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Financial Knowledge and Financial Resilience in Greece

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Motivation

- Lusardi, Michaud, and Mitchell (2017) attribute some 35-40% of retirement wealth inequality in the USA to differences in financial knowledge, formed early in life, and becoming endogenous to the most important choices throughout the lifecycle
- The literature finds consistent gender differences in financial literacy against females
  - It is uncertain if they signify differences in knowledge or differences in confidence (e.g. Bucher-Koenen, et al, 2016), i.e., in some settings females are not more likely to respond wrongly, but they are more likely to respond DK/DA
  - Their origin is yet to be explained
- Gender differences in financial literacy seem to be smaller or even non-existent at younger ages when at school
- They seem to be smaller or non-existent outside the Western world
- The link between gender differences in financial knowledge and the related differences in financial well-being requires additional inquiry

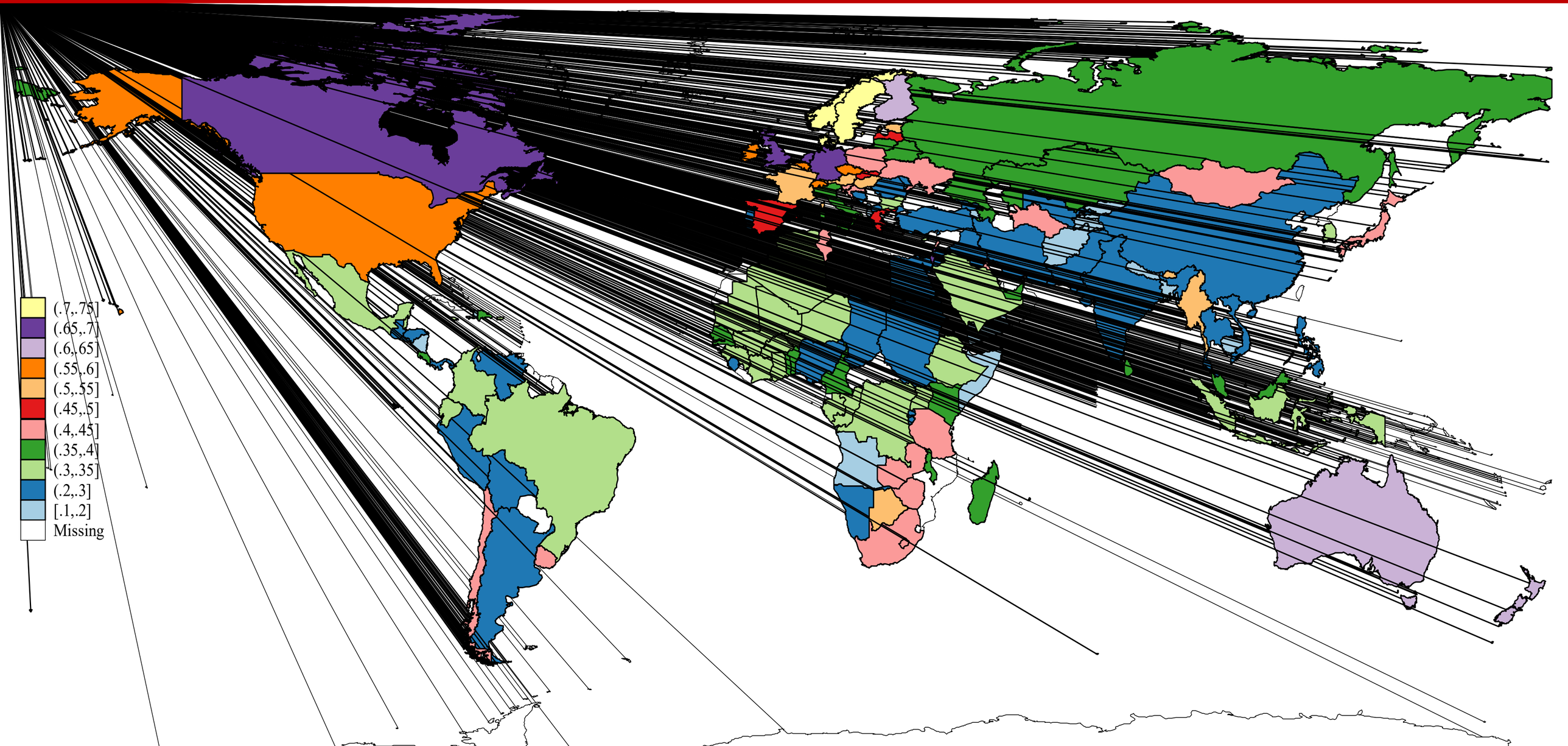
What we do [1 out of 2]

- We conduct the first nationally-representative Pan-Hellenic measurement of financial literacy of 15-year-olds in Greece introducing a novel state-of-the-art survey instrument
- The study of financial literacy among high-school students in Greece is timely for several reasons
  1) Greece is at the stage of designing its national-financial-education-strategy and our study aims to inform this strategy.
  2) Greece did not participate in the financial knowledge module of the Programme for International Student-Assessment (PISA).
     - However, in 2018, the index of students' cognitive adaptability in Greece was one of the lowest among PISA-participating countries and economies.
     - In the 20 remaining participating countries, only 1 out of 3 students were able to evaluate a bank statement.
  3) Greece is coming out of a major economic crisis, experiencing the highest deterioration in macroeconomic indicators amongst developed nations.
     - Cucinelli, et al. (2019) and Bottazzi and Lusardi (2021) show that the regional environment matters for financial knowledge.

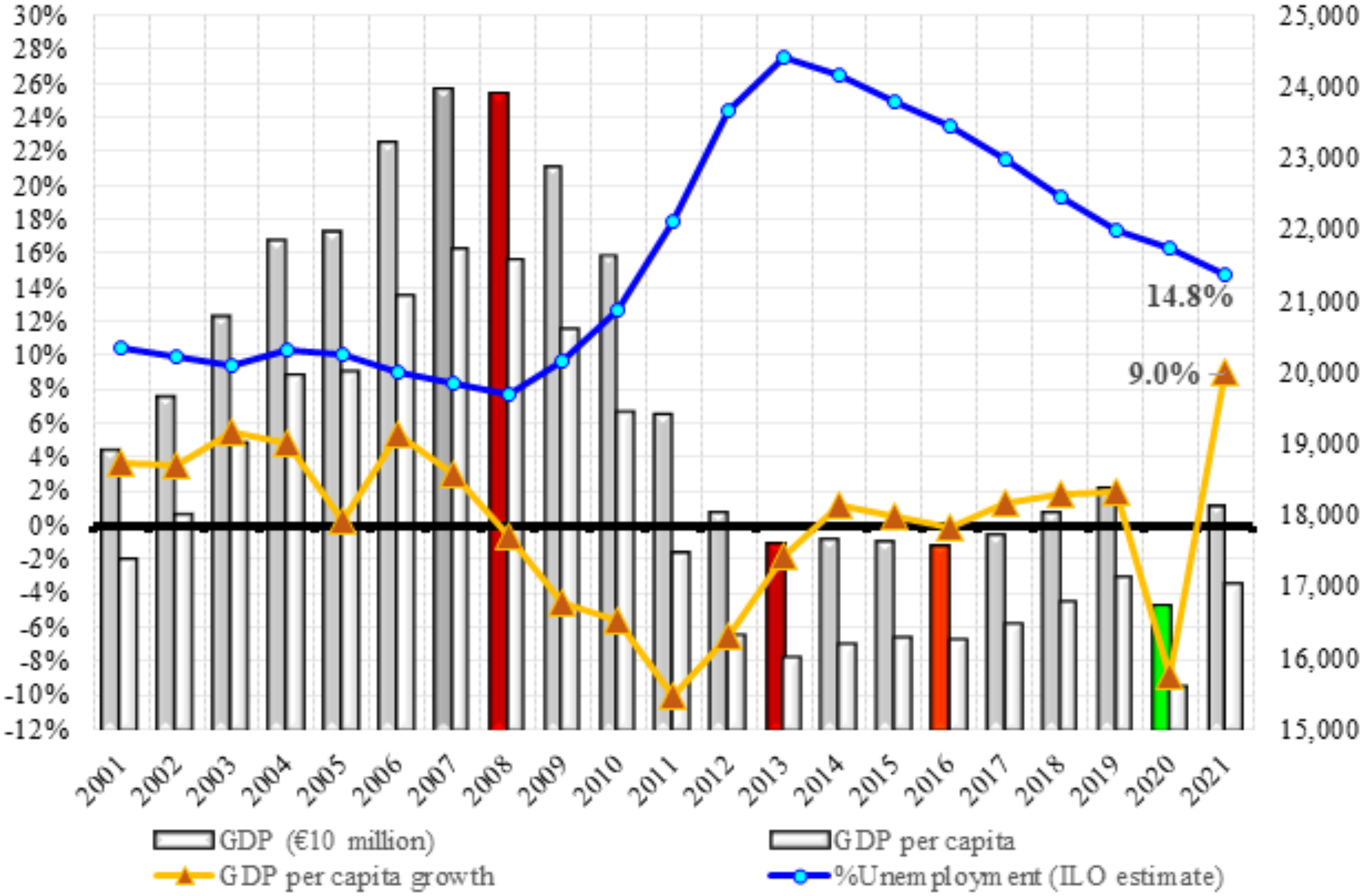
What we do [2 out of 2]

- We examine the levels of financial knowledge of the adult population in Greece, using a nationally representative sample for Greece, collected by the ECB (HFCS, 2017)
- We inspect the geographical discrepancies in financial literacy within the country
- We inquire about any gender gap in financial knowledge in Greece, and the factors that are likely to contribute to it
  - Does regional economic and financial development play a role?
  - Do regional gender stereotypes matter?
- Is lower financial literacy among females related to any major disadvantages for females in the challenging environment of Greece in 2017?

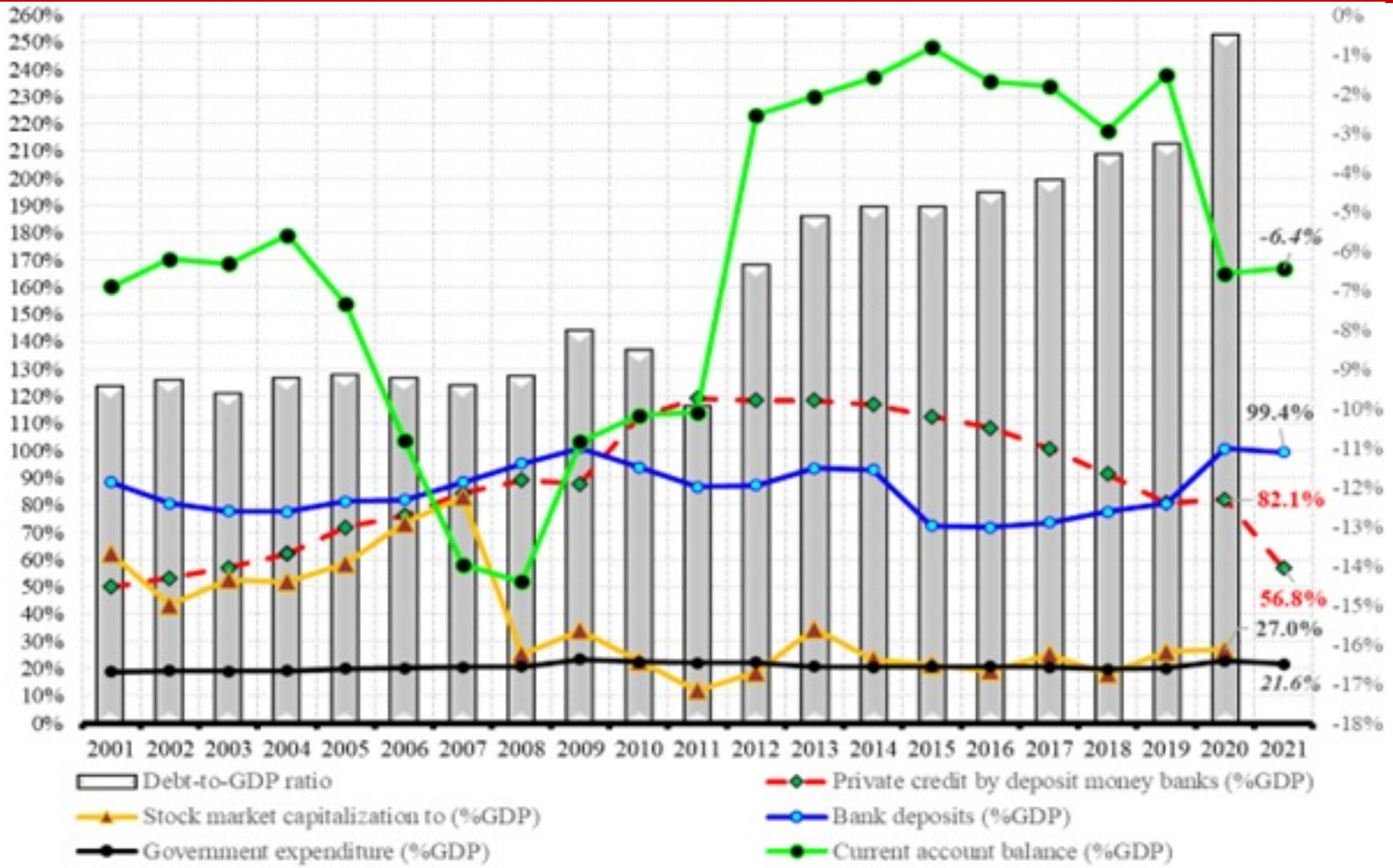
Stylized Fact [1]: Financial literacy in Greece (S&P, 2015)



