engel et al., 2003; Weston & Gore, 2006; Weiber & Mülhhaus, 2014). According to the literature, the two main indexes are the RMSEA and the SRMR.

As an index of fit, RMSEA corrects for a model's complexity. As a result, when two models explain the observed data equally well, the simpler model will have the more favorable RMSEA value. A RMSEA value of zero indicates that the model fits the data exactly. Weston and Gore (2006) suggest using the 90% CI (confidence interval) for the RMSEA that incorporates the sampling error associated with the estimated RMSEA. The SRMR index is based on covariance residuals in which smaller values indicate a better fit. The SRMR is a summary of how much difference exists between the observed data and the model.

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indicator can measure the construct without error, which is why the variance of the associated error variable is fixed at a value of 0 (Byrne, 2001; Weiber & Mülhhaus, 2014). Single-item constructs:

## Variables and Hypotheses for the Structural Equation Analysis

### *Dependent Variables in the structural model and measurement concepts*

A SEA, unlike a RA, allows individual variables in the different hypotheses to be both independent and dependent variables. These variables are also referred to as intervening variables. In our analysis, the variables *Risk Attitude* and *Financial Literacy* act as intervening variables between the independent and exogenous variables and the main dependent variable CMP.

### *Capital Market Participation*

The main dependent variable, *Capital Market Participation* (CMP), comprises the following wealth positions of a household (PHF Survey Team, 2019b, pp. 4-5): mutual funds, bonds, publicly traded shares (Buccioli et al., 2019; Calvet & Sodini, 2014; Calvet et al., 2007; Halko et al., 2012). Hence, we widen the scope of previous studies and focus not only on stock market participation. In order to cover the participation in that three main categories of capital market assets, we define dummy variables for the holding of publicly traded shares, bonds, and mutual funds (Fey et al., 2020). As a hypothetical construct, the latent endogenous variable CMP influences these three measurement variables. The three dummy variables contain the empirical measurement from the operationalization of the endogenous variable CMP.

### *Financial Literacy*

For the definition of financial literacy, we follow the growing strand of literature that uses the concept of financial capability with the key element of practical skills (see Aubram et al., 2016; Bernheim et al., 2001; Deepak et al., 2015; Dixon, 2006; Oehler & Werner, 2008; Oehler et al., 2018b; Xiao & O'Neill, 2016) and the related concept of financial competencies by the OECD (OECD/INFE, 2016). To measure financial literacy empirically, Lusardi and Mitchell

age, gender, net wealth, net income, satisfaction with life (present), planning horizon (future), financial advice, and investment experience).

develop three questions that are suitable for surveys, although the questions reflect a rather narrow definition of financial literacy (see Bucher-Koenen & Knebel, 2021; Bucher-Koenen et al., 2017; Bucher-Koenen et al., 2021; Lusardi & Mitchell, 2011; Lusardi & Mitchell, 2014). The three questions are on compound interest, inflation, and risk diversification. According to Rieger (2020), the Cronbach's Alpha of this scale is .43, which is "acceptable, given that it consists of only three items" (p. 4). The PHF Survey also follows this measurement of financial literacy. However, in its third wave, a fourth question on compound interest and debt is added (PHF Survey Team, 2019a, pp. 164-165).

The PHF study allows us yet another perspective on financial literacy, namely the possibility of taking economic literacy courses while in school. This variable is determined by the answer to the question whether the respondent participated in courses or training sessions on household finances or asset management (PHF Survey Team, 2019a, p. 32).

In order to cover both categories of financial literacy, we define two variables for operationalizing the extent of financial literacy. As a hypothetical construct, the latent endogenous variable *Financial Literacy* influences that two measurement variables. The both variables contain the empirical measurement from the operationalization of the endogenous variable *Financial Literacy*.

We determine our first measurement variable on financial literacy, *Fin\_Lit\_Score*, with the answers to the four questions mentioned above and code the answers as indicator variables (Van Rooij et al., 2011). *Fin\_Lit\_Score* equals four if all answers are correct, three if three out of four answers are correct, two if two out of four questions are correct, one if only one answer is correct, and zero otherwise (Oehler et al., 2022a).

The second measurement variable, *Fin\_Lit\_Training*, equals one if a member of the respective household participated in courses or training sessions on household finances or asset management and zero otherwise.

### ***Risk Attitude***

In addition to *Financial Literacy*, the other dependent variable, *Risk Attitude*, acts as a main influencing variable in the analysis of capital market participation. The risk appetite, usually measured as degree of risk aversion, is a crucial determinant, and acts as an intervening variable between the independent variables and *Capital Market Participation*.

