

Financial Knowledge and Financial Resilience in Greece

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Abstract

We examine the determinants of financial knowledge in Greece, using a nationally representative sample of adults from the Household Finance and Consumption Survey (HFCS) in 2017. We approximate financial knowledge via two questions, capturing the understanding of financial risk and risk diversification. We find a notable gender difference in financial knowledge in the magnitude of 17-28% in favour of males. Among the factors explaining financial knowledge and the related gender gap, we find that local economic and financial sector development are positively related to financial knowledge and negatively related to the unexplained component of the gender. The prevalence of strong local stereotypes demeaning the role of females in society and higher gender wage gaps by region are negatively related to financial knowledge and explain a large fraction of the gender knowledge gap. We find that less more financially literate women are more likely to be financially resilience, and they are less likely to seek financial assistance from friend and relatives and/or find themselves below the poverty line seeking assistance.

Keywords:

Financial literacy; Financial resilience; Household finance; Greece; Gender differences; Local environment; HFCS.

JEL Classifications:

G11; G53; D10; D11; C58

* Corresponding author, Georgios Panos: Adam Smith Business School, University of Glasgow: Georgios.Panos@gla.ac.uk. Ioannis Petrakis: Glasgow Caledonian University, Ioannis.Petrakis@gcu.ac.uk. The data for this study stems from the Household Finance and Consumption Survey (HFCS), collected by the European Central Bank (ECB). Neither the data collectors nor the ECB and its directors bear any responsibility for the findings, interpretations, and conclusions of this study. Any remaining errors are our own. We must thank the Greek Central Bank and Mr. Sotiris Saperas for providing the data on administrative regions and prefectures for the HFCS in Greece.

1. Introduction

The recent economic crisis and the income losses experienced by households raised the interest for an improved understanding of how financial knowledge can relate to savvier household financial behaviour. The existing literature on financial literacy¹ suggests there is a significant gender gap, with females being less literate and confident on their financial literacy (Lusardi and Mitchell, 2011). The common accepted optimal measure for financial literacy is based on the “Big Three” questions introduced by Lusardi and Mitchell (2007). Those question relate to the responses of individuals on questions on inflation and interest (and compound interest) calculation as also their ability to identify risk diversification strategies. The 2008 financial crisis put into the frame the gaps in financial literacy, as lower levels of financial literacy may lead to poor financial decision-making and potential financial distress (OECD, 2009). Recent research (Klapper and Lusardi, 2020) has presented the types of financial distress households are exposed, as they are more prone to consumer and financial market risks and carry higher interest, leading to lower levels of financial resilience. The latter finding related to financial literacy and financial resilience are more probable to be present to selected demographic groups, e.g., to women, poorer population and specific racial demographic groups (Lusardi, Hasler *et.al*, 2021; Klapper and Lusardi, 2020).

This study extends upon the recent literature on the gender differences in financial literacy by adding the role of the regional environment and gender stereotypes on determining the gender gap in Greece. Greece is also an interesting country case study as it experience significant income losses after the 2008 economic crisis that reached to a hike of 25% for the period 2007-2017, leading to an uncommon -for the Eurozone- intervention and the adoption of capital controls in 2015 (Lyberaki and Tinios, 2014). This is one of the few microdata sets rich in income and wealth information with which we can answer our main research questions as: Are there any gender gaps in financial literacy in Greece? Are those gaps local? Do the local context and gender stereotypes affect any existing gender differences and if so, how much of the gaps are explained by them? Finally, how does financial knowledge affect household financial behaviours and financial resilience?

Literature has examined the effects of financial literacy on household finances and financial behaviour, with Behrman, Mitchell *et.al* (2010) finding positive effects on wealth

¹ We use the terms financial knowledge and financial literacy in the text interchangeably.

accumulation while positive effects are also found on retirement finances as the studies of Jappeli and Padula (2013) and Xu and Zia, (2012) show. Those skills are more than essential in times of a financial crisis (Klapper, Lusardi *et.al*, 2013). Other studies examine its effects on alternative household financial decisions. (Christelis, Jappelli *et.al*, 2010; Grinblatt, Keloharju *et.al*, 2011; Haliassos, Jansson *et.al*, 2020). Financial literacy affects facets of inclusive growth, as it is subject to inequality and inclusion differences (Lusardi, Michaud *et.al*, 2017).

The empirical strategy benefits from the rich in information data on income and wealth for the Greek households in 2017 as also additional macroeconomic data from established sources (Eurobarometer, World Values Survey, European Values Survey, Greek Statistical Authority Database, Greek Labour Force Survey) on the regional environment and gender stereotypes. Despite the lack of answers for the questions of financial literacy on inflation and interest in the Greek sample of HFCS, the existence of answers on the questions on riskiness and risk diversification offer a robust understanding and measure of financial knowledge of Greek households. Moreover, there is the opportunity to use an appropriate measure of financial resilience based on the liquid rate of the household and whether that exceeds 3 months of their annual household income. The additional measure of the regional poverty line is another novel measurement based on the local context. Finally, from the econometric approach, while the examination of the existence of gender differences in financial literacy, the effects of the regional environment and gender stereotypes and its effect on financial resilience are estimated with the use of ordinary least squares (OLS) regressions, the inclusion of Blinder-Oaxaca decomposition offers the opportunity to discuss the magnitudes with which the regional environment and gender stereotypes affect the established gender gaps.

The findings suggest significant gender differences in financial literacy in Greece in favour of men that are in a magnitude range between 17-27.7% for the pooled sample and more exaggerated in some administrative regions of the country, especially in the periphery. Moving to the examination of the regional environment and gender stereotypes, we find that the local context exerts positive effects on financial literacy among the population whereas gender stereotypes exert negative effects. Focusing on the local context, regional financial development, assessed through regional financial education, employment in the local financial sector and deposits per capita, show significant benefits on populations' financial literacy. In

addition, further indicators for self-employment, political interest and higher education at the 13 administrative regions level also show positive effects.

While the positive effects discussed above offer an initial conclusion, the Blinder-Oaxaca decomposition at this stage answers how those regional indicators affect the gender differences in financial literacy. An increased share of the decomposition close to 61.9% is attributed to the unexplained component. Regional financial development makes out again as financial higher education, employment in the financial sector and deposits per capita remain significant at the unexplained component of the decomposition in favour of females, besides regional economic development (GDP per capita), university higher education and local self-employment and thus contributing to the reduction of the existing gap. On the other hand, gender stereotypes further contribute to the existing gender differences except for the presence of females in managerial positions in local firms.

Finally, the estimates when examining the effects of financial literacy on financial resilience show that females fall behind household financial outcomes compared to males. Females also show increased probabilities when we examine seeking financial assistance from friends and relatives and being placed below the regional poverty line. Financial literacy eases those gender differences. The last stage of the empirical analysis adds in the importance of understanding and have sound magnitude indications on the gender gaps in financial literacy in Greece.

The remainder of this study is organised as follows. *Section 2* reviews the relevant literature, *Section 3* offer a descriptive presentation of the data, summary statistics and presentation of the empirical strategy. Then, *Section 4* presents and discusses the estimation results on gender differences in financial literacy and the role of stereotypes and local environment along with the Blinder-Oaxaca decomposition of the gender differences in financial literacy and the role of the local environment and gender stereotypes. *Section 5* presents and discusses the estimation results on the effects of financial literacy on household finances. Finally, *Section 6* concludes.

2. Background and literature

The share of financial literacy in forming financial behaviour and having effects on several financial decisions is a subject gained interest after the financial crisis, when it was observable that we need to understand why individuals' decisions lead to unnecessary or risky decision and what could be the policy makers' interventions are to prevent that. As Lusardi and Mitchell (2011) suggest in one of their empirical overviews, there is a global gap in terms of financial literacy, with females, less educated individual and younger people being more vulnerable to the risk it entails.

The increased financial fragility along with the higher frequency of economic crises highlighted the need of focusing on financial education and its major impact on tackling financial difficulties (Laeven and Valencia, 2020). It is also indicative that especially banking and debt crises have stronger and significant effects considering the context of emerging or developing countries while on developed countries the effects are moderate or not significant (Nguyen, Castro *et.al*, 2022). Bernheim and Garrett (2003) were one of the first major empirical studies on the impact of financial education on financial planning, examining the effect of it on personal saving planning in the USA, using their self-conducted survey data for the period 1994-1995. Their results suggested a significant positive stimulation of saving for every life-cycle period –when working and when on retirement-.

The established financial literacy questions were developed with the research from Lusardi and Mitchell (2007). They used data from the HRS² for the USA for the years 1992-2004 to examine the effect of financial literacy and housing on wealth of the “baby boomers”. The latter referred to the younger population when they split their sample to planners and non-planners. Their results concluded that planners showed increased levels of wealth and financial literacy, especially when they approached their retirement year. Lusardi, Mitchell *et.al* (2010) followed this study by examining the financial literacy levels of younger people in the USA for the years 1997-2007 with the use of data from the 1997 National Longitudinal Survey of Youth, finding that younger people tend to have lower levels of financial literacy, with only 1/3 of them managing to answer the relevant questions. The survey proposed that other family and socio-demographic affect the levels of financial literacy of individuals. Lusardi and

² HRS refers to the Health and Retirement Study.

Mitchell (2011) followed those studies for the USA and conducted a descriptive review on the trends of financial literacy across the world. Their findings indicate that females are less financially literate than males and younger population follows the same trends compared to the older one. Education is found to be a significant factor on the financial literacy levels, whereas there is a strong channel for retirement security as the financial literate people tend to have planned better their retirement funds and show increased financial security. Later research outputs focused on those propositions, with Van Rooij, Lusardi *et.al* (2012) studying the case of the Netherlands and in specific the effect of financial literacy on household wealth. They used data from the De Nederlandsche Bank Household Survey for 2005 and found a strong positive correlation of household wealth and financial literacy, channelled through better stock market investments and retirement planning. Finally, Haliassos, Jansson *et.al* (2020) studied the externalities of financial literacy in Sweden, using data from STATIV³ for the period 1987-2007, examining the neighbours' financial literacy effects across the financial behaviours of individuals, and found that educated households show positive spill overs from financial literate neighbours, increased saving for retirement planning and increased levels of stockholding.

2.1 Gender differences in financial literacy

The importance of finance on the implementation of inclusive growth is a common accepted argument, with several policy-related reports suggesting that one is essential to achieve the other. Denk, Schich *et.al* (2015) studied the effect of implicit bank debt on income inequality for the OECD countries during the period 2008-2014, with negative effects shown and leading to increased income inequality due to unequal pay increases per sector. Following research focused on the OECD countries and concluded to similar interpretations, with Denk and Cournède (2015) examining the impact of financial expansion on income inequality with data from the OECD Income Distribution and Poverty Database for the years 1974-2011 and resulting in conclusions on low but significant effects of credit growth on economic growth as also on stagnation of income. Denk and Cazenave-Lacroutz (2015) examined the household dynamics, using the first wave of Household Finance and Consumption Survey (HFCS) in 2010 to study the effect of household financial composition on income inequality. Household credit distribution was found to be two times less equal, whereas stock market wealth was found to

³ STATIV (or LINDA STATIV) refers to the Longitudinal Database for Integration Studies.

be four times less equal. More recently, Cicchiello, Kazemikhasragh *et.al* (2021) offered a cross-country study for a selection of 42 countries in Asia and South Africa on the relationship of financial inclusion with development. They used data from several established databases (World Bank's, ILO's, IMF's and UN's databanks) and concluded there is a positive relationship of financial inclusion and development, with unemployment and literacy being major determinants and females being more vulnerable to their negative effects.

The literature that examines the relationship between inclusive growth and finance highlights the need to reduce income inequalities across the globe. Besides income, though, there are other inequalities we need to address, with gender inequality following. Gender differences in financial literacy exist and are noticeable as Lusardi and Mitchell (2011) point in their global financial literacy review and further research is needed to ascertain their determinants. Sekita (2011) studied the link of financial literacy and retirement planning for Japan using data from SLPS⁴ in 2010, finding observable and significant effects on females, especially those on the lower income, education and age bands. Klapper and Panos (2011) studied the case of Russia with data from their field study on the relation of financial literacy and retirement planning. They selected Russia due to the ageing population, with their results suggesting that less than half the population is financial literate, whereas there are positive effects on retirement planning including the private pension funds.

Fonseca, Mullen *et.al* (2012) focused on the gender gap in financial literacy in the USA with data from the RAND American Life Panel for 2009 and with the use of a Blinder-Oaxaca decomposition analysis. They found that most of the gap is due to the differences in coefficient and literacy sources rather than individual characteristics. Relative education also showed a significant effect in the decomposition. Brown and Graf (2013) studied the case of Switzerland with a self-created survey in St Gallen University in 2011, resulting that there are high levels of financial literacy in Switzerland, with immigration being one of the determinants in the analysis showing statistically significant effects. Mahdavi and Horton (2014) used a sample of highly educated women of Smith College in the USA that graduated in 2009 to explore the gender differences in financial literacy, concluding that both age and education have significant positive effects. Arrondel, Debbich *et.al* (2014) used the 2011 wave of the PATER survey in France and found that females, lower educated and younger individuals show lower financial

⁴ SLPS refers to the Kurashi no Konomi to Manzokudo Chosa (Japanese translated) survey.

literacy skills, with political opinion also showing an effect. Agnew and Harrison (2015) offered a comparative study of university students in England and New Zealand with a self-constructed survey during the period 2013-2014, resulting that male performed better than females. Overall, the New Zealand's sample performed better than the English, whose female sample were however less predictive compared to males.

