Regional Comparative Analysis on the Determinants of the Spaniards' Financial Knowledge

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Abstract

Are there regional differences in the determinants of financial knowledge in the Spanish adult population? To answer this question, we use data from the Spanish Survey of Financial Competences to estimate qualitative response models in which each of the "big three" of financial knowledge (inflation, compound interest, and risk diversification) acts as a dependent variable on a set of explanatory variables concerning the particularities of individuals. We find that, while some factors determine financial knowledge in a generalized way in most regions and in the same direction (e.g., gender, education, self-confidence), others do so in different ways depending on the region analyzed. Among the latter are health status and financial fragility (where, in both, the different degree of social protection between regions may play an important role), as well as birthplace and age, among others. Rurality also stands out as having different implications in Navarra than in the rest of the regions. We conclude by proposing to use both longitudinal and aggregate indicators of financial knowledge in Spanish regions in order to analyze in the future related issues that are beyond the possibilities offered by microdata bases.

Keywords Financial Knowledge · Regional Differences · Determining Factors · Spain · Social Protection · Rural

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Introduction

For more than a decade, the OECD (2005) has been stressing the need to improve the financial knowledge of individuals. This issue began to take on greater importance after the outbreak of the 2008 crisis. In fact, at that time, many governments and public bodies began to point to the generalized financial ignorance of economic agents as one of the factors amplifying the devastating consequences of that crisis (OECD/INFE, 2009).

Thus, the 2008 crisis ended up acting as "an 'efficient promoter' of the importance of improving financial literacy" (OECD/INFE, 2009, p.9) with the idea that this would cushion the economic effects of subsequent crises, such as the one derived from the current pandemic (Chhatwani & Misha, 2021; Sukumaran & Alamelu, 2021). In this sense, the OECD itself promoted the design and implementation of national strategies of financial education around the world (OECD/INFE, 2013, 2015). Likewise, and as a way of knowing how prepared 15-year-old adolescent students are for the future that the 21st century holds for them, the OECD (2014) introduced financial literacy in its fifth edition of the Programme for International Student Assessment (PISA).

Indeed, individuals' financial knowledge is becoming increasingly important in view of the myriad of financial products and services that are increasingly available to them. Moreover, they increasingly find it necessary to contract this type of products and services to preserve their welfare, especially in those countries where public social security systems are increasingly unsustainable and, therefore, incapable of satisfactorily covering certain contingencies such as retirement (OECD, 2005, 2019). In fact, Spain is heading towards this situation (Blanco and Ruiz, 2017; Moreno-Herrero et al., 2017).

Therefore, it is increasingly common for Spaniards to have to contract financial products and services. However, and according to the Survey of Financial Competences (SFC) prepared within the Bank of Spain and the Spanish National Securities Market Commission (BdE & CNMV, 2018a), they do not always have the financial knowledge necessary to make sound financial decisions. For this reason, these two organizations have long assumed the role of making the Spanish population financially literate through successive financial education plans (BdE & CNMV, 2008, 2013, 2018b).

However, these two organizations are also aware of the need to identify collectives (BdE & CMVN, 2018b, p.42) in the interest of ensuring that the financial education programs that are designed and implemented are truly effective in improving the financial knowledge of the Spanish population. Indeed, not all individuals are the same in terms of their individual characteristics, their degree of familiarity with the financial world, and even the socioeconomic and demographic environment that surrounds them. In fact, Henchoz (2016) already pointed out the little attention that the social embeddedness of individuals was having in the design of national

financial education strategies; embeddedness that could be identified with the region where individuals reside.

To contribute to all this, our main objective is to analyze whether the financial knowledge of Spaniards is influenced by the same factors and in the same way in each of the Autonomous Communities (regions) that make up Spain; an issue that has not yet been addressed. Therefore, we expect our work will provide support to those designing financial education programs in terms of which groups to target depending on the region where they are to be implemented. We also hope to shed more light on the determinants of financial knowledge among Spaniards, an issue that requires further exploration and consensus.

To this end, this introduction is followed by a review of the most important papers that have analyzed the determinants of individuals' financial knowledge, ending with those works that have addressed these factors with a regional comparative approach, on the one hand, and in the Spanish context, on the other. Then, in the empirical analysis, we address what data and methodologies we used to solve our objective. This is followed by our results and their discussion. Finally, we present our conclusions without ignoring our limitations and proposing future research on the Spaniards' financial knowledge.

Prior Literature

Not a few previous papers have analyzed the determinants of financial knowledge. Educational level, income, gender, and age are those that have been most commonly explored, with the first three being the ones on which there tends to be the greatest consensus. Thus, in general, a higher educational level implies higher financial knowledge, while those with lower income or who are female are more likely to be financially illiterate (e.g., Chen & Volpe, 1998, 2002; Lusardi & Mitchell, 2005, 2014; Lusardi et al., 2010, 2014; Klapper et al., 2012; Boisclair et al., 2017; Potrich et al., 2015, 2018; Kiliyanni & Sivaraman, 2018; Moreno-Herrero et al., 2018; West & Worthington, 2018; Xue et al., 2019; Banerjee & Roy, 2020; Shimizutani & Yamada, 2020; Garcia-Mata et al., 2021; Oliver-Márquez et al., 2021a; to name a few).

Age, although well explored, is not a factor on which a clear consensus has been reached. In this regard, some papers suggest that young people are more likely to be financially illiterate compared to other age groups (e.g., Lusardi et al., 2010; Mottola, 2014; Loke, 2017; Xue et al., 2019; Baneerje & Roy, 2020). Meanwhile, there are authors pointing to a linear positive association between age and financial knowledge (e.g., Elan and Goodrich, 2011; Xiao et al., 2015; Jayanthi & Rau, 2017). It is also common to find papers that reveal an inverted U-shaped relationship between age and financial knowledge, suggesting that it is the middle age group that is more financially literate (e.g., Agarwal et al., 2009; Monticone, 2010; West & Worthington, 2018; Mancebón-Torrubia & Ximénez-de-Embún, 2020).

Nonetheless, there are other factors that, although to a lesser extent, have also been previously analyzed as determinants of financial knowledge. Thus, some papers point to a negative relationship between being a foreigner in a country (or simply a

racial or ethnic minority) and being financially literate (e.g., Gerrans et al., 2009; Boisclair et al., 2017; Nam et al., 2018; Yakoboski et al., 2019), although some authors find evidence to the contrary (Mancebón-Torrubia & Ximénez-de-Embún, 2020; Oliver-Márquez et al., 2021a). Other papers analyze people's self-confidence as a predictor of their financial knowledge (Arellano et al., 2018; Bannier & Sinzing, 2018; Andreou & Anyfantaki, 2020; Fonseca & Lord, 2020; Oliver-Márquez et al., 2021a).

Influence of occupational status (especially being self-employed or salaried) on financial knowledge has also been the subject of studies by some authors (Fornero & Monticone, 2011; Cumurovic & Hyll, 2019; West & Worthington, 2018; Fonseca & Lord, 2020; Oliver-Márquez et al., 2021a). So has been marital status, a sometimes approximated by household structure (Lusardi & Tufano, 2015; Potrich et al., 2018; West & Worthington, 2018, Xue et al., 2019; Oliver-Márquez et al., 2021a). Likewise, Klapper and Panos (2011), Klapper et al. (2012), Yuan and Jin (2017), Faulkner et al. (2019) and Oliver-Márquez et al. (2021a) are some of the authors who have evidenced the existence of urban-rural gaps in financial knowledge (the rural population is more likely to be financially illiterate than their urban counterparts).

Previous literature on how financial knowledge is a determinant of financial market participation is quite extensive (e.g., Kimball & Shumway, 2007; Graham et al., 2009; van Rooij et al., 2011; Stix, 2012; Arrondel et al., 2015; Arrondel, 2018, 2021; Yamori & Uema, 2021; to name a few). But, how the use of financial products increases individuals' financial knowledge is a comparatively less explored issue (Love & Phelan, 2015; Murendo & Mutsonsiwa, 2017; Lusardi et al., 2017, 2020a; Baneerje & Roy, 2020). Even more so if we are dealing with real assets (West & Worthington, 2018; Xue et al., 2019). Apart from that, the association between financial fragility and financial knowledge is another issue on which further exploration is required (Lusardi & Tufano, 2015; Lusardi & De Bassa Scheresberg, 2017; Lusardi et al., 2020b; Mancebón-Torrubia y Ximénez-de-Embún, 2020; Oliver-Márquez et al., 2021a). The same is true for the relationship between health status and financial knowledge (James et al., 2012; Han et al., 2014, 2016; Finke et al., 2017).

Additionally, the regional comparative perspective around the determinants of financial knowledge is not very abundant in the literature. Some papers have pointed to the existence of regional differences in financial knowledge (Monticone, 2010; Fornero & Monticone, 2011; Klapper & Panos, 2011; Kim et al., 2017; Baglioni et al., 2018). But few authors have addressed this issue in detail to the point of detecting different determinants of such knowledge in each of the regions (or a set of regions) that make up a given country (Bucher-Koenen & Lusardi, 2011; Bucher-Koenen & Lamla-Dietrich, 2018; Cucinelli et al., 2019; Garcia-Mata, 2021).