Risk aversion is covered by two different concepts in the financial domain (Schoemaker, 1993). One strand of literature relies on the neo-classical assumption that the financial risk taken by an individual mirrors exactly her risk aversion (e.g., Arrow, 1965; Pratt, 1964). Hence, risk attitude can be measured by the self-selected level of financial risk. This concept is considered as objective risk aversion (see Nasic & Weber, 2010). Other studies use the terms risk-taking (Schooley & Worden, 1996), observed risk-taking (Schoemaker, 1993), risk tolerance (Wang & Hanna, 1997), or relative risk aversion (Riley & Chow, 1992). We do not employ this concept due to possible endogeneity issues.

The second strand of literature assumes that investment decisions are the result of a process that is additionally influenced by individuals' subjective perception, heuristics, and bounded rationality (Hirshleifer, 2015). Therefore, the investment decisions, and likewise the measured objective risk aversion, are most likely driven by partially unobservable factors (Schoemaker, 1993). In this framework, researchers consequently can only measure an individual's risk aversion by directly asking them to self-assess their willingness to take financial risk (Chaulk et al., 2003; Dohmen et al., 2011; Nasic & Weber, 2010; Oehler & Horn, 2019). Since individuals' self-assessment always includes subjective components, it is a subjective risk aversion. Other studies use the terms such as financial risk aversion (Kaustia et al., 2023) or intrinsic attitude toward risk (Schoemaker, 1993).

Since both concepts are not mutually exclusive, some studies combine both in one framework. For example, Nasic and Weber (2010) differentiate between subjective and objective risk aversion and find that the subjective risk aversion is a significant determinant of the objective risk aversion (see also Schooley &

Worden, 1996; Chaulk et al., 2003; Halko et al., 2012; Kaustia et al., 2023). Oehler et al. (2018a) conclude from a simultaneous analysis of both measures of risk aversion in an experimental setting that the subjective risk aversion is a better predictor for the objective risk aversion than a set of commonly used socio-demographic and economic factors such as age or income. Hence, we assume that a measure of subjective risk aversion shall be a good predictor for CMP.

Dohmen et al. (2011) add to this discussion and use a question asking people about their willingness to take risks “in general”. They confirm the behavioral validity of this measure in an experiment that uses paid lottery choices and conclude that this question is the best all-round predictor of risky behavior.

Following the main findings of the literature, we use the measure of Dohmen et al. (2011) and a measure of subjective risk aversion within the measurement model for the latent variable *Risk Attitude*. In order to cover both categories of risk attitude, we define two variables for operationalizing the extent of risk aversion. As a hypothetical construct, the latent endogenous variable *Risk Attitude* influences that two measurement variables. The both variables contain the empirical measurement from the operationalization of the endogenous variable *Risk Attitude*, the self-assessment of risk aversion in the financial domain, *RiskFin*; and the self-assessment of general risk-taking, *RiskGen* (Oehler et al., 2022a).

*RiskFin* is determined by the answer to the question, “If savings or investment decisions are made in your household, which of the statements best describes the attitude toward risk?” (PHF Survey Team, 2019a, p. 153), on a scale from one to four. One means that “We take significant risks and want to generate high returns”; two means that “We take above-average risks and want to generate above-average returns”; Three means that “We take average risks and want to generate average returns”; and four means that “We are not ready to take any financial risks”.

*RiskGen* is determined by the answer to the question, “How do you view yourself? Are you in general a risk-taking person or do you try to avoid risks?” on a scale from 0 to 10. Zero means that

you are “very willing to take risks”; 10 means that you are “not at all ready to take risks” (the original scale is recoded to align in the same direction as in the question on risk aversion in the financial domain) (Oehler et al., 2022a).

### **Independent Variables in the Structural Model and Measurement Concepts**

The measurement model of the *latent exogenous variables* contains the empirical measurements from the operationalization of the exogenous variables and reflects the assumed relationships between the measurements and the exogenous variables.

#### ***Net Wealth***

We use a household’s net wealth as proxy for its wealth position (total household assets minus total outstanding liabilities, measured in Euros) (PHF Survey Team, 2019b, p. 8). Among others, households’ financial assets include the total value of deposits, mutual funds, bonds, non self-employment private businesses, publicly traded shares, managed accounts, money owed to the household, ‘other’ financial assets, voluntary pension plans and whole life insurance contracts. The main share lies in deposits and “households need to keep enough of their wealth in deposits to manage their everyday spending and meet any unforeseen needs; the lower their overall wealth, the more they will need to rely on easily accessible cash” (EFAMA, 2020, p. 28). The other main wealth component is the real asset position including the household’s main residence.

#### ***Home Loan Saving and HMR Mortgage Outstanding***

For a clearly differentiated analysis, we additionally use the amount saved in Euros for a household main residence (HMR) via home loan saving contracts (PHF Survey Team, 2019a, p. 139) as an alternative investment in the household’s portfolio as well as the current level of outstanding debt in Euros for existing HMR as the major share of household’s debt (PHF Survey Team, 2019b, p. 5).