Almenberg and Dreber (2015) included the stock market participation as a variable to consider in the analysis of gender differences in financial literacy for Sweden, with data from the Swedish Financial Supervisory Authority Survey of 2010. Stock market participation positively correlated with financial literacy and other numeracy skills, with a gender risk-taking gap also being observed. Filipiak and Walle (2015) added the household culture characteristics in the analysis for India, using the data from NDSSP in 2004-2005. They categorized the households based on being matrilineal or patriarchal by region, with their results indicating that females are less literate than males, despite those coming from matrilineal oriented households being more financially literate than the patriarchal ones. This offered some ground for the hypothesis that household characteristics to understand the dynamics in individuals' literacy. Kaiser and Menkhoff (2017) conducted a meta-analysis of 126 financial literacy studies for the period 1999-2016 and summarized that financial education has lower than anticipated effects on several outcomes in low-income households and low and middle-income economies. Bucher-Koenen, Lusardi *et.al* (2017) added to the cross-country understanding of the gender gap on financial literacy with samples from the USA -with the use of data from NFCS⁵ and DHS⁶-, the Netherlands -with the use of data from De Nederlandsche Bank and Germany -with the use of data from SAVE- for 2009-2010. Their cross-country analysis results showed that females have decreased levels of self-confidence alongside lower financial literacy levels and improving their knowledge is important we consider that they have higher life expectancy.

Bannier and Swartz (2018) used the 2009 wave of SAVE dataset for Germany to examine the differences between the actual and perceived levels of financial literacy on financial wealth. They used education as the moderator of this effect and found positive effects on financial wealth, persistent on females in addition to males. Self-confidence is also a major factor in the analysis, but it is observable to males rather than females. Arellano, Cámara *et.al* (2018) added the role of non-cognitive skills in explaining the gender gap in financial literacy, with the

⁵ NFCS refers to the US National Financial Capability Study.

⁶ DHS refers to the Demographic and Health Survey.

sample from PISA⁷ dataset for Spain in 2012. Their multilevel mixed effects regression analysis indicated a 20% decrease of the gender gap when they control for non-cognitive skills, although the remaining gap remains significant. Bannier, Meyll, Röder *et.al* (2019) offered new empirical research on the gender differences in financial literacy and digital finance, focusing on their Bitcoin financial literacy in the USA, using the dataset of UAS⁸ for the period 2015-2018. Their Blinder-Oaxaca decomposition analysis resulted that the gender gap might explain around 40% of the Bitcoin financial literacy, with socio-demographic and individual characteristics showing lower effects. Their final suggestions reprimand the role of financial technology for the future policies on financial well-being. Grohmann, Hübler *et.al* (2021) used an online survey in Thailand in 2012 to establish the levels of the relevant gender gap in the country, with no primary signs of gaps concurrent and concluding that the gender gap in financial literacy are country-specific and of diverge effect magnitudes. Cupák, Fessler *et.al* (2021) examined further the assumptions of Bannier and Swartz (2018) on the role of confidence in financial literacy on risk taking with a selection of 13 countries and data from the OECD/INFE microdata database for 2016. Their results confirmed prior research that suggested that risk-taking behaviour is strongly correlated with financial literacy and explains the gender differences.

The review of existing literature suggests there are several channels to consider when examining the gender differences in financial literacy, as also that isolating the analysis in one country could be more efficient. This study is going to focus on the case of Greece, a country that had negative outcomes from the economic crisis, resulting in major economic policy changes, and increasing the insights on how the crisis coincided and determined the gender differences in financial literacy and what are the effects on financial behaviour. That leads to the first research hypothesis which is formed as:

H_0^A : *Males are not more financially literate than females in Greece.*

H_1^A : *Males are more financially literate than females in Greece.*

Bottazzi and Lusardi (2021) studied the role of stereotypes in determining the gender gap in financial literacy in Italy, with a sample of Italian high school students from the PISA dataset

⁷ PISA refers to the Programme for International Student Assessment.

⁸ UAS refers to the Understanding America Study.

of 2012. South Italy and the islands are found to be the worst performing regions in Italy, with parental educational background being an important factor in the analysis besides culture and history (stereotypes). Tinghög, Ahmed *et.al* (2021) studied the case of Sweden, using two different data sources, a self-conducted online survey and the Swedish Standardized Scholastic Aptitude Test of 2010-2011 and a mixed methodology which included regression and mediation analysis. Their empirical results highlighted the role of self-confidence in explaining gender gaps, whereas using financial anxiety as the mediation variable in the mediation analysis confirmed the role of stereotypes in maintaining the gap. Prakash, Alagarsamy *et.al* (2022) studied the nexus of financial literacy, financial behaviour and financial stress and its effects on financial well-being in India with data from an online survey. Their mediation analysis, with financial behaviour and stress being the mediation variables, found that financial literacy and behaviour had positive effects, while financial stress had negative. Brous and Han (2022) conducted a natural experiment in the USA in 2018-2019 based on the structure of the Deal/No Deal game to examine the relation of risk tolerance and individual characteristics – and in specific ethnicity- on a sample of 374 students from 13-difference finance course at the university level. Their results showed that international students are more risk averse compared to American students. Finally, Wang, Cheng *et.al* (2022) studied the effect of higher education on homeownership and household wealth in China, with data from the China Family Panel Studies of 2018 and found an increase on homeownership on the range of 3.5-6.3% and similar increased on the range of 24.3-51.1% for household wealth. They exploited financial literacy as one of the determinants of higher education that could affect housing. That led to the second research question/hypothesis which is formed as:

H_0^B : *The local context does not explain gender differences in financial literacy.*

H_1^B : *The local context explains gender differences in financial literacy.*

2.2 Household finances in Greece in 2017

This study uses Greece as the country of the analysis due to its deteriorating economic development among the European Union countries. Greece is country that has undertaken major economic and financial system modifications during the economic crisis, with the country losing almost 25% of its GDP in a decade and with incomes decreasing significantly. In addition to that, the capital controls of 2016 added to the existing financial distress. Hence,

examining the gender differences in financial literacy and its effect on household finances is essential on understanding the effects on financial behaviour and resilience.

Former literature has offered analysis on the effects of economic and financial restructure in Greece and decreases in income. The country ought to face several constraints due to its major public finance problem, with budgetary concerns and other economic constraints adding to its increasing deficit. Ageing and pension system reforms were necessary as the system became unsustainable (European Commission, 2012; Lyberaki and Tinios, 2012). The reforms implemented were made on a large scale and according to several critics extreme and unproductive (Lyberaki, Tinios *et.al*, 2010; Lyberaki and Tinios, 2014). Former studies had highlighted long before that the emergent need for restructuring (O'Donnell and Tinios, 2003; Nektarios, 2008; 2012) caused imbalances in household asset holding (Nektarios and Georgiadis, 2009).

The pension system and household finances were two factors in the long list of economic constraints the policy makers had to solve. The economic crisis and major income reductions contributed to the loss of human capital, with a large share of the workforce that was high-skilled leaving the country for better working and salary conditions abroad (Pegkas, 2012; Pegkas and Tsamadias, 2014). The negative effects to the Greek economy were observable, as educational capacity and workforce skills as of the main determinants of the dynamics of economic growth (Knight, Loayza *et.al*, 1993; Hamilton, and Monteagudo, 1998; Petrakis and Stamatakis, 2002; De la Fuente and Doménech, 2006; Vandenbussche, Aghion *et.al*, 2006). The fleeing educated and high-skilled workforce in losses in labour market productivity and downward pressures in salaries, affecting household finances.

The twin problem of macro and micro finances had further implications, with the unemployment rates increasing drastically, reaching a high of 25% nationwide and above 50% for the youth workforce (Pissarides, 2013), while the overwhelming debt to GDP ratios did not relieve the Greek economy and there were suggestion for policy interventions (Zettelmeyer, Trebesch *et.al*, 2013; Philippon, 2015; Schumacher and di Mauro, 2015). Although the Greek banking system is small and did not have a considerable exposure to the global financial crisis, the Greek banks faced significant challenges and the need for major reforms (Battistini, Pagano *et.al*, 2014). The major constraint for the Greek banks was the possession of “toxic” and unsustainable Greek debt, which deteriorated their balances. The higher share of non-performing loans (NPL) alongside the incomes reduction in the country was another piece in

the puzzle. The higher concentration of banks in the financial system was a dual obstacle too, as the non-existence of investment diversity expedited the need for banking reforms through government support and took away policy-making tools (Mylonakis, 2013). Moreover, Greek household portfolios were mostly consisting of illiquid assets (e.g., of real estate) compared to other countries in the European Union, whereas their liquid assets consist mainly by bank deposits (Haliassos, Hardouvelis *et.al*, 2017).

The crisis in the financial sector along with the absence of household investment diversification was the primary motive for research on gender differences in financial literacy in Greek and on its effects on household finances. The addition of economic and financial constraints imposed by the recent economic crisis contributed to the conceptualization in this study, while the data collection year of the HFCS (2017) adds to the insights as it follows the policy intervention from the European Central Bank and the imposition of capital controls in the summer of 2015. *Figure 3.1* presents the macroeconomic trends of key indicators to address the impact of the economic crisis in Greece for the period 2007-2017. As it can be seen, household debt (percentage of net household disposable income) increased significantly during this 10-year period from 83.6% of net disposable income in 2007 to 105.7% in 2017. Unemployment –one of the main economic constraints of the country- followed a similar increasing trend, as from 8.4% that it was in 2007 climbed to 21.4% in 2017, while the country during this time experienced even higher unemployment rates (27.4% in 2013 and 26.4% in 2014). On the other hand, financial sector development deteriorated as the share of private credit by deposit money to GDP, financial system’s deposit share to GDP and stock market capitalization followed decreasing trends. The financial sector took another hit with the imposition of capital controls in June 2015, a policy that lasted for the next four years and constrained firms’ and households’ transactions and credibility.

[Insert Figure 1 about here]

The impact of financial literacy on household financial decision-making in line with the gender gaps present globally led to the last two research questions/hypotheses that are formed as:

H_0^C : *Males are not more financially resilient than females in Greece.*

H_1^C : *Males are more financially resilient than females in Greece.*

and

H_0^D : *Financial literacy does not ameliorate the gender gaps in financial resilience.*

H_1^D : *Financial literacy ameliorates the gender gaps in financial resilience.*

3. Data and empirical strategy

3.1 Descriptive statistics

We use data from the third wave Household Finance and Consumption Survey of 2017 showing trends on income and wealth of households in 22 EU countries to conduct the analysis for Greece. The data was collected with the collaboration of countries' central banks in three different waves (2010, 2014 and 2017 respectively), with the latest wave (2017) including questions on financial literacy for the Greek sample. As discussed before, despite the lack of responses on the financial literacy questions on inflation and interest, the inclusion for those on riskiness and risk diversification offers a comprehensive measure and understanding of household financial knowledge, facilitated with the creation of a score ranging from zero (0) to two (2) for the number of correct responses. The questions on financial literacy were answered from the financial head of the household, hence the sample is at 3,007 observations/households for Greece.⁹

Table 1 presents the summary statistics on financial literacy in the sample. In Panel A we can see the summary statistics for the financial literacy proxies created, namely the number of correct, wrong, DK/DA answers and at least one “Don’t know”, while in panel B we can see the summary statistics for the constituents of financial literacy. On the pooled sample of 3,007 observations, the average number of correct answers were 0.75 out of 2, whereas the number of wrong were 0.89 out of 2. Comparing the number of correct responses on financial literacy questions, males’ (0.86) score was 0.20 points higher than that of females (0.66). A smaller sample share had selected “Don’t know” at least in one of the two questions while on average there are 0.36 out of 2 DK/DA responses. 20.6% of the sample answered every question correctly, whereas 54.8% had one of the two questions asked correct. A gap is seen when we compare the number of wrong and DK/DA answers and is in favour of females (0.04 and 0.17 points respectively), offering a primary indication of the gender differences in financial literacy

⁹ Household heads are mentioned as reference persons in the HFCS.

presented in the empirical analysis. Considering every of the two questions separately, 26.5% of the sample answered the question on risk diversification correct whereas 48.9% answered correct the question on riskiness. An interesting remark at this part is that a higher share (33.5%) selected “Don’t know” in the question for financial risk, in line with recent literature reprimanding that this is considered of the most difficult questions for financial literacy. Panel C presents the comparisons with the 29 countries of EEA¹⁰ to offer a comparative perspective of how Greece stands in terms of financial knowledge and perception of risk. Greece is placed at the bottom parts of the table, with 36% of the population able to answer correct in the questions on financial risk and 45% answering correctly at least three of the four questions included in the survey. Females fall behind males by 7% in this survey.

[Insert Table 1 about here]

Table 2 presents the summary statistics for the demographic variables used and the indicators on local environment and gender stereotypes. Females represent 52.6% of the total sample of Greece, with the mean age being of 54 years old. The biggest share of the sample are residents in Attiki (36%), with North Greece (28.6%), Central Greece (24.2%) and Aegean islands and Crete (11.2%) following. The highest share of the sample is either employed (35.4%) or pensioners (39.7%), while unemployed (5.9%) and other types of employment (3.4%) represent the lowest share. On the educational status, secondary education is the main educational attainment with 39.6% of the sample for upper and 13.4% for lower-secondary education, whereas 22.2% have tertiary and 24.8% primary education. Most of the respondents are either married or in a consensual relationship (59.8%), while on average the household has close to one child. Moving to income and wealth, the average total gross household income is of 13,329 euro, while the average household net wealth is of 93,915 euro. Females fall behind males in both variables by 1,129 and 9,275 euro respectively. Finally, turning to financial behaviour and orientation, 56.7% on average are present oriented and risk averse whereas 48.5% of the sample are financially resilient as they own liquid assets that represent at least 25% of their annual household income. When we consider households’ position in the regional poverty line, 3.6% are placed below. In addition, 8.4% asked and are receiving financial support from friends, relatives or private transfers.