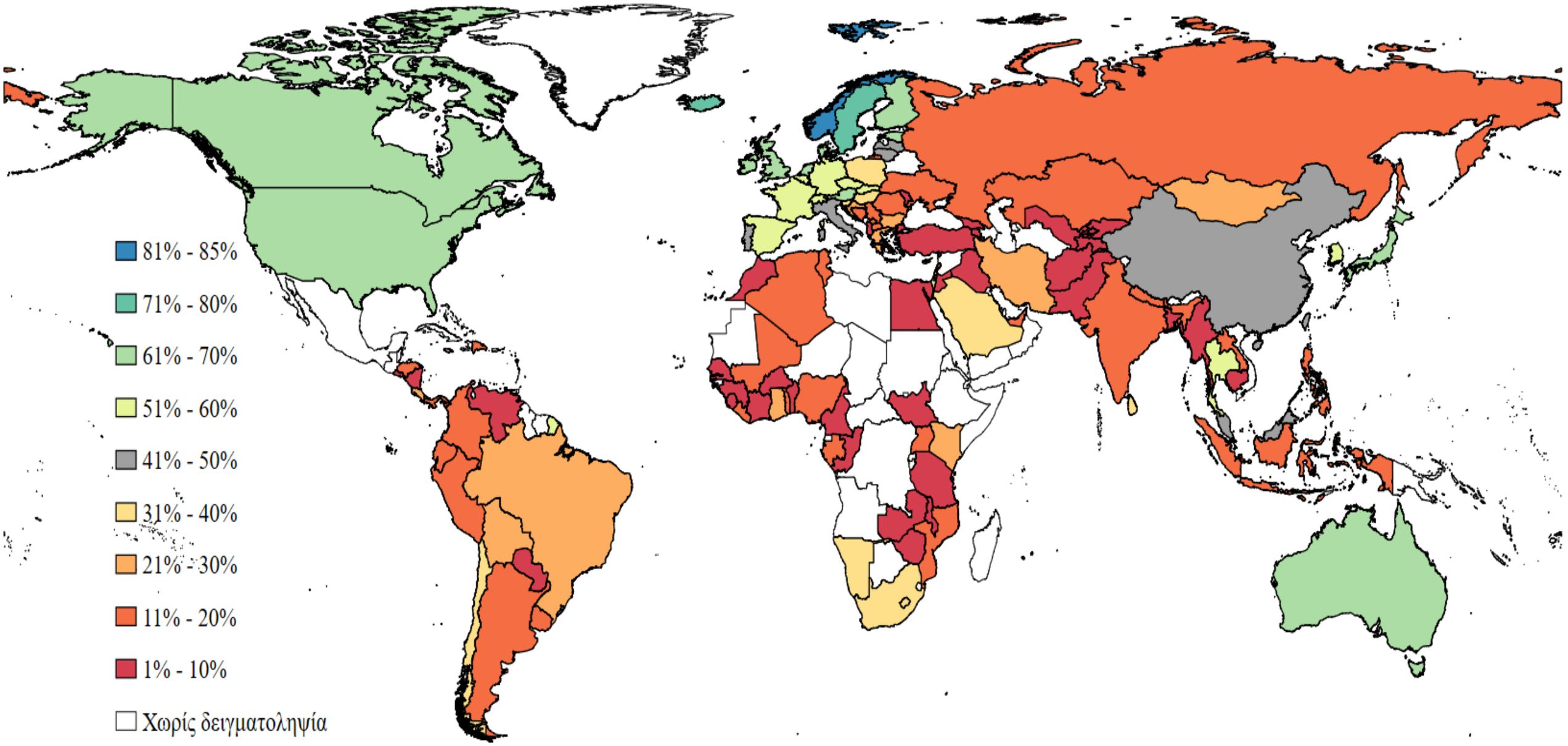
Stylized Fact [2]: Economic Development in Greece



Stylized Fact [3]: Financial Sector Development in Greece



Stylized Fact [4]: Saving in Greece (Global Findex, 2021)



Stylized Fact [5]: Financial Resilience in Greece (Global Findex, 2021)

Coming up with emergency funds	30 days	Rank	7 days	Rank
Possible	95.2%	**(24)**	93.7%	**(27)**
Possible and not difficult or somewhat difficult	70.3%	**(43)**	47.9%	**(50)**
Possible and not difficult at all	35.5%	**(44)**	29.2%	**(43)**
Sources				
Family or friends	33.5%	**(57)**	33.0%	**(56)**
Savings	30.6%	**(39)**	30.3%	**(39)**
Work	20.7%	**(25)**	20.1%	**(25)**
Loan from a bank, employer or moneylender	6.6%	**(68)**	6.6%	**(64)**
Other	3.0%	**(58)**	2.9%	**(59)**
Sale of assets	0.8%	**(116)**	0.8%	**(115)**

The Student Data

- The survey was approved from the Hellenic Ministry of Education, Research and Religious Affairs (41396/Δ2/09-03-16).
- All schools follow a national curriculum instructed by the Ministry of Education.
- The data collection was carried out between March – June 2016.

260	high schools were invited to participate from all administrative regions of Greece
96	high schools agreed to participate
37%	response rate from high schools
3,529	15-year-old students participated on the online survey
3,028	questionnaires were returned complete

The Sample and Weighting

- Our 96 primary sampling units (PSUs) cover all 13 administrative regions of Greece, and 41 out of 55 prefectures.
- We generate multistage sampling weights that enable within stratum adjustments to account for the number of prefectures, the number of schools, and the number of 15-year-old students sampled within each Greek administrative region.
- Our weights sum to the population of 105,525 15-year-old-students in Greece

Table 1—Descriptive Statistics

	Unweighted	*Weighted*		*Unweighted*	*Weighted*
Female	50.9%	48.7%	Migrant	13.3%	13.7%
Grade Point Average	16.65	16.64	Two-parent household	84.7%	84.6%
Grade repetition	3.3%	3.4%	Father's education	11.40	11.45
Private school	5.1%	6.1%	Mother's education	12.00	12.09
Public school	94.9%	94.0%	Income knowledge	45.9%	45.0%
School type: Day	93.9%	92.2%	Financially-constrained by crisis	68.0%	67.3%
–"–: Art	0.2%	0.3%	Pocket money	81.8%	81.2%
–"–: Music	1.6%	1.0%	#Pocket money	9.65	9.58
–"–: Experimental	4.3%	6.5%			
$GDP^{Prefecture}_{per-capita(2016)}$	15,246.8	15,608.3	$Unemployment^{Admin.Region}_{2016}$	23.3%	23.5%
$\Delta GDP^{Prefecture}_{per-capita(2006-2016)}$	(-)2,323.0	(-)2,067.8	$\Delta Unemployment^{Admin.Region}_{2016-2006}$	14.1%	14.4%
$Deposits^{Prefecture}_{per-capita(2016)}$	9,514.1	9,632.8	$\%Employment^{Admin.Region}_{Financial-sector(2016)}$	3.1%	3.3%
$\Delta Deposits^{Prefecture}_{per-capita(2006-2016)}$	(-)4,015.0	(-)4,669.1	$\%Entrepreneurship^{Admin.Region}_{2016}$	7.7%	7.5%
			$\%Educated^{Admin.Region}_{Post-secondary(2016)}$	36.7%	38.6%

Financial Literacy Measurement

Students are called to answer 31 multiple choice questions, of which 4 measured the financial literacy.

Financial Literacy concepts:

- Interest
- Compound Interest
- Inflation
- Risk diversification

The Big3 Questions
Klapper, Lusardi & van Oudheusden, 2015 (S&P Survey)

Financial Literacy Measurement

- **Q1. NUMERACY (INTEREST)**

  Assume that Alexander needs to borrow €100. What is the lowest amount he will have to repay?
  [104 EURO; 105 EURO; 100 EURO plus interest 3%; 100 EURO plus interest 4%; DK/DA]

- **Q2. COMPOUND INTEREST**

  Evita's parents gave her €100 as a birthday present and with this money they opened a family bank account (joint account) with an annual interest rate of 10%. If no movement takes place in the account, this money in five years will be:
  [more than €150; exactly €150; less than €150; DK/DA]

- **Q3. INFLATION**

  Suppose that after 10 years the prices of goods and services have doubled. At the same time, the money Dimitris receives after 10 years has doubled. Dimitris in 10 years will be able to buy:
  [more; the same; less; DK/DA]