#### ***Voluntary Pension Plan and Whole Life Insurance***



Investments as precautions, in particular for old-age provision, are a diversifying addition to the portfolio of financial assets. These investment alternatives through financial intermediaries such as insurance companies typically represent no direct investments in capital markets. It could be argued that such products of financial intermediaries are also related to the capital market, because a part of the clients' insurance premiums are likely to be invested in bonds. For this analysis, however, the perception of households is crucial. Most households probably understand such investments as so-called safe investments, similar to deposits. According to EFAMA (2020, p. 5 & p. 24), the "strong market position of insurance-based products can be explained by the preference of many citizens for products with a nominal capital guarantee and a strong preference by households for saving in bank deposits and insurance products that offer some form of guarantee." We employ the total amount in Euro invested by a household in voluntary pension plans and whole life insurance contracts (PHF Survey Team, 2019b, p. 3) as independent variables.

#### ***Net Income***

Household income originates from different sources, in particular from employment, self-employment, and pensions (PHF Survey Team, 2019b, pp. 4-5). For a more realistic analysis, we calculate a household's net income position in Euro to approximate a possible volume for the CMP. The net income takes the estimate of monthly net disposable income into account (after the deduction of taxes and social security contributions; PHF Survey Team, 2019a, p. 38), minus total expenditures of the household typically spend per month on consumer goods and services (without financial payments) (e.g.. loan repayments) (PHF Survey Team, 2019a, p. 35), and minus payments for household's total debt (PHF Survey Team, 2019b, p. 6).

#### ***Satisfaction with Life (present)***

The PHF Survey provides a subjective measure of satisfaction that captures the self-perceived overall satisfaction status. To map the current life situation in the life cycle, we use the question about the current satisfaction with life as a proxy (satisfied overall with life at present, 0 = totally

dissatisfied, 10 = entirely satisfied; PHF Survey Team, 2019a, p. 119).

#### ***Planning Horizon (future)***

To map the future life situation in the life cycle, we use the question about the planning horizon as a proxy. We code the answers as follows: 0 = "we do not make plans in advance"; 1 = "a few months"; 2 = "one year"; 3 = "a few years"; 4 = "5 to 10 years"; 5 = "more than 10 years".

#### ***Age***

We use the variable *Age* as an additional proxy for the life-cycle status (e.g. Oehler et al., 2022a). *Age* is calculated as the difference between 2017 (the year when the third wave of the survey was conducted) and the year of birth of the FKP. Some empirical studies have also used the squared age and higher moments of age (Ameriks & Zeldes, 2004; Cocco et al., 2005; Guiso & Sodini, 2013; Fagereng et al., 2017; Fey et al., 2020; Kaustia et al., 2023; Poterba & Samwick, 2001). When we use the age squared, the results of our model differ only marginally. Hence, we only use *Age* for a more intuitive interpretation.

#### ***Gender***

Following the literature we control for gender effects by including the gender of the financially knowledgeable person (FKP) as dummy variable (1 = male, 2 = female; PHF Survey Team, 2019a, p. 168). The analysis of Hanna et al. (2021) on whether the husband or wife was the financially knowledgeable person (FKP) showed a strong effect of the spouse with more education being the respondent.

#### ***Education***

According to Cole et al. (2012), Guiso and Sodini (2013), Calvet and Sodini (2014), Bannier and Schwarz (2018), Laurinaityte (2018), Kaustia et al. (2019), Bucher-Koenen et al. (2021), Bucher-Koenen and Knebel (2021), and Hammer et al. (2022) the basic and main drivers of financial literacy are the formal level of education in school and the formal level of professional education. We combine the highest level of school education completed (scale from 6 = "General or specific upper level secondary school permitting admission to university" to 1 = "currently still a pupil" with 0 = no answer/no school degree) and

the highest level of professional education completed (scale from 7 = "PhD" to 1 = "currently in vocational training or degree program" with 0 = no answer/no higher education degree) in our variable *Education* (PHF Survey Team, 2019b, pp. 30-31; Oehler et al., 2022a).

### ***Financial Advice***

Within the PHF Survey, households are asked about the financial advice obtained from the household's main bank in the three years prior to the interview. We code their answers as a dummy variable (1 = advice, 2 = no advice; PHF Survey Team, 2019a, p. 157). While we have no information on the frequency at which households consulted their banks, the content of these meetings or if the household ever acted upon the advice that it receives, this variable gives a good proxy about the household's general willingness to seek professional advice (Fey et

al., 2020). In addition, it can be argued that the possible use of the bank's consulting service also implies that a direct approach is made by the main bank concerned to its customers.

### ***Investment Experience***

Another predictor variable for the CMP is the household's own experience with investments in risky assets. The PHF Survey provides us with answers to the question on significant gains or losses from trading with financial assets in the three years prior to the interview (1 = gains, 2 = neither, 3 = losses; PHF Survey Team, 2019a, p. 156).

### ***Descriptive Statistics and Hypotheses in the Structural Model***

Table 1 displays the descriptive statistics for the variables of the measurement concepts of the surveyed households.