¹⁰ EEA refers to the European Economic Area. The data stem from the S&P Global Financial Literacy Survey of 2015.

[Insert Table 2 about here]

3.2 *Financial literacy across Greek regions*

Figure 2 presents the interactive map for mean financial literacy scores per NUTS 2 (13) administrative region in Greece. The higher mean scores indicate higher average financial literacy in the region based on the number of correct answers at the respective questions. The map shows that we find the highest score in the regions of North Aegean (1.185), with Thessaly (1.018) following. On the bottom levels, South Aegean (0.265) and East Macedonia and Thrace (0.539) show the lowest scores. Attica, the most populated administrative region in Greece that includes the capital (Athens), is placed in the upper bounds of the rank (0.820) and in the fifth place in the list.

[Insert Figure 2 about here]

3.3 *Empirical strategy*

The local context and gender stereotypes affect households' financial knowledge and decision-making in later adult life. Former studies have pointed the impact of the cultural influences in economic decision-making, which sometimes is an important factor in the analysis (Alesina and Giuliano, 2010, 2014). Considering the gender related cultural norms, every country has its own norms and themselves they affect female's position in the household and participation in the decisions, as e.g., their labour market status (Petraakis, 2021) or their financial literacy (Bottazzi and Lusardi, 2021). The questions on financial literacy in HFCS Wave 3 were answered by the representative household heads, which means that we keep only the reference persons as our sample. This consists of 3,007 heads/households.

The study starts with the determinants of financial literacy at the first part of the empirical analysis to show whether there are gender differences, before focusing on the effects of the local environment and gender forming them. The data are inclusive of wealth and income related variables, which offers a unique opportunity to examine the impact of financial literacy on real household finances along with gender considerations. The regional analysis of stereotypes and the local environment is according to the geographical classification at the 13 NUTS 2 administrative regions of Greece. The econometric specification uses OLS regression models of the form:

$$FL_i = \beta_0 + \beta_1 \text{female} + \beta_2 X_i + \varepsilon_i \quad (1)$$

where FL_i refers to the measure for financial literacy for the household i , female is a dummy indicator stating whether the respondent is a female, X_i is a vector of household and individual characteristics, including region fixed effects and/or indicators capturing the local context.

To facilitate our understanding on the role of the local environment and gender stereotypes on forming the gender differences in financial knowledge in Greece, the following stage use a Blinder-Oaxaca decomposition model. The Blinder-Oaxaca decomposition model is of the form:

$$FL_i^m - FL_i^f = \hat{\beta}_f (\bar{X}_i^f - \bar{X}_i^m) + (\hat{\beta}_f - \hat{\beta}_m) \bar{X}_i^m \quad (2)$$

The decomposition of Blinder and Oaxaca decomposes the difference based on linear regressions. The effect is separated to one based on differences in components (explained) and to one based on differences in coefficients and constant terms (unexplained) (Jann, 2008). This offers the chance to understand how much the model explains the differences and whether there are additional unexplained components to consider in future studies. The first parenthesis of the right hand of equation (2) indicates the explained component of the Blinder-Oaxaca decomposition. This part suggests how much of the gender differences in financial literacy are explained by differences in variables' *components* rather than the linear prediction or the constant terms, namely by differences between males and females in the variables used in the linear model. The latter are shown by the second parenthesis of the right-hand side of equation (2), the differences in *coefficients*. This part is the unexplained or discrimination component of gender differences in financial literacy, suggesting that the gap is not subject to control variables differences but in parts that cannot be explained by the existing linear regression specifications.

The final stage of the analysis examines the effects on household financial resilience with equations of the form:

$$y_i = \beta_0 + \beta_1 FL_i + \beta_2 \text{female} + \beta_3 X_i + \varepsilon_i \quad (3)$$

where y_i refers to financial resilience with the rest of the notations being like the equation (1). The last equation includes the interaction terms between financial knowledge and resilience and is of the form:

$$y_i = \beta_0 + \beta_1 FL_i + \beta_2 FL_i * female + \beta_3 female + \beta_4 X_i + \varepsilon_i \quad (4)$$

where $FL_i * female$ is the interaction terms between financial literacy and gender (female).

4. The analysis of financial literacy in Greece

This section will present the empirical results on the determinants of financial literacy in Greece.

4.1 *The determinants of financial literacy*

The first set of estimates in *Table 3* presents the determinants of financial literacy in Greece. Column 1 shows the baseline gender differences in financial literacy in Greece, while Columns 2 adds the explanatory socio-economic variables for the household. Columns 3 and 4 add region fixed effects. Column 3 includes the fixed effects for the 13 (NUTS2) administrative regions of Greece, while columns 4-6 expand the regional perspective with the inclusion of fixed effects for NUTS1 and NUTS3 prefectures of the country. Columns 5 and 6 consists of samples solely of males and females household heads respectively. The estimates are based on OLS regressions, while to facilitate the understanding of the linear effects, we divide the percentage point effect with the linear probability of the model.

Column 1 shows a baseline gender difference in financial literacy of 27.7% in favour of males, suggesting that females are 27.7% less likely to correctly answer one additional question on financial literacy, significant at 1% level. Adding the socio-economic explanatory variables reduces the effect to 17%, whereas adding the fixed effects based on the NUTS 2 administrative regions increases it to 19.6%. That suggests that while socio-economic factors could reduce the gender gap, regional disparities would increase it. When we add additional regional specifications (fixed effects) on both NUTS1 and NUTS3 prefectures, the gender effect is marginally reduced to 19%, showing there are not considerable regional differences between the geographical NUTS classifications. Moreover, educational attainment levels retain their significant effects at 1% level for secondary and tertiary education and 5% level for primary education, which shows that improved education raises the financial knowledge of Greek households. On the other hand, the logarithm of age does not seem to exert any significant

effects. The determinants of the samples of males and females in columns 5-6 follow the determinants in the pooled sample.

Commenting on other household characteristics, marital status does not show significant effects on financial knowledge, except for the case of widowed/divorced males, where they are 20.4% less likely to have an additional financial literacy point. Number of children also show insignificant effects whereas employment status matters on financial knowledge only in two of the specifications with regions fixed effects when the individual is retired or has other types of employment. In that case, retired Greeks and those with other types of employment are less likely to have correct answers on financial literacy questions when we include region fixed effects. As expected, household income and wealth show positive effects, while it is the logarithm of net wealth that always shows statistically significant positive effects between the ranges of 62.3% to 94.4% in favour of males. Finally, present-oriented households have a 25.6% higher likelihood to answer correct financial literacy questions, while similar effects are present for those who prefer risky attitudes in investment (13.3%).

[Insert Table 3 about here]

Figure 3 presents the coefficient plots from separate regressions of gender (female) on financial literacy on NUTS 1 and NUTS 2 prefectures and administrative regions. That provides insights on the regional disparities across the country. Starting from the NUTS 1 prefectures, Central Greece and Attiki show the highest gender (female) negative effects between the percentage points of 0.23 and 0.18, whereas Crete/Aegean islands and North Greece show the lowest and non-significant effects. It is interesting that Crete and the Aegean islands show non-significant gender effects, while they are placed at the lower ranks in the map of *Figure 2*. The coefficient for Attiki could be representative for a major share of households in the country, as it is there where almost half the population resides. Turning to the effects based on the 13 NUTS 2 administrative regions, we can spot the gender effects in more detail, with the Ionian islands and West Greece showing the highest gender effects and the regions of East Macedonia and Thrace and Epirus following. The two of the most populated cities in Greece (Attiki for Athens and Central Macedonia for Thessaloniki) are lower in the rank, with the gender effect of Central Macedonia being close to lose its statistical significance. The majority of the lowest, negative and not significant gender effects are seen in Crete, whereas although they do not have statistical significance, the gender effects for the regions of Epirus, West Macedonia, North Aegean and Peloponnese are in favour of females.

[Insert Figure 3 about here]

Figure 4 shows the interaction terms of gender (females) with education, income quantiles and wealth quantiles. Starting with the interactions with education, tertiary education makes the gender effect non-significant, while in line with the results in *Table 3* the higher the educational level, the lower the gender effects and the gaps. Turning to the interactions with the income quantiles, we can see that income affects gender gaps like how educational attainment does, with the higher 40% of the income quantiles (income quantiles 4 and 5) turning the gender effect to non-significant, whereas the lower the income quantile the higher the negative interaction term. The interactions with the wealth quantiles follow a similar pattern and denotes better the positive effects of wealth on reducing the gap. It should be noted at this point that in terms of wealth, the interactions with the 2nd wealth quantile shows lower gender effects than those with the 3rd quantile, suggesting that when the household moves from the poorer wealth quantiles to the “middle class” the gender differences could increase. On the contrary, the poorest households (1st wealth quantile) show lower gender interactions as they should not possess significant household wealth.

[Insert Figure 4 about here]

The second set of estimates in *Table 4* presents the robustness regression results for the determinants of financial literacy in Greece. A selection of alternative financial literacy specifications are selected to examine whether the gender gap persists. Columns 1-2 show the gender differences for each of the two questions asked individually, as the dummy dependent variable equals to one if the household respondent answers correctly and zero otherwise. The following estimates in Column 3 use a dummy on whether the respondent answered both the financial literacy questions correctly, while columns 4-5 have as dependent variables the number of wrong and DK/DA responses. Those are the opposite measures of financial knowledge used in the baseline regressions in *Table 3*. Finally, column 6 uses a dummy variable on whether there is at least one DK/DA answer in the two questions.

Examining the magnitudes of the linear effects, females are 23.1% less likely to answer correct the question on risk diversification at 1% statistical significance and 16.7% less likely to answer correct that on financial risk. They are also 22.5% less likely to answer both the questions correctly at 5% significance level. The gender effect on the number of wrong responses in column 4 does not show statistical significance, although it is in favour of females

and at 3% effect. Turning to the DK/DA specifications in columns 5-6, females are 32.7% more likely to select DK/DA at an additional financial literacy question with 1% significance, while at the same time they are also more likely to have at least 1 DK/DA answers in the two questions asked. The effect magnitudes confirm that females fall behind males in terms of financial knowledge, while they also show they lack self-confidence when they answer questions on financial literacy.

[Insert Table 4 about here]

4.2 *Financial literacy and the local environment in Greece*

Having established the gender gaps in financial knowledge in Greece and their magnitudes, the estimates in *Table 5* includes the local environment and gender stereotypes in the narrative. To show how they affect financial literacy, we select representative variables from the Greek Labour Force Survey (LFS), the Hellenic Statistical Authority, the 2017 Eurobarometer and the joint World Values Survey and European Values Survey of 2017 (WVS/EVS) that define the local environment and gender stereotypes. All the variables are regional aggregates based on the 13 NUTS2 administrative regions of Greece, offering an opportunity to show the regional effects on financial literacy, while the regressions exclude the regional fixed effects for that purpose. The gender stereotypes index is created with principal components analysis based on the indicators of the joint WVS/EVS of 2017 on opinions about whether females' education is not a priority compared to males, that they make worse executives, that they should not be prioritised in job search, and that they make worse political leaders.

For the assessment of the effects of the local environment, the regional GDP per capita, regional deposits per capita and regional employment and their deterioration during the time of the economic crisis (2007-2017) are deployed, enriched with indicators for financial sector employment, the share of the regional labour force in finance and university graduates, the number of self-employed per administrative region, the political interest index and the share of the population discussing national matters. For the gender stereotypes, we select indicative variables on gender stereotyping from the 2017 Eurobarometer and the 2017 joint WVS/EVS survey. Those are the share of females in managerial positions based on the 2017 Greek LFS, the gender stereotypes for females' household position, stereotypes for their participation in politics and the gender stereotype index mentioned above. The political interest index is

normalised for most robust estimates. *Appendix Table 1* describes in detail every variable and presents the sources taken from.

Results from Panel A in *Table 5* show that the local context has positive effects on financial knowledge. Living in an administrative region with higher GDP per capita increases likelihood of answering correctly financial literacy questions by 0.1%, significant at 1% level. When the region has an increased share of university graduates and self-employees the respondent has 1.9% and 0.1% increased likelihood of answering correctly respectively. Regional unemployment and its increase during the economic crisis affected financial literacy, as the deterioration (increase) in unemployment during the last 10 years (2007-2017) has negative and significant at 10% effects on financial literacy. Moreover, administrative regions that have population keener to participate in political life, as shown either from the political interest index or discussing national matters, show positive but non-significant effects.

Panel B in *Table 5* turns to the effects of the regional financial sector development and Panel C presents the effects of regional gender stereotypes. Living in a geographical region with a higher percentage of employees in the financial sector increases by 12.7% the likelihood for additional correct answers on financial literacy questions at 1% significance, while household respondents in regions with more university graduates from finance subjects and increased deposits per capita are 2.6% and 11.6% more likely to answer correct an additional question also respectively. The importance of the local financial sector development adds to the significance of financial knowledge and the need for a more sustainable financial market in Greece.

Panel C presents the estimates for the variables on regional gender stereotypes and how they affect financial literacy. Living in an administrative region with more females in managerial positions increases the likelihood of answering correct an additional financial literacy question by 4.1%, whereas on the contrary gender stereotypes -as expressed by the stereotypes index- decrease the likelihood of correct answers by 13.3% at the population level with 1% significance. The regional gender wage gap -measured as the differences in median wages- also decreases the likelihood of additional points on financial literacy by 1.2%, while the stereotype that females should take care of home shows negative effects of 66.5% at 5% level. Lastly, the stereotype on females' lack of skills compared to males for participating in politics shows negative but not statistically significant effects.

