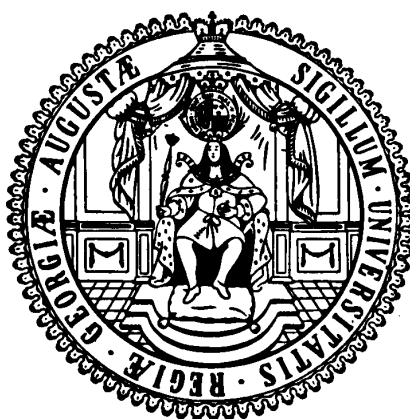# Ibero-Amerika Institut für Wirtschaftsforschung
Instituto Ibero-Americano de Investigaciones Económicas
Ibero-America Institute for Economic Research
(IAI)

Georg-August-Universität Göttingen
(founded in 1737)

Diskussionsbeiträge · Documentos de Trabajo · Discussion Papers

Nr. 254

Gender gaps in financial literacy in three Southern Cone countries: Argentina, Chile, and Paraguay

José Espinoza-Delgado, Jacques Silber

March 2022

Gender gaps in financial literacy in three Southern Cone countries: Argentina, Chile, and Paraguay.[*]

José Espinoza-Delgado[†]and Jacques Silber[‡]

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Abstract

Understanding why women are less financially literate than men is crucial for developing effective policies that decrease gender inequalities and improve women's financial literacy, agency and empowerment. Accordingly, in this paper, we adopt a multidimensional approach to measure financial literacy; rather than focusing solely on financial knowledge, as most empirical work has done, we also take into account what has been referred to in the literature as financial behavior and financial attitude. We analyze financial capability data from Argentina, Chile and Paraguay and consider the answers given to 27 questions covering the three domains mentioned above. We find that there are statistically significant gender differences in these countries, which we confirm through extensive econometric analysis. We also conduct a traditional Oaxaca-Blinder decomposition, which indicates that the respective role played by the "explained" and "unexplained" part varies across countries.

Keywords: Gender inequality; financial literacy; South America; Argentina; Chile; Paraguay

JEL Codes: D14 • G11 • G41 • I24

1 Introduction

Gender equality has been the subject of many public policy debates, its promotion has been at the forefront of policy objectives of governments and international organizations around the world for more than two decades (Arora, Braunstein, and Seguino, 2021), and it is at the center of sustainable development, as reflected in Goal 5 of the post-2015 development agenda that calls for achieving gender equality as well as empowering all women and girls (UN, 2015, p. 14).

There is by now an extensive literature on the various aspects of gender inequality, its determinants and its impact on economic growth and development, as well as on why women are key to economic development (for example, Nussbaum and Glover, 1995; Dollar and Gatti, 1999; Klasen, 2002, 2018, 2020; Osmani and Sen, 2003; Quisumbing, 2003; Deere and Doss, 2006; Berik, G., van der Meulen Rodgers, and Seguino, 2009; Klasen and Lamanna, 2009; Duflo, 2012; Kabeer and Mitra, Bang, and Biswas, 2015; Kabeer, 2016). This is a topic of great importance in both developed and developing countries, not only from a normative point of view, but also because of its policy implications; gender equality is also an important development objective in its own right, not least because of the link between a number of gender equality measures, such as education, health, and employment, and higher rates of economic growth and development (Duflo, 2012; Braunstein and Seguino, 2018).

There are several intrinsic and instrumental grounds to be concerned about existing gender gaps in different well-being-related dimensions (Robeyns, 2003; Espinoza-Delgado and Klasen, 2018; Dilli, Carmichael, and Rijpma, 2019). From a well-being and equity point of view, gender inequalities are a form of injustice, may reduce people's well-being and undermine women's agency and empowerment (Sen, 2000; Kabeer, 1999, 2016; Klasen, 2002; Klasen and Wink, 2003; Qizilbash, 2005; Deere and Doss, 2006; World Bank, 2011; Hanmer and Klugman, 2016; Donald, Koolwal, Annan, Falb, and Goldstein, 2020); from an instrumental perspective, gender gaps may, in turn, have an impact on economic growth, productivity, and development (Berik et al., 2009; Klasen and Lamanna,