Furthermore, those papers that have analyzed the determinants of financial knowledge among Spaniards (the population on which the objectives of our work focus) are scarce, sometimes contradictory, and almost always limited to a very specific group of the population, mainly adolescent students (Molina-Marfil et al., 2015; Cordero et al., 2016; Moreno-Herrero et al., 2018; Mancebón et al., 2019). Recently, some works referring to larger samples have appeared (Mancebón-Torrubia &

Ximénez-de-Embún, 2020; Oliver-Márquez et al., 2021a). However, there is still no work that analyzes the determinants of financial knowledge among Spaniards from a comparative regional perspective.

Precisely the latter is our objective. We also take the opportunity to cover all the existing shortcomings in previous national and international literature, analyzing possible determinants of financial knowledge on which there is still not much exploration and, therefore, no clear consensus. To do so, we use the representative sample of the Spanish population aged between 18 and 79 years provided by the Survey of Financial Competencies (SFC) prepared within the framework of the Bank of Spain and the National Securities Market Commission (BdE & CNMV, 2018a). We also conduct our analysis attending to the "big three" dimensions of financial knowledge (Lusardi & Mitchell, 2005): inflation, compound interest, and risk diversification. Of course, we consider all Spanish regions, except Ceuta and Melilla, as they are excluded from the SFC.

Empirical Analysis

We use the SFC micro-database (BdE & CNMV, 2018a), created from interviews conducted between October 2016 and June 2017 to a representative sample of the Spanish population aged 18-79. Precisely because it is a survey almost all the variables in this database are qualitative, including the "big three" dimensions of financial knowledge (inflation, compound interest and risk diversification) that we use as dependent variables in our estimations.

Thus, due to the qualitative nature of these dependent variables, we resort to logit regressions and, more specifically, to the odds-ratios that result from them. The latter provide a great deal of information and are easy to interpret. We estimated a logistic model for each of the three dimensions of financial knowledge analyzed for each of the 17 regions that make up Spain[1], as well as for Spain as a whole. Thus, we estimated a total of 54 logistic models.

In the following three sections, we provide a statistical-descriptive analysis of the variables used in our estimations, then we address the specifications of our estimated models and their corresponding pre- and post-estimation analyses, and we close by presenting and discussing our results.

Data

All the variables we use in our work are extracted from the SFC. This follows the methodological guidelines recommended by the OECD (2015) which, in turn, are inspired by the methodology of Lusardi and Mitchell (2005, 2014), pioneers in treating financial knowledge in economic research and measuring it through the "big three" dimensions we use here: (i) inflation, (ii) compound interest and (iii) risk

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[1] Ceuta and Melilla are not included in the SFC.

diversification. The SFC also contains a wealth of information on the personal characteristics of respondents and their households, their financial portfolio, their real wealth, and their financial attitudes, among other aspects.

This SFC guarantees the representativeness of the populations of all the regions that make up Spain and, of course, of the entire adult Spanish population (Bover et al., 2018). 8,854 is the total number of valid observations. To meet our objective, we have segmented the sample into 17 samples, each of which corresponds to each of the regions that make up Spain. The number of observations corresponding to each region is shown in Table 2 (see appendix). We also use the national sample to facilitate comparison, not only between regions, but also with respect to Spain as a whole.

Table 1 provides each of the variables used in our analyses and their definition.

Table 2 (see appendix) is the statistical-descriptive summary of these variables.

Estimations

Our conclusions are supported by the odds-ratios obtained in our logistic regressions, the specifications of which are discussed in this section. However, for these results to be valid and reliable, a series of pre- and post-estimation analyses must be carried out. As for the preliminary ones, although we address all the basic assumptions of the classical linear regression model, in logistic models the most important thing is that there is no multicollinearity. The post-estimation analysis in this type of models usually revolves around the goodness of fit.

Starting with the preliminary analysis, the SFC is constructed from interviews with "a large sample of randomly selected individuals" (Bover et al., 2018, p.7). Therefore, we confirm the randomness assumption. Although, we cannot confirm the assumption of normality of the random disturbances because they (as well as the dependent variables) are dichotomous and, therefore, follow the Bernoulli distribution. Non-normality is not a problem when estimating logistic models. In fact, it is not even an issue in the classical linear regression model, where "if the objective is point estimation, the assumption of normality is not necessary" (Gujarati and Porter, 2009, p. 544).

We did not address the presence of outliers because these are only a problem when they are due to human error (Draper & Smith, 1998) and we consider the SFC to be reliable in this respect. Likewise, given that the database we use is cross-sectional and that these data have been randomly collected, the presence of autocorrelation is quite unlikely. Nor is the issue of heteroscedasticity important when we are estimating binary qualitative response models using the maximum likelihood method (Ginker and Lieberman, 2017), as we do here.

But it is important that there is no multicollinearity, i.e., a high correlation between two or more explanatory variables. To detect this, we resort to the Variance Inflation Factor (VIF), which shows how the variance of an estimator is inflated due to the presence of collinearity. Since all VIF values are well below 10 (see Table 3 in appendix), we can consider that there are no multicollinearity problems according to the related econometric literature (Kleinbaum et al., 1988, p. 210; Greene, 2018, p. 95).

Table 1 Definitions of variables we use

	Definition
Dependent Variables	
FK-inflation	Dichotomous variable that equals 1 when the respondent identifies that inflation implies a decrease in purchasing power. It acts as a dependent variable in some of the estimation models.
FK-compund interest	Dichotomous variable whose value is 1 when the respondent correctly calculates a compound capitalization operation. It acts as a dependent variable in some of the estimation models.
FK-risk diversification	Dichotomous variable equal to 1 when the respondent agrees that it is possible to reduce risk by diversifying. It acts as a dependent variable in some of the estimation models.
Explanatory Variables	
Gender	Dichotomous variable that records the value 1 when the respondent is a woman.
Native	Dichotomous variable with a value of 1 when the respondent was born within the Spanish borders.
Rural	Dichotomous variable that is 1 when the respondent resides in a municipality with less than 15,000 inhabitants.
Health	Dichotomous variable equal to 1 if the respondent confesses that, during the year prior to the survey, he/she (or any member of his/her family) has had an accident or health problem that has prevented him/her from leading a normal life.
Household	Dichotomous variable that takes the value 1 when the respondent usually lives alone at home and 0 when the household structure is different.
Financial Fragility	Dichotomous variable equal to 1 when the respondent recognizes that, during the year prior to the interview, he/she has faced situations in which his/her income was not sufficient to cover his/her current expenses (food, electricity, water, cell phone, school, etc.).
Self-Confidence	Ordinal polytomous variable that follows the Likert scale. It is 1 when the respondent rates his/her general knowledge of financial matters as very low. Meantime, it is equal to 5 when the respondent considers that he/she has a very high level of such knowledge.
Education	Dichotomous variable that is equal to 1 when the maximum educational attainment attained by the respondent is the basic and compulsory level required by law in Spain or lower (ISCED classification 2 and lower). Otherwise (ISCED classification 3 and above) this variable is equal to 0.
Income	Dichotomous variable equal to 1 when the total gross annual household income of the respondent is less than 26,001 euros. Consider that, according to the Spanish National Institute of Statistics (INE, 2022a), the average income per household in Spain was 26,730 euros at the time of the interview. Otherwise (26,001 euros or more) this variable is equal to 0.
Tenure	Dichotomous variable that is equal to 1 when the respondent's household owns real estate assets in addition to the main dwelling (e.g., plots of land, farms, warehouses, garages not included in the main dwelling, etc.). This variable is important in the Spanish context, where real estate wealth predominates over financial wealth (BdE, 2019).
Age: 18-39	Dichotomous variable that is equal to 1 when the respondent is between 18 and 39 years old. Base category: age 40-64.
Age: 65-79	Dichotomous variable that is equal to 1 when the respondent is between 65-79 years old. Base category: age 40-64.

Table 1 (continued)

	Definition
Self-Employed	Dichotomous variable equal to 1 when the respondent is self-employed.
Salaried	Dichotomous variable equal to 1 when the respondent is employed.
Unemployed	Dichotomous variable equal to 1 when the respondent is unemployed.
Retired	Dichotomous variable equal to 1 when the respondent is retired.
Shares	Dichotomous variable that is 1 when, during the two years prior to the interview, the respondent has personally or jointly acquired shares in a company.
Pension Plans	Dichotomous variable equal to 1 if, during the two years prior to the interview, the respondent has personally or jointly acquired pension plans.
Investment Funds	Dichotomous variable equal to 1 when, during the two years prior to the interview, the respondent has participated in investment funds.
Mortgages	Dichotomous variable that is 1 if, during the two years prior to the interview, the respondent has personally or jointly taken out a mortgage.
Personal Loans	Dichotomous variable that takes the value 1 when, during the two years prior to the interview, the respondent has personally or jointly contracted a personal loan.