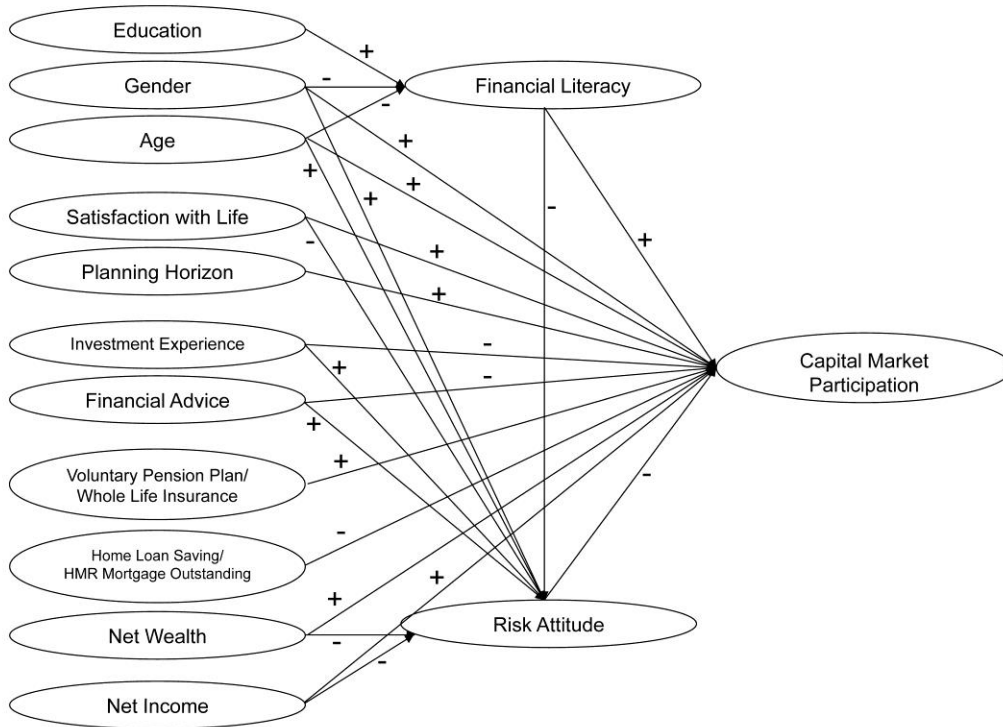
**Table 1. Descriptive Statistics for the Variables of the Measurement Concepts of the Surveyed Households (N = 4,538)**

	Mean	Median	SD	Min	Max
<b>Net Wealth (in Euros)</b>	518,552	260,081	1671,257	-1271,354	92691,570
<b>Home Loan Saving and HMR Mortgage Outstanding (in Euros)</b>					
Home Loan Saving	584	0	1,848	0	60,000
HMR Mortgage Outstanding	27,223	0	71,701	0	980,00
<b>Voluntary Pension Plan and Whole Life Insurance (in Euros)</b>					
Voluntary Pension Plan	22,804	1,400	48,246	0	662,600
Whole Life Insurance	15,828	0	43,241	0	800,000
<b>Net Income (in Euros)</b>	2,842	1,900	9,039	0*	149,600
<b>Satisfaction with Life (present)</b>	7.57	8	1.80	0	10
<b>Planning Horizon (future)</b>	2.20	2	1.53	0	5
<b>Age</b>	58	59	16.08	19	90
<b>Gender</b>	1.42	1	.49	1	2
<b>Education</b>					
Level of education in school	4.21	4	1.67	0	6
Level of professional education	3.66	3	2.02	0	7
<b>Financial Advice</b>	1.71	2	.45	1	2
<b>Investment Experience</b>	1.94	2	.012	1	3
<hr/>					
<b>Capital Market Participation (CMP)</b>					
Mutual funds	.27	0	.44	0	1
Bonds	.07	0	.26	0	1
Stocks	.23	0	.42	0	1
<b>Financial Literacy</b>					
Fin_Lit_Score	3.22	3	.95	1	4
Fin_Lit_Training	.27	0	.45	0	1
<b>Risk Attitude</b>					
RiskFin	3.63	4	.53	1	4
RiskGen	5.86	6	2.16	0	10

Notes: Table 1 displays the descriptive statistics for the variables of the measurement concepts of the surveyed households. For each variable we provide mean value (Mean), median value (Median), standard deviation (SD), minimum value (Min), and maximum value (Max). Example: The mean value of *Fin\_Lit\_Score* is 3.22 with a standard deviation of .95, the median is 3 with a range from 1 to 4. \*Variable Net Income: negative values were replaced by the value 0 because these were likely caused by imputations (N = 120).

Figure 1 illustrates an overview of the hypothesized relationships and the expected effects between the dependent variables (*Capital*

*Market Participation (CMP)*, *Risk Attitude*, *Financial Literacy*) and the independent variables.