2009; World Bank, 2011; Duflo, 2012; Kabeer and Natali, 2013; Mitra et al., 2015).[1]

After decades of seemingly continuous advance in lessening gender inequality, "since about 2000, there has been an unexpected stagnation and regress in many dimensions of gender inequality" in developing as well as developed countries (Klasen, 2020, p. 2). As a result, gender differences continue to exist in many domains, in particular when looking at data, for example, on labor force participation rates, occupational distribution and job segregation (Braunstein, 2013; Sparreboom, 2014; Seguino, 2016; Klasen, 2020; Borrowman and Klasen, 2020; Arora et al., 2021; Waitkus and Minkus, 2021); school enrollment rates and adult literacy rates (Goldin, 2006); mortality and life expectancy at birth (Sen, 1998; Klasen and Wink, 2002, 2003;); care burdens, domestic responsibilities, and expenditures within the household (Thomas, 1993; Kabeer, 2004; Anxo et al., 2011; Braunstein, van Staveren, and Tavani, 2011); access to assets and credit (Doss, 2013); the extent of food security (Johnston, Stevano, Malapit, Hull, and Kadiyala, 2015); political decision making (Austen and Mavisakalyan, 2016;); the capacity to cope with natural disasters, the probability to remain safe and survive in times of conflict (Brück and Schindler, 2008); multidimensional poverty (Espinoza-Delgado and Klasen, 2018; Tekgüç and Akbulut, 2021); and vulnerability to poverty (Klasen, Lechtenfeld, and Povel, 2015).

One aspect of gender inequality that has received less attention from researchers and policymakers concerns the issue of financial literacy; this topic has become quite popular in recent years, especially in the wake of the past global financial crisis, which had far-reaching economic consequences (Lusardi and Mitchell, 2014; Mitchell, 2017), and has proven to be a mechanism for reducing inequalities and improving women's financial behavior, agency and empowerment (Lusardi, Michaud, and Mitchell, 2017; Cupák, Fessler, and Schneebaum, 2021; Tinghög et al., 2021). In the framework of the OECD International Network on Financial Education (OECD/INFE), it has been defined as "a combination of awareness, knowledge, skills, attitude and behaviors necessary to make sound financial decisions and ultimately achieve individual financial wellbeing" (Atkinson

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[1] As emphasized by the World Bank (2011, p. 3), gender equality matters in its own right; so just as development means less income-poverty or better access to justice, it should also mean fewer differences in well-being between men and women. Gender equality is also "smart economics": it can improve economic efficiency and enhance other development outcomes.

and Messy, 2011, p. 659).

Lusardi and Mitchell (2008, 2011, and 2014) were among the first to attempt to estimate the extent of financial literacy; they focused their attention on three aspects of financial literacy: the notions of compound interest, inflation rates, and risk diversification; they have found, for example, that the overall financial literacy score is 53% in Germany, 50% in Switzerland, 31% in France, 30% in the United States, but 4% in Russia. Likewise, Lusardi et al. (2017) have also found that educational programs designed to inform people about risk diversification have increased the risk and, in general, the financial literacy of those who have participated in these programs. Lusardi (2019) has also explained why financial education is so important.