[Insert Table 5 about here]

4.3 *Blinder-Oaxaca decomposition*

The estimates in *Table 5* show the effect magnitudes on the population and offer an initial understanding of how the local context and stereotypes affect financial knowledge. To facilitate a better understanding on how they contribute to the dynamics of the existing gaps, Blinder-Oaxaca decomposition is used. The benefits of the decomposition are that it distinguishes the effects to the explained one -differences in coefficients- and the unexplained one -differences in constants and regression coefficients- showing in further detail how much the representative variable explains each component. A positive sign suggests that the indicator can increase the existing gaps, whereas a negative sign shows that the indicators contribute to its tackling.

The estimates in *Table 6* present the Blinder-Oaxaca decomposition estimates. The first row shows the effects by gender and the gap at the population level, while the first column shows the contributions of the selected variables on the explained component of the decomposition. The second column presents the contributions to the unexplained component. Based on the pooled sample estimates of the Blinder-Oaxaca decomposition, there is a 38.1% gender difference in financial literacy in Greece, of which 38.1% is explained from differences in components between males and females and 61.9% is unexplained. That means the females in Greece are 38.1% less likely to answer correct an additional question on financial literacy compared to males, with 14.5% being explained by the socio-economic variables and 23.6% of the effect cannot be explained by them and is attribute to differences in estimates.

Panel A starts with the baseline specifications when we add the regional fixed effects for the 13 Greek administrative regions and without any indicators for the local context and gender stereotypes. If females had the same demographics (age and marital status) attributes, then that could explain 32% of the gap at 1% significance, while if they had the same attributes on education, it could explain 19.4% of the difference. Differences in behavioural (present orientation and risk tolerance) attributes explain 42.9% of the gap at 1% level. Income, wealth and employment components differences explain a lower share of the explained component and in specific 7.1% at 5% significance level and 6.1% at 10% level respectively. The effects in the unexplained component and in the differences in estimates are not statistically significant for the socio-economic variables, except for income and wealth that over-explains the gender

gap. Regional differences do not seem to explain significantly neither the explained nor the unexplained component.

Turning to Panel B and Panel C, we show the decomposition when we include the 10 indicators for the local environment. To show the complete effects in the decomposition and due to the measurement of the local environment indicators at administrative regions level, we exclude the regional fixed effects. All local environment variables do not have significant effects on the explained component of the Blinder-Oaxaca decomposition, suggesting that it does not affect the differences of components rather than those of estimates. Regional GDP per capita explains 73.5% of the total gap and is in favour of females at 10% significance, while the deterioration in unemployment explain higher than the total gap and shows how unemployment affected the gender dynamics. The share of university graduates' indicator also explains the total gap in financial literacy and is in favour of females, while regional self-employment explains 48.2% of the gap at 5% significance. The regional environment indicators related to economic development confirm the effects presented in *Table 5* and are in favour of females, thus decreasing the gender gap. The contribution of the deterioration of regional unemployment to reducing the gap can only mean that females were eager to work due to the household finances deterioration and that would adopt positive influences on their skills.

When we focus on how the local financial sector development contributes to the existing gender gaps, all the three representative variables show statistically significant effects in the unexplained component. The variable for the share of finance graduates at regional level explains 54.5% of the total differences and is in favour of females, while employment in the financial sector explains 40% at 10% significance. Regional deposits per capita is in favour of males and explains 8.2% of the gap. It should be noted, though, that 2017 was a transition period for Greece, as we mentioned the capital constraints created from the imposition of capital controls in the Greek banks.

Finally, Panel D shows the estimates when including the five variables for gender stereotypes at the local level. Gender stereotypes, in line with the decompositions in Panel B and C, do not show significant effects in the explained component despite the case that their effect signs show that they are in favour of males (positive signs). Most of the variables, though, show statistically significant effects in the unexplained component of the Blinder-Oaxaca decomposition. In detail, the regional share of females in managerial positions explains 34.2%

of the total gap at 10% level in favour of females, while the regional wage gap adds to the existing gender differences in financial literacy and explains 31.1% of the gap at 1% significance. Gender stereotypes, expressed by the index, do not show significant effects in the decomposition whereas the stereotype that females should stay and take care of home explains most of the total difference at 5% significance level and expands the existing gap. Finally, the stereotype on females' abilities in politics does not show significant effects but the sign shows it would increase the differences.

[Insert Table 6 about here]

5. Does the gender gap in financial knowledge matter?

The final stage of the empirical analysis consists of regression analysis examining the gender differences in household financial resilience in Greece. While the local context and gender stereotypes can explain the existing gap in financial knowledge, it is important to understand how that reflects on households' financial resilience and how female stands compared to males. Liquid rate is employed as the measure for the household's financial resilience and is a dummy stating that the household has at least three months' worth of liquid assets more than its annual household income available (as that the ratio of the liquid rate to the household income is at least 25%). The liquid assets considered are deposits, shares, bonds, mutual funds, managed accounts and non-self-employment private business. For the creation of the indicator for liquid rate, those assets are divided by the gross household income and are indicative of household's liquid wealth. The assistance from friends and relatives variable is a dummy indicating that the household has received informal financial support, when it is equal to one, while the last dependent variable examines whether it is also placed below the regional poverty line. The regional poverty line is created based on the mean household income for the 13 administrative regions in Greece.

The set of estimates in *Table 7* include two different specifications for every dependent variable. Columns 1, 3 and 5 show the baseline specifications when we add financial literacy in the regression. Columns 2, 4 and 6 insert an interaction term of gender (female) with financial literacy to examine how gender affects the causal relationship between financial knowledge and resilience. Estimates on financial resilience in column show that financial

knowledge increases the likelihood of financial resilience, and that one additional correct response in a question of financial literacy increases it by 6.2%. A gender gap is present in that specification, with females being 17.5% less likely to be financial resilient compared to males at 1% significance. The addition of the interaction term of gender (female) with financial literacy in column 2 is indicative, as while females at population level are 26.9% less likely to be resilient, *financial literate females* are 12.2% more likely to have increased financial resilience levels.

Turning to the estimates of informal financial support from friends and relatives in columns 3 and 4, females are 37% more likely to ask and receive it compared to males, whereas financial literacy does not exert significant effects. When we add the interaction term of gender with financial literacy, that suggests that females who can correctly answer an additional question on financial literacy are 40.6% less likely to seek informal financial support. At the same time, females in general are 68% more likely to approach friends and relatives for financial help. Those two sets of estimates pinpoint how financial knowledge affects financial resilience and security between genders and affect the behavioural responses of females.

Finally, columns 5 and 6 show the estimates on whether while receiving informal financial support the household is also below the regional poverty line. Estimates in column 5 show that females are 47% more likely to be the same time below the poverty line, with financial literacy not exerting statistically significant magnitudes. Adding the interaction term with gender, on one hand, makes financial literacy find statistical significance and that suggests that answering correct an additional relevant question decreases the likelihood of being the same time below the poverty line and receiving informal support by 36%. Probably that refers to the poorest households in Greek administrative region, where the income effects are more noticeable. From the gender perspective, on the other hand, while females have an increased likelihood compared to males to be below the poverty line, those who are financially knowledgeable and can respond correctly to an additional question are 77.6% less likely to be in that scenario. Hence, financial knowledge also affects the poverty placement of Greek households.

Another interesting remark is that the education-related variables retain their statistically significance in every specification, showing that financial knowledge is an additional and essential skill besides schooling for households and females according to the findings of past studies (Klapper, Lusardi *et.al*, 2013; Behrman, Mitchell *et.al*, 2012). Another interesting

notice is that age does not show any significant effects when considering the estimates on financial resilience and whether they are below the poverty line but shows significant effects when examining the estimates of informal support from friends and relatives. Younger households seem to rely on informal support, showing how the younger cohorts in the country's labour force are affected by the crisis. The crisis increased unemployment and the younger employees find it more difficult to build financial resilience.

[Insert Table 7 about here]

6. Concluding remarks

Financial knowledge is proven as an essential skill for households and individuals in their trial to take optimal financial decisions. Addressing the gaps in financial knowledge is through an important element in the analysis of household finances. Females tend to fall behind males in terms of financial knowledge around the world (Lusardi and Mitchell, 2011) and that reflects to their financial resilience. This study examines the case of Greece, a country that faced a major economic crisis in the period 2008-2016 and faced major economic changes. The novel dataset of HFCS for 2017 offers the opportunity to examine the gender differences in financial knowledge in Greece and disentangle the nexus between the gender gaps and household financial resilience. We do not rest in those results, though, and suggest that determinants of the local context and gender stereotypes can help us understand further why those differences exist.

The estimation results are in line with Lusardi and Mitchell (2011) and indicate that females in Greece can be up to 27.7% less likely to correctly answer questions on financial literacy compared to males. Moreover, considering regional disparities reduce the gender gaps but they remain noticeable. Besides their lack in terms of knowledge, females also tend to lack confidence, as they are more likely to answer, "*Don't know*". We proceed by examining the role of the local context and gender stereotypes. That provides additional insights to policy makers on why the gaps exist across the country and which could be the appropriate interventions needed per region. Moreover, as financial knowledge is a skill that determines latter-life outcomes of households, understanding why specific regions fall behind others in Greece can also help us understand the determinants of financial resilience in the country.

The results confirm the benefits of the local context on financial knowledge. Regional development exerts positive effects on financial literacy, whereas gender stereotypes exert negative effects. Regional financial sector development distinguishes in those specification and proves an important channel on knowledge. While the effects at the population are significant, we examine what is their role on gender differences, providing further insight. The Blinder-Oaxaca decomposition confirm the effects at the population level and signify that the regional environment can explain a large share of the gap.

Finally, in addition to the gender differences in financial literacy, the study concludes with an assessment on the effects on household financial resilience. Financial knowledge is an essential skill to build resilience and examining the gender effects offer additional insights. The results for the last stage of the analysis confirm those of the first stages, with females also falling behind males in terms of financial resilience. They are up to 26.8% less resilient and up to 68% more likely either to ask for informal financial support or to be placed below the regional poverty line. The lack of financial literacy skills is thus translated to lower financial resilience of Greek females. Those findings are gaining points when we consider that Greece is a country with major income and wealth reductions due to the crisis, adding to the skill of financial knowledge on building financial capability.

The study contributes to the fields of household finance and socioeconomic by adding the role of the local context in the narrative. While spotting the gender differences in financial knowledge is important in our understanding, decomposing those gaps can be proved ever more essential when we look for appropriate policies and interventions. This chapter offers conclusive findings and can help the planner to offer improved decentralized policies.

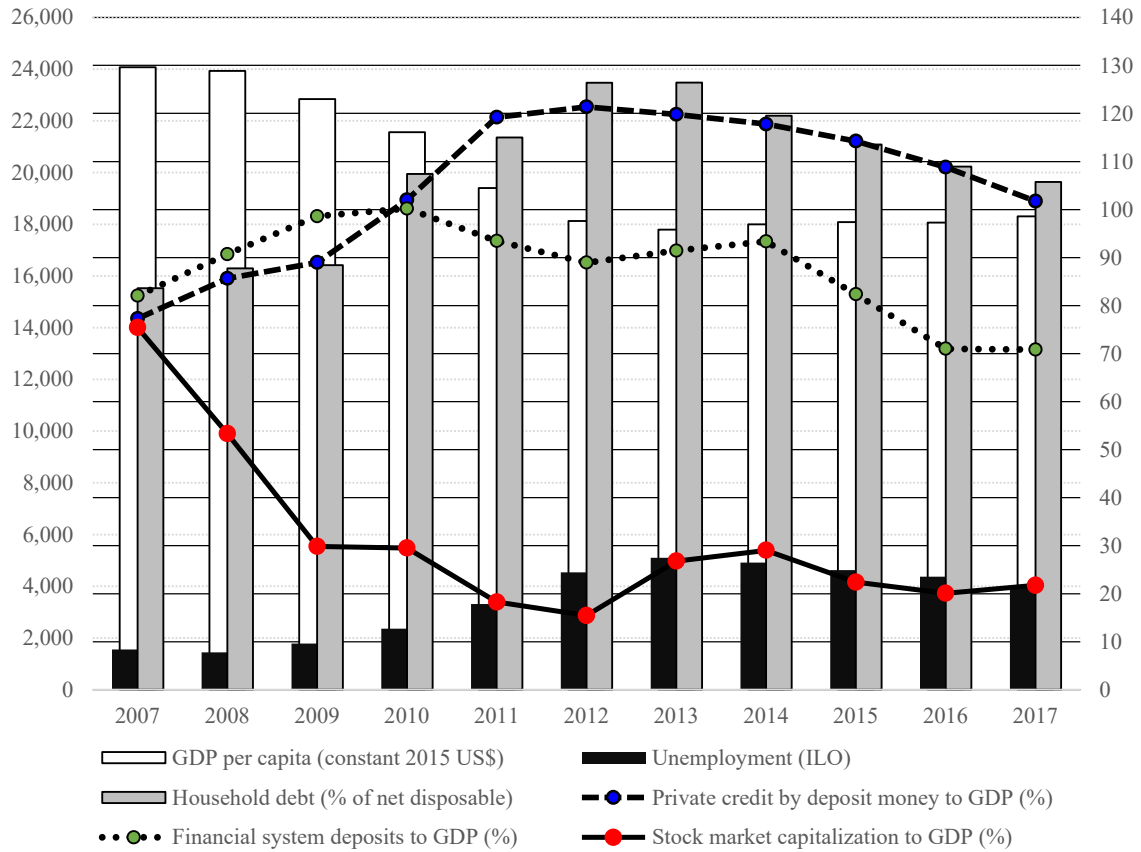


Figure 1

Economic and financial-sector development in Greece during 2007-2017

This figure shows the macroeconomic trends of key variables for Greece in the period 2007-2017. The sources of the data are: Financial Structure Database / World Development Indicators / OECD Database ; Household debt data are from the OECD Database, whereas financial system deposits to GDP, private credit by deposit money to GDP and stock market capitalization to GDP are from the Financial Structure Database. GDP per capita and unemployment are from the World Development Indicators