**Figure 1. Hypotheses in the Structural Model**

Consistent with the literature, we expect higher CMP with higher financial literacy and a lower degree of risk aversion. Financial literacy should be higher among better educated, younger male FKPs. Risk aversion should decrease with higher financial literacy, net income and wealth, satisfaction in life, positive investment experiences, and financial advice. Older and female FKPs should show a higher degree of risk aversion. CMP should be higher among older, male FKPs that received financial advice, have a higher degree of satisfaction in life, longer planning horizon, better investment experience,

investments in voluntary pension plans / whole life insurances, and higher net income and wealth. Home loan savings or an outstanding mortgage should have a negative influence on CMP.

**Results**

*Structural Model*

The results support the hypothesized relationships in our structural equation model presented in Figure 1. We provide the results of the structural equation model in Table 2.

**Table 2. Results of the Structural Equation Model (Standardized Estimates)**

<b>Panel A</b>		
<b>Model Fit Indices</b>	Value	
RMSEA	.041	
<b>Panel B</b>		
<b>Squared Multiple Correlations (SMC) of the Endogenous (dependent) Variables</b>	Value	
<i>Capital Market Participation (CMP)</i>	.59	
<i>Financial Literacy</i>	.64	
<i>Risk Attitude</i>	.39	
<b>Panel C</b>		
<b>Standardized Total Effects Dependent Variables</b>	<b>Independent Variables</b>	Value
<i>Capital Market Participation</i>	<i>Financial Literacy</i>	.43***
<i>Capital Market Participation</i>	<i>Risk Attitude</i>	-.53***
<i>Risk Attitude</i>	<i>Financial Literacy</i>	-.47***
<i>Capital Market Participation</i>	<i>Net Wealth</i>	.11***
<i>Capital Market Participation</i>	<i>Home Loan Saving and HMR Mortgage Outstanding</i>	-.06*
<i>Capital Market Participation</i>	<i>Voluntary Pension Plan and Whole Life Insurance</i>	.15***
<i>Capital Market Participation</i>	<i>Net Income</i>	.00
<i>Capital Market Participation</i>	<i>Satisfaction with Life (present)</i>	.08
<i>Capital Market Participation</i>	<i>Planning Horizon (future)</i>	.09***
<i>Capital Market Participation</i>	<i>Age</i>	.17***
<i>Capital Market Participation</i>	<i>Gender</i>	-.09**
<i>Capital Market Participation</i>	<i>Financial Advice</i>	-.21***
<i>Capital Market Participation</i>	<i>Investment Experience</i>	-.20***

**Table 2 (continued). Results of the Structural Equation Model (Standardized Estimates)**

Panel C (continued)		
Standardized Total Effects		Value
Dependent Variables	Independent Variables	
<i>Financial Literacy</i>	<i>Education</i>	.69***
<i>Financial Literacy</i>	<i>Gender</i>	-.15***
<i>Financial Literacy</i>	<i>Age</i>	-.25***
<i>Risk Attitude</i>	<i>Net Wealth</i>	-.09***
<i>Risk Attitude</i>	<i>Net Income</i>	-.04
<i>Risk Attitude</i>	<i>Investment Experience</i>	.19***
<i>Risk Attitude</i>	<i>Financial Advice</i>	.08***
<i>Risk Attitude</i>	<i>Satisfaction with Life (present)</i>	-.09***
<i>Risk Attitude</i>	<i>Gender</i>	.21***
<i>Risk Attitude</i>	<i>Age</i>	.14**

Notes: We provide the fit indices for the full model in **Panel A**. Given the benchmark values from the literature (see Section 4.1) our model has a very good fit.

**Panel B** shows the squared multiple correlations (SMC) of the latent endogenous variables (proportion of explained variance) in which 59% of the variance is in capital market participation, 39% is in risk attitude, and 64% in financial literacy are explained by the latent variables.

According to the reference in the literature (see Section 4.2), this is a substantial value for capital market participation and for financial literacy, and a moderate value for risk attitude.

**Panel C** displays the standardized total effects within the structural model. Most of the coefficients are in the proposed direction and significant.

For example, *Financial Literacy* has a great impact on *Capital Market Participation* (.43) and *Risk Attitude* has a great impact on *Capital Market Participation* (-.53), too. Both are significant at the one per mill level.

The symbols \*\*\*, \*\*, and \* denote significance at the one per mill, 1%, and 5% levels, respectively.

The benchmarks for a good model fit that are recommended in the literature are below or equal to .06 for the RMSEA index; below or equal to .08 for the SRMR index; and above or equal to .9 for the AGFI, IFI, and CFI.

Given that our results for the RMSEA equal .041 (above the lower 90% confidence estimate: .039; below the upper 90% confidence estimate: .043) and the SRMR equals .028, our model has a very good fit.

#### ***Capital Market Participation: Financial Literacy, Risk Attitude, and Other Predictors***

The squared multiple correlation (SMC) of CMP is calculated as one minus the value of the respective residual term and amounts to 0.59. This is the proportion of the variance in

participation that the latent variables can explain. According to the example in Chin (1998), these results show a substantial SMC.