Studies dealing with the determinants of financial literacy have shown that it is positively related to income (see, e.g., Klapper, Lusardi, and Panos, 2015) and education (see, e.g., Calvet, Campbell, and Sodini, 2009), that employees and self-employed people are more financially literate than unemployed people (see, e.g., Lusardi and Mitchell, 2011), that financial literacy is lower in rural than in urban areas (see, e.g., Klapper and Panos, 2011), and that even religion (Alessie, van Rooij, and Lusardi, 2011), political opinions (Arrondel, Debbich, and Savignac, 2013) and ethnicity (Nejad and O'Connor, 2016) matter. In turn, regarding the impact of financial literacy, it appears that financial literacy and financial management skills are correlated (Jappelli and Padula, 2013), that people with lower financial literacy use more costly forms of borrowing (Lusardi and Scheresberg, 2013), have lower consumption growth (Jappelli and Padula, 2017), tend to use informal sources of borrowing (Klapper, Lusardi, and Panos, 2012), plan worse for retirement (Boisclair, Lusardi, and Michaud, 2017; Mitchell, 2017), are less likely to invest in stocks (Arrondel, Debbich, and Savignac, 2012), and even, when they participate in financial markets, they earn a lower return on their investment (Chu, Wang, Xiao, and Zhang, 2017; Clark et al., 2017). More recently, Song (2020) has found that explaining the concept of compound interest to subjects living in rural China increased their pension contributions by approximately 40%.

The literature on financial literacy has also highlighted that women are less financially literate than men, as emphasized, for example, in the section on gender differences in

financial literacy in Lusardi and Mitchell's (2014) survey on the economic importance of financial literacy. Fonseca et al. (2012) have examined possible explanations for the gender gap in financial literacy, including the role of marriage and who within the couple makes financial decisions. Hung et al. (2012) have reviewed the literature on gender differences in financial literacy and concluded that, on average, women perform worse than men on financial knowledge tests and are less confident in their financial skills. Almenberg and Dreber (2015) have explored the link between basic financial literacy and the gender gap in stock market participation. Driva et al. (2016), using data from a field study conducted in German schools among adolescents aged 13-15, have concluded that stereotypical beliefs play a role in the formation of the gender gap in financial literacy. Bannier and Neubert (2016) have studied financial risk-taking and found that sophisticated investments are significantly related to perceived financial literacy. Ghosh and Vinod (2016) have observed a significant gender gap in India in both access to and use of finance. Using data from several countries, Grohmann (2016) has stressed that cultural differences may play a role. Bucher-Koenen, Lusardi, Alessie, and van Rooij (2017) have found that women are less likely than men to answer financial literacy-related questions correctly and give themselves lower scores on financial literacy self-assessments than men. Hasler and Lusardi (2017) have concluded that, worldwide, only one in three adults understand basic financial concepts and that the gender gap in financial literacy is independent of a country's income level. Agnew et al. (2018) consider that differing financial socialization of children in the home by gender are a possible cause of gender differences later in life. Cupák et al. (2018), using international OECD/INFE micro data, have shown that the gender gap in financial literacy is larger in more developed countries. Using data from the "2012 U.S. National Financial Capability Studies dataset", Chen and Garand (2018) have focused their attention on the gender gap in terms of those who responded "Don't Know (DK)" or gave incorrect answers; they have found that men are more likely to give correct answers, but they have also noted that women are considerably more likely to give DK answers. Robson and Peetz (2020) have found that underlying differences in individual characteristics explain most of the observed gender gap in financial literacy when psychological traits are taken into account. Rink, Walle and Klasen (2021), using nationally representative survey data from India, have concluded that a financial literacy

gender gap is not observed when only matrilineal states are considered.

As far as South America is concerned, Garcia, Grifoni, Lopez, and Mejía (2013) have examined the characteristics of financial education programs in Latin America and the Caribbean while Mejía, Pallota, and Egúsquiza (2015), analyzing the results of a 2014 survey in Bolivia, Colombia, Ecuador, and Peru, concluded that financial capacities were lower among people with limited educational levels, among inactive and unemployed, rural residents, people belonging to the lowest socioeconomic sectors, women and youth (see also Mejía Anzola and Guzmán, 2016). Roa, Garrón, and Barboza (2018) have also focused their attention on Latin America and the Caribbean and concluded that for complex decisions or those requiring more information, such as having a credit, the role of financial literacy may be greater than for simpler decisions, such as having basic savings accounts. Roa and Mejía (2018), in a study on financial decisions of households and financial inclusion in Latin America and the Caribbean, have highlighted the fact that in recent decades much emphasis has been placed on the importance of financial inclusion as a key factor for the development of countries. Azar, Lara and Mejía (2018), in a study on women's financial inclusion in Latin America, have emphasized that financial inclusion is an important factor for women's economic empowerment and autonomy. Most, but not all, studies on financial literacy and inclusion in Latin America and the Caribbean have generally been descriptive; although, the volume edited by Roa and Mejía (2018) includes several papers with an econometric analysis, these have only dealt with one aspect, such as the determinants of holding savings or taking credit.