- **Q4. RISK DIVERSIFICATION**

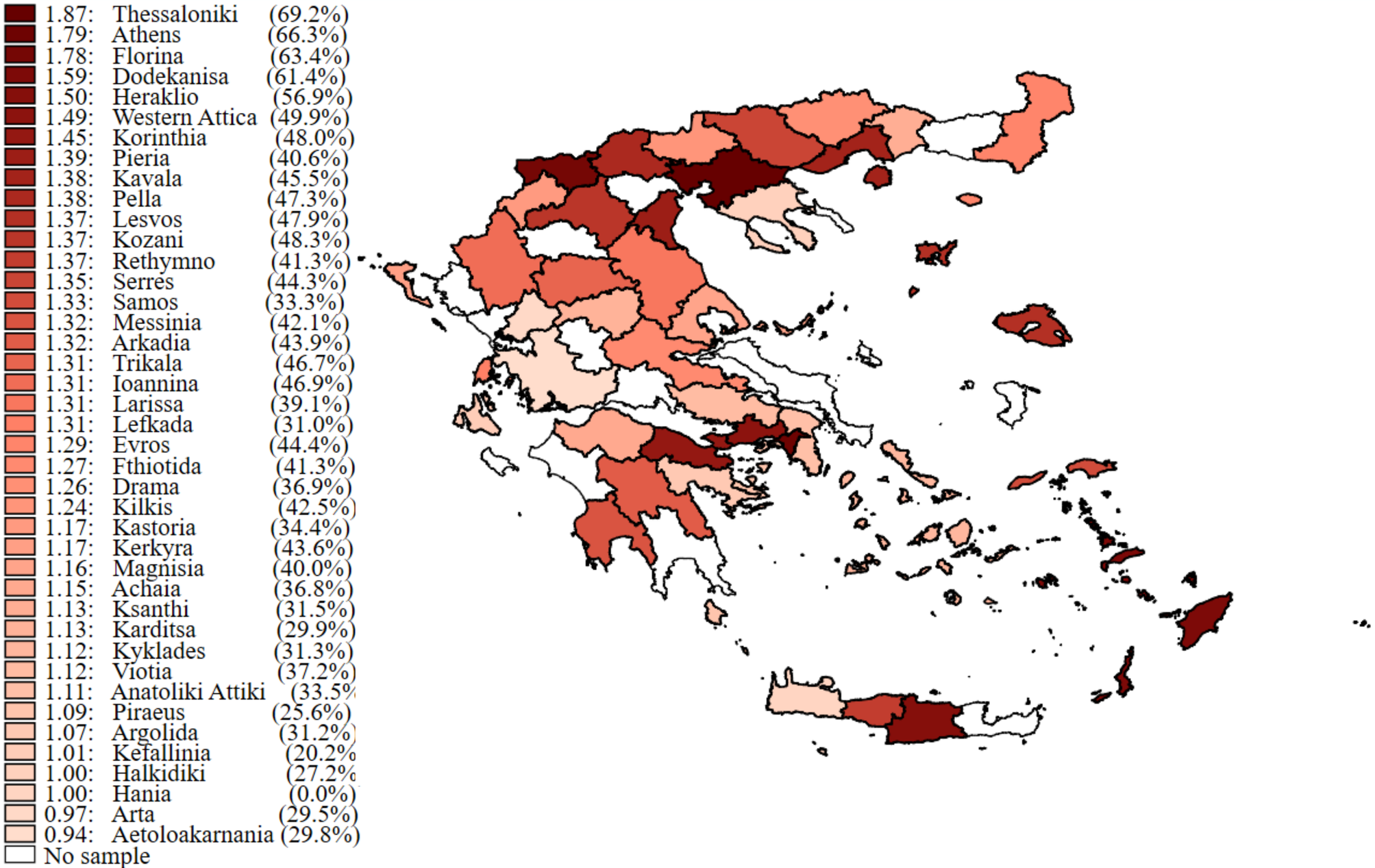
  Mary wants to invest some of her money. What do you think is safer, to put all the money she wants to invest in one company or to put that money in different companies?
  [In a company because this investment is safer; In different companies because this investment is safer; DK/DA]

Regional Analysis I: Administrative Regions

- 1.81: Central Macedonia (66.4%)
- 1.69: Attica (61.3%)
- 1.55: Southern Aegean (59.2%)
- 1.39: Crete (45.5%)
- 1.38: Northern Aegean (46.8%)
- 1.38: Western Macedonia (47.5%)
- 1.32: Peloponnese (42.3%)
- 1.30: Eastern Macedonia & Thrace (41.2%)
- 1.27: Epirus (44.9%)
- 1.25: Thessaly (39.4%)
- 1.20: Central Greece (39.3%)
- 1.17: Western Greece (37.3%)
- 1.15: Ionian Islands (39.6%)

Regional Analysis II: Prefectures

- 41 out of the 55 Greek prefectures participated in the survey
- All 13 administrative regions are covered
- The data is representative at the regional administrative level



The Adult Population Data

- ECB's Household Finance and Consumption Survey Wave 3 (2017)
  - Multiple-imputed dataset, based on 5 replications
- The available questions asked regarding financial literacy approximate the understanding of financial risk and risk diversification.
- The sample consists of 3,007 household representatives, i.e., household heads ("Household representative").
- Geographical dimensions covered:
  - 4 geographic regions
  - 13 administrative regions
  - 44 out of 54 prefectures

The Sample

Variable name *#Observations*	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	***
Below poverty line & receiving financial assistance	3.6%	2.7%	4.5%	-0.0184	*

Financial Knowledge Questions

- **A company can obtain financing either issuing shares or bonds. In your opinion, which financial instrument entails a greater risk of losing money?**
  - 1 - shares
  - 2 - bonds
  - 3 - equally risky
  - 4 - I don’t know the difference between bonds and shares
- **In your opinion, which of the following investment strategies entails a greater risk of losing money?**
  - 1 - Invest all savings in the securities issued by a single company
  - 2 - Invest all savings in the securities issued by a wide range of unrelated companies
- HFCS includes 2 more questions on financial literacy (inflation/interest compounding) but there are ***no observations***.

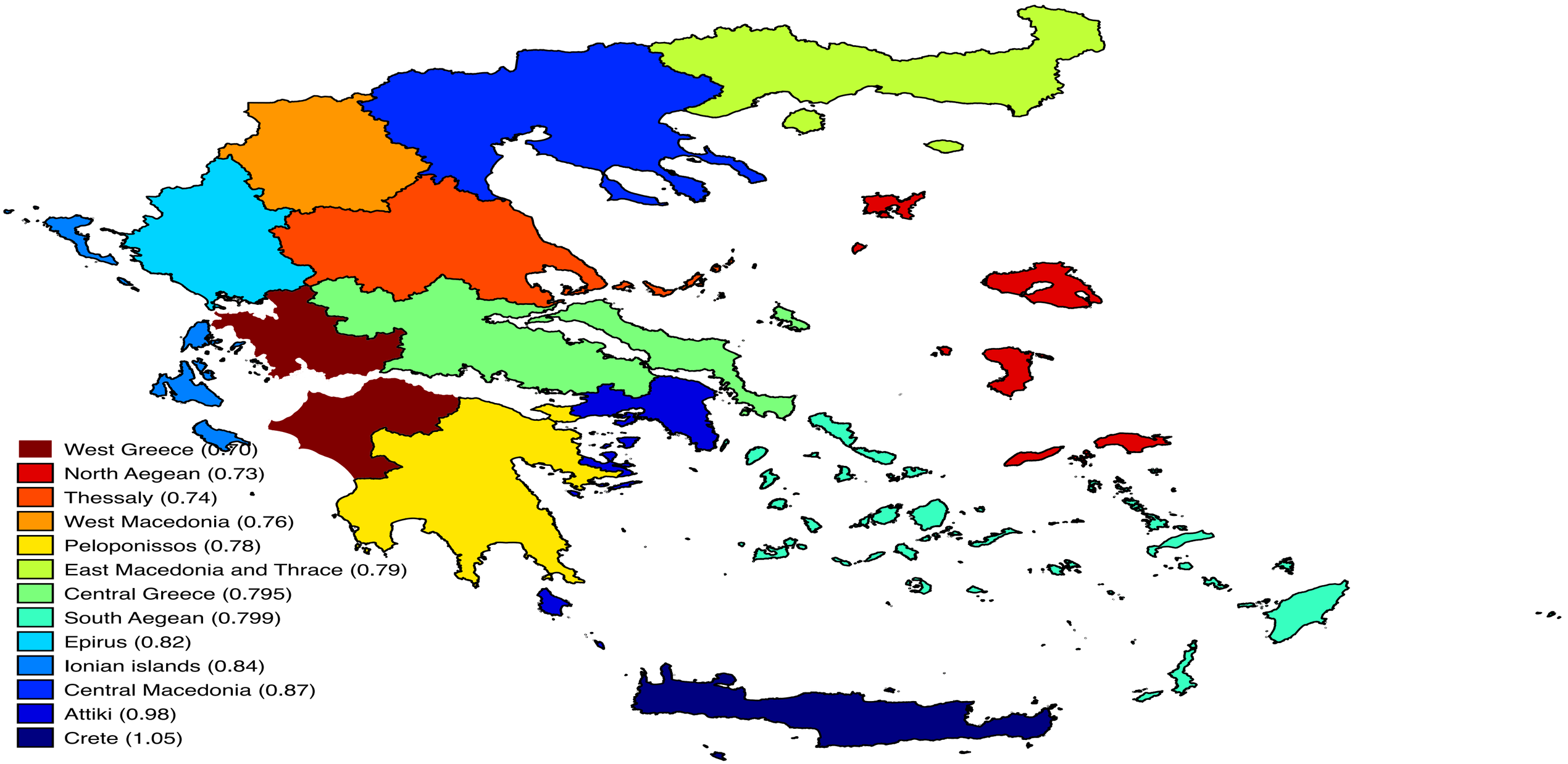
Understanding of Financial Risk

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%	0.0000	
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%	0.0000	

Validity Check

Panel C: European comparisons (EEA 29) [S&P Global Financial Literacy Survey 2015]	Financial literacy				Financial risk
	Total	Males	Females	%Difference	
Denmark	71%	76%	67%	14%	78%
Finland	63%	68%	58%	16%	76%
Sweden	71%	72%	70%	3%	75%
Germany	66%	72%	60%	20%	74%
Netherlands	66%	75%	58%	29%	73%
Norway	71%	75%	68%	10%	69%
Belgium	55%	59%	52%	14%	65%
Switzerland	57%	61%	53%	15%	63%
Slovenia	44%	50%	39%	29%	63%
Austria	53%	55%	51%	8%	59%
Ireland	55%	59%	52%	14%	58%
Latvia	48%	54%	44%	24%	56%
Spain	49%	50%	48%	5%	56%
Czech Republic	58%	65%	53%	23%	56%
Malta	44%	48%	40%	21%	56%
Luxembourg	53%	61%	46%	33%	53%
France	52%	56%	48%	18%	50%
Hungary	54%	53%	55%	-4%	50%
Slovakia	48%	49%	47%	3%	42%
Italy	37%	45%	30%	50%	40%
Poland	42%	49%	36%	37%	39%
Lithuania	39%	42%	36%	16%	39%
Greece	***45%***	***49%***	***42%***	***16%***	***36%***
Cyprus	35%	39%	31%	28%	33%
Croatia	44%	45%	44%	2%	33%
Portugal	26%	29%	23%	28%	23%
Romania	22%	22%	22%	2%	22%
Bulgaria	35%	38%	31%	23%	20%

Regional Analysis III: Adult Population



Regression Analysis I: Students

- We find a significant gender difference in financial literacy, against females
- The effect magnitude is between 6.5% - 7.6%, significant at the 1% level
- The magnitude and significance holds controlling for student, school, parental, and household characteristics
- It holds when controlling for prefecture fixed effects, and school and administrative region fixed effects [preferred specification 6]
- Numeracy and foreign language literacy matter
- So does parental education
- Private school students don't do better

	[1]	[2]	[3]	[4]	[5]	[6]
Female	-0.115***	-0.109**	-0.099***	-0.099***	-0.114***	-0.105***
	[0.038]	[0.047]	[0.033]	[0.030]	[0.034]	[0.035]
Migrant	-0.019	-0.037	0.013	0.013	0.011	-0.005
	[0.094]	[0.083]	[0.079]	[0.081]	[0.082]	[0.083]
GPA	0.143***	0.130***	0.099***	0.064***	0.070***	0.076***
	[0.013]	[0.014]	[0.012]	[0.011]	[0.010]	[0.011]
Failed year	-0.112	-0.153	-0.108	-0.152*	-0.135	-0.123
	[0.094]	[0.096]	[0.096]	[0.089]	[0.085]	[0.086]
School type: Experimental	0.447***	0.465***	0.342***	0.188***	0.178	0.09
	[0.068]	[0.070]	[0.065]	[0.061]	[0.128]	[0.068]
-"-: Art/Music	0.128**	0.153**	0.078*	0.136***	0.221*	-0.348**
	[0.057]	[0.069]	[0.046]	[0.042]	[0.119]	[0.171]
-"-: Day	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
Private school	0.363	0.361	0.25	0.199	-0.004	-0.285***
	[0.244]	[0.241]	[0.218]	[0.164]	[0.166]	[0.102]
Income knowledge	-	0.118*	0.093	0.082	0.081	0.092
		[0.067]	[0.057]	[0.062]	[0.064]	[0.065]
Income decline perception	-	0.160**	0.155***	0.127**	0.127**	0.143**
		[0.066]	[0.053]	[0.056]	[0.056]	[0.057]
Amount of pocket money	-	0.007**	0.005**	0.004	0.006**	0.006**
		[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Two-parent household	-	-	-0.031	-0.086	-0.062	-0.04
			[0.089]	[0.074]	[0.075]	[0.077]
Father's years of schooling	-	-	0.019***	0.015***	0.016***	0.014***
			[0.004]	[0.004]	[0.004]	[0.005]
Mother's years of schooling	-	-	0.018***	0.015***	0.012***	0.012**
			[0.004]	[0.005]	[0.005]	[0.005]
Numeracy [0, 4]	-	-		0.206***	0.202***	0.182***
				[0.020]	[0.020]	[0.021]
Foreign languages	-	-	-	0.069*	0.072*	0.079*
				[0.040]	[0.043]	[0.041]
Prefecture FE	-	-	-	-	+	-
School FE	-	-	-	-	-	+
Administrative Region FE	-	-	-	-	-	+
%Effect	*-7.6%*	*-7.2%*	*-6.5%*	*-6.5%*	*-7.5%*	*-6.9%*
Linear prediction	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*
No. of observations	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*