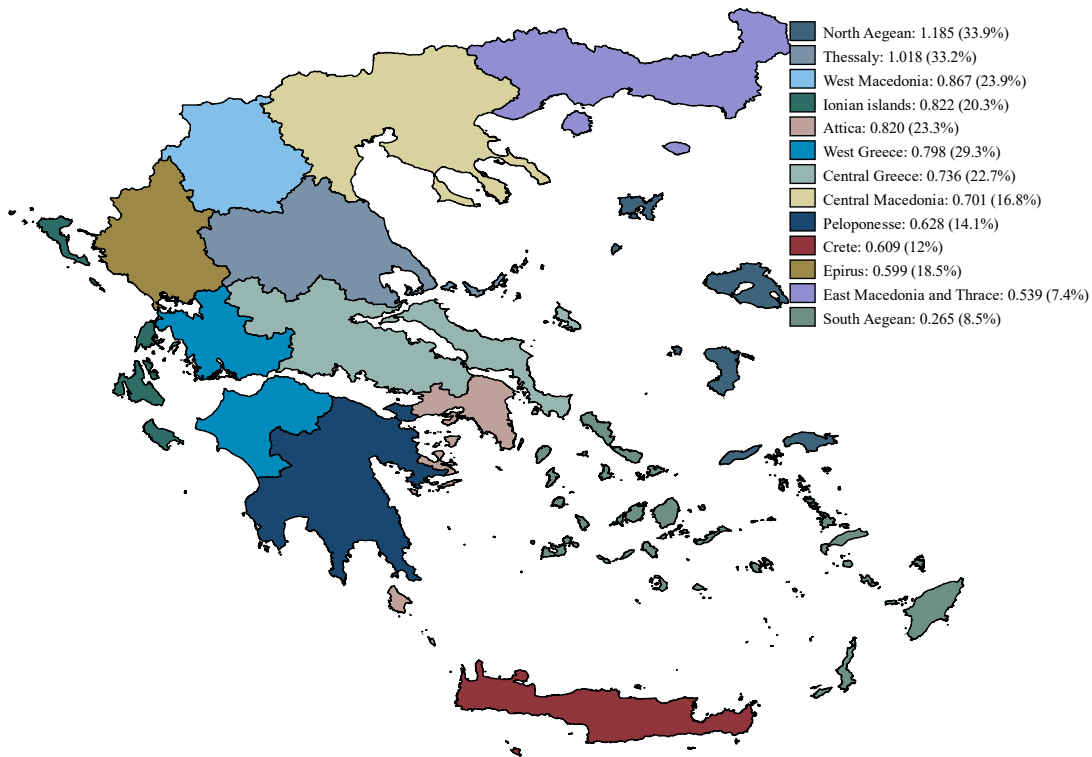


Figure 2

Financial literacy of the adult population across Greek administrative regions

This figure shows the mean financial literacy score in NUTS II administrative regions of Greece. Financial literacy score represents the average number of correct answers in the two financial literacy questions on risk diversification and riskiness. In parenthesis is the average of all correct responses to financial literacy questions. The sources of the data are: (NUTS 2 - HFCS Wave 3, 2017)

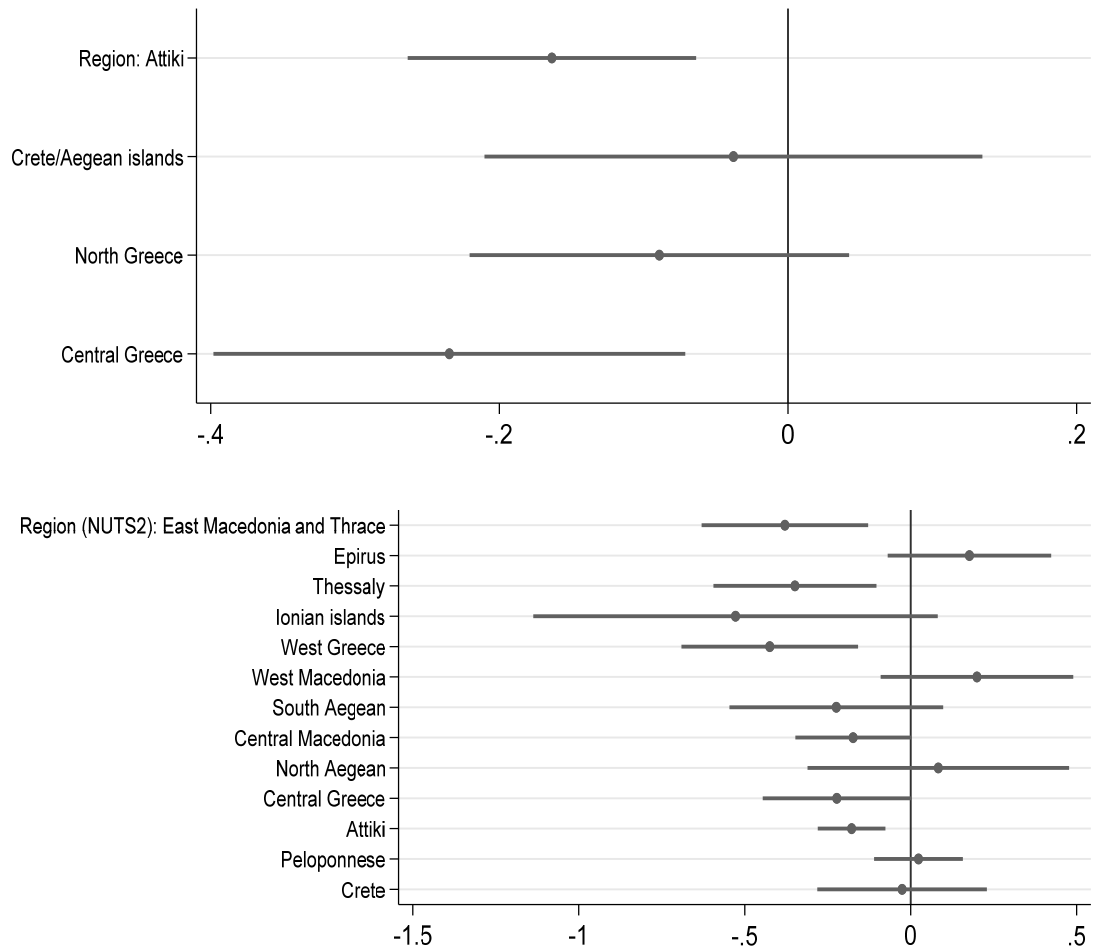


Figure 3

Coefficient plot – The effect of gender (female) on financial literacy across Greek administrative regions

This figure shows the effects of gender (female) on financial literacy for every NUTS1 and NUTS2 regional classifications of Greece. The coefficient plots are separate OLS regressions of financial literacy on gender per NUTS 1 and NUTS 2 prefectures respectively. (NUTS2 level).

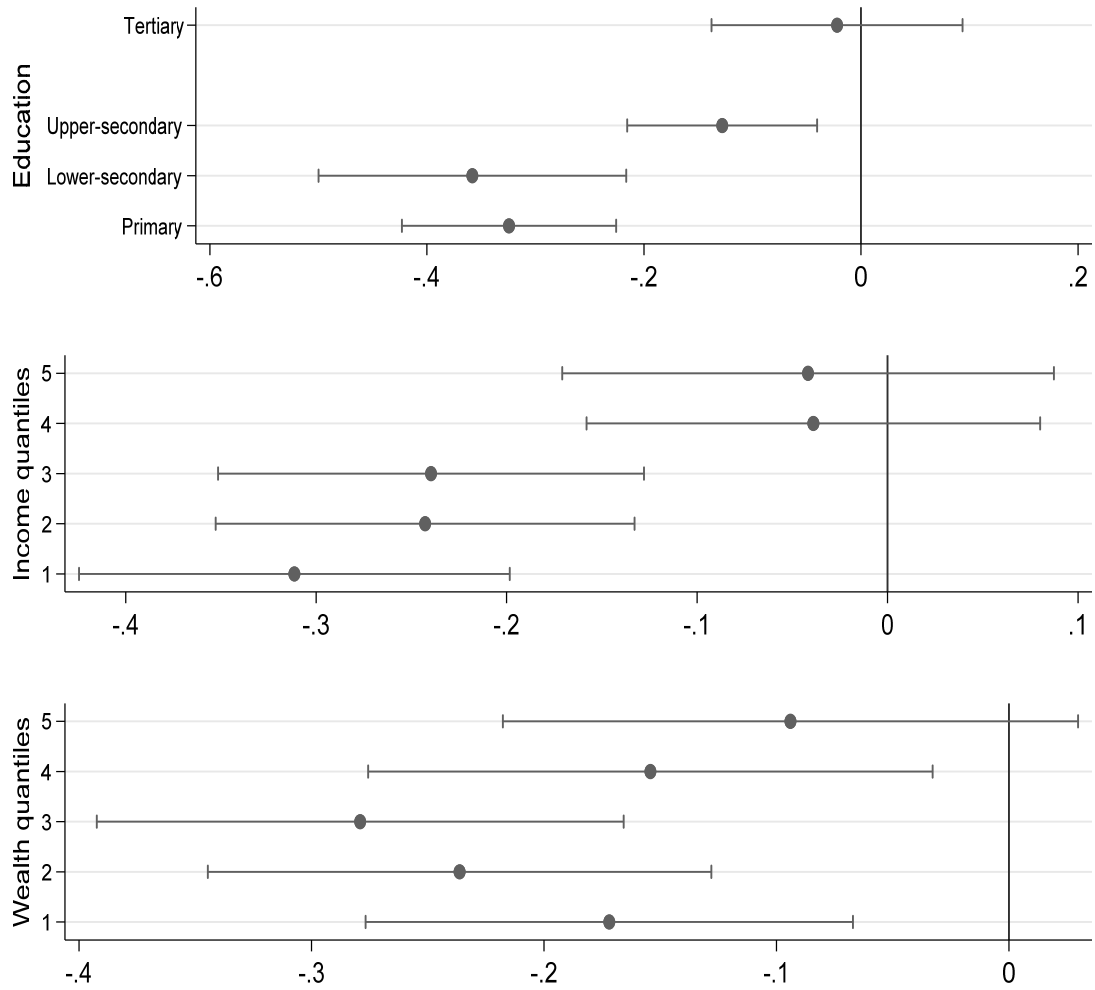


Figure 4

The effect of interaction terms of gender (female) with education, income and wealth

This figure shows the interactions of financial literacy (#Correct) with highest educational attainment, income and wealth quantiles respectively. The interaction plots are OLS regressions with interactions of gender (female) with income quantiles, wealth quantiles and education respectively.

Table 1

The distribution of financial literacy in Greece

This table shows the summary statistics for the Pooled sample and by gender for the main financial literacy variables used in the empirical analysis as also an international comparison of financial literacy with Greece.

Panel A: Financial knowledge proxies	Pooled	Male	Female	t-test
#Correct responses	0.75	0.86	0.66	0.2089***
Both correct responses	20.6%	24.5%	17.0%	0.0741***
At least one correct response	54.8%	61.9%	48.4%	0.1348***
#Wrong responses	0.89	0.87	0.91	-0.0374
#DK/DA responses	0.36	0.27	0.44	-0.1716***
At least one "Don't know"	2.1%	1.6%	2.5%	-0.0089

Panel B: Financial literacy constituents	Pooled	Male	Female	t-test
Financial risk: Correct	48.9%	54.5%	43.8%	0.1077***
Financial risk: Incorrect	17.6%	20.5%	15.0%	0.0549**
Financial risk: Don't know	33.5%	24.9%	41.2%	-0.1627***
Financial risk: No answer	0.0%	0.1%	0.1%	0.000
Risk diversification: Correct	26.5%	31.8%	21.7%	0.1012***
Risk diversification: Incorrect	71.4%	66.6%	75.8%	-0.0923***
Risk diversification: Don't know	2.1%	1.6%	2.5%	-0.0089
Risk diversification: No answer	0.0%	0.0%	0.0%	0.000

Panel C: European comparisons (EEA 29)	Financial risk	Financial literacy	Male	Female
Denmark	78%	71%	76%	67%
Finland	76%	63%	68%	58%
Sweden	75%	71%	72%	70%
Germany	74%	66%	72%	60%
Netherlands	73%	66%	75%	58%
Norway	69%	71%	75%	68%
Belgium	65%	55%	59%	52%
Switzerland	63%	57%	61%	53%
Slovenia	63%	44%	50%	39%
Austria	59%	53%	55%	51%
Ireland	58%	55%	59%	52%
Latvia	56%	48%	54%	44%
Spain	56%	49%	50%	48%
Czech Republic	56%	58%	65%	53%
Malta	56%	44%	48%	40%
Luxembourg	53%	53%	61%	46%
France	50%	52%	56%	48%
Hungary	50%	54%	53%	55%
Slovakia	42%	48%	49%	47%
Italy	40%	37%	45%	30%
Poland	39%	42%	49%	36%
Lithuania	39%	39%	42%	36%
Greece	36%	45%	49%	42%
Cyprus	33%	35%	39%	31%
Croatia	33%	44%	45%	44%
Portugal	23%	26%	29%	23%
Romania	22%	22%	22%	22%
Bulgaria	20%	35%	38%	31%

Table 2

Summary statistics for the sample of the reference persons in the HFCS-2017 (3,007 observations)

This table shows the summary statistics for the Pooled sample, the sample of Males and Females respectively. The last two columns show the t-test by gender and the significance of the differences.