In this paper, we take a different approach and propose a more comprehensive view of the issue of financial literacy and inclusion by adopting a multidimensional approach to the topic, that is, by defining variables that aggregate numerous aspects of financial literacy and inclusion. First, we adopt Lusardi and Mitchell's approach, and focus solely on financial knowledge, examining the answers given to five questions in this domain. Next, we take a more general view of financial literacy, which considers not only financial knowledge, but also financial behavior and attitude. More specifically, we take into account the answers given to 27 questions, aggregating the answers either by giving equal weight to each question or by applying the so-called "fuzzy approach" to weight the questions (see,

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e.g., Hizgilov and Silber, 2020). In this descriptive section of the paper, we also examine separately the three domains of financial literacy, namely financial behavior, attitude and knowledge. In the second part of the paper, we complement the descriptive analysis by performing a comprehensive econometric analysis in which the dependent variable is the number of questions (out of 27) to which an individual gave a correct answer, while the explanatory variables are various socio-economic characteristics. The choice of these variables was based on the literature on financial inclusion and, in general, on the literature on human capital.

Understanding why women present less financial literacy than men is crucial to developing policies that lessen gender inequalities and enhance women's financial literacy, agency and empowerment (Tinghög et al., 2021). Our analysis reveals that of the three Southern American Cone countries we examined, Chile has the highest and Paraguay the lowest level of financial literacy, with Argentina in the middle. In all three countries, our results suggest that there are statistically significant gender differences, but small in relative terms (less than 10%). In turn, the econometric analysis confirms, when pooling males and females, as well as the three countries, that gender differences are, *ceteris paribus*, significant, with women being the least financially literate. A traditional Oaxaca-Blinder decomposition indicates that, other things constant, in Chile, almost two-thirds of the observed gender difference in financial literacy in this country are due to differences in the characteristics taken into account (age, area of residence, marital status and number of dependent children, level of education, current situation in the labor market, income level and stability of household income and dummy variables that account for who is responsible for day-to-day money management decisions). In Argentina, on the other hand, 85% of the gender gap in financial literacy is related to differences in the coefficients of the explanatory variables. In Paraguay, neither the explained nor the unexplained part of the gender gap is statistically significant at 5%.

2 Methodological strategy

Let us assume a survey that includes questions on various aspects of financial literacy. We will assume that for each question the individual can give a correct or incorrect answer. Let then a_{hk} be a binary variable, equal to 1 if individual h gives a correct answer to question k, to 0 otherwise. Let us first look at the selection of weights for the different questions.

We can give the same weight to all questions or select a criterion that allows us to define the specific weight of each question. Moreover, when choosing these weights, we can consider the entire set of questions or examine various parts of the questionnaire separately, as they cover different aspects of financial literacy, and then decide how to aggregate the results to obtain an overall measure of financial literacy. Appendix A details these possible procedures. Let us first examine the case where we limit ourselves to the case in which we examine the entire questionnaire and give the same weight to each question.