Within this part of the model, *Financial Literacy* (.43) and *Risk Attitude* (-.53) are the dominant drivers of investments in risky assets (funds, bonds, publicly traded shares). The influence of both variables is strong and significant with  $p < .001$ .

As hypothesized and in accordance with the literature (Beshears et al., 2018; Fey et al., 2020; Kaustia et al., 2023; Laurinaityte, 2018; Thomas & Spataro, 2015; von Gaudecker, 2015), higher financial literacy leads to higher CMP.

In addition to *Financial Literacy*, as proposed, the second major variable, *Risk Attitude*, has a strong

impact on capital market participation. The degree of risk aversion is a crucial determinant and acts as an intervening variable between the independent variables and CMP. As expected, lower risk aversion leads to higher CMP.

Households' *Net Wealth* has a positive impact on CMP with  $p < .001$ . This is in line with the literature (Calvet and Sodini, 2014; Fey et al. 2020; Laurinaityte, 2018), but the magnitude of the influence is not strong (.11).

In addition, our analysis shows that the impact of the two correcting variables in the context of wealth, the *Home Loan Saving and HMR Mortgage Outstanding*, and the *Voluntary Pension Plan and Whole Life Insurance*, act in the expected direction, however, only with moderate impact (coefficients of  $-.06$  and  $.15$ ., respectively). The positive impact of the investment in voluntary pension plans and whole life insurances is statistically significant with  $p < .001$ . Overall, housing or HMR influence CMP (Cocco et al., 2005; EFAMA, 2020; Gomes et al., 2021; Kaustia et al., 2023). However, housing discourages saving in financial assets not in a crucial manner. Households' perception that the investment in voluntary pension plans and whole life insurances act as so-called safe investments (EFAMA, 2020), similar to deposits, may lead to the moderate influence on capital market participation.

*Financial Advice* has a positive impact on CMP. Households who use the consulting service of their main bank invest more in capital markets with  $p < .001$ . Hence, our findings provide further support for those of von Gaudecker (2015), Chien and Morris (2017), and Fey et al. (2020). Additionally, *Investment Experience* has the hypothesized impact. Significant previous gains result in higher CMP, while significant losses have the opposite effect (.20). The influence is statistically significant with  $p < .001$ .

*Age* has a positive influence on CMP (.17,  $p < .001$ ). It is plausible that investments in human capital and CMP compete for the limited resources of younger people (Athreya et al., 2023; Poterba & Samwick, 2001). Consistent with the literature, our results provide evidence that men invest more in capital markets than women (i.e., the gender gap) (Fey et al., 2020; Guiso &

Zaccaria, 2023; Hanna et al., 2021). We will discuss this result more deeply in the light of literacy and education below.

While *Satisfaction with Life* (present) hardly has an impact on capital market participation (.08, not significant), *Planning Horizon* positively influences the participation decision, however, with only small magnitude (.09,  $p < .001$ ). The longer the planning horizon is aligned, the larger the CMP (Ameriks & Zeldes, 2004; Barberis, 2000; Calvet et al., 2007).

Contrary to our expectation, higher *Net Income* results not in a larger CMP. This could be due to the fact that households' income stems from different sources, in particular from employment, self-employment, and pensions.

### Financial Literacy

In order to cover both categories of *Financial Literacy*, we defined two measurement variables for operationalizing the extent of financial literacy: *Fin\_Lit\_Score*, and *Fin\_Lit\_Training*. Their standardized total effects (i.e. their influences) are quite similar: .42 for *Fin\_Lit\_Score* and .35 for *Fin\_Lit\_Training*.

Overall, the squared multiple correlation (SMC) of *Financial Literacy* amounts to .64, which means that more than 60% of the variance is explained by the assumed predictors *Education*, *Gender*, and *Age*. According to Chin (1998), these results show a substantial SMC.

Our results indicate that higher schooling education and higher professional qualification will contribute to higher *Financial Literacy*. Hence, *Education* has a positive impact of more than 69% on *Financial Literacy* (standardized total effect: .69,  $p < .001$ ), and increases with the level of school education completed and the level of professional qualification completed.

*Age* (.25) and *Gender* (.15) also play a highly significant role, but the effects are weaker than the influence of *Education*. As expected, *Financial literacy* will be higher at a lower age (Guiso & Sodini, 2013; Calvet et al., 2009; Korniotis & Kumar, 2011), and men seem to be more financial literate than women (Bannier & Schwarz, 2018; Fey et al., 2020; Guiso & Zaccaria, 2023; Hanna et al., 2021).

### Risk Attitude

In order to cover both categories of *Risk Attitude*, we define two measurement variables: *RiskFin*, the self-assessment of risk aversion in the financial domain, and *RiskGen*, the self-assessment regarding general risk-taking. Their standardized total effects are substantially different: .67 on *RiskFin* and .37 on *RiskGen*.