Variable name <i>#Observations</i>	Pooled sample 3,007	Males (47.4%)	Females (52.6%)	t-test	Sig.
	(1)	(2)	(3)	(4)	
Panel A: Demographic and socioeconomic characteristics					
Age	54.23	53.83	54.58	-0.7525	
Education: Tertiary education	24.1%	26.8%	21.7%	0.0524	*
"-": Upper secondary education	37.7%	37.6%	37.8%	-0.0022	***
"-": Lower secondary education	13.4%	14.6%	12.3%	0.0235	
"-": Primary education	24.8%	21.0%	28.2%	-0.0727	***
Marital status: Single	17.4%	21.9%	13.4%	0.0852	***
"-": Married/Relationship	59.8%	65.6%	54.6%	0.1102	***
"-": Widowed/Divorced	22.7%	12.5%	32.0%	-0.1955	***
Number of children	0.325	0.307	0.342	0.0421	
Risk attitudes in investment, Z-score	-0.044	0.155	-0.224	0.3797	***
Present orientation	0.567	0.569	0.565	0.0045	
Household income	13,330	13,924	12,795	1,100	*
Household wealth	93,915	98,794	89,520	9,300	
Labour market status: Employed	35.4%	37.6%	33.4%	0.0421	
"-": Self-employed	15.7%	16.3%	15.1%	0.0111	
"-": Unemployed	5.9%	7.1%	4.8%	0.0231	*
"-": Retired	39.7%	37.9%	41.3%	-0.0336	
"-": Other type of employment	3.4%	1.1%	5.4%	-0.0426	***
NUTS1 region: Attica	36.0%	37.6%	34.6%	0.0305	
"-": Crete and Aegean islands	11.2%	10.7%	11.6%	-0.0091	
"-": North Greece	28.6%	29.9%	27.4%	0.0251	
"-": Central Greece	24.2%	21.7%	26.4%	-0.0465	*
Panel B: Household finances					
Financial resilience	48.5%	55.5%	42.1%	0.1335	***
Financial assistance from friends and relatives	8.4%	6.2%	10.4%	-0.042	***
Receiving informal assistance and below poverty line	3.6%	2.7%	4.5%	-0.0184	*
Panel C: Regional environment					
GDP per capita	16,581	16,709	16,466	243.37989	
Deposits per capita	7.512	6.919	8.047	-1,1284	
Unemployment	23.4%	23.4%	23.4%	-0.0003	
Deterioration in regional GDP per capita 07/17	2,620	2,630	2,610	-0.0025	
Deterioration in regional unemployment 07/17	14.0%	14.1%	14.01%	-0.0009	
Political interest, Z-score	0.028	0.075	-0.015	0.0902	*
Regional self-employment	160.83	167.02	155.25	11.77	**
University graduates	20.0%	20.2%	19.7%	0.005	**
Financial sector development: Finance graduates	5.4%	5.5%	5.3%	0.0018	
"-": %Employed in financial sector	1.0%	1.0%	1.0%	0.0004	
Gender stereotypes Females in managerial positions	2.4%	2.5%	2.4%	0.0013	
"-": Index	0.020	0.021	0.018	0.0033	
"-": %Agree: Females should take care of home	68.3%	68.3%	68.3%	0.0005	
"-": %Agree: Females lack skills for policy making	18.9%	18.9%	18.8%	0.0012	

Table 3

The determinants of financial literacy in Greece

This table shows the determinants of financial literacy in Greece. The dependent variable is the number of correct responses in the two financial literacy questions. The regressions are OLS. Column 1 shows the gender difference, while Columns 2 to 4 insert the personal/household controls, NUTS1, NUTS2 and NUTS 3 regions. Columns 5 and 6 present estimates for the sub-samples of males and females, respectively. Standard errors are robust and clustered on regional administrative level. The asterisks denote the following levels of significance: ***: <0.01, **: <0.05, *<0.1.

	Pooled sample				Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.209*** [0.043]	-0.128*** [0.044]	-0.147*** [0.040]	-0.143*** [0.045]	–	–
Log(age)	–	0.047 [0.080]	0.048 [0.079]	-0.009 [0.065]	0.092 [0.101]	-0.093 [0.077]
Education: Tertiary	–	0.398*** [0.071]	0.387*** [0.070]	0.340*** [0.071]	0.237*** [0.076]	0.473*** [0.102]
"-": Upper post-secondary	–	0.227*** [0.051]	0.216*** [0.052]	0.203*** [0.056]	0.202*** [0.056]	0.187** [0.073]
"-": Lower post-secondary	–	0.123** [0.052]	0.119** [0.053]	0.091** [0.045]	0.075 [0.069]	0.082 [0.056]
"-": Primary	–	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
Marital status: Married/Relationship	–	-0.036 [0.054]	-0.047 [0.054]	-0.041 [0.057]	-0.074 [0.075]	-0.02 [0.072]
"-": Widow/Divorced	–	-0.071 [0.070]	-0.072 [0.067]	-0.083 [0.069]	-0.168** [0.074]	-0.003 [0.093]
"-": Single	–	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
Number of children	–	-0.038 [0.032]	-0.016 [0.030]	-0.015 [0.031]	-0.041 [0.044]	0.017 [0.036]
Risk attitudes in investment	–	0.100*** [0.027]	0.099*** [0.026]	0.090*** [0.025]	0.066** [0.027]	0.182*** [0.035]
Present orientation	–	0.193*** [0.071]	0.187*** [0.066]	0.168** [0.073]	0.13 [0.083]	0.158** [0.078]
Log(household income)	–	0.025 [0.017]	0.028 [0.017]	0.032* [0.019]	0.015 [0.023]	0.066*** [0.024]
Log(household wealth)	–	0.477*** [0.182]	0.487*** [0.179]	0.496** [0.193]	0.712*** [0.196]	0.17 [0.226]
Labour market status: Employed	–	-0.045 [0.105]	-0.089 [0.097]	-0.082 [0.089]	-0.128 [0.105]	-0.022 [0.133]
"-": Self-employed	–	-0.08 [0.103]	-0.125 [0.094]	-0.089 [0.081]	-0.137 [0.096]	-0.034 [0.115]
"-": Retired	–	-0.119 [0.098]	-0.155* [0.090]	-0.130* [0.077]	-0.157 [0.114]	-0.101 [0.085]
"-": Unemployed	–	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Other status	–	-0.17 [0.111]	-0.199* [0.102]	-0.226** [0.091]	-0.189 [0.304]	-0.132 [0.093]
Urbanity: City	–	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Intermediate populated area	–	-0.004 [0.069]	0.004 [0.071]	-0.002 [0.088]	-0.064 [0.087]	0.011 [0.080]
"-": Rural area	–	-0.075 [0.055]	-0.093 [0.060]	-0.107 [0.067]	-0.074 [0.079]	-0.129* [0.067]
Region F.E. - NUTS 2: West Greece	–	–	{Ref.}	–	–	–
"-": East Macedonia and Thrace	–	–	-0.326** [0.152]	–	–	–

Table continued from the last page

	(1)	(2)	(3)	(4)	(5)	(6)
"-": Epirus	-	-	-0.293 [0.195]	-	-	-
"-": Thessaly	-	-	0.076 [0.151]	-	-	-
"-": Ionian islands	-	-	0.073 [0.183]	-	-	-
"-": West Macedonia	-	-	-0.005 [0.220]	-	-	-
"-": South Aegean	-	-	-0.529*** [0.168]	-	-	-
"-": Central Macedonia	-	-	-0.213 [0.152]	-	-	-
"-": North Aegean	-	-	0.349* [0.181]	-	-	-
"-": Central Greece	-	-	-0.111 [0.154]	-	-	-
"-": Attiki	-	-	-0.119 [0.148]	-	-	-
"-": Peloponnese	-	-	-0.193 [0.144]	-	-	-
"-": Crete	-	-	-0.361* [0.193]	-	-	-
Region F.E. – NUTS 1	-	-	-	+	+	+
Region F.E. – NUTS 3	-	-	-	+	+	+
<i>% Female effect</i>	-27.7%	-17.0%	-19.6%	-19.0%	-	-
<i>Linear prediction</i>	0.7536	0.7536	0.7536	0.7536	0.8247	0.6892
<i>No. of Observations</i>	3,007	3,007	3,007	3,007	1,464	1,543

Table 4

The determinants of financial-literacy constituents and financial illiteracy

This table shows the determinants of financial illiteracy in Greece. The regressions are OLS. Columns 1 and 2 present the determinants for the questions for risk diversification and riskiness respectively while Columns 3 and 4 show the results for answering both correct and the number of wrong responses. Columns 5 and 6 show the results for the number of DK/DA responses and having at least in one of the two questions a response DK/DA. The asterisks denote the following levels of significance: *** : <0.01, ** : <0.05, * <0.1.

	Risk diversification	Financial risk	Both Correct	#Wrong responses	#DK/DA responses	At least 1 DK/DA
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.061*** [0.017]	-0.082** [0.033]	-0.046** [0.021]	0.027 [0.031]	0.116*** [0.027]	0.111*** [0.025]
Log(age)	-0.013 [0.040]	0.005 [0.043]	0.008 [0.042]	-0.055 [0.063]	0.063 [0.063]	0.048 [0.057]
Education: Tertiary	0.155*** [0.039]	0.185*** [0.042]	0.145*** [0.042]	-0.110* [0.057]	-0.230*** [0.035]	-0.208*** [0.032]
"-": Upper post-secondary	0.067** [0.032]	0.135*** [0.032]	0.078** [0.032]	-0.012 [0.053]	-0.190*** [0.042]	-0.170*** [0.036]
"-": Lower post-secondary	0.042 [0.034]	0.048 [0.030]	0.039 [0.027]	0.039 [0.053]	-0.130*** [0.034]	-0.110*** [0.031]
"-": Primary	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
Marital status: Single	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Married/Relationship	0.003 [0.033]	-0.044 [0.038]	0.011 [0.034]	0.011 [0.050]	0.03 [0.028]	0.026 [0.025]
"-": Widow/Divorced	-0.045 [0.038]	-0.038 [0.041]	-0.03 [0.039]	0.04 [0.062]	0.043 [0.037]	0.051 [0.033]
Number of children	-0.011 [0.016]	-0.004 [0.021]	-0.015 [0.013]	0.012 [0.018]	0.004 [0.022]	0.006 [0.020]
Risk attitudes in investment	0.051*** [0.015]	0.039*** [0.014]	0.045*** [0.014]	-0.01 [0.024]	-0.080*** [0.011]	-0.078*** [0.011]
Present orientation	0.022 [0.043]	0.146*** [0.045]	0.033 [0.038]	-0.089 [0.085]	-0.080* [0.043]	-0.062 [0.041]
Log(household income)	0.01 [0.010]	0.022* [0.011]	0.006 [0.009]	-0.008 [0.012]	-0.024* [0.013]	-0.022* [0.012]
Log(household wealth)	0.195 [0.124]	0.301*** [0.113]	0.230* [0.119]	-0.275 [0.169]	-0.221** [0.099]	-0.177* [0.092]
Labour market status: Employed	-0.02 [0.052]	-0.062 [0.057]	0.007 [0.044]	0.029 [0.071]	0.053 [0.066]	0.054 [0.053]
"-": Self-employed	-0.03 [0.054]	-0.058 [0.058]	-0.035 [0.043]	0.039 [0.075]	0.05 [0.063]	0.054 [0.053]
"-": Retired	-0.06 [0.046]	-0.07 [0.061]	-0.031 [0.037]	0.081 [0.071]	0.049 [0.068]	0.057 [0.059]
"-": Unemployed	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Other status	-0.076 [0.056]	-0.150** [0.064]	-0.051 [0.040]	-0.027 [0.067]	0.253*** [0.074]	0.228*** [0.066]
Urbanity: City	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Intermediate populated area	0.041 [0.035]	-0.043 [0.067]	0.029 [0.039]	0.009 [0.070]	-0.007 [0.048]	-0.001 [0.048]
"-": Rural area	-0.024 [0.035]	-0.083* [0.048]	-0.035 [0.037]	0.013 [0.061]	0.093** [0.046]	0.106** [0.043]
Region F.E. – NUTS 1	+	+	+	+	+	+
Region F.E. – NUTS 3	+	+	+	+	+	+
<i>%Effect</i>	-23.1%	-16.7%	-22.5%	3.0%	32.7%	32.6%
<i>Linear prediction</i>	0.265	0.4886	0.2055	0.8906	0.3559	0.34
<i>No. of Observations</i>	3,007	3,007	3,007	3,007	3,007	3,007

Table 5

The effect of the local environment on financial literacy

This table shows the OLS regressions for the effects of local context on financial literacy. Column 1 presents the regression coefficients for each indicator selected for the local environment and gender stereotypes. Column 2 presents the gender (female) coefficient while Column 3 presents the standardized effects based on the linear prediction of the model. Standard errors are robust. The asterisks denote the following levels of significance: ***: <0.01, **: <0.05, * <0.1.