If, overall, there are K questions, the proportion of questions to which the individual h gives a correct answer will be expressed as

$$a_h = \left(\frac{1}{K}\right) \sum_{k=1}^{K} a_{hk} \tag{1}$$

If T refers to the total number of individuals participating in the survey, the proportion of individuals who have given a correct answer to question k will be

$$\bar{a}_k = \left(\frac{1}{T}\right) \sum_{h=1}^{T} a_{hk} \tag{2}$$

If we now consider the whole questionnaire, the proportion $\bar{a}$ of correct answers will be

$$\begin{aligned}
\bar{a} &= \left(\tfrac{1}{T}\right)\left(\tfrac{1}{K}\right) \sum_{h=1}^{T} \sum_{k=1}^{K} a_{hk} = \left(\tfrac{1}{K}\right) \sum_{k=1}^{K} \left[\left(\tfrac{1}{T}\right) \sum_{h=1}^{T} a_{hk}\right] = \left(\tfrac{1}{K}\right) \sum_{k=1}^{K} \bar{a}_k \\
&= \left(\tfrac{1}{T}\right) \sum_{h=1}^{T} \left[\left(\tfrac{1}{K}\right) \sum_{k=1}^{K} a_{hk}\right] = \left(\tfrac{1}{T}\right) \sum_{h=1}^{T} a_h
\end{aligned} \tag{3}$$

If we give a different weight to each question but still analyze the whole questionnaire, we may write, using (2) and following Cerioli and Zani (1990) and Cheli and Lemmi (1995), that the weight of question k will be

$$s_k = \frac{ln\left(\frac{1}{\bar{a}_k}\right)}{\sum_{k=1}^{K} ln\left(\frac{1}{\bar{a}_k}\right)} \tag{4}$$

so that the weighted proportion of questions answered correctly by individual h will be

$$\lambda(h) = \sum_{k=1}^{K} s_k a_{hk} \tag{5}$$

while the weighted proportion of questions to which a correct answer was given in the whole population will be

$$\bar{\lambda} = \left(\frac{1}{T}\right) \sum_{h=1}^{T} \lambda_{(h)} \tag{6}$$

2.1   Data sources

Our empirical analysis is based on the latest financial literacy surveys conducted in three Southern Cone countries:[2] Argentina (2017), Chile (2016), and Paraguay (2016).[3] These survey questionnaires generally included questions on respondents' behavior, attitude and financial knowledge. There were also questions on respondents' socioeconomic characteristics (e.g., age, gender, education, employment status, and income).[4]

The questions on *financial behavior* investigated whether the individual planned his/her expenses, whether he/she saved, what financial products he/she had, how financial prod-

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[2]The datasets used in our analyses are publicly available (these can be retrieved, for example, from: https://scioteca.caf.com/handle/123456789/1086.)

[3]As an example, see Appendix B for the list of questions asked in the survey conducted in Argentina.

[4]The surveys weights were included in the datasets and were computed by the company that was in charge of data collection (IPSOS). According to people from CAF, the Development Bank of Latin America, who gave us the micro data, and IPSOS, in each of the countries, the survey weights were estimated considering "the actual distribution of region, sex and age".

ucts were selected and what financial operations (credit/debit card use, internet payment,...) had been carried out during the last two years. The questions on *financial attitude* asked the individual whether he/she was careful when buying (checking if he/she had resources), if he/she was worried about the future, if he/she preferred spending to saving, if he/she paid on time, if he/she took risks and if he/she controlled his/her wealth. Finally, the questions on *financial knowledge* asked the individual whether the individual thought he/she was more financially literate than others, whether he/she understood the impact of interest on deposits, the relationship between returns and risks, the meaning of inflation, and the notion of diversification (for more details on each question, see Appendix B).

3 Results: descriptive analysis

3.1 Implementing the Lusardi and Mitchell (2008, 2011) approach

This was the first stage of our analysis, given that these two authors pioneered the study of financial literacy and that many studies followed their approach. We used the following questions (see Tables C-1, C-2 and C-3 in Appendix C for the percentage of correct answers given to each question, for the sample as a whole, and separately for men and women):

- Question 23: "Suppose you deposit $ 100,000 in a savings account with an interest rate of 2 percent per year. You make no other payments to this account and do not withdraw any money. How much would be in the account at the end of the first year, after interest payments are made?"