Next, are the specifications of our estimated models:

$$Logit\ [P(Y=1)] = F(\beta_0 + \beta_1 gen + \beta_2 nat + \beta_3 rur + \beta_4 hea + \beta_5 hou$$

$$+ \beta_6 fra + \beta_7 con + \beta_8 edu$$

$$+ \beta_9 inc + \beta_{10} ten + \beta_{11} yng + \beta_{12} old + \beta_{13} occ + \beta_{14} fin + u_i)$$

$$Odds = \frac{P(Y=1)}{1 - P(Y=1)} \iff Logit\ [P(Y=1)] = \ln\left[\frac{P(Y=1)}{1 - P(Y=1)}\right]$$

Where:

- $P(Y=1)$ is the probability that the dependent variable takes the value 1. That is, the probability that the individual gets the question measuring his/her financial knowledge right.
- F: cumulative logistic distribution function.
- gen: gender.
- nat: native.
- rur: rural.
- hea: health.
- hou: household structure.
- fra: financial fragility.
- con: subjective financial knowledge.
- edu: education.
- inc: income.
- ten: tenure.

- *yng*: age 18-39.
- *old*: age 64-79.
- *occ*: occupational status (self-employed, salaried, unemployed, retired).
- *fin*: financial products (shares, pension plans, investment funds, mortgages, personal loans).
- u_i: random disturbances.

Post-estimation analyses of logistic models usually revolve around goodness-of-fit. Nevertheless, such goodness "is of secondary importance. What matters is the expected signs of the regression coefficients and their statistical and/or practical significance" (Gujarati & Porter, 2009, p.563).

Count R^2 is greater than 0.5 in all our estimations, which implies a correct fit of the data to the model. Besides, in most of our estimations the p-values of Pearson's test does not allow us to reject the null hypothesis that there is conformity in the predicted and observed frequencies across patterns. Alternatively, the p-values of the Hosmer-Lemeshow's test does, which, in turn, also verifies a good part of the results obtained in the Pearson test. Anyway, ROC areas are sufficiently wide (>0.5), which reinforces the previous tests. Thus, there are more tests that guarantee the goodness of fit of the data to the models than those that suggest the opposite.

Results and Discussion

Here we address and discuss the results obtained in our estimations, carried out according to the specifications described previously. Table 4 contains the value of the estimated odds-ratios for each region considered (as well as for the country as a whole), with FK-inflation as the dependent variable. This table differs from Tables 5 and 6 in that in these the dependent variable is FK-compound interest and FK-risk diversification, respectively. All these tables include the value of the tests that guarantee both validity and reliability of our results (see appendix).

We begin with those factors that have been most explored and agreed upon in previous literature (education, income, and gender). We find that a lower level of education is negatively associated with financial knowledge. Lower income also increases the probability of being financially illiterate. Similarly, being a woman is negatively associated with financial knowledge. These three phenomena are widespread throughout the country, especially the first two, since the "income" variable yields a smaller (although not negligible) number of significant results compared to the other two.

These three findings are consistent with most of the previous literature, both national and international (e.g., Lusardi et al., 2010; Molina-Marfil et al., 2015; Moreno-Herrero et al., 2018; West & Worthington, 2018 Mancebón et al., 2019; Xue et al., 2019; García-Mata, 2021; Mancebón-Torrubia & Ximénez-de-Embún, 2020; Oliver-Márquez et al., 2021a). However, this is the first time that these factors have been analyzed in Spain from a comparative regional perspective. In fact, for the variable "gender" we find odds-ratios greater than 1 in some regions (Aragón, Galicia, La Rioja, and Navarra). But as these not significant, we cannot affirm that

in them the gender gaps are favorable to women, as pointed out by Mancebón et al. (2019) for Spanish adolescents.

Self-confidence is another of the factors analyzed whose significant results point in the same direction for most of Spain. Specifically, we find that the probability of a person being financially literate increases as their self-confidence (measured through their subjective financial knowledge) increases. We concur with other papers that have explored this issue in the Spanish context (Arellano et al., 2018; Oliver-Márquez et al., 2021a). However, we complement it, at least, in two senses. On the one hand, this association is stronger in FK-risk diversification, agreeing with Graham et al. (2009). On the other hand, this association is also stronger in the regions than in the country as a whole. Be that as it may, our findings are also consistent with related international literature (e.g., Bannier & Sinzing, 2018; Andreou & Anyfantaki, 2020; Fonseca & Lord, 2020).

Apart from that, our results suggest that the relationship between being a native (or foreigner) and being financially literate does not lie so much in the region where the individual lives, but rather in which dimension of financial knowledge we are analyzing. Thus, we find that being born outside Spanish borders is positively associated with financial knowledge in Spain as a whole and Galicia (risk diversification), Region of Murcia (inflation), as well as in Aragon and Asturias (compound interest). Meanwhile, the opposite (negative relationship between being a foreigner and financial knowledge) occurs in Galicia (compound interest), Aragón, Cantabria, Castilla-León, La Rioja and Spain as a whole (inflation).

Therefore, it could be affirmed that, in general, being born within Spanish borders is positively associated with financial knowledge on less complex issues (such as inflation), while the probability of being financially literate on comparatively more complex issues (such as compound interest or risk diversification) is higher among those born outside these borders. This likely lies in the management of remittances typically undertaken by immigrants (Gibson et al., 2014). Be that as it may, these findings are important because, in addition to completing an issue little explored in the Spanish context (Mancebón-Torrubia and Ximénez-de-Embún, 2020; and Oliver-Márquez et al., 2021a), it does so from a comparative regional perspective (unpublished to date in that context). Moreover, it contributes to the international literature (e.g., Gerrans et al., 2009; Boisclair et al., 2017; Nam et al., 2018; Yakoboski et al., 2019).

Our results also reveal that, for the Spanish population as a whole, the probability of being financially literate is lower for those residing in rural areas compared to those residing in urban areas. We thus confirm the finding of Oliver-Márquez et al. (2021a). But, in addition, we complete it by adding that these urban-rural gaps (to the detriment of the rural population) are replicated in Aragón, Andalusia, Cantabria, Castilla-León, Galicia, the Basque Country and the Islands (Canary and Balearic). These gaps, in turn, are deeper in the regions than in Spain as a whole. In any case, this relationship between rurality and financial knowledge is consistent with that pointed out by other previous papers in the context of other countries (e.g., Klapper & Panos, 2011; Klapper et al., 2012; Beckman, 2013; Cui et al., 2017; Yuan & Jin, 2017; Faulkner et al., 2019).

However, there is one Spanish region for which this is not true. Specifically, our results for Navarra indicate that residing in rural areas is positively associated with financial knowledge (compound interest). The fact that in this region the rural population predominates over the urban population may be related to this finding (unpublished both in the Spanish context and in the prior literature). But, in turn, it is likely that this finding is due to the greater degree of accessibility to banking services that the population of Navarra in general (and, specifically, its rural population) has with respect to Spain as a whole and its regions. Indeed, in the SFC time frame, and according to data from INE (2022b) and BdE (2022), the population of Navarre had a greater number of bank branches per 1,000 inhabitants than the Spanish population as a whole (0.82 compared to 0.60).

Moreover, this data is 0.94 when only the rural population of Navarre is considered (as opposed to 0.68 if only their urban counterparts are considered). Therefore, the data for bank offices per 1,000 inhabitants in rural Navarre diverges widely from the same data for urban Navarre, as well as for Spain as a whole (with the latter two converging). To some extent, this could explain why our findings on rurality for Navarre are the opposite of those obtained for Spain as a whole and the regions mentioned above. Furthermore, according to IVIE (2022), the number of kilometers (and minutes) that those residing in Spanish municipalities without an access point to banking services[2] have to travel is lower in Navarre than in Spain as a whole (5.6 versus 7.6 kilometers and 7.8 versus 9.7 minutes). In this regard, already Kagotho et al. (2018) pointed out that greater geographical proximity to banking services positively influences the financial capabilities of individuals.

As for health status, our results are significant only for some regions. On the one hand, in the Basque Country and La Rioja, people who have a state of health that prevents them from leading a normal life (themselves or their family members) are less likely to be financially literate. On the other hand, in the Murcia Region and Extremadura, the relationship between poor health and financial knowledge is positive. These differences between regions could be attributed to the different degree of social protection existing between them (Gerrans et al., 2009; Kalmi & Ruuskanen, 2018). In this sense, in the Basque Country and La Rioja the resources allocated to public health care (decentralized in Spain) are managed more efficiently (without reducing the quality of its service) than in comparison with other regions (Cabello-Granado and Hidalgo-Vera, 2014). Also, in these two regions (especially in the Basque Country) there is a lower tendency to privatization of public healthcare compared to the rest of regions (Bacigalupe et al., 2016), as well as a greater development of their social services (AEDGSS, 2015).