		Local Context		Female		%Effect
Panel A: Models with local context variables						
(A ₁)	GDP per capita	0.001***	[0.001]	-0.172***	[0.029]	0.1%
(A ₂)	Log(Unemployment)	0.001	[0.001]	-0.173***	[0.029]	0.1%
(A ₃)	Deterioration in regional unemployment	-0.002*	[0.001]	-0.174***	[0.029]	-0.2%
(A ₄)	Political interest index	0.001	[0.014]	-0.173***	[0.029]	0.1%
(A ₅)	%Discussing national matters	0.120	[0.150]	-0.172**	[0.029]	15.0%
(A ₆)	%University graduates	0.015***	[0.004]	-0.169***	[0.029]	1.9%
(A ₇)	%Self-employment	0.001***	[0.001]	-0.170***	[0.029]	0.1%
Panel B: Models with regional financial sector controls						
(B ₁)	%Employed in financial sector	0.102***	[0.025]	-0.171***	[0.029]	12.7%
(B ₂)	%Finance graduates	0.021***	[0.006]	-0.171***	[0.029]	2.6%
(B ₃)	Deposits per capita	0.004***	[0.001]	-0.175***	[0.028]	11.6%
Panel C: Models with regional gender stereotype controls						
(C ₁)	%Females in managerial position	0.033***	[0.009]	-0.171***	[0.029]	4.1%
(C ₂)	Gender median wage gap	-0.010***	[0.003]	-0.174***	[0.029]	-1.2%
(C ₃)	Gender stereotypes index	-0.621***	[0.079]	-0.178***	[0.028]	-13.3%
(C ₄)	%Agree: Females should take care of home	-0.532**	[0.237]	-0.174***	[0.029]	-66.5%
	<i>Linear prediction</i>			<i>0.7991</i>		
	<i>No. of Observations</i>			<i>3,007</i>		

Table 6**Models with Blinder-Oaxaca decomposition**

This table shows 16 specifications of a model with Blinder-Oaxaca twofold decomposition. Robust standard errors are presented in brackets. Panel A presents the main model, i.e., the specification of Column 3 of Table 3 to present whether there are regional effects in the decomposition. *Panel B* presents 10 models, in which the specification removes the 13 control variables for administrative region and adheres macroeconomic indicators by Greek administrative region and prefectures. *Panel C* presents 2 models that incorporate controls for financial sector development by Greek administrative region. *Panel D* presents 4 models that incorporate controls the prevalence of gender stereotyping by Greek administrative region. The asterisks denote the following levels of significance: ***: <0.01, **: <0.05, *<0.1.

Panel A: Main model				
	Male	Female	Gap	
Mean values	0.931***	0.674***	-0.257***	[0.028]
	Explained		Unexplained	
Component contribution	-0.098***	[0.014]	-0.159***	[0.025]
Demographics	-0.031***	[0.008]	-0.096	[0.460]
Education	-0.019***	[0.006]	0.033	[0.053]
Behavioural	-0.042***	[0.007]	0.015	[0.050]
Income and wealth	-0.007**	[0.003]	0.375*	[0.223]
Employment	-0.006*	[0.004]	-0.033	[0.114]
Administrative region	0.006	[0.006]	0.040	[0.027]
<i>No. of Observations</i>			3,007	
Panel B: Models with local context variables				
(B ₁) Log (GDP per capita)	0.001	[0.002]	-0.189*	[0.106]
(B ₂) Log(Unemployment)	0.001	[0.001]	0.407	[0.310]
(B ₃) Deterioration in regional unemployment	0.001	[0.001]	-0.352**	[0.173]
(B ₄) Political interest index	0.001	[0.001]	-0.001	[0.001]
(B ₅) %Discussing national matters	0.001	[0.001]	-0.089	[0.246]
(B ₆) %University graduates	-0.002	[0.002]	-0.263*	[0.150]
(B ₇) %Self-employment	-0.002	[0.002]	-0.124**	[0.052]
Panel C: Models with regional financial sector controls				
(C ₁) %Finance graduates	0.001	[0.002]	-0.140*	[0.072]
(C ₂) %Employed in financial sector	0.001	[0.002]	-0.103*	[0.053]
(C ₃) Deposits per capita	0.002	[0.003]	0.021**	[0.010]
Panel D: Models with regional gender stereotype controls				
(D ₁) %Females in managerial positions	0.001	[0.002]	-0.088*	[0.047]
(D ₂) Gender median wage gap	0.002	[0.002]	0.080***	[0.024]
(D ₃) Gender stereotypes index	0.005	[0.004]	-0.002	[0.002]
(D ₄) %Agree: Women should take care of home	0.001	[0.001]	0.695**	[0.331]

Table 7

The determinants of financial resilience in Greece

This table shows estimates from linear probability models. Columns 1 and 2 are regressions with whether the household is financial resilient as dependent variable and with the insertion of an interaction term of gender (female) with financial literacy in Column 2. Columns 3 and 4 and Columns 5 and 6 follow the same specifications with dependent variables whether the household received financial assistance from friends and relatives and whether the household is below the regional poverty line and received that assistance. The asterisks denote the following levels of significance: ***: <0.01, **: <0.05, *: <0.1.

	Financial resilience		Assistance from friends/relatives		Below the poverty line and receiving informal assistance	
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.085*** [0.023]	-0.130*** [0.031]	0.031*** [0.012]	0.057*** [0.018]	0.017** [0.008]	0.038*** [0.011]
Financial literacy: #Correct responses	0.030* [0.016]	0.001 [0.017]	-0.011 [0.008]	0.006 [0.010]	-0.001 [0.005]	0.013* [0.007]
Female × Financial literacy	–	0.059** [0.028]	–	-0.034** [0.015]	–	-0.028*** [0.009]
Log(age)	-0.093 [0.056]	-0.093 [0.057]	-0.112*** [0.036]	-0.111*** [0.036]	-0.019 [0.019]	-0.018 [0.019]
Education: Tertiary	0.196*** [0.047]	0.191*** [0.046]	-0.023 [0.019]	-0.02 [0.019]	-0.014 [0.011]	-0.012 [0.011]
"-": Upper post-secondary	0.099*** [0.032]	0.097*** [0.032]	-0.001 [0.018]	0.001 [0.018]	0.003 [0.012]	0.004 [0.012]
"-": Lower post-secondary	0.093** [0.039]	0.093** [0.039]	-0.001 [0.021]	-0.001 [0.021]	0.006 [0.016]	0.007 [0.016]
"-": Primary	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
Marital status: Single	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Married/Relationship	-0.081** [0.040]	-0.082** [0.040]	-0.018 [0.022]	-0.018 [0.022]	-0.002 [0.012]	-0.001 [0.012]
"-": Widow/Divorced	-0.039 [0.046]	-0.038 [0.046]	0.037 [0.027]	0.036 [0.027]	0.030* [0.016]	0.030* [0.016]
Number of children	-0.049** [0.021]	-0.051** [0.021]	-0.013 [0.012]	-0.013 [0.012]	0.002 [0.007]	0.002 [0.007]
Risk attitude in investment	0.026** [0.012]	0.027** [0.012]	0.005 [0.007]	0.005 [0.007]	0.001 [0.004]	0.001 [0.004]
Present orientation	-0.133*** [0.037]	-0.135*** [0.036]	0.032 [0.023]	0.034 [0.023]	0.018 [0.012]	0.019 [0.012]
Log(household income)	-0.041*** [0.008]	-0.042*** [0.008]	-0.039*** [0.010]	-0.039*** [0.010]	-0.028*** [0.009]	-0.028*** [0.009]
Log(household wealth)	0.633*** [0.109]	0.642*** [0.108]	-0.023 [0.058]	-0.029 [0.060]	-0.012 [0.036]	-0.016 [0.036]
Labour market status: Employed	0.314*** [0.060]	0.314*** [0.059]	-0.082* [0.047]	-0.082* [0.047]	-0.118*** [0.039]	-0.118*** [0.039]
"-": Self-employed	-0.144** [0.059]	-0.144** [0.059]	-0.103** [0.047]	-0.103** [0.047]	-0.115*** [0.040]	-0.115*** [0.040]
"-": Retired	-0.074 [0.059]	-0.071 [0.058]	-0.081* [0.047]	-0.083* [0.047]	-0.110*** [0.039]	-0.112*** [0.039]
"-": Unemployed	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Other type of employment	-0.06 [0.062]	-0.056 [0.061]	0.009 [0.068]	0.007 [0.069]	-0.157*** [0.053]	-0.159*** [0.052]
Urbanity: City	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}	{Ref.}
"-": Intermediate populated area	-0.016 [0.028]	-0.016 [0.027]	-0.016 [0.018]	-0.015 [0.018]	0.014 [0.012]	0.014 [0.012]
"-": Rural area	-0.049* [0.029]	-0.048* [0.028]	-0.023 [0.022]	-0.024 [0.022]	0.001 [0.011]	0.001 [0.011]

Table continued from the last page

Region F.E. – NUTS2	(1)	(2)	(3)	(4)	(5)	(6)
	+	+	+	+	+	+
<i>% Female effect</i>	-17.5%	-26.8%	37.0%	68.0%	47.1%	105.2%
<i>Linear prediction</i>	0.4845	0.4845	0.0838	0.0838	0.0361	0.0361
<i>No. of Observations</i>	3,007	3,007	3,007	3,007	3,007	3,007

References

- Aghion, P., Meghir, C. and Vandenbussche, J. (2006) 'Distance to Frontier, Growth, and the Composition of Human Capital', *Journal of Economic Growth*, 97–127.
- Agnew, S. and Harrison, N. (2015) 'Financial literacy and student attitudes to debt: A cross national study examining the influence of gender on personal finance concepts', *Journal of Retailing and Consumer Services*, 25, pp. 122-129.
- Almenberg, J. and Dreber, A. (2015) 'Gender, stock market participation and financial literacy', *Economics Letters*, 137, pp. 140-142.
- Arellano, A., Cámara, N. and Tuesta, D. (2018) 'Explaining the gender gap in financial literacy: The role of non-cognitive skills', *Economic Notes: Review of Banking, Finance and Monetary Economics*, 47(2-3), pp. 495-518.
- Arrondel, L., Debbich, M. and F. Savignac, (2014) 'Financial literacy and financial planning in France': Article 8. DOI: <http://dx.doi.org/10.5038/1936-4660.6.2.8>
- Bannier, C.E. and Schwarz, M. (2018) 'Gender-and education-related effects of financial literacy and confidence on financial wealth', *Journal of Economic Psychology*, 67, pp. 66-86.
- Bannier, C., Meyll, T., Röder, F. and Walter, A. (2019) 'The gender gap in 'Bitcoin literacy'', *Journal of Behavioral and Experimental Finance*, 22, pp. 129-134.
- Battistini, N., Pagano, M. and Simonelli, S. (2014) 'Systemic risk, sovereign yields and bank exposures in the euro crisis', *Economic Policy*, 29(78), pp. 203-251.
- Behrman, J.R., Mitchell, O.S., Soo, C.K. and Bravo, D. (2012) 'How financial literacy affects household wealth accumulation', *American Economic Review*, 102(3), pp. 300-304.
- Bernheim, B.D. and Garrett, D.M. (2003) 'The effects of financial education in the workplace: Evidence from a survey of households', *Journal of Public Economics*, 87(7-8), pp. 1487-1519.
- Bottazzi, L. and Lusardi, A. (2021) 'Stereotypes in financial literacy: Evidence from PISA', *Journal of Corporate Finance*, 71, pp. 101831.
- Brous, P. and Han, B. (2022) 'Personal characteristics and risk tolerance in a natural experiment', *The Journal of Risk Finance*, Vol. 23 No. 2, pp. 155-168. <https://doi.org/10.1108/JRF-11-2021-0176>
- Brown, M. and Graf, R. (2013) 'Financial literacy and retirement planning in Switzerland', *Numeracy*, 6(2), pp. 2-23.

- Bucher-Koenen, T., Lusardi, A., Alessie, R. and Van Rooij, M. (2017) 'How financially literate are women? An overview and new insights', *Journal of Consumer Affairs*, 51(2), pp. 255-283.
- Christelis, D., Jappelli, T. and Padula, M. (2010) 'Cognitive abilities and portfolio choice', *European Economic Review*, 54(1), pp. 18-38.
- Cicchello, A.F., Kazemikhasragh, A., Monferrá, S. and Girón, A. (2021) 'Financial inclusion and development in the least developed countries in Asia and Africa', *Journal of Innovation and Entrepreneurship*, 10(1), pp. 1-13.
- Cournède, B. and Denk, O. (2015) 'Finance and economic growth in OECD and G20 countries', SSRN Working Paper No. 2649935.
- Cupák, A., Fessler, P. and Schneebaum, A. (2021) 'Gender differences in risky asset behavior: The importance of self-confidence and financial literacy', *Finance Research Letters*, 42, pp. 101880.
- De la Fuente, A. and Doménech, R. (2006) 'Human capital in growth regressions: how much difference does data quality make?', *Journal of the European Economic Association*, 4(1), pp. 1-36.
- Denk, O. and Cazenave-Lacroutz, A. (2015) 'Household finance and income inequality in the euro area', [OECD Economics Department Working Papers](#) 1226, OECD Publishing..
- Denk, O., Schich, S. and Cournède, B. (2015) 'Why implicit bank debt guarantees matter: Some empirical evidence', *Financial Market Trends*, 2015(2), issue 2, pp. 63-88, <https://EconPapers.repec.org/RePEc:oec:dafkad:5js3bfznx6vj>.
- European Commission (2012) *The 2012 Ageing Report: Economic and budgetary projections for the 27 EU Member States (2010-2060)*. Available at: https://ec.europa.eu/economy_finance/publications/european_economy/2012/2012-ageing-report_en.htm (Accessed: .
- Filipiak, U. and Walle, Y.M., 2015. *The financial literacy gender gap: A question of nature or nurture?* (No. 176). Discussion Papers.
- Fonseca, R., Mullen, K.J., Zamarro, G. and Zissimopoulos, J. (2012) 'What explains the gender gap in financial literacy? The role of household decision-making', *Journal of Consumer Affairs*, 46(1), pp. 90-106.
- Gerardi, K., Goette, L. and Meier, S. (2010) 'Financial Literacy and Subprime Mortgage Delinquency: Evidence from a survey matched to administrative data', [FRB Atlanta Working Paper](#) 2010-10, Federal Reserve Bank of Atlanta.