Overall, the squared multiple correlation (SMC) of *Risk Attitude* amounts to .39, which means that about 40% of the variance is explained by the assumed predictors *Financial Literacy*, *Investment Experience*, *Financial Advice*, *Gender*, *Age*, *Net Wealth*, *Net Income*, and *Satisfaction with Life*. According to Chin (1998), these results show a moderate SMC.

Our results indicate that higher *Financial Literacy* will contribute to lower *Risk Attitude* (i.e. lower degree of risk aversion) (standardized total effect: .47,  $p < .001$ ). Moreover, risk aversion decreases with the level of school education and the level of professional qualification.

As expected, positive *Investment Experience* (i.e. significant gains) result in a lower degree of risk aversion, while significant losses have the opposite effect (.19,  $p < .001$ ). With respect to the usefulness of professional advice, we find that *Financial Advice* leads to lower risk aversion, but the effect is rather weak (.08,  $p < .001$ ).

Although *Age* and *Gender* play a significant role, their influences are weaker than the influence of *Financial Literacy*. As expected, risk aversion is lower for younger FKPs (.14,  $p < .01$ ) (Calvet et al., 2009; Guiso & Sodini, 2013; Korniotis & Kumar, 2011), and women are more risk averse than men (.21,  $p < .001$ ) (Fey et al., 2020; Guiso & Zaccaria, 2023; Halko et al., 2012; Hanna et al., 2021).

Our results indicate that higher *Net Wealth* will contribute to lower *Risk Attitude* (i.e., lower risk aversion) (standardized total effect: .09,  $p < .001$ ) (Calvet & Sodini, 2014; Fey et al., 2020; Laurinaityte, 2018). However, the latter effect is not strong in magnitude. Contrary to our expectation, higher *Net Income* does not result in a lower degree of risk aversion. As mentioned above this could be due to the fact that

household's income stems from different sources, in particular from employment, self-employment, and pensions. Calvet et al. (2021) estimate a lower degree of risk aversion for households with riskier labor income. Further, reduced income in old age from low pensions may lead to higher risk aversion. Both effects could explain our findings. *Satisfaction with Life* (present) has only a small impact on risk aversion (.09,  $p < .001$ ).

### Discussion

Stock market investments are in the spotlight of the household finance literature, although real-world households make other financial decisions of higher relevance (Kaustia et al., 2023). We widen the scope and include decisions related to voluntary pension plans, whole life insurance contracts, housing, and investments in risky assets other than stocks, (e.g., bonds and mutual funds). Further, we provide a methodology that goes beyond regression analysis by employing a multi-factor structural analysis and apply it on data from a broad and representative survey of the German Central Bank. Our SEA allows us to investigate and quantitatively estimate complex relationship structures between manifest and/or latent variables. In contrast to regression analysis, SEA tests several causal hypotheses *simultaneously*.

Our structural equation model explains about 60% of the variation in the capital market participation decision. Yet, our study uses a cross-sectional dataset. Hence, we discuss our findings with caution in terms of causality. The results show that although households' financial literacy and risk aversion are the dominant drivers of investments in risky assets, further factors such as wealth, voluntary pension plans and whole life insurance contracts, financial advice, and investment experience play a remarkable role. Financial literacy reduces risk aversion (i.e., the higher the financial literacy, the lower is the risk aversion). Since CMP is related to investment experiences, financial advisors should take care of clients that suffered from losses, explain that temporary losses are part of risky investments, and that a complete divestment from capital markets would harm the clients' future wealth accumulation severely. We do not find significant



results of housing on capital market participation, but age and gender play a role, directly, and indirectly via financial literacy and risk attitude.

As proposed in our structural model, *Financial Literacy* has a strong impact on *Capital Market Participation* (.43). Our analysis additionally allows us to attribute this influence on CMP to a direct component and to an indirect effect via *Risk Attitude*. The direct effect amounts to the smaller part (.18 or 42% of the effect), while the indirect part via *Risk Attitude* is higher (.25 or 58%). The higher the *Financial Literacy*, the lower the risk aversion is; and lower risk aversion is associated with higher investments in risky assets.

Contrary to our expectation, higher *Net Income* results not in a larger CMP. Therefore, we dig deeper and differentiate different income types instead of only looking at total net income. If we examine the entire sample of 4,538 households, only 1,202 households report investing in mutual funds (26.5%), only 7.4% use bonds (N = 334), and 22.6% (N = 1,026) invest in stocks. If we now differentiate the CMP according to the three types of income mentioned, we find that the CMP for households with employee income (N = 2,916) is rather lower than in the entire sample (funds: 26.5, bonds: 6.5, stocks: 21.7%). In contrast, households with pension income (N = 2,018) show a higher participation rate in stocks and bonds (funds: 26.3, bonds: 9.1, stocks: 24.3%; intervening effect from higher wealth with higher age), which explains the relative neutrality of the variable *Net Income*. Households with income from self-employment (N = 913) show an even stronger CMP (funds: 30.7, bonds: 9.9, stocks: 27.3%). These results confirm the assessment of Georgarakos and Inderst (2011) which state that self-employed people are more likely to invest in stocks.