But, in addition, the Murcia Region and Extremadura are characterized, practically, by the opposite. Therefore, it is feasible to think that those people with a poor state of health (themselves or their relatives) who live in regions with a lower degree of social protection (such as the Murcia Region and Extremadura) face greater economic difficulties than their counterparts. Precisely this situation could lead them to an improvement in their financial skills, the result of a greater

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[2] Precisely, 99.3% of these municipalities are rural (IVIE, 2022, p.49).

need for contracting private healthcare to replace or complement public health-care (Buckland, 2010; Japelli, 2010; Yong & Tan, 2017; Kalmi & Ruuskanen, 2018, Cupák et al. 2021; Oliver-Márquez et al., 2021b). These findings are novel as the implications that individuals' health has on their financial knowledge is an under-explored issue in previous literature (James et al., 2012; Han et al., 2014, 2016; Finke et al., 2017). Especially from the perspective of the degree of social protection and, even more so, in the context of Spain and its regions.

Precisely this different degree of social protection could justify the regional differences we find in terms of financial fragility (i.e., situation in which a personal income is not sufficient to cover current expenses). Thus, in La Rioja, financially fragile people are more likely to be financially illiterate. This could be since, in this region, people have easier access to public mechanisms to alleviate their situation. Therefore, they are less exposed to the obligation to solve their economic problems by their own means. However, in the Valencian Community and Galicia (regions where there is greater exposure to such an obligation) being financially fragile is positively associated with financial knowledge. With these findings we complement the few previous papers that have analyzed this issue both in the international context (Lusardi & Tufano, 2015; Lusardi & De Bassa Scheresberg, 2017; Lusardi et al., 2020b) and in the Spanish context (Mancebón-Torrubia & Ximénez-de-Embún, 2020; Oliver-Márquez et al., 2021a), where the regional perspective is an additional novelty.

Regarding household structure, we find that sharing a household with other people (partner, family, friends, etc.) is negatively associated with financial knowledge in Navarra, the Madrid Community, the Basque Country, and Castilla-León. This could be because, in them, people tend to delegate household financial decisions to a single person (Bover et al., 2018, p.26). However, in Asturias, living alone (single-person household) implies having less financial knowledge. This could be because people who usually live alone do so because they are single, widowed or divorced (in short, they are not married). In this regard, our findings are consistent with previous related literature (Lusardi & Tufano, 2015; Baglioni et al., 2018; Potrich et al., 2018; West & Worthington, 2018; De Beckker et al., 2019; Xue et al., 2019).

Age is a factor on which it is difficult to find a clear consensus in previous literature. In fact, our results vary according to the region and even the dimension of financial knowledge analyzed. At the national level, we find that the young and the elderly are more likely to be financially illiterate compared to the intermediate age group (40-64 years). Therefore, we confirm the concave or inverted U-shaped relationship pointed out by Mancebón-Torrubia and Ximénez-de-Embún (2020). Some authors attribute this relationship to the experiences with economic-financial content that a person over 39 years of age has normally gone through and to how the cognitive deterioration associated with old age itself can reduce financial knowledge after the age of 65 (Agarwal et al., 2009; Monticone, 2010; Finke et al., 2017).

However, these national results are only replicated in Extremadura and Castilla-León. In fact, in Galicia this relationship is just the inverse (convex or U-shaped). Thus, the lower degree of social protection existing in Galicia could have put pressure on the financial skills of people who are about to retire (Jappelli, 2010; Kalmi y

Ruuskanen, 2018; Cupák et al., 2021). As for young Galicians, they may have seen their FK-compound interest improved by being more familiar with technologies, increasingly linked to the financial world (OECD/INFE, 2018; French et al., 2021). Although, when it comes to less complex financial matters (inflation), these young people denote being financially illiterate.

This negative association between being young and having financial knowledge is not uncommon (Mottola, 2014; Loke, 2017; Xue et al., 2019; Baneerje & Roy, 2020). In fact, the value of the significant odds-ratios obtained for the variable "age: 18-39" verifies this association in most Spanish regions. In this sense, Spanish millennials and centennials have directly suffered the consequences of the 2008 crisis and have not been able to enjoy the same economic conditions as their parents. This has conditioned their financial behaviors while generating distrust towards the financial system, negatively impacting their financial skills (Shaw & Waite, 2015; Fernández-López et al., 2020).

In La Rioja, in addition to this negative relationship between being young and having financial knowledge, we find a positive relationship between being over 64 years old and being financially literate. Therefore, in this region there would be an ascending linear relationship between age and financial knowledge, according to which individuals improve their financial knowledge as they get older, in line with some previous papers (Elan & Goodrich, 2011; Xiao et al., 2015; Jayanthi & Rau, 2017). We did not find significant (and therefore conclusive) results around age in Aragón, Cantabria, and the Islands (Canary and Balearic).

With respect to occupational status, being a salaried employee is positively associated with financial knowledge, as well as in Spain as a whole, in the Valencian Community, La Rioja, and Galicia. Around 25% of those interviewed stated that they had stable jobs (full-time, open-ended contracts or civil servants). Thus, our findings are consistent with those papers that suggested that job stability has positive implications for financial knowledge (Loke, 2017; Cude et al., 2019). We also corroborate while complementing the findings of Oliver-Márquez et al. (2021a). In turn, in Andalusia and the Basque Country, being unemployed is negatively associated with financial knowledge. Meanwhile, the opposite occurs in the Canary Islands, Catalonia, and the Madrid Community.

Likewise, being retired is negatively associated with financial knowledge in the Basque Country and La Rioja and positively in Galicia and the Madrid Community. These results for "unemployed" and "retired" could be due to the different degree of social protection that exists between these regions, in a similar way to what we pointed out when dealing with the variables "health" and "financial fragility". Last, being self-employed is negatively related to the financial knowledge of the Spanish population as a whole. However, this relationship is positive in Asturias, the Valencian Community, the Madrid Community and Catalonia. This could be because, in Spain, in general, many people undertook entrepreneurship out of obligation (not vocation) with the aim of overcoming (often unsuccessfully) the economic consequences of the 2008 crisis.

In fact, the entrepreneurial initiative of Spaniards has traditionally been scarce, with foreign entrepreneurs prevailing (Tortella, 1994), especially in regions such as those in which we have found such a positive association. In the Canary Islands the

results are more diffuse. There, we find that self-employment is positively associated with FK-inflation, but negatively with FK-risk diversification. Knowing the professional category of the respondent would have helped to shed light on this issue, but many of the respondents did not disclose this information. These findings on the self-employed help to complement previous related literature (Cumurovic & Hyll, 2019; Fonseca & Lord, 2020; Mancebón-Torrubia & Ximénez-de-Embún, 2020; Oliver-Márquez et al., 2021a).

Regarding the contracting of financial products, owning shares is positively associated with financial knowledge both in Spain as a whole and in some of its regions. Similarly, participating in investment funds has positive implications for the financial knowledge of those residing in Andalusia, the Murcia Region, Extremadura, and Castilla-La Mancha. These two findings are consistent with much of the previous literature (e.g., Love & Phelan, 2015, Banerjee & Roy, 2020; Oliver-Márquez et al., 2021a). However, in Catalonia, the Canary Islands, and Castilla-León participating in investment funds is negatively associated with financial knowledge.

Indeed, investment funds are made up of many investors and various assets. They are therefore more complex products than stocks. Therefore, individuals are likely to incur behavioral biases that end up hindering their acquisition of financial knowledge when participating in them. According to Lim et al. (2021), some of these biases could be mental separation or correlation neglect. Focusing on long-term savings products, in the Murcia Region, taking out private pension plans is negatively associated with FK-risk diversification, but positively associated with FK-compound interest. Certainly, compound interest is more intrinsic to such plans than risk diversification.

Meanwhile, in Castilla-León we find that contracting private pension plans has negative implications on financial knowledge (inflation and compound interest). Considering that in this region the degree of social protection exceeds the national average (AEDGS, 2015), it does not seem that individuals here contract this type of products out of necessity. They probably do so influenced by their relatives or friends (herding behavior) or due to the information received at their bank branch (anchoring effect), thus being hindered in their acquisition of financial knowledge (Lin et al., 2019; Hala et al., 2020).

Our results on financial financing products (mortgages and personal loans) are diverse. In Aragón, Cantabria, the Valencian Community and Catalonia contracting these products has a negative influence on financial knowledge. Although, such influence is positive in the Balearic Islands, in line with the findings of Fürstenau and Hommel (2019) for the German population. Curiously, the presence of Germans is palpable in those Islands (INE, 2022c). Therefore, these regional differences could be basically due to cultural aspects (Almenberg et al., 2021). Meanwhile, for Spain as a whole, the association between having a personal loan and being financially literate is positive, but very weak. In Asturias this association is positive for mortgages, but negative for personal loans, which could be due to bad personal experiences in contracting this type of product in the past (Boatman & Evans, 2017).