Robustness

- Females are 10.7% less likely to be in the high financial literacy group (at least 2 out of 3 correct answers)
- Interestingly, they give 15.7% more wrong answers on average
- The gender difference in DK/DA answers is insignificant

	[1] High FL	[2] #Wrong	[3] #DK/DA	[4] At least 1 DK/DA
Female	-0.057***	0.076**	-0.037	-0.031
	[0.019]	[0.032]	[0.029]	[0.021]
Migrant	-0.023	0.072	-0.048	0.006
	[0.045]	[0.055]	[0.034]	[0.022]
GPA	0.033***	-0.068***	0.001	0.008
	[0.006]	[0.009]	[0.007]	[0.005]
Failed year	-0.05	-0.103	0.241**	-0.004
	[0.033]	[0.105]	[0.095]	[0.031]
School type: Experimental	0.298***	0.253***	-0.094**	-0.057**
	[0.048]	[0.041]	[0.046]	[0.024]
-"-: Art/Music	-0.235***	0.145	0.239	0.190***
	[0.037]	[0.428]	[0.388]	[0.042]
-"-: Day	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
Private school	-0.016	0.589***	-0.529***	-0.196***
	[0.058]	[0.061]	[0.096]	[0.047]
Income knowledge	-0.014	-0.100***	0.037	0.019
	[0.033]	[0.028]	[0.026]	[0.014]
Income decline perception	0.042	-0.022	-0.019	-0.009
	[0.038]	[0.034]	[0.044]	[0.027]
Amount of pocket money	0.002**	0.002	-0.005***	-0.002
	[0.001]	[0.003]	[0.002]	[0.002]
Two-parent household	-0.023	0.027	0.039	-0.011
	[0.059]	[0.053]	[0.039]	[0.024]
Father's years of schooling	0.007**	-0.009**	-0.010***	-0.002
	[0.003]	[0.004]	[0.003]	[0.002]
Mother's years of schooling	0.007	0.001	0.001	0.001
	[0.004]	[0.003]	[0.006]	[0.002]
Numeracy [0, 4]	0.061**	0.027	-0.091**	-0.033*
	[0.029]	[0.031]	[0.038]	[0.017]
Foreign languages	0.099***	-0.099***	-0.01	0.026***
	[0.014]	[0.018]	[0.013]	[0.005]
School FE	+	+	+	+
Administrative Region FE	+	+	+	+
%Effect	*-10.7%*	*15.7%*	*-3.3%*	*-3.4%*
Linear prediction	*0.5323*	*0.4841*	*1.13*	*0.8965*
No. of observations	*3,028*	*3,028*	*3,028*	*3,028*

Regression Analysis II: Adults

- We find a significant gender difference in financial literacy, against females
- The effect magnitude is between 17% - 27.7%, significant at the 1% level
- The magnitude and significance holds controlling for rich household financial, demographic, and behavioural characteristics
- It holds when controlling for urbanity, and all sorts of regional/NUTS fixed effects

	Pooled sample				Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.209***	-0.128***	-0.147***	-0.143***	–	–
	[0.043]	[0.044]	[0.040]	[0.045]		
Log(age)	–	0.047	0.048	-0.009	0.092	-0.093
		[0.080]	[0.079]	[0.065]	[0.101]	[0.077]
Education: Tertiary	–	0.398***	0.387***	0.340***	0.237***	0.473***
		[0.071]	[0.070]	[0.071]	[0.076]	[0.102]
"-": Upper post-secondary	–	0.227***	0.216***	0.203***	0.202***	0.187**
		[0.051]	[0.052]	[0.056]	[0.056]	[0.073]
"-": Lower post-secondary	–	0.123**	0.119**	0.091**	0.075	0.082
		[0.052]	[0.053]	[0.045]	[0.069]	[0.056]
"-": Primary	–	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
Marital status: Married/Relationship	–	-0.036	-0.047	-0.041	-0.074	-0.02
		[0.054]	[0.054]	[0.057]	[0.075]	[0.072]
"-": Widow/Divorced		-0.071	-0.072	-0.083	-0.168**	-0.003
		[0.070]	[0.067]	[0.069]	[0.074]	[0.093]
"-": Single	–	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
Number of children	–	-0.038	-0.016	-0.015	-0.041	0.017
		[0.032]	[0.030]	[0.031]	[0.044]	[0.036]
Risk attitudes in investment	–	0.100***	0.099***	0.090***	0.066**	0.182***
		[0.027]	[0.026]	[0.025]	[0.027]	[0.035]
Present orientation	–	0.193***	0.187***	0.168**	0.13	0.158**
		[0.071]	[0.066]	[0.073]	[0.083]	[0.078]
Log(household income)	–	0.025	0.028	0.032*	0.015	0.066***
		[0.017]	[0.017]	[0.019]	[0.023]	[0.024]
Log(household wealth)	–	0.477***	0.487***	0.496**	0.712***	0.17
		[0.182]	[0.179]	[0.193]	[0.196]	[0.226]
Labour market status: Employed	–	-0.045	-0.089	-0.082	-0.128	-0.022
		[0.105]	[0.097]	[0.089]	[0.105]	[0.133]
"-": Self-employed	–	-0.08	-0.125	-0.089	-0.137	-0.034
		[0.103]	[0.094]	[0.081]	[0.096]	[0.115]
"-": Retired	–	-0.119	-0.155*	-0.130*	-0.157	-0.101
		[0.098]	[0.090]	[0.077]	[0.114]	[0.085]
"-": Unemployed	–	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
"-": Other status	–	-0.17	-0.199*	-0.226**	-0.189	-0.132
		[0.111]	[0.102]	[0.091]	[0.304]	[0.093]
Urbanity FE	–	+	+	+	+	+
Region F.E. – NUTS 2	–	–	+	–	–	–
Region F.E. – NUTS 1	–	–	–	+	+	+
Region F.E. – NUTS 3	–	–	–	+	+	+
% Female effect	*-27.7%*	*-17.0%*	*-19.6%*	*-19.0%*	–	–
Linear prediction	*0.7536*	*0.7536*	*0.7536*	*0.7536*	*0.8247*	*0.6892*
No. of Observations	*3,007*	*3,007*	*3,007*	*3,007*	*1,464*	*1,543*

Robustness

- In the adult sample, females are not significantly more likely to give a wrong response
- They are significantly more likely to give a DK/DA response

- They are some 22.5% less likely to get both questions right, and significantly less likely to get either of the two questions right

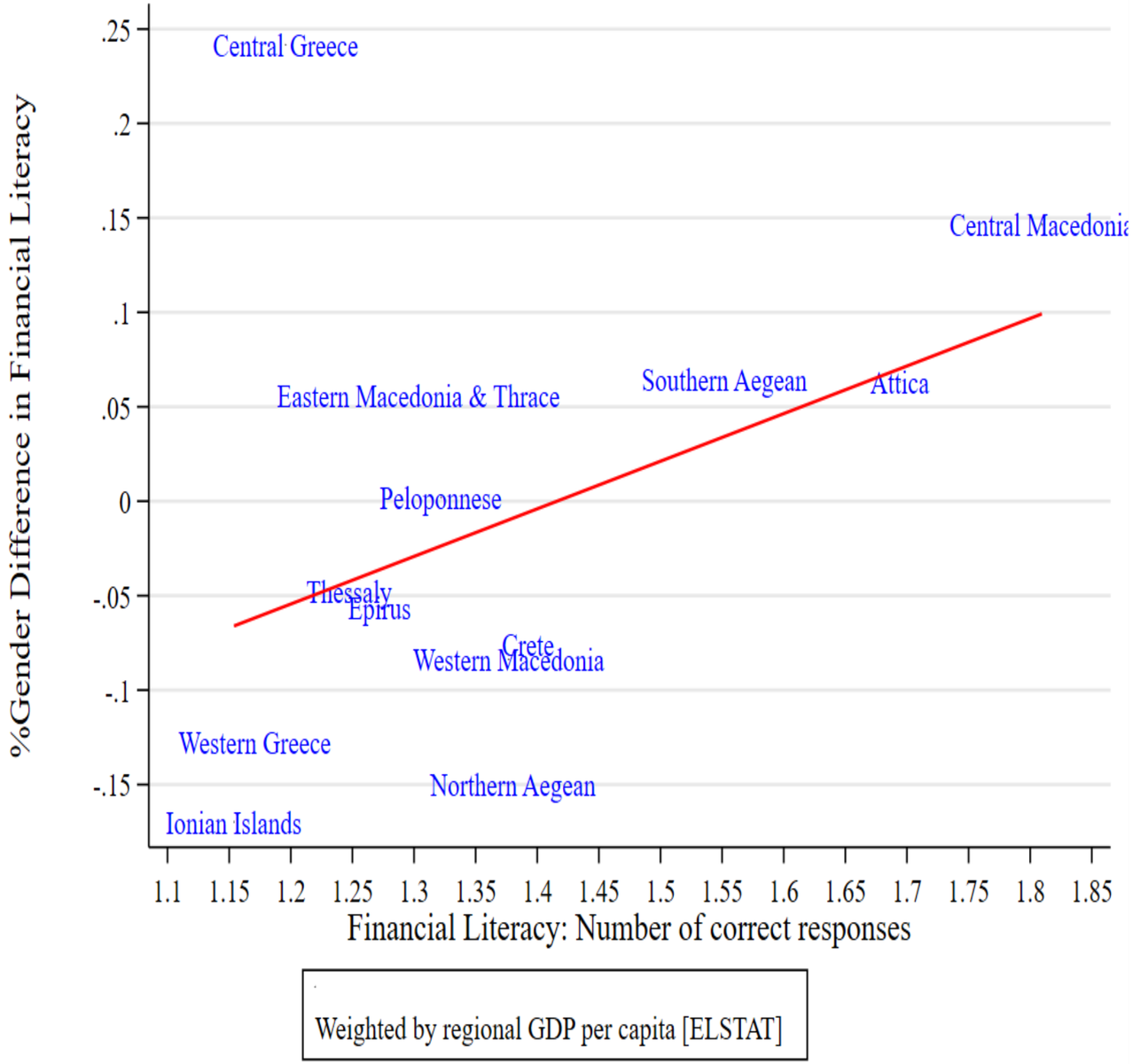
	Risk diversification	Financial risk	Both Correct	#Wrong responses	#DK/DA responses	At least 1 DK/DA
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.061***	-0.082**	-0.046**	0.027	0.116***	0.111***
	[0.017]	[0.033]	[0.021]	[0.031]	[0.027]	[0.025]
Log(age)	-0.013	0.005	0.008	-0.055	0.063	0.048
	[0.040]	[0.043]	[0.042]	[0.063]	[0.063]	[0.057]
Education: Tertiary	0.155***	0.185***	0.145***	-0.110*	-0.230***	-0.208***
	[0.039]	[0.042]	[0.042]	[0.057]	[0.035]	[0.032]
"-": Upper post-secondary	0.067**	0.135***	0.078**	-0.012	-0.190***	-0.170***
	[0.032]	[0.032]	[0.032]	[0.053]	[0.042]	[0.036]
"-": Lower post-secondary	0.042	0.048	0.039	0.039	-0.130***	-0.110***
	[0.034]	[0.030]	[0.027]	[0.053]	[0.034]	[0.031]
"-": Primary	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
Marital status: Single	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
"-": Married/Relationship	0.003	-0.044	0.011	0.011	0.03	0.026
	[0.033]	[0.038]	[0.034]	[0.050]	[0.028]	[0.025]
"-": Widow/Divorced	-0.045	-0.038	-0.03	0.04	0.043	0.051
	[0.038]	[0.041]	[0.039]	[0.062]	[0.037]	[0.033]
Number of children	-0.011	-0.004	-0.015	0.012	0.004	0.006
	[0.016]	[0.021]	[0.013]	[0.018]	[0.022]	[0.020]
Risk attitudes in investment	0.051***	0.039***	0.045***	-0.01	-0.080***	-0.078***
	[0.015]	[0.014]	[0.014]	[0.024]	[0.011]	[0.011]
Present orientation	0.022	0.146***	0.033	-0.089	-0.080*	-0.062
	[0.043]	[0.045]	[0.038]	[0.085]	[0.043]	[0.041]
Log(household income)	0.010	0.022*	0.006	-0.008	-0.024*	-0.022*
	[0.010]	[0.011]	[0.009]	[0.012]	[0.013]	[0.012]
Log(household wealth)	0.195	0.301***	0.230*	-0.275	-0.221**	-0.177*
	[0.124]	[0.113]	[0.119]	[0.169]	[0.099]	[0.092]
Labour market status: Employed	-0.020	-0.062	0.007	0.029	0.053	0.054
	[0.052]	[0.057]	[0.044]	[0.071]	[0.066]	[0.053]
"-": Self-employed	-0.030	-0.058	-0.035	0.039	0.05	0.054
	[0.054]	[0.058]	[0.043]	[0.075]	[0.063]	[0.053]
"-": Retired	-0.060	-0.070	-0.031	0.081	0.049	0.057
	[0.046]	[0.061]	[0.037]	[0.071]	[0.068]	[0.059]
"-": Unemployed	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
"-": Other status	-0.076	-0.150**	-0.051	-0.027	0.253***	0.228***
	[0.056]	[0.064]	[0.040]	[0.067]	[0.074]	[0.066]
Urbanity FE	+	+	+	+	+	+
Region F.E. – NUTS 1	+	+	+	+	+	+
Region F.E. – NUTS 3	+	+	+	+	+	+
%Effect	*-23.1%*	*-16.7%*	*-22.5%*	*3.0%*	*32.7%*	*32.6%*
Linear prediction	*0.265*	*0.4886*	*0.2055*	*0.8906*	*0.3559*	*0.34*
No. of Observations	*3,007*	*3,007*	*3,007*	*3,007*	*3,007*	*3,007*