Moreover, the income variable is likely to be biased in the case of positive or negative wealth shocks (Oehler et al., 2022a). For example, households that have inherited a substantial amount of money or assets but tend to have lower incomes are more likely to behave like high-asset households than low-income households. On the other hand, households with high income and low wealth (e.g. shortly after starting a job or getting divorced) are more likely to behave like

households with low wealth by first building up precautionary liquidity as insurance against income shocks (job loss or similar) and to be able to cover unexpected expenses (EFAMA 2020); additionally, measurement errors are claimed (Calvet & Sodini, 2014; Guiso & Sodini, 2012; Fagereng et al., 2017). Nevertheless, financial planners, financial counselors, and policy makers should try to convince more households with employee income to participate in capital markets, maybe with opt-out programs for capital market linked pension plans.

Another strand in the literature on household finance analyzes the question whether there is a *Gender* effect on participation in the capital market (Bannier & Schwarz, 2018; Fey et al., 2020; Guiso & Zaccaria, 2023; Hanna et al., 2021). Most of the studies conclude that the so-called gender gap disappears once risk aversion is considered (Halko et al., 2012). Consistent with the literature, our results provide evidence that men invest more in capital markets than women, but the total effect is not strong (.09). In the context of Halko et al.'s (2012) findings, we take a deeper look at the PHF data and our results show that women have a higher risk aversion than men (.21, significant at the one per mill level). The variable for risk in the financial domain, *RiskFin* (median: 4, scale from 1 to 4), is equally distributed for men (N = 2,650) and women (N = 1,888). However, regarding the variable covering risk in a general context, *RiskGen* (median: 6, scale from 0 to 10) we find a difference. While the sample of men shows a median of 5, women show a median value of 6. At the same time, men show a higher financial literacy (*Fin\_Lit\_Score*: 4 vs. 3 correct answers; *Fin\_Lit\_Training*: 31 vs. 23% passed a course). Further differences concern the level of education in school (median 5 vs. 4) and the professional education completed (median 4 vs. 2). These differences add up to higher risk aversion among women as risk aversion decreases with the level of school education and the level of professional education.

Referring to the results in Fey et al. (2020) and Hanna et al. (2021), we additionally consider the marital status when analyzing a possible gender gap. We find a difference in the CMP depending on whether the FKP as respondent of the household is married, divorced, or widowed.

Divorced and, to a smaller extent, widowed persons invest below average in funds, bonds, and stocks. In contrast, households with married FKP have above-average CMP. A more detailed analysis also shows that widowed and divorced FKPs are mostly women (Fey et al., 2020; Georgarakos & Inderst, 2011; Hanna et al., 2021). Policy makers should elaborate on measures to enable these women to participate in capital markets. Many of these households are in challenging economic situations. The situation only gets worse when they do not receive a share of the equity premium.

### Conclusion

Our multi-factor structural model explains about 60% of the variation of households' capital market participation and, hence, solves major aspects of the so-called participation puzzle. Although households' financial literacy and risk aversion are the dominant drivers of investments in stocks, bonds, or mutual funds, further factors such as net wealth, voluntary pension plans and whole life insurance contracts, financial advice, and investment experience play a remarkable role. Financial literacy reduces risk aversion (i.e., the higher the financial literacy, the lower is the risk aversion). We do not find significant results of housing on capital market participation, but age and gender play a role, directly, and indirectly via financial literacy and risk attitude. The so-called gender gap can be mainly explained by more risk averse women and their role as financially knowledgeable person (FKP), if at the same time it is taken into account that it is above average women who were interviewed as widowed or divorced FKP.

In addition, any effort to promote the capital market participation, and the financial literacy to that end, should keep in mind that many households, but in particular younger ones, do not seem to be in a position to have financial funds available for capital market participation at all due to their tight budget (Campbell, 2006; Vissing-Jorgensen, 2002, 2004). Given the economic consequences of progressively higher inflation, but also given the nexus of physical health aspects and financial health, further analysis should also clarify the extent to which

capital market participation may be permanently impaired.

When policymakers and academics elaborate on concepts to increase the engagement of households in capital markets, they should be aware of households' challenging economic situations as a determining factor. If policymakers and academics only focus on enhancing financial literacy without considering the households' financial restrictions, the interventions would most probably fail. Practitioners such as financial advisors should better point out to low net wealth households that participation in the capital market is already possible and feasible with diversified investments as low as five Dollars/Euros per month, for example, via exchange traded funds (D'Acunto & Rossi, 2020; Horn & Oehler, 2020; Oehler et al., 2022a, 2022b; Rossi & Utkus, 2020).

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