Nevertheless, the financial profile of Spaniards is quite conservative, so they tend to opt for real estate assets (BdE, 2019). In this sense, most of the significant results yielded by "tenure" reveal that the volume of real wealth has a positive influence on

the financial knowledge of individuals. Extremadura and the Valencian Community are the exception, probably because in these regions there is a higher percentage of homeowners whose amount paid for the mortgage of their main home is equal to or higher than the purchase price of the same compared to their counterparts in Spain as a whole (10.9% and 8.7%, respectively, compared to 8%, according to the SFC itself). In any case, it seems that financial knowledge is not equally influenced by real assets as by financial assets (Hala et al., 2020). Be that as it may, with these findings we contribute to the scarce related international literature (West & Worthington, 2018; Xue et al., 2019), especially in the context of Spain and its regions.

Conclusions, Limitations, and Future Research

Previous research that has analyzed the determinants of financial knowledge among Spaniards is scarce. Most of them are limited to specific segments of the population, mainly adolescent high school students. Moreover, they tend not to reach a clear consensus even using the same databases. Likewise, although some works has recently appeared that has addressed this issue for the Spanish population as a whole, there is still none that has done so from a comparative regional perspective. The latter is precisely our main objective. Apart from this novelty, we take the opportunity to shed light on some determining factors that, in general, have not been sufficiently explored in the prior literature.

Our empirical analysis has led us to several conclusions. First, we confirm that being a woman, having a low level of education, as well as a lower level of income, have negative implications for financial knowledge. Moreover, this is true across the board for all Spanish regions. We also find that self-confidence is positively related to financial knowledge at the national level and even more strongly in the regions. Second, although age influences Spaniards' financial knowledge, it does not do so equally across regions. Third, we corroborate the existence of urban-rural gaps at both the national and regional levels. However, Navarra differs from the rest of the regions, as well as from most of the previous literature, in that its gaps are in favor of the rural population.

Additionally, we address the implications that being born outside Spain, living alone (single-person household) and employment status (self-employed, salaried, unemployed, retired) have on financial knowledge, finding differences for some of the regions analyzed and complementing the existing literature on the subject. We also find that the implications of using financial products on financial knowledge are different depending not only on the region, but also on the type of financial product (investment, long-term savings, or financing). In addition, we also consider real estate wealth, which is important in the Spanish context. Finally, we shed light on factors that still require further exploration, such as financial fragility and health status, especially in the Spanish context, where, unlike in other countries, the degree of social protection may play an important role.

Despite the various contributions we make to the literature, we are also aware of the limitations we encounter. First, we use a cross-sectional database, which prevents us from analyzing the evolution of these factors over time. Second, some of

the variables we use are too narrowly defined. Thus, for example, respondents do not have the option of choosing their exact income level, but have to choose between different specific income ranges. Thus, a person who earns 15,000 euros is in the same range as a person who earns 25,000 euros, because both would choose the option "14,501-26,000" euros. Therefore, we code the variable so that we know whether their income is higher or lower than the Spanish average. Similarly, individuals also do not have the possibility to report the exact amount of their tenure.

Another important limitation is that the database used excludes two regions (Ceuta and Melilla), which makes it impossible to draw conclusions about them. Including them could have been interesting, especially given both population and cultural diversity that exists in these regions. Because of all these limitations, future research could be aimed at creating aggregated and longitudinal indicators of financial knowledge -analogous to the one created by Oliver-Márquez et al. (2021b) - for each of the Spanish regions. In this way, it would be possible to know how financial knowledge (and its determinants) has evolved over time in these regions (without excluding any of them) and, also, to analyze how such knowledge is related to certain macroeconomic variables that are not included in the surveys (e.g., S80/S20 ratio, wealth-income ratio, public spending on health, education, social services, etc.).

Appendix

Declarations

We use secondary data sources. Therefore, we do not work directly with people or animals. Consequently, we understand that it is not necessary to provide any informed consent or animal welfare statement.

Conflicts of interest None of the authors have any conflict of interest.

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Table 2 Statistical-Descriptive Summary of variables we used (M: Mean; SD: Standard Deviation)

	1		2		3		4		5		6	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Gender	0.515	0.500	0.491	0.500	0.485	0.500	0.472	0.500	0.495	0.501	0.510	0.501
Native	0.941	0.237	0.872	0.334	0.926	0.261	0.771	0.421	0.877	0.329	0.91	0.287
Rural	0.301	0.459	0.352	0.478	0.343	0.475	0.253	0.436	0.161	0.368	0.483	0.501
Health	0.121	0.326	0.090	0.287	0.180	0.385	0.111	0.315	0.155	0.362	0.097	0.297
Household	0.099	0.298	0.106	0.308	0.102	0.302	0.090	0.287	0.082	0.275	0.083	0.277
Fragility	0.349	0.477	0.203	0.402	0.231	0.422	0.340	0.475	0.366	0.482	0.278	0.449
Self-Confidence	2.144	4.665	2.291	4.743	2.355	0.862	2.455	0.947	1.486	9.75	2.462	0.85
Education	0.524	0.500	0.403	0.491	0.429	0.496	0.517	0.501	0.464	0.499	0.351	0.478
Income	0.650	0.477	0.522	0.500	0.543	0.499	0.594	0.492	0.713	0.453	0.517	0.501
Tenure	0.363	0.481	0.467	0.499	0.431	0.496	0.330	0.471	0.268	0.444	0.368	0.483
Age: 18-39	0.363	0.481	0.328	0.470	0.294	0.456	0.333	0.472	0.344	0.476	0.326	0.470
Age: 65-79	0.159	0.366	0.200	0.401	0.206	0.405	0.170	0.376	0.104	0.306	0.153	0.360
Self-Employed	0.107	0.31	0.099	0.299	0.122	0.328	0.111	0.315	0.126	0.333	0.108	0.310
Salaried	0.327	0.469	0.447	0.498	0.317	0.466	0.455	0.499	0.385	0.487	0.462	0.499
Unemployed	0.175	0.380	0.112	0.316	0.160	0.367	0.149	0.357	0.196	0.397	0.118	0.323
Retired	0.161	0.368	0.172	0.378	0.231	0.422	0.174	0.379	0.114	0.318	0.153	0.360
Shares	0.040	0.197	0.079	0.270	0.084	0.277	0.073	0.260	0.057	0.232	0.146	0.354
Pension Plans	0.023	0.151	0.018	0.132	0.015	0.123	0.028	0.165	0.035	0.183	0.035	0.183
Investment Funds	0.032	0.176	0.051	0.220	0.063	0.244	0.063	0.242	0.028	0.166	0.066	0.249
Mortgages	0.040	0.197	0.022	0.147	0.028	0.165	0.035	0.183	0.022	0.147	0.031	0.174

Table 2 (continued)

	1		2		3		4		5		6	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Personal Loans	0.151	0.358	0.143	0.351	0.152	0.360	0.160	0.367	0.192	0.395	0.083	0.277
Obs.	*942*		*454*		*394*		*288*		*317*		*288*	

	7		8		9		10		11		12	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Gender	0.493	0.500	0.489	0.500	0.497	0.500	0.512	0.500	0.521	0.500	0.51	0.500
Native	0.937	0.244	0.932	0.253	0.793	0.405	0.861	0.346	0.953	0.212	0.934	0.248
Rural	0.446	0.498	0.553	0.498	0.266	0.442	0.249	0.432	0.552	0.498	0.387	0.488
Health	0.112	0.316	0.089	0.285	0.104	0.306	0.114	0.318	0.108	0.311	0.115	0.319
Household	0.088	0.284	0.083	0.276	0.093	0.290	0.082	0.275	0.088	0.283	0.080	0.271
Fragility	0.245	0.431	0.265	0.442	0.229	0.420	0.310	0.463	0.24	0.428	0.264	0.441
Self-Confidence	2.273	4.391	2.155	4.605	2.403	3.452	2.313	3.957	2.373	0.902	1.809	7.258
Education	0.507	0.500	0.484	0.500	0.436	0.496	0.418	0.494	0.566	0.496	0.484	0.500
Income	0.601	0.490	0.650	0.477	0.554	0.497	0.621	0.485	0.670	0.471	0.602	0.49
Tenure	0.482	0.500	0.470	0.500	0.241	0.428	0.406	0.491	0.415	0.493	0.521	0.500
Age: 18-39	0.273	0.446	0.350	0.477	0.336	0.473	0.347	0.476	0.332	0.471	0.293	0.456
Age: 65-79	0.202	0.402	0.141	0.348	0.172	0.378	0.156	0.363	0.165	0.372	0.229	0.421
Self-Employed	0.150	0.357	0.104	0.305	0.095	0.293	0.112	0.316	0.106	0.308	0.120	0.325
Salaried	0.392	0.489	0.437	0.497	0.465	0.499	0.424	0.495	0.371	0.483	0.378	0.485
Unemployed	0.114	0.318	0.157	0.365	0.109	0.311	0.153	0.360	0.173	0.379	0.137	0.344
Retired	0.181	0.385	0.133	0.339	0.176	0.381	0.150	0.357	0.132	0.339	0.212	0.409

Table 2 (continued)