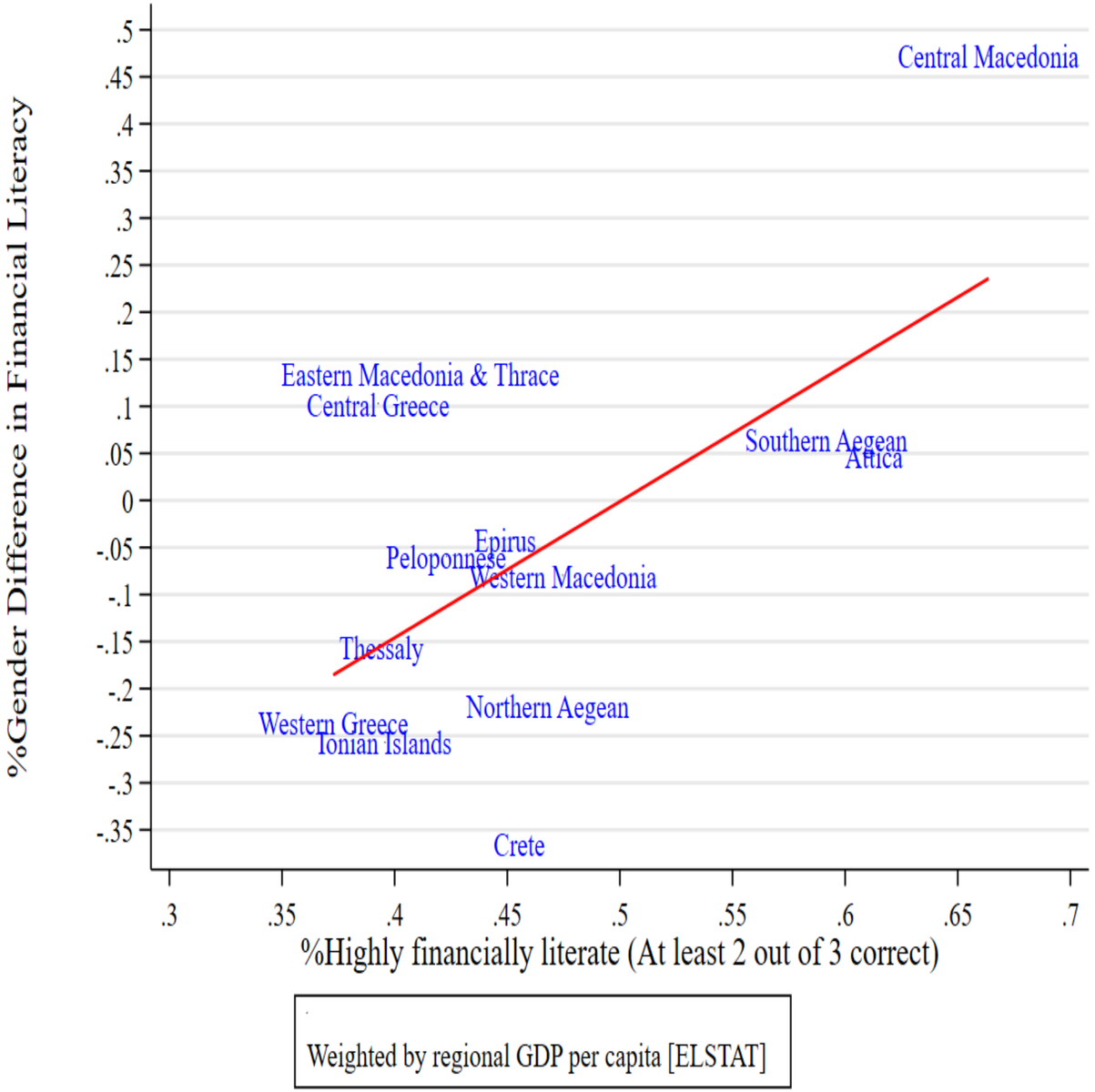
Student Sample: The Effect of the Regional Macro Environment

	GDP per capita		Deposits per capita		%Employed in fin. Sector		%Fin.-related education		%Post-secondary education	
	A_1	A_2	B_1	B_2	C_1	C_2	D_1	D_2	E_1	E_2
Female	-0.105***	0.090	-0.110***	0.036	-0.106***	0.097	-0.107***	0.038	-0.107***	-0.073
	[0.032]	[0.103]	[0.034]	[0.070]	[0.032]	[0.081]	[0.032]	[0.066]	[0.033]	[0.057]
Local/macro environment	0.019***	0.025***	0.025***	0.031***	0.078***	0.109***	0.026***	0.033***	0.003***	0.003***
	[0.007]	[0.008]	[0.006]	[0.007]	[0.029]	[0.036]	[0.008]	[0.010]	[0.001]	[0.001]
Interaction: Female×Macro	–	-0.012*	–	-0.012**	–	-0.062**	–	-0.014*		-0.001
		[0.006]		[0.006]		[0.026]		[0.007]		[0.001]
%Female effect	*-6.9%*	*5.9%*	*-7.2%*	*2.3%*	*-7.0%*	*6.4%*	*-7.1%*	*2.5%*	*-7.0%*	*-4.8%*
Linear prediction	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5223*
No. of observations	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*	*3,028*

- Economic and financial sector development are positively related to student financial literacy
- However, as financial literacy increases in more developed administrative regions, so do the observed gender differences

FL and GD_{FL}


%Gender Difference in Financial Literacy
.25
.2
.15
.1
.05
0
-.05
-.1
-.15
Central Greece
Central Macedonia
Eastern Macedonia & Thrace
Southern Aegean
Attica
Peloponnese
Thessaly
Epirus
Crete
Western Macedonia
Western Greece
Northern Aegean
Ionian Islands
1.1 1.15 1.2 1.25 1.3 1.35 1.4 1.45 1.5 1.55 1.6 1.65 1.7 1.75 1.8 1.85
Financial Literacy: Number of correct responses
Weighted by regional GDP per capita [ELSTAT]

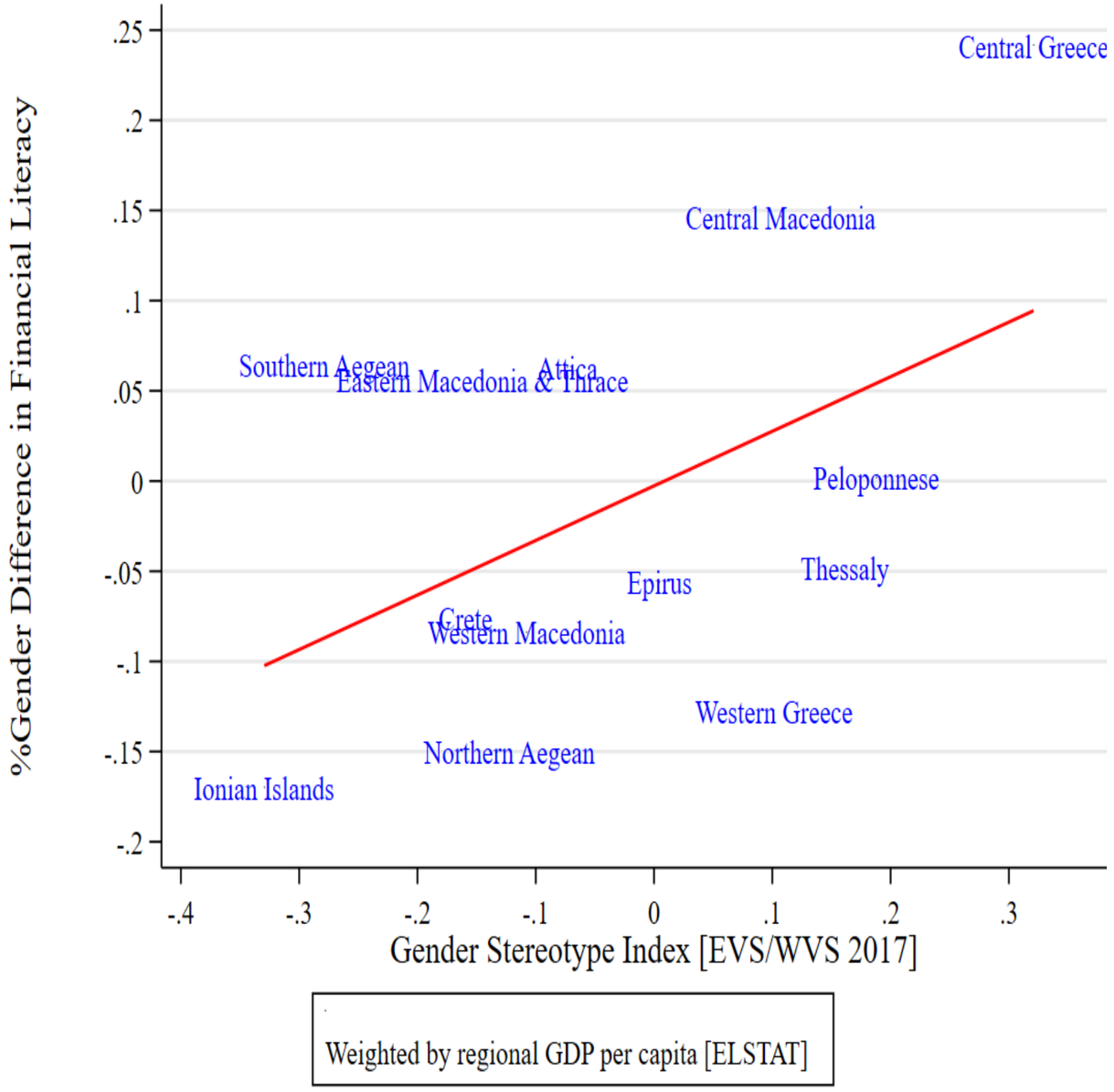

%Gender Difference in Financial Literacy
.5
.45
.4
.35
.3
.25
.2
.15
.1
.05
0
-.05
-.1
-.15
-.2
-.25
-.3
-.35
Central Macedonia
Eastern Macedonia & Thrace
Central Greece
Southern Aegean
Attica
Epirus
Peloponnese
Western Macedonia
Thessaly
Northern Aegean
Western Greece
Ionian Islands
Crete
.3 .35 .4 .45 .5 .55 .6 .65 .7
%Highly financially literate (At least 2 out of 3 correct)
Weighted by regional GDP per capita [ELSTAT]