- Grinblatt, M., Keloharju, M. and Linnainmaa, J. (2011) 'IQ and stock market participation', *The Journal of Finance*, 66(6), pp. 2121-2164.
- Grohmann, A., Hübler, O., Kouwenberg, R. and Menkhoff, L. (2021) 'Financial literacy: Thai middle-class women do not lag behind', *Journal of Behavioral and Experimental Finance*, 31, pp. 100537.
- Haliassos, M., Hardouvelis, G., Tsoutsoura, M. and Vayanos, D. (2017). 'Financial development and the credit cycle in Greece'. In: Names (Eds.) *Beyond Austerity: Reforming the Greek Economy*, MIT Press, September 2017, pp. 251-305
- Haliassos, M., Jansson, T. and Karabulut, Y. (2020) 'Financial literacy externalities', *The Review of Financial Studies*, 33(2), pp. 950-989.
- Hamilton, J.D. and Monteagudo, J. (1998) 'The augmented Solow model and the productivity slowdown', *Journal of Monetary Economics*, 42(3), pp. 495-509.
- Jappelli, T. and Padula, M. (2013) 'Investment in financial literacy and saving decisions', *Journal of Banking & Finance*, 37(8), pp. 2779-2792.
- Jann, B., 2008. The Blinder–Oaxaca decomposition for linear regression models. *The Stata Journal*, 8(4), pp.453-479.
- Kaiser, T. and Menkhoff, L. (2017) 'Does financial education impact financial literacy and financial behavior, and if so, when?', *The World Bank Economic Review*, 31(3), pp. 611-630.
- Klapper, Lusardi, and Panos (2013) “Financial literacy and its consequences: Evidence from Russia during the financial crisis.” [Journal of Banking & Finance](#), Elsevier, vol. 37(10), pages 3904-3923.
- Klapper, L. and Panos, G.A. (2011) 'Financial literacy and retirement planning: the Russian case', *Journal of Pension Economics & Finance*, 10(4), pp. 599-618.
- Knight, M., Loayza, N. and Villanueva, D. (1993) 'Testing the neoclassical theory of economic growth: a panel data approach', *Staff papers*, 40(3), pp. 512-541.
- Laeven, L. and Valencia, F. (2013) 'Systemic banking crises database', *IMF Economic Review*, 61(2), pp. 225-270.
- Lusardi, A., Hasler, A. and Yakoboski, P.J. (2021) 'Building up financial literacy and financial resilience', *Mind & Society*, 20(2), pp. 181-187.
- Lusardi, A., Michaud, P. and Mitchell, O.S. (2017) 'Optimal financial knowledge and wealth inequality', *Journal of Political Economy*, 125(2), pp. 431-477.

- Lusardi, A. and Mitchell, O.S. (2007) 'Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth', *Journal of Monetary Economics*, 54(1), pp. 205-224.
- Lusardi, A. and Mitchell, O.S. (2011) 'Financial literacy around the world: an overview', *Journal of Pension Economics & Finance*, 10(4), pp. 497-508.
- Lusardi, A., Mitchell, O.S. and Curto, V. (2010) 'Financial literacy among the young', *Journal of Consumer Affairs*, 44(2), pp. 358-380.
- Lyberaki, A. and Tinios, P. (2012) 'Labour and pensions in the Greek crisis: The Microfoundations of Disaster', *Comparative Southeast European Studies*, 60(3), pp. 363-386.
- Lyberaki, A. and Tinios, P. (2014) 'The informal welfare state and the family: Invisible actors in the Greek drama', *Political Studies Review*, 12(2), pp. 193-208.
- Lyberaki, A., Tinios, P. and Georgiadis, T. (2010) 'Multidimensional poverty in Greece: a deep persistent grey?', *South-Eastern Europe Journal of Economics*, 8(1).
- Mahdavi, M. and Horton, N.J. (2014) 'Financial knowledge among educated women: Room for improvement', *Journal of Consumer Affairs*, 48(2), pp. 403-417.
- Mylonakis, J. (2013) 'The prospects of the European Banking Union and the Hellenic banking sector challenges: A preliminary exercise', *Review of European Studies*, 5, pp. 13.
- Nektarios, M. and Georgiadis, T. (2009) 'Aged in Europe: Ownership and value of assets', *Life*, 50, pp. 329-346.
- Nektarios, M. (2008) 'Pension reform with consensus and transparency', *Papazisis, Athens*
- Nektarios, M. (2012) 'Greece: The NDC paradigm as a framework for a sustainable pension system', *Nonfinancial Defined Contribution Pension Schemes in a Changing Pension World*, 1, pp. 259-277.
- Nguyen, T.C., Castro, V. and Wood, J. (2022) 'A new comprehensive database of financial crises: Identification, frequency, and duration', *Economic Modelling*, 108, pp. 105770.
- O'Donnell, O. and Tinios, P. (2003) 'The politics of pension reform: lessons from public attitudes in Greece', *Political Studies*, 51(2), pp. 262-281.
- OECD (2009) *FINANCIAL EDUCATION AND THE CRISIS*. OECD. Available at: <https://www.oecd.org/finance/financial-education/50264221.pdf> (Accessed: 08/10/2022).
- Pegkas, P. (2012) 'Educational stock and economic growth The case of Greece over the period 1981-2009', *SPOUDAI-Journal of Economics and Business*, 62(1-2), pp. 56-71.

- Pegkas, P. and Tsamadias, C. (2014) 'Does higher education affect economic growth? The case of Greece', *International Economic Journal*, 28(3), pp. 425-444.
- Petrakis, I. (2021) 'Determinants of female labour force participation: Evidence from Greece', *Labour*, 35(4), pp. 538-567.
- Petrakis, P.E. and Stamatakis, D. (2002) 'Growth and educational levels: a comparative analysis', *Economics of Education Review*, 21(5), pp. 513-521.
- Philippon, T. (2015) 'Fair debt relief for Greece: new calculations', *VoxEu*, <http://www.voxeu.org/article/fair-debt-relief-greece-new-calculations>.
- Pissarides, C.A. (2013) 'Unemployment in the great recession', *Economica*, 80(319), pp. 385-403.
- Prakash, N., Alagarsamy, S. and Hawaldar, A. (2022) 'Demographic characteristics influencing financial wellbeing: a multigroup analysis', *Managerial Finance*, Vol. 48 No. 9/10, pp. 1334-1351. <https://doi.org/10.1108/MF-09-2021-0466>
- Preston, A., Qiu, L. and Wright, R. (2022) 'A study of the Chinese gender gap in financial literacy', .
- Schumacher, J. and di Mauro, B.W. (2015) 'Greek debt sustainability and official crisis lending', *Brookings Papers on Economic Activity*, , pp. 279-305.
- Sekita, S. (2011) 'Financial literacy and retirement planning in Japan', *Journal of Pension Economics & Finance*, 10(4), pp. 637-656.
- Tinghög, G., Ahmed, A., Barrafreem, K., Lind, T., Skagerlund, K. and Västfjäll, D. (2021) 'Gender differences in financial literacy: The role of stereotype threat', *Journal of Economic Behavior & Organization*, 192, pp. 405-416.
- Van Rooij, M.C., Lusardi, A. and Alessie, R.J. (2011) 'Financial literacy and retirement planning in the Netherlands', *Journal of economic psychology*, 32(4), pp. 593-608.
- Van Rooij, M.C., Lusardi, A. and Alessie, R.J. (2012) 'Financial literacy, retirement planning and household wealth', *The Economic Journal*, 122(560), pp. 449-478.
- Wang, H., Cheng, Z., Smyth, R., Sun, G., Li, J. and Wang, W. (2022) 'University education, homeownership and housing wealth', *China Economic Review*, 71, pp. 101742.
- Xu, L. and Zia, B. (2012) 'Financial literacy around the world: an overview of the evidence with practical suggestions for the way forward', *World Bank Policy Research Working Paper*, (6107).

Zettelmeyer, J., Trebesch, C. and Gulati, M. (2013) 'The Greek debt restructuring: an autopsy', *Economic Policy*, 28(75), pp. 513-563.

Appendix

Appendix Table 1

Variable description for the HFCS sample of reference persons in Greece

The table presents the variable description and sources for every local environment and gender stereotypes indicator used.

Variable name	Description	Source
GDP per capita	Regional GDP per capita, NUTS 2	Hellenic Statistic Authority Database
Deposits per capita	Regional deposits per capita, NUTS 2	Hellenic Statistic Authority Database
Unemployment	Regional unemployment, NUTS 2	Hellenic Statistic Authority Database
Deterioration in regional GDP per capita	Difference in regional GDP per capita for the period 2007-2017	Hellenic Statistic Authority Database
Deterioration in regional deposits per capita	Difference in regional deposits per capita for the period 2007-2017	Hellenic Statistic Authority Database
Deterioration in regional unemployment	Difference in regional unemployment for the period 2007-2017	Hellenic Statistic Authority Database
%Employed in financial sector	Share of employment in the financial sector per NUTS 2 prefectures	Greek Labour Force Survey, 2017
Self-employment	Number of self-employed in the workforce	Greek Labour Force Survey, 2016
University graduates/region	University graduates in the labour force by NUTS 2 prefecture	Hellenic Statistic Authority Database
Finance graduates/region	Finance graduates in the labour force per NUTS 2 prefecture	Greek Labour Force Survey, 2017
Political interest	Political interest index, Normalised	Eurobarometer 2017
Discussing national matters	Share of the regional population discussing national matters, NUTS 2	Eurobarometer 2017
Female in managerial positions	Share of females in supervisory positions	Greek Labour Force Survey, 2017
%Agree: Women should take care of home	Females' position is taking care of home	Eurobarometer 2017
Gender stereotypes index	Gender stereotypes index, NUTS 2,	European Values Survey/World Values Survey 2017

Appendix Table 2

Pairwise correlation matrix

	Financial literacy	Female	Financial resilience	Informal support and BPL	Informal support	GDP per capita	Deposits per capita	%Employed in fin. sector	Finance graduates	%Females in management	"-": Index	"-": %Agree: FHP	"-": %Agree: FPP	Age	Single	Tertiary education	Risk tolerance	Present orientation	Household income	Household wealth	Employed	
Financial literacy	1.00																					
Female	-0.13*	1.00																				
Financial resilience	0.15*	-0.13*	1.00																			
Informal support and BPL	-0.05*	0.07*	-0.01	1.00																		
Informal support	-0.03*	0.04*	-0.04*	0.64*	1.00																	
GDP per capita, Regions	0.04*	-0.02*	0.01	-0.05*	-0.01	1.00																
Deposits per capita, Regions	0.07*	0.03*	-0.02*	0.03*	-0.02*	-0.16*	1.00															
%Employed in fin. sector	0.05*	-0.03*	-0.01	-0.03*	0.01	0.95*	-0.14*	1.00														
Finance graduates	0.04*	-0.04*	-0.01	-0.05*	0.01	0.95*	-0.12*	0.98*	1.00													
%Females in management	0.04*	-0.04*	-0.01	-0.03*	0.01	0.93*	-0.11*	0.97*	0.93*	1.00												
"-": Index	-0.09*	-0.01	-0.01	-0.01	0.01	-0.51*	-0.44*	-0.55*	-0.52*	-0.52*	1.00											
"-": %Agree: FHP	-0.03*	-0.01	-0.03*	-0.01	-0.01	-0.51*	0.01*	-0.66*	-0.60*	-0.66*	0.45*	1.00										
"-": %Agree: FPP	-0.05*	0.03*	0.01	0.07*	-0.01	-0.35*	-0.06*	-0.30*	-0.41*	-0.20*	-0.03*	-0.13*	1.00									
Age	-0.11*	0.02	-0.31*	-0.10*	-0.02*	0.11*	-0.03*	0.09*	0.09*	0.10*	-0.01	-0.01	-0.04*	1.00								
Single	0.07*	-0.11*	0.18*	0.10*	0.02*	0.01	0.02	0.01	0.01	0.01	-0.01	-0.02*	-0.03*	-0.44*	1.00							
Tertiary education	0.19*	-0.05*	0.23*	-0.06*	-0.07*	0.09*	-0.04*	0.12	0.11*	0.11*	-0.02*	-0.13*	-0.05*	-0.15*	0.13*	1.00						
Risk tolerance	0.20*	-0.19*	0.16*	-0.01	-0.02*	-0.02*	-0.03*	-0.02*	-0.03*	-0.01	0.01	0.02*	0.04*	-0.21*	0.13*	0.13*	1.00					
Present orientation	0.06*	-0.01	-0.07*	0.06*	0.05*	0.07*	0.01	0.09*	0.09*	0.07*	-0.10*	-0.04*	0.04*	-0.03*	0.04*	-0.02	0.01	1.00				
Household income	0.19*	-0.06*	0.13*	-0.21*	-0.20*	-0.04*	0.01	0.05*	0.04*	0.06*	-0.02*	-0.05*	-0.01	-0.02*	0.01	0.26*	0.23*	-0.07*	1.00			
Household wealth	0.13*	-0.03*	0.06*	-0.09*	-0.07*	0.02	0.01	0.02	0.01	0.04*	-0.03*	-0.05*	0.05*	0.08*	-0.08*	0.13*	0.19*	0.01	0.34*	1.00		
Employed	0.10*	-0.04*	0.42*	0.01	-0.06*	0.01	-0.02	0.03*	0.01	0.02*	-0.03*	-0.07*	0.04*	-0.50*	0.13*	0.20*	0.08*	0.01	0.08*	-0.17*	1.00	