	7		8		9		10		11		12	
	M	SD	M	SD	M	SD	M	SD	M	SD	SD	M
Shares	0.078	0.268	0.039	0.195	0.053	0.224	0.051	0.220	0.053	0.224	0.054	0.226
Pension Plans	0.036	0.187	0.027	0.162	0.018	0.133	0.036	0.186	0.022	0.148	0.028	0.164
Investment Funds	0.067	0.250	0.035	0.184	0.049	0.215	0.049	0.217	0.041	0.198	0.038	0.192
Mortgages	0.040	0.195	0.041	0.199	0.032	0.175	0.028	0.166	0.039	0.193	0.03	0.169
Personal Loans	0.114	0.318	0.106	0.308	0.149	0.357	0.156	0.363	0.086	0.280	0.125	0.331
Obs.	554		483		884		668		491		576	

	13		14		15		16		17		18	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Gender	0.503	0.500	0.501	0.501	0.541	0.499	0.469	0.500	0.508	0.501	0.502	0.500
Native	0.824	0.381	0.887	0.318	0.864	0.343	0.907	0.290	0.854	0.354	0.885	0.319
Rural	0.105	0.306	0.116	0.321	0.673	0.470	0.300	0.459	0.467	0.500	0.334	0.472
Health	0.114	0.318	0.113	0.318	0.122	0.328	0.088	0.284	0.098	0.298	0.113	0.316
Household	0.082	0.274	0.061	0.239	0.082	0.274	0.088	0.284	0.098	0.298	0.088	0.283
Fragility	0.318	0.466	0.269	0.444	0.228	0.420	0.161	0.368	0.229	0.421	0.270	0.444
Self-Confidence	2.202	6.339	2.467	0.915	2.381	0.911	2.359	0.916	2.394	0.887	2.246	4.414
Education	0.312	0.464	0.504	0.501	0.384	0.487	0.326	0.469	0.429	0.496	0.445	0.497
Income	0.467	0.499	0.678	0.468	0.507	0.501	0.441	0.497	0.502	0.501	0.580	0.494
Tenure	0.373	0.484	0.330	0.471	0.371	0.484	0.377	0.485	0.511	0.501	0.391	0.488
Age: 18-39	0.34	0.474	0.380	0.486	0.320	0.467	0.330	0.471	0.330	0.471	0.332	0.471

Table 2 (continued)

	13		14		15		16		17		18	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Age: 65–79	0.142	0.350	0.140	0.347	0.173	0.379	0.154	0.362	0.140	0.347	0.167	0.373
Self-Employed	0.093	0.291	0.113	0.318	0.112	0.316	0.128	0.334	0.140	0.347	0.112	0.316
Salaried	0.475	0.500	0.456	0.499	0.490	0.501	0.469	0.500	0.457	0.499	0.419	0.493
Unemployed	0.128	0.334	0.140	0.347	0.092	0.289	0.097	0.296	0.133	0.340	0.138	0.345
Retired	0.145	0.352	0.135	0.342	0.156	0.364	0.150	0.357	0.130	0.337	0.161	0.367
Shares	0.094	0.293	0.047	0.213	0.068	0.252	0.086	0.281	0.073	0.261	0.066	0.248
Pension Plans	0.032	0.177	0.034	0.182	0.048	0.213	0.040	0.195	0.019	0.137	0.028	0.165
Investment Funds	0.078	0.268	0.026	0.160	0.068	0.252	0.075	0.264	0.086	0.280	0.052	0.223
Mortgages	0.038	0.19	0.042	0.201	0.034	0.182	0.033	0.179	0.029	0.167	0.034	0.181
Personal Loans	0.141	0.348	0.121	0.327	0.133	0.340	0.077	0.267	0.152	0.360	0.133	0.340
Obs.	*773*		*379*		*294*		*454*		*315*		*8,554*	

(applicable to all tables). 1: Andalusia; 2: Aragón; 3: Asturias; 4: Balearic Islands; 5: Canary Islands; 6: Cantabria; 7: Castilla-León; 8: Castilla-La Mancha; 9: Catalonia; 10: Valencian Community; 11: Extremadura; 12: Galicia; 13: Madrid Community; 14: Murcia Region; 15: Navarra; 16: Basque Country; 17: La Rioja; 18: Spain

Table 3 VIF values

	1	2	3	4	5	6	7	8	9
Gender	1.13	1.17	1.17	1.12	1.13	1.14	1.18	1.19	1.09
Native	1.04	1.18	1.17	1.29	1.07	1.10	1.12	1.08	1.18
Rural	1.07	1.15	1.09	1.09	1.09	1.07	1.08	1.07	1.06
Health	1.03	1.09	1.09	1.08	1.09	1.06	1.06	1.09	1.04
Household	1.06	1.15	1.08	1.13	1.08	1.06	1.07	1.09	1.08
Fragility	1.14	1.26	1.18	1.16	1.27	1.14	1.19	1.12	1.17
Self-Confidence	1.04	1.09	1.23	1.19	1.08	1.30	1.04	1.05	1.05
Education	1.35	1.55	1.56	1.23	1.37	1.42	1.43	1.37	1.32
Income	1.24	1.39	1.34	1.39	1.30	1.33	1.36	1.31	1.30
Tenure	1.14	1.17	1.15	1.32	1.14	1.22	1.17	1.10	1.11
Age: 18-39	1.26	1.32	1.33	1.28	1.35	1.29	1.28	1.17	1.24
Age: 65-79	2.33	3.39	2.19	4.42	2.37	2.49	2.51	2.34	2.68
Self-Employed	1.44	1.75	1.72	2.37	1.87	1.73	2.14	1.75	1.68
Salaried	1.86	2.65	2.35	3.49	2.37	2.46	2.55	2.54	2.54
Unemployed	1.59	1.79	1.76	2.30	1.76	1.78	1.70	1.83	1.64
Retired	2.48	2.84	2.86	4.69	2.70	2.76	2.70	2.37	3.05
Shares	1.21	1.18	1.32	1.38	1.32	1.32	1.17	1.12	1.15
Pension Plans	1.06	1.07	1.24	1.15	1.12	1.27	1.11	1.10	1.03
Investment Funds	1.18	1.18	1.29	1.33	1.22	1.24	1.15	1.10	1.14
Mortgages	1.05	1.08	1.09	1.07	1.06	1.14	1.07	1.16	1.02
Personal Loans	1.07	1.11	1.10	1.07	1.10	1.06	1.13	1.10	1.09
Mean VIF	*1.32*	*1.50*	*1.44*	*1.74*	*1.42*	*1.45*	*1.44*	*1.38*	*1.41*

	10	11	12	13	14	15	16	17	18
Gender	1.10	1.17	1.14	1.07	1.17	1.27	1.14	1.14	1.09

Table 3 (continued)

	10	11	12	13	14	15	16	17	18
Native	1.13	1.07	1.06	1.14	1.07	1.22	1.14	1.14	1.08
Rural	1.02	1.09	1.10	1.02	1.08	1.10	1.02	1.02	1.03
Health	1.05	1.12	1.03	1.08	1.10	1.07	1.09	1.09	1.02
Household	1.11	1.15	1.05	1.07	1.05	1.20	1.07	1.07	1.04
Fragility	1.10	1.17	1.14	1.15	1.10	1.26	1.13	1.13	1.12
Self-Confidence	1.04	1.25	1.07	1.03	1.24	1.13	1.23	1.23	1.02
Education	1.35	1.61	1.44	1.30	1.37	1.45	1.31	1.31	1.32
Income	1.30	1.44	1.21	1.39	1.29	1.41	1.47	1.47	1.29
Tenure	1.19	1.14	1.13	1.15	1.19	1.28	1.14	1.14	1.11
Age: 18-39	1.21	1.34	1.27	1.24	1.24	1.37	1.24	1.24	1.22
Age: 65-79	2.97	2.72	3.16	2.43	2.90	3.37	2.77	2.77	2.57
Self-Employed	1.76	1.61	1.82	1.54	1.89	1.88	1.89	1.89	1.68
Salaried	2.43	2.13	2.63	2.46	2.60	2.74	2.63	2.63	2.37
Unemployed	1.88	1.72	1.89	1.77	1.81	1.69	1.63	1.63	1.70
Retired	2.94	2.38	3.03	2.84	3.05	3.38	2.92	2.92	2.72
Shares	1.08	1.18	1.15	1.21	1.21	1.15	1.19	1.19	1.15
Pension Plans	1.07	1.08	1.11	1.03	1.15	1.19	1.10	1.10	1.05
Investment Funds	1.10	1.17	1.12	1.17	1.18	1.20	1.17	1.17	1.13
Mortgages	1.06	1.11	1.04	1.05	1.11	1.08	1.09	1.09	1.03
Personal Loans	1.06	1.09	1.10	1.06	1.10	1.12	1.06	1.06	1.04
Mean VIF	*1.43*	*1.42*	*1.46*	*1.39*	*1.47*	*1.55*	*1.45*	*1.45*	*1.37*