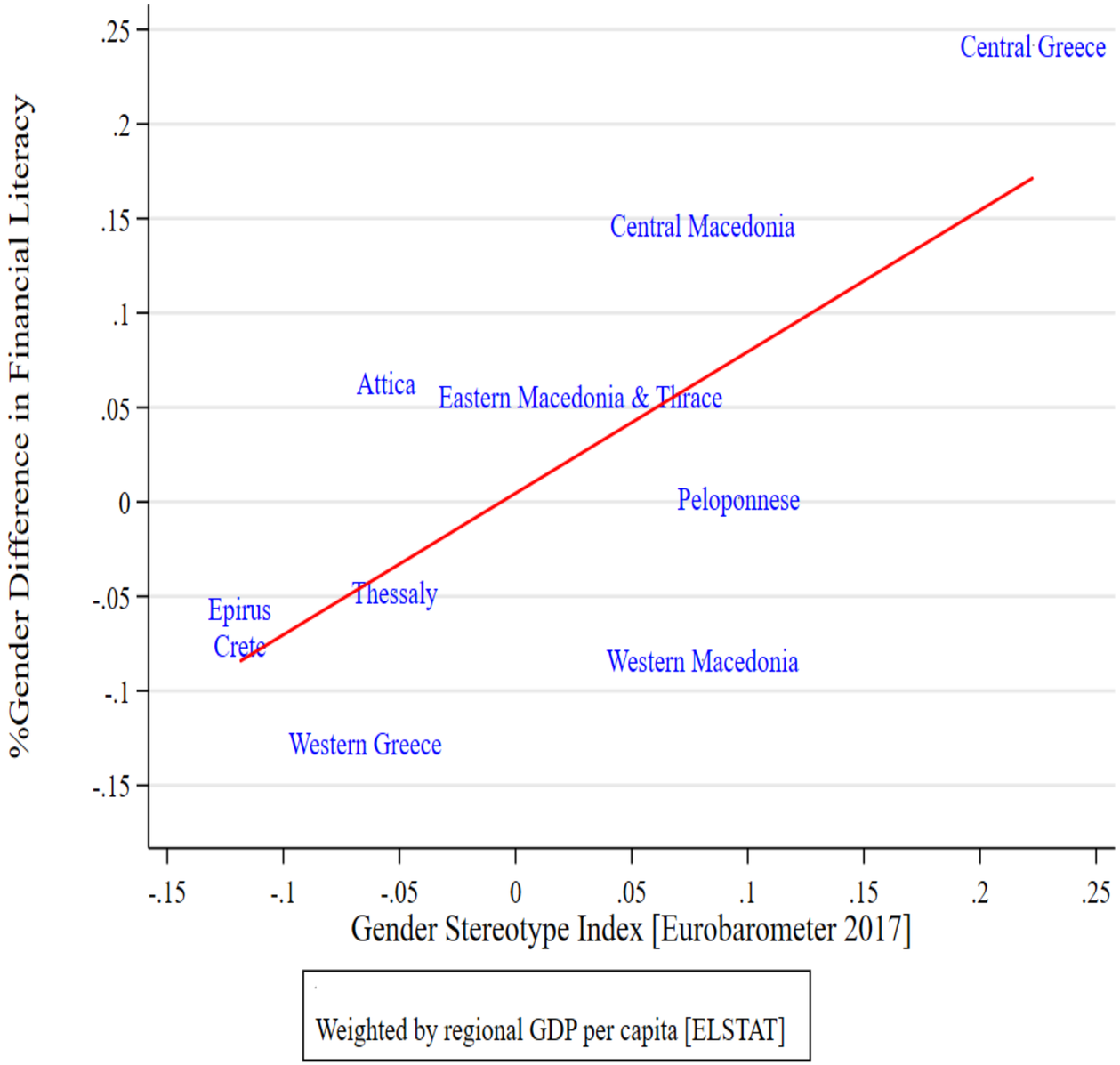
Do Stereotypes Matter? (Student sample)

	Average wage gap (LFS)		Predicted wage gap (LFS)		%Find acceptable that women are paid less for the same job (Eurobarometer)		Stereotype index (Eurobarometer)		Stereotype index (EVS/WVS)		%Female managers (LFS)	
	A_1	A_2	B_1	B_2	C_1	C_2	D_1	D_2	E_1	E_2	F_1	F_2
Female	-0.101***	-0.040	-0.100***	-0.053	-0.113***	0.008	-0.116***	-0.117***	-0.102***	-0.102***	-0.099***	-0.186***
	[0.031]	[0.037]	[0.030]	[0.038]	[0.033]	[0.054]	[0.034]	[0.035]	[0.031]	[0.032]	[0.030]	[0.053]
Stereotype	0.768*	1.386**	0.391	0.828*	-1.089***	-0.357	-0.767***	-0.373	-0.451***	-0.233	-0.022	-0.064
	[0.447]	[0.582]	[0.343]	[0.462]	[0.356]	[0.489]	[0.237]	[0.312]	[0.108]	[0.144]	[0.038]	[0.045]
Female×Stereotype	–	-1.276**	–	-0.910**	–	-1.514***	–	-0.812***	–	-0.453***	–	0.089**
		[0.526]		[0.453]		[0.496]		[0.247]		[0.144]		[0.034]
Linear prediction	*1.5223*	*1.5223*	*1.5223*	*1.5223*	*1.5318*	*1.5318*	*1.5318*	*1.5318*	*1.5223*	*1.5223*	*1.5223*	*1.5223*
No. of observations	*3,028*	*3,028*	*3,028*	*3,028*	*2,675*	*2,675*	*2,675*	*2,675*	*3,028*	*3,028*	*3,028*	*3,028*

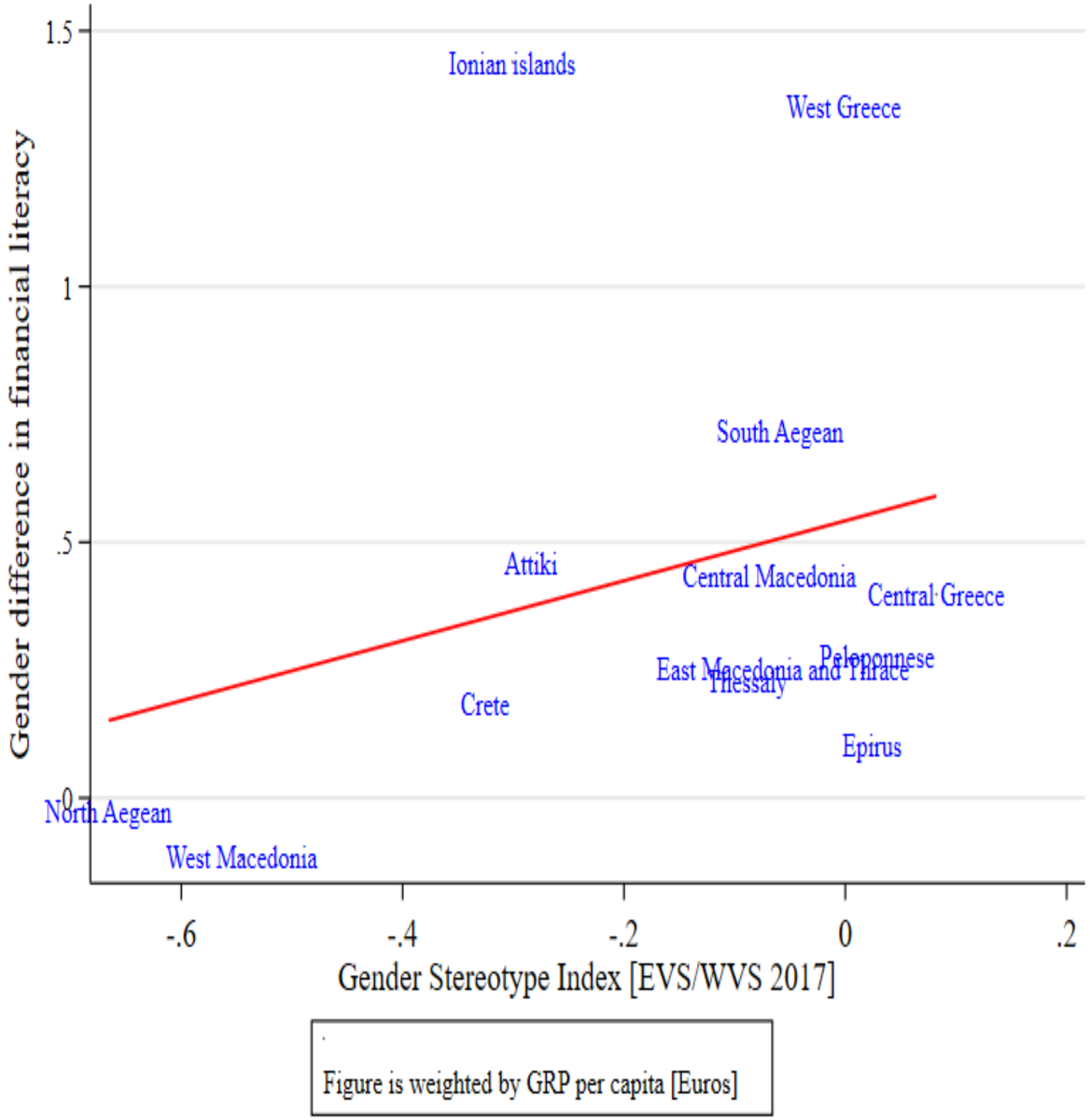
- Stereotypes against women appear negatively related to the financial literacy of students
- Moreover, the seem to exacerbate the related gender differences