Table 4 Odds-Ratios. Dependent variable: FK-inflation

	1	2	3	4	5	6	7	8	9
Gender	0.669***	1.047	0.388***	0.721	0.562**	0.767	0.617***	0.515***	0.888
Native	1.292	2.254**	0.780	1.082	0.961	2.988**	1.980*	1.168	1.146
Rural	0.934	1.055	0.755	1.126	1.075	0.565**	0.695**	0.801	0.987
Health	0.972	1.259	0.976	0.757	0.537**	0.706	0.609	1.078	0.931
Household	1.216	1.321	0.936	0.837	1.151	1.461	1.065	1.114	1.525
Fragility	1.284	1.045	0.819	1.198	0.874	0.971	1.234	0.874	0.937
Self-Confidence	0.968	0.977	1.328**	1.034	0.986	1.846***	1.295**	1.026	1.297***
Education	0.370***	0.657	0.548**	0.681	0.381***	1.652	0.430***	0.383**	0.575***
Income	0.610***	0.659	0.582**	0.737	0.595	0.565**	1.043	0.8117	0.638***
Tenure	1.442**	0.799	1.373	1.231	1.809**	1.086	1.492**	0.839	1.361**
Age: 18-39	0.650***	0.837	0.843	0.654	0.628	0.866	0.463***	0.657***	0.712**
Age: 65-79	1.108	0.628	1.062	1.930	0.902	1.301	0.503**	0.984	1.177
Self-Employed	1.341	0.702	2.740**	1.091	0.319**	2.176	1.278	0.509	1.129
Salaried	0.877	0.848	0.703	2.030	0.881	0.955	1.545	0.768	1.275
Unemployed	0.718	0.845	1.432	2.309	2.994**	0.716	1.095	0.833	0.912
Retired	1.036	1.339	1.376	1.053	0.440	0.671	1.769	0.813	0.987
Shares	0.611	0.623	1.685	1.733	1.043	3.207**	1.489	1.483	1.678
Pension Plans	0.574	1.098	2.221	0.793	2.797	1.074	0.352**	1.220	2.122
Investment funds	2.343*	2.438	0.613	3.748**	0.206**	0.652	2.154*	0.401*	1.180
Mortgages	0.986	0.307*	0.551	4.742**	2.609	0.272	0.529	0.692	0.673
Personal Loans	1.125	1.715	0.954	1.135	1.167	0.620	1.142	1.451	0.905
Intercept	2.587**	2.756*	3.879**	0.779	5.912***	0.358	0.628	5.216***	0.831
Obs.	942	454	394	288	317	288	554	483	884
Count R²	0.633	0.738	0.725	0.628	0.684	0.729	0.659	0.633	0.632

Table 4 (continued)

	1	2	3	4	5	6	7	8	9
Pearson Test (*p*-value)	0.243	0.202	0.090	0.165	0.165	0.000	0.356	0.246	0.225
Hosmer-Lemeshow Test (*p*-value)	0.713	0.959	0.531	0.720	0.942	0.806	0.839	0.861	0.210
Roc Curve	0.689	0.655	0.739	0.676	0.725	0.753	0.727	0.668	0.678

	10	11	12	13	14	15	16	17	18
Gender	0.706**	0.872	0.741	0.510***	0.725	0.518**	0.839	0.619*	0.695***
Native	1.251	0.584	0.895	0.728	0.429**	1.852	1.821	1.945*	1.165**
Rural	1.050	1.336	0.710*	1.236	0.790	1.105	0.524***	0.772	0.915*
Health	0.987	1.425	1.512	0.978	2.201**	1.159	0.495**	0.559	0.980
Household	0.767	0.799	0.703	1.571	1.837	0.930	0.864	0.6527513	1.066
Fragility	0.798	1.034	1.168	1.073	0.893	0.656	0.6578	0.686	0.978
Self-Confidence	1.138	1.473***	0.993	1.013	1.053	0.974	1.336**	1.208	1.004
Education	0.668**	0.561**	0.462***	0.518***	0.483***	0.388***	0.509***	0.614*	0.489***
Income	0.958	0.671	0.765	0.768	0.802	0.785	1.064	0.801	0.724***
Tenure	1.929***	1.710**	1.479**	1.297	1.306	1.302	1.513*	0.914	1.352***
Age: 18-39	0.488***	0.510***	0.567***	0.525***	0.515***	0.325***	0.557**	0.497**	0.605***
Age: 65-79	0.874	0.412**	0.777	1.325	0.720	0.362	0.734	3.479**	0.926
Self-Employed	1.070	1.310	1.168	1.142	1.995	0.772	1.659	1.038	1.137
Salaried	0.781	1.382	1.238	1.269	0.959	0.899	1.038	1.162	1.095
Unemployed	0.764	1.083	0.607	1.204	0.948	0.392	0.541	1.098	0.975
Retired	1.085	1.182	1.375	0.934	1.203	1.190	1.942	0.143***	1.070

Table 4 (continued)

	10	11	12	13	14	15	16	17	18
Shares	1.135	1.356	2.772*	1.394	0.744	0.624	3.900**	0.698	1.372***
Pension Plans	0.998	0.883	0.875	0.620	0.953	0.970	0.508	0.501	0.841
Investment funds	0.842	1.521	0.804	2.189**	2.527	1.887	0.877	1.652	1.318***
Mortgages	0.510	0.473	0.807	1.657	1.055	0.685	0.670	1.643	0.827
Personal Loans	1.093	1.093	1.081	1.363	0.762	0.960	1.011	1.365	1.131*
Intercept	1.509	1.030	4.071***	3.252***	4.590***	6.876**	1.002	1.702	2.539***
Obs.	668	491	576	773	379	294	454	315	8,554
Count R^2	0.6198	0.674	0.656	0.653	0.660	0.745	0.692	0.692	0.625
Pearson Test (p-value)	0.232	0.176	0.279	0.096	0.068	0.211	0.081	0.130	0.064
Hosmer-Lemeshow Test (p-value)	0.305	0.208	0.390	0.179	0.235	0.492	0.556	0.265	0.606
Roc Curve	0.667	0.729	0.676	0.691	0.694	0.741	0.731	0.723	0.661

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 5 Odds-Ratios. Dependent variable: FK-compound interest

	1	2	3	4	5	6	7	8	9
Gender	0.873	0.901	0.767	0.820	0.914	0.885	0.851	0.778	0.578***
Native	1.107	0.462**	0.465*	1.130	0.757	1.224	0.759	0.745	1.026
Rural	0.713**	0.542***	0.654	1.070	1.241	0.851	1.110	0.891	0.850
Health	0.920	0.658	0.806	0.629	0.745	0.726	1.497	0.912	1.058
Household	1.175	1.039	0.451**	0.636	1.518	0.842	1.993**	0.723	0.807
Fragility	1.243	1.494	0.799	1.332	1.450	0.738	0.861	0.944	0.998
Self-Confidence	1.170**	1.080	1.091	1.466***	1.137	1.378**	1.279**	1.686***	1.034
Education	0.628***	0.617**	0.491***	0.642	1.230	0.608	0.945	1.029	0.967
Income	1.013	1.125	0.677	0.597*	0.655	1.537	1.031	1.146	0.902
Tenure	1.236	1.043	1.515*	1.032	1.045	2.344**	0.809	0.953	1.395**
Age: 18-39	0.969	0.944	0.679	1.383	0.970	0.824	0.984	0.806	1.010
Age: 65-79	0.661	2.087	1.269	0.483	0.520	0.631	0.791	0.666	0.613
Self-Employed	1.333	1.833	3.377***	1.116	1.195	0.760	0.924	1.084	0.867
Salaried	1.134	1.484	1.654	1.498	1.040	0.766	0.761	0.785	1.108
Unemployed	0.660*	1.271	1.549	1.707	1.139	0.494	0.700	0.616	1.115
Retired	1.093	0.768	1.388	1.491	0.537	1.285	1.117	0.616	1.060
Shares	1.316	1.656	1.205	1.652	1.229	1.395	1.241	1.053	0.991
Pension Plans	1.708	1.108	0.916	0.529	1.117	0.614	0.273**	1.608	1.220
Investment funds	0.887	1.952	0.718	0.434	0.994	1.425	0.920	3.092**	0.490**
Mortgages	0.692	1.118	0.572	0.591	1.357	0.156**	1.181	2.177	0.882
Personal Loans	0.977	0.797	0.996	0.623	1.161	0.661	1.043	0.857	0.975
Intercept	0.572	1.982	1.912	0.547	0.682	0.462	0.846	0.473	1.240
Obs.	942	454	394	288	317	288	554	483	884
Count R²	0.620	0.621	0.652	0.639	0.621	0.618	0.588	0.625	0.577

Table 5 (continued)

	1	2	3	4	5	6	7	8	9
Pearson Test (p-value)	0.239	0.232	0.194	0.177	0.187	0.182	0.291	0.391	0.191
Hosmer-Lemeshow Test (p-value)	0.430	0.731	0.393	0.075	0.990	0.075	0.631	0.526	0.094
Roc Curve	0.644	0.659	0.715	0.716	0.635	0.691	0.613	0.679	0.610