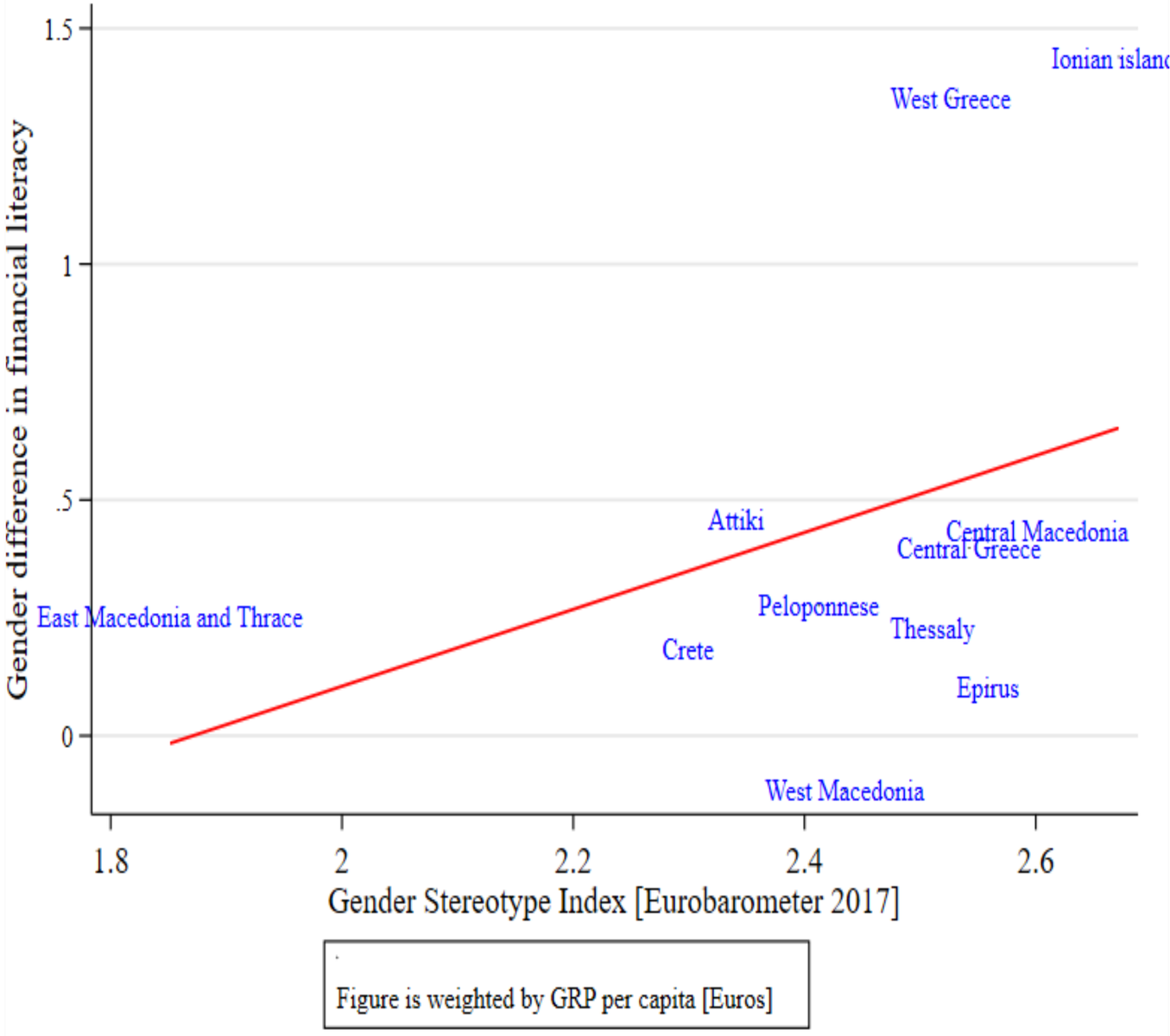
Do Stereotypes Matter? (Student sample)





Do Stereotypes Matter? (Adult sample)





Oaxaca Decomposition of the Gender Differences (Student sample)

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

Panel A: Main model					
		Female	**Male**	**Gap**	
Mean values		1.489***	1.554***	-0.065*	[0.038]
		Explained		**Unexplained**	
Component contribution		**0.038***	**[0.020]**	**-0.103*****	**[0.027]**
	Migrant	0.001	[0.002]	0.010	[0.013]
	Student performance	0.042***	[0.014]	0.580	[0.410]
	School variables	0.001	[0.005]	-0.066	[0.041]
	Income-related	-0.001	[0.008]	0.165**	[0.082]
	Parental variables	-0.003	[0.011]	0.197	[0.133]
	Administrative Regions	0.001	[0.000]	-0.004	[0.076]
	No. of Observations		*3,007*		
Panel B: Models with local context variables					
(B_1)	GDP per capita	0.001	[0.001]	-0.280**	[0.110]
(B_2)	Deposits per capita	0.001	[0.002]	-0.188**	[0.077]
(B_3)	%Employed in fin. Sector	0.001**	[0.000]	-0.230**	[0.093]
(B_4)	%Fin.-related education	0.001***	[0.000]	-0.109	[0.078]
(B_5)	%Post-secondary education	0.001***	[0.000]	-0.095*	[0.052]
Panel C: Models with regional gender stereotype controls					
(C_1)	Average wage gap (LFS)	0.001	[0.001]	-0.075***	[0.026]
(C_2)	Predicted wage gap (LFS)	0.001	[0.001]	-0.069***	[0.024]
(C_3)	% acceptable that women are paid less for the same job	-0.001***	[0.000]	-0.121**	[0.046]
(C_4)	Stereotype index (Eurobarometer)	-0.001***	[0.000]	-0.001***	[0.000]
(C_5)	Stereotype index (EVS/WVS)	-0.001***	[0.000]	-0.001**	[0.000]
(C_6)	%Female managers (LFS)	0.001	[0.001]	0.078**	[0.032]

Oaxaca Decomposition of the Gender Differences (Adult sample)

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

Panel A: Main model					
		Female	**Male**	**Gap**	
Mean values		0.674***	0.931***	*-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]
No. of Observations		*3,007*			
Panel B: Models with local context variables					
(B_1)	GDP per capita	0.001	[0.002]	-0.189*	[0.106]
(B_2)	Unemployment	0.001	[0.001]	0.407	[0.310]
(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)	%Employed in financial $sector_{LFS}$	0.001	[0.002]	-0.103*	[0.053]
(C_2)	%Graduates: Finance & $Related_{LFS}$	0.001	[0.002]	-0.140*	[0.072]
(C_3)	$Deposits\ per\ capita_{LFS}$	0.002	[0.003]	0.021**	[0.010]
Panel D: Models with regional gender stereotype controls					
(D_1)	Females in managerial positions $_{LFS}$	0.001	[0.002]	0.108*	[0.064]
(D_2)	Median $wage\ gap_{LFS}$	0.002	[0.002]	-0.061**	[0.028]
(D_3)	Gender stereotype $index_{EVS/WVS}$	0.005	[0.004]	-0.004*	[0.002]
(D_4)	Gender stereotype $index_{Eurobarometer}$	0.001	[0.001]	-0.006*	[0.004]

Can Stereotypes Affect Economic Outcomes?

- Guiso et al. (2006) argue about the several channels through which culture affects economic outcomes.
- Boschini (2016) argues that gender-specific educational choices have macroeconomic consequences in terms of economic growth.
  - The presence of a social norm affecting persons choosing gender atypical educations at the university level generates a suboptimal allocation of ability, which lowers technological change and the stock of human capital, and thus hurts growth.
- Alan et al. (2018) find that gender stereotyping exerts a causal effect on classroom achievement, with the effect being from teacher stereotypes negatively affecting girls' performance
- G**ender stereotyping holds back financial performance and that female directors help improve financial performance (Compton, et al., 2019)**
- Acunto, Malmendier and Weber (2020) present experimental evidence that expectations about macro-finance variables, such as inflation, vary significantly across genders, even within the same household. We conjecture that traditional gender roles expose women and men to different economic signals in their daily lives, which in turn produce systematic variation in expectations.