	10	11	12	13	14	15	16	17	18
Gender	0.698**	0.535***	0.869	0.647***	0.854	0.515**	0.822	0.990	0.750***
Native	1.066	0.799	2.475**	1.346	0.583	0.949	0.893	1.074	0.901
Rural	1.065	1.072	1.055	1.234	0.686	1.842**	1.165	1.066	0.947
Health	1.183	2.825***	0.707	0.780	0.660	0.669	0.673	0.471*	0.905
Household	1.100	0.905	1.368	1.100	1.786	1.774	1.106	1.184	1.056
Fragility	1.489**	0.902	1.307	0.967	0.959	0.690	0.761	0.493*	1.020
Self-Confidence	1.308***	1.212	1.004	0.994	1.179	1.173	1.057	1.325*	1.024**
Education	0.672**	0.721	0.524***	0.614***	0.853	0.778	0.635**	0.730	0.697***
Income	0.776	0.899	0.734	1.076	1.032	0.736	0.875	1.095	0.899**
Tenure	0.696**	0.704*	1.233	0.955	0.687	1.321	1.120	1.176	1.055
Age: 18-39	0.674**	1.031	1.621**	0.938	0.612**	0.879	0.984	1.094	0.924
Age: 65-79	0.838	0.289**	2.163**	0.568	0.472	0.869	0.842	0.377	0.764***
Self-Employed	1.464	1.391	0.977	1.124	1.835	0.835	0.919	2.024	1.240***
Salaried	1.630**	0.861	1.447	1.014	1.688	0.827	0.617	2.430*	1.148**
Unemployed	1.226	0.770	1.224	0.891	1.789	1.600	0.435**	1.536	0.952
Retired	0.862	2.788**	0.638	1.461	2.316	0.550	0.497	2.030	1.024

Table 5 (continued)

	10	11	12	13	14	15	16	17	18
Shares	0.737	1.030	2.966**	1.523	0.786	2.062	2.155**	0.791	1.356***
Pension Plans	0.893	0.765	0.798	1.373	7.844**	0.610	1.276	0.451	1.028
Investment funds	1.068	1.020	0.6522	0.981	8.350**	0.506	1.229	1.174	1.019
Mortgages	1.448	1.170	1.167	1.723	0.636	0.529	2.203	0.566	1.019
Personal Loans	0.632**	0.803	1.119	1.174	1.013	0.732	1.264	0.907	0.927
Intercept	0.730	1.157	0.238***	0.957	0.976	1.252	1.827	0.405	1.257**
Obs.	668	491	576	773	379	294	454	315	8,554
Count R^2	0.623	0.635	0.652	0.602	0.612	0.609	0.619	0.654	0.570
Pearson Test (p-value)	0.272	0.375	0.239	0.300	0.223	0.087	0.250	0.212	0.257
Hosmer-Lemeshow Test (p-value)	0.569	0.568	0.879	0.527	0.981	0.915	0.212	0.725	0.009
Roc Curve	0.667	0.673	0.669	0.625	0.672	0.678	0.662	0.700	0.599

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 6. Odds-Ratios. Dependent variable: FK-risk diversification

	1	2	3	4	5	6	7	8	9
Gender	0.544***	0.821	0.381***	0.635*	0.607**	0.481***	0.771	0.672**	0.597***
Native	0.925	0.876	1.002	0.986	0.809	0.771	0.630	0.797	0.736
Rural	0.973	0.444***	1.262	0.517**	0.542**	0.800	0.826	1.032	0.823
Health	0.967	1.467	1.073	0.713	0.792	0.845	0.860	1.467	0.788
Household	1.073	1.319	0.622	0.640	1.064	0.970	0.914	0.718	0.996
Fragility	0.843	0.940	1.133964	1.110	1.165	0.852	1.005	1.258	0.820
Self-Confidence	1.333***	0.987	1.746***	1.352**	1.007	1.394**	1.659***	1.402***	1.639***
Education	0.586***	0.450***	0.504***	0.705	1.014	0.565***	0.772	0.643**	0.641***
Income	0.966	0.620**	1.522	0.881	0.944	0.862	0.930	0.804	0.680**
Tenure	1.115	1.201	1.637**	1.160	1.086	1.221	1.495**	0.769	1.389**
Age: 18-39	0.585***	0.814	0.452***	0.685	1.117	0.845	0.791	0.772	0.765
Age: 65-79	0.746	0.576	1.447	0.466	0.785	0.960	0.761	1.170052	0.668
Self-Employed	0.927	1.116	0.799	0.633	2.991**	1.054	1.358	0.885	1.847**
Salaried	0.917	0.912	1.236	0.587	2.241**	0.801	1.289	0.913	1.313
Unemployed	0.921	0.511	0.515	0.482	1.241	0.601	1.446	1.083	1.900**
Retired	0.962	1.822	0.754	1.412	1.036	1.115	1.382	0.829	1.330
Shares	2.117*	1.571	4.935***	1.630	2.692	1.153	1.363	0.521	1.219
Pension Plans	0.544	1.731	3.345	1.750	1.149	2.178	1.107	0.769	2.652
Investment funds	1.661	1.927	0.874	1.377	2.333	1.693	1.301	1.776	1.252
Mortgages	0.743	0.527	0.156**	1.427	1.409	1.366	0.791	0.801	0.954
Personal Loans	1.110	1.111	1.810*	0.951	1.170	0.558	0.897	1.003	0.693*
Intercept	1.025	6.184***	0.354	1.715	0.802	1.293	0.410	0.768	0.602
Obs.	942	454	394	288	317	288	554	483	884
Count R²	0.641	0.683	0.693	0.601	0.650	0.642	0.635	0.629	0.658

Table 6. (continued)

	1	2	3	4	5	6	7	8	9
Pearson Test (p-value)	0.304	0.153	0.248	0.213	0.160	0.156	0.322	0.164	0.320
Hosmer-Lemeshow Test (p-value)	0.964	0.778	0.604	0.2977	0.805	0.066	0.671	0.180	0.448
Roc Curve	0.678	0.714	0.765	0.665	0.679	0.698	0.673	0.650	0.711

	10	11	12	13	14	15	16	17	18
Gender	0.659**	0.515***	1.020	0.564***	0.650**	1.092	0.570***	1.109	0.651***
Native	1.379	0.568	0.611*	0.962	1.190	1.337	0.651	0.906	0.848**
Rural	0.869	1.416	0.718	0.863	0.798	1.159	0.600**	0.887	0.818***
Health	0.892	0.978	1.173	1.134	1.163	0.957	0.496*	0.768	0.965
Household	0.752	0.929	1.304	2.490***	1.056	2.520*	2.221**	1.690	1.123
Fragility	1.021	0.818	1.649**	0.957	1.269	1.103	0.894	0.881	0.986
Self-Confidence	1.258**	2.184***	1.239**	0.993	1.052	1.287*	1.445***	1.095	1.037**
Education	0.481***	1.004	0.434***	0.603***	0.438***	0.319***	0.586**	1.008	0.550***
Income	0.846	0.787	0.628**	0.937	0.624**	1.395	0.830	0.479**	0.799***
Tenure	1.081	1.316	1.299	1.773***	1.520*	1.861**	1.210	1.233	1.261***
Age: 18-39	0.462***	0.647*	0.798	0.689**	0.722	0.901	0.380***	0.600*	0.690***
Age: 65-79	0.714	0.234***	0.598	0.876	1.041	1.645	1.680	0.864	0.822**
Self-Employed	1.860*	0.887	1.191	1.775*	1.825	1.065	0.945	0.524	1.220**
Salaried	1.318	1.016	1.744**	1.369	0.869	1.398	0.785	0.839	1.151**
Unemployed	1.763*	1.026	1.223	2.547***	1.360	1.131	0.407**	0.630	1.113
Retired	1.518	2.829**	2.305**	2.068**	0.712	0.995	0.343**	0.598	1.160

Table 6. (continued)

	10	11	12	13	14	15	16	17	18
Shares	1.442	4.883***	2.977*	2.586***	0.728	3.497**	5.338***	7.237***	2.102***
Pension Plans	1.407	0.843	4.245	1.332	0.311*	2.055	0.999	0.529	1.173
Investment funds	1.695	4.040***	1.625	1.483	3.536	1.233	1.805	0.511	1.559***
Mortgages	0.907	1.464	0.992	1.671	1.200	0.966	0.7333	2.744	0.979
Personal Loans	1.225	1.336	0.976	1.327	1.798	1.123	0.887	1.182	1.087
Intercept	0.654	0.312	0.870	1.073	1.482	0.288	2.180	1.821	1.744***
Obs.	668	491	576	773	379	294	454	315	8,554
Count R^2	0.647	0.682	0.668	0.639	0.644	0.646	0.685	0.647	0.615
Pearson Test (p-value)	0.210	0.378	0.470	0.354	0.385	0.227	0.211	0.133	0.0053
Hosmer-Lemeshow Test (p-value)	0.581	0.804	0.672	0.153	0.271	0.944	0.179	0.954	0.050
Roc Curve	0.699	0.753	0.7220	0.6893	0.697	0.716	0.750	0.687	0.660

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

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