Gender Stereotypes Around the World

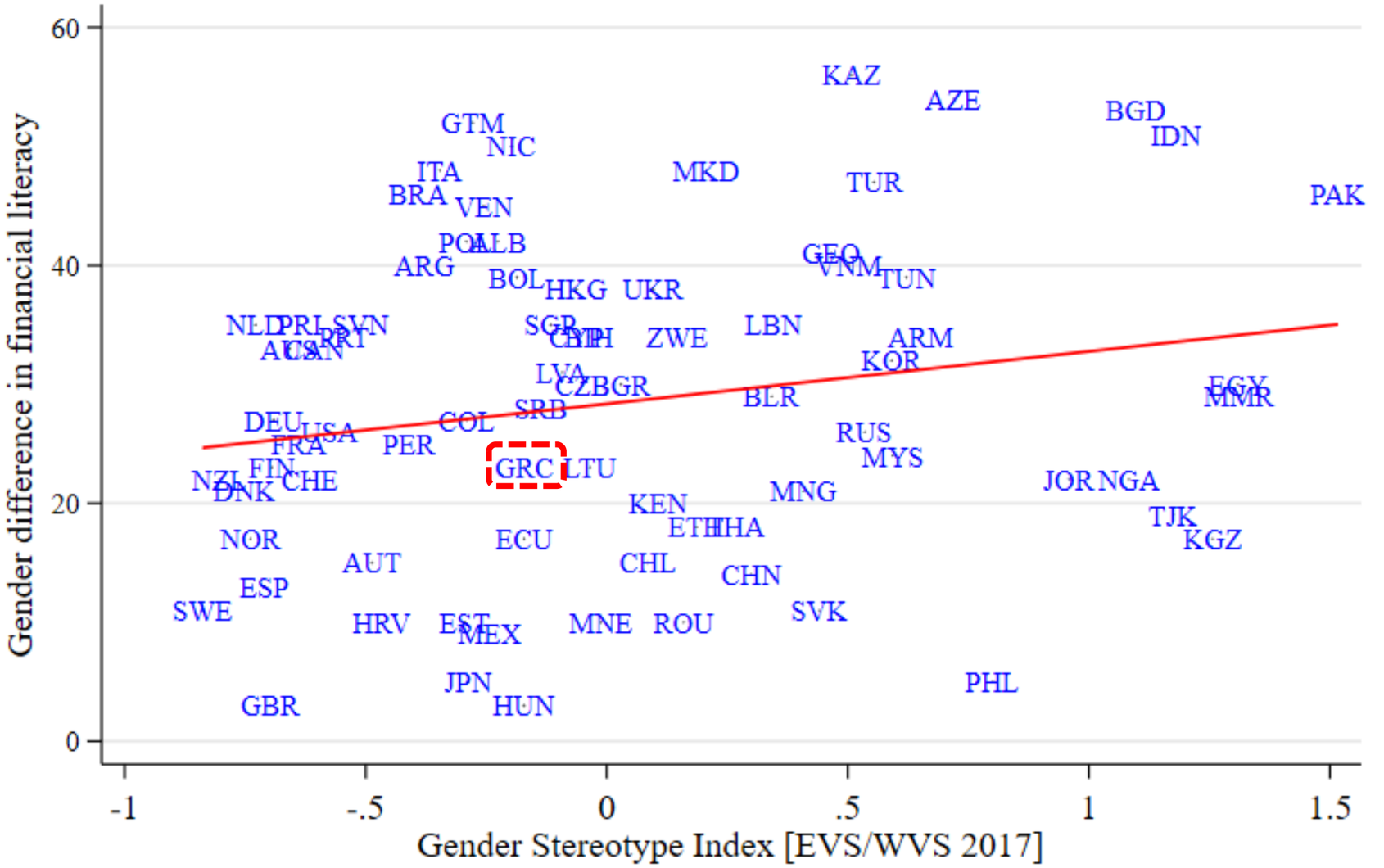


Figure is weighted by GDP per capita, International 2017

Gender Stereotypes in Europe

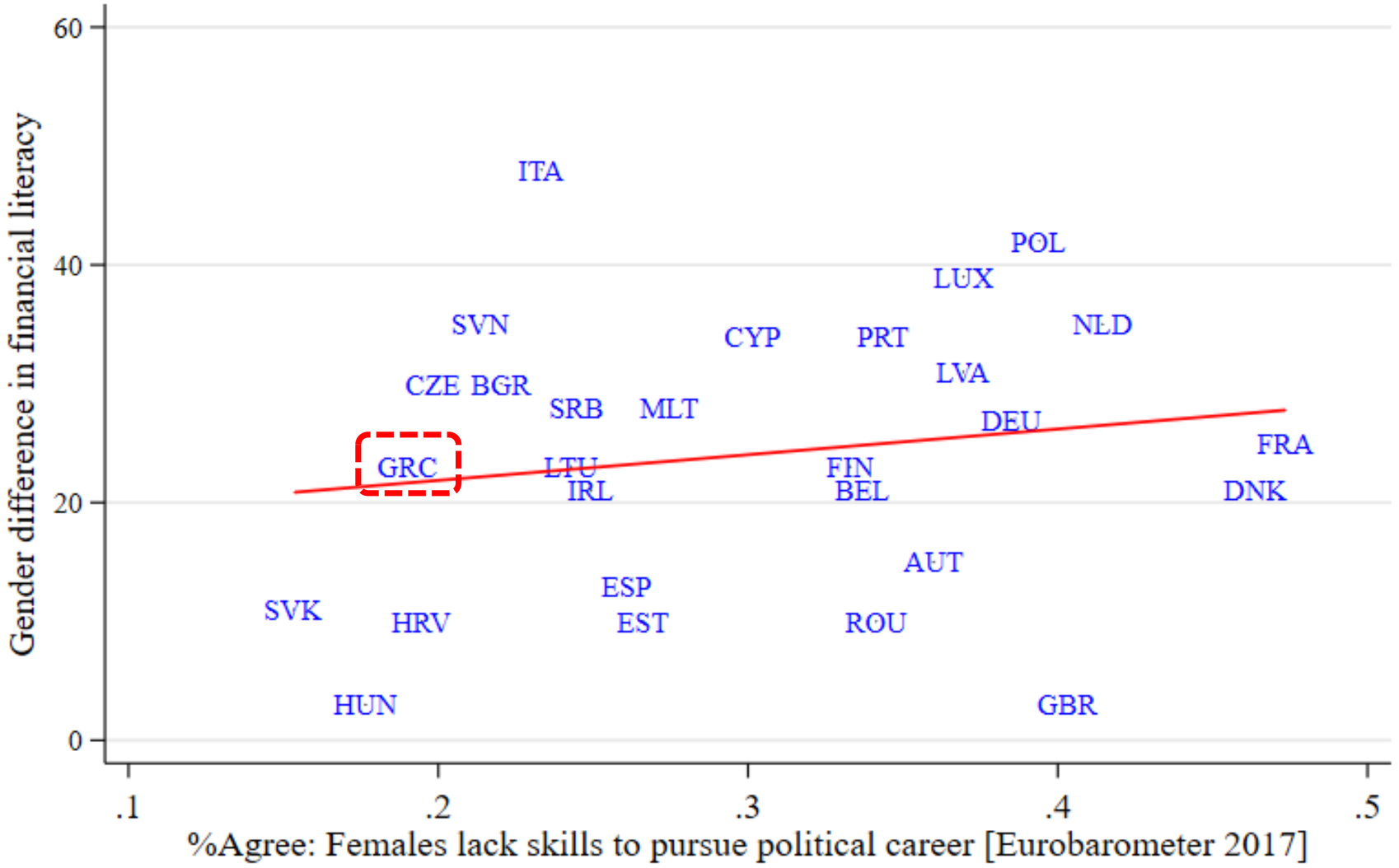


Figure is weighted by GDP per capita, International 2017

Do gender differences in financial literacy matter elsewhere?

Student sample

- Using multivariate linear regression analysis and OECD's terminology, Tzora, Filippas and Panos (2023) find that the gender difference in the overall financial capability of students in Greece manifests itself in all financial knowledge, behaviour, and attitudes

	Financial capability (≥70% correct)	Financial knowledge score	Financial behaviour score	Financial attitude score
	(1)	(2)	(3)	(4)
Female	-0.047***	-0.176***	-0.182***	-0.094*
	[0.016]	[0.038]	[0.033]	[0.054]
Migrant	0.011	-0.035	-0.090*	0.034
	[0.024]	[0.050]	[0.053]	[0.069]
Grade Point Average	0.057***	0.189***	0.052***	0.111***
	[0.005]	[0.016]	[0.012]	[0.014]
Grade repetition	-0.023	-0.126	-0.233	0.055
	[0.040]	[0.145]	[0.141]	[0.144]
School type: Experimental	0.324***	1.337***	0.540***	0.763***
	[0.018]	[0.044]	[0.040]	[0.046]
–"–: Art/Music	-0.201***	-0.256	0.189	-0.737
	[0.036]	[0.214]	[0.738]	[0.633]
–"–: Day	{*Ref.*}	{*Ref.*}	{*Ref.*}	{*Ref.*}
Private school	-0.060***	0.047	0.464***	-0.591***
	[0.018]	[0.040]	[0.040]	[0.047]
Two-parent household	-0.040*	-0.034	0.052	-0.096
	[0.023]	[0.071]	[0.055]	[0.082]
Father's education	0.006***	0.020***	0.007	0.011*
	[0.002]	[0.006]	[0.005]	[0.007]
Mother's education	0.003	0.015***	0.010*	0.006
	[0.002]	[0.006]	[0.005]	[0.005]
Income knowledge	0.099***	0.329***	0.188***	0.245***
	[0.019]	[0.058]	[0.039]	[0.056]
Income decline perception	0.081***	0.295***	0.077*	0.179***
	[0.018]	[0.047]	[0.043]	[0.053]
#Pocket money	-0.001	-0.007**	-0.011***	0.005
	[0.001]	[0.003]	[0.002]	[0.003]
School FE	+	+	+	+
Var(Dependent variable)	0.177***	1.176***	0.789***	1.282***
	[0.005]	[0.035]	[0.024]	[0.030]
$Cov(\varepsilon_{1,2})$, $Cov(\varepsilon_{1,3})$, $Cov(\varepsilon_{1,4})$	–	0.302***	0.133***	0.171***
		[0.009]	[0.008]	[0.008]
$Cov(\varepsilon_{2,3})$–$Cov(\varepsilon_{2,4})$	–	–	0.647***	0.784***
			[0.026]	[0.029]
$Cov(\varepsilon_{3,4})$	–	–	–	0.182***
				[0.018]
#Observations (Population)		*3,028 (105,525)*		

Do gender differences in financial literacy matter elsewhere?

Adult sample (HFCS)

- In the crisis-hit Greece of 2017, females are 17.5% less likely to be financially resilient, i.e., to have liquid assets worth 3 months their annual consumption
- However, the more financially literate women are significantly more likely to be financially resilient
- Females are 37% more likely to seek assistance from friends & relatives, and they are 47.1% more likely to do so while living below the poverty line
- Financially literate females are less likely to rely on friends & relatives, and to so while in poverty

	Financial resilience		**Assistance from friends/relatives**		**Below the poverty line & receiving assistance**	
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.085***	-0.130***	0.031***	0.057***	0.017**	0.038***
	[0.023]	[0.031]	[0.012]	[0.018]	[0.008]	[0.011]
Financial literacy: #Correct responses	0.030*	0.001	-0.011	0.006	-0.001	0.013*
	[0.016]	[0.017]	[0.008]	[0.010]	[0.005]	[0.007]
Female × Financial literacy	–	0.059**	–	-0.034**	–	-0.028***
		[0.028]		[0.015]		[0.009]
Log(age)	-0.093	-0.093	-0.112***	-0.111***	-0.019	-0.018
	[0.056]	[0.057]	[0.036]	[0.036]	[0.019]	[0.019]
Education: Tertiary	0.196***	0.191***	-0.023	-0.02	-0.014	-0.012
	[0.047]	[0.046]	[0.019]	[0.019]	[0.011]	[0.011]
"-": Upper post-secondary	0.099***	0.097***	-0.001	0.001	0.003	0.004
	[0.032]	[0.032]	[0.018]	[0.018]	[0.012]	[0.012]
"-": Lower post-secondary	0.093**	0.093**	-0.001	-0.001	0.006	0.007
	[0.039]	[0.039]	[0.021]	[0.021]	[0.016]	[0.016]
"-": Primary	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
Marital status: Single	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
"-": Married/Relationship	-0.081**	-0.082**	-0.018	-0.018	-0.002	-0.001
	[0.040]	[0.040]	[0.022]	[0.022]	[0.012]	[0.012]
"-": Widow/Divorced	-0.039	-0.038	0.037	0.036	0.030*	0.030*
	[0.046]	[0.046]	[0.027]	[0.027]	[0.016]	[0.016]
Number of children	-0.049**	-0.051**	-0.013	-0.013	0.002	0.002
	[0.021]	[0.021]	[0.012]	[0.012]	[0.007]	[0.007]
Risk attitude in investment	0.026**	0.027**	0.005	0.005	0.001	0.001
	[0.012]	[0.012]	[0.007]	[0.007]	[0.004]	[0.004]
Present orientation	-0.133***	-0.135***	0.032	0.034	0.018	0.019
	[0.037]	[0.036]	[0.023]	[0.023]	[0.012]	[0.012]
Log(household income)	-0.041***	-0.042***	-0.039***	-0.039***	-0.028***	-0.028***
	[0.008]	[0.008]	[0.010]	[0.010]	[0.009]	[0.009]
Log(household wealth)	0.633***	0.642***	-0.023	-0.029	-0.012	-0.016
	[0.109]	[0.108]	[0.058]	[0.060]	[0.036]	[0.036]
Labour market status: Employed	0.314***	0.314***	-0.082*	-0.082*	-0.118***	-0.118***
	[0.060]	[0.059]	[0.047]	[0.047]	[0.039]	[0.039]
"-": Self-employed	-0.144**	-0.144**	-0.103**	-0.103**	-0.115***	-0.115***
	[0.059]	[0.059]	[0.047]	[0.047]	[0.040]	[0.040]
"-": Retired	-0.074	-0.071	-0.081*	-0.083*	-0.110***	-0.112***
	[0.059]	[0.058]	[0.047]	[0.047]	[0.039]	[0.039]
"-": Unemployed	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*	*{Ref.}*
"-": Other type of employment	-0.06	-0.056	0.009	0.007	-0.157***	-0.159***
	[0.062]	[0.061]	[0.068]	[0.069]	[0.053]	[0.052]
Urbanity	+	+	+	+	+	+
Region F.E. – NUTS2	+	+	+	+	+	+
% Female effect	*-17.5%*	*-26.8%*	*37.0%*	*68.0%*	*47.1%*	*105.2%*
Linear prediction	*0.4845*	*0.4845*	*0.0838*	*0.0838*	*0.0361*	*0.0361*
No. of Observations	*3,007*	*3,007*	*3,007*	*3,007*	*3,007*	*3,007*

Conclusions

- For a national strategy for financial education to be fulfilled, it is essential to identify the needs and gaps via measurement, so as to target the groups that might lag, especially the young
- Our evidence shows that there is a small significant gender gap in the financial literacy of 15-year-olds in Greece
  - The gap seems to genuine, as females are more likely to respond wrong in a question, rather than say they do not know the answer
- The gender gap in financial knowledge becomes larger in the adult sample
  - In the adult sample, females are more likely to respond DK/DA, rather than wrong
- There are large regional discrepancies with lower scores in the central and the western part of Greece.

Conclusions

- The current curriculum, which entails a generic home-economics course for ages 13-14 and lacks a personal-finance component does not seem to foster financial capability, as less than one-third of students are able to reach OECD's 70% threshold.
- The local environment seems to affect the prevalence and extend of gender differences in financial literacy
- Prefectures and administrative regions lagging in economic and financial development exhibit lower student financial literacy.
  - However, more developed regions also show higher gender differences in financial literacy
- Gender stereotypes against women exert a large negative impact on both overall financial literacy, and an even greater impact on the financial literacy of females

Some Points of Caution

- Fernandez, et al. (2014): Early financial education interventions did not seem to have a lasting effect 2 years after the reform
- Kaiser, et al (2022): More recent and effective financial literacy programmes have lasting effect in downstream behaviours later in life
- Burke, et al. (2023): Using variation in state financial education mandates for high school students across US states and over time, they find that financial education improves subjective financial well-being and objective financial situations, especially among men and those who obtain college degrees.
  - However, they find that individuals who end their education with a high school diploma actually have lower subjective financial well-being in states with mandated financial education, even though these students report they are less likely to spend more than their income as young adults.