- Question 24: "And at the same 2% interest rate, how much money would be in the account after five years? (Not including fees and taxes). It would be: More than $ 110,000 (1); Exactly $ 110,000 (2); Less than $ 110,000 (3); It is impossible to know from the information given (4)."

- Question 26: "I would like to know if you think the following statement is true or

false: High inflation means the cost of living is rising rapidly."

- Question 25: "I would like to know if you think the following statement is true or false: An investment with a high return is likely to be high risk."

- Question 27: "You are less likely to lose all your money if you invest it in more than one place."

Table 1 gives the percentage of individuals who gave a correct answer to each of these questions. In this table, we observe that the two questions on the interest rate (questions 23 and 24) are those in which we find the lowest percentage of correct answers, regardless of the country. In Argentina the question with the highest percentage of correct answers is question 26 (the one related to the definition of inflation) with 91% of correct answers. In Chile it is question 25 (correlation between return and risk) with also 91% of correct answers, while in Paraguay it is question 26 (the question on inflation) but with only 72% of correct answers. In general, men obtain better results than women, but only in 7 out of the 15 results that we have, this gender difference is significant. It is interesting to note that in question 27 (the one on diversification of risk), in Chile, women do significantly better; apparently, they know better than men that one should not "put all one's eggs in the same basket".

3.2 Overall financial literacy measurement using equal and "fuzzy" weights

Let us first ignore the distinction between financial behavior, attitude and knowledge and look at results based on all the 27 questions we examined. We present the results for two weighting schemes.

The results obtained with these two weighting schemes are shown in Table 2. First, we observe that Chile is the country that obtains the best results, while Paraguay has the lowest level of financial literacy, regardless of the weighting structure used; note that this ranking is also valid if we look at males and females separately.

Table 1: Financial knowledge; proportion (Mean) of individuals who have given a correct answer to questions 23 to 27, and gender differences (Female mean – Male mean). *Sources*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Argentina

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q23 (interest after one year)	0.224	0.012	0.270	0.018	0.176	0.016	-0.094***	0.65
Q24 (interest after five years)	0.369	0.014	0.387	0.020	0.349	0.019	-0.037	0.90
Q25 (correlation risk-return)	0.677	0.013	0.714	0.018	0.640	0.020	-0.074**	0.90
Q26 (definition high inflation)	0.912	0.008	0.915	0.011	0.908	0.012	-0.007	0.99
Q27 (notion of diversification)	0.595	0.014	0.605	0.020	0.584	0.020	-0.021	0.96

Chile

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q23 (interest after one year)	0.188	0.011	0.246	0.018	0.131	0.014	-0.115***	0.53
Q24 (interest after five years)	0.495	0.014	0.522	0.020	0.470	0.020	-0.052	0.90
Q25 (correlation risk-return)	0.911	0.008	0.917	0.011	0.905	0.012	-0.013	0.99
Q26 (definition high inflation)	0.895	0.009	0.899	0.012	0.892	0.012	-0.007	0.99
Q27 (notion of diversification)	0.661	0.014	0.628	0.020	0.692	0.018	0.064*	1.10

Paraguay

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q23 (interest after one year)	0.059	0.007	0.088	0.012	0.033	0.007	-0.055***	0.38
Q24 (interest after five years)	0.388	0.014	0.403	0.020	0.374	0.019	-0.029	0.93
Q25 (correlation risk-return)	0.574	0.014	0.601	0.020	0.550	0.020	-0.051	0.92
Q26 (definition high inflation)	0.723	0.013	0.769	0.018	0.681	0.019	-0.088***	0.89
Q27 (notion of diversification)	0.556	0.014	0.573	0.021	0.540	0.020	-0.033	0.94

Notes: survey weights used, which were estimated by the company that collected the data and considered, in each country, the actual distribution of region, sex and age; SE: standard error at 95% confidence level; *, **, ***: the difference is statistically significant at 5%, 1%, and 0.1%, respectively.

Second, Table 2 also shows that the extent of financial literacy is always higher when equal weights are used than when "fuzzy" weights are considered, and this is true for each of the three countries and for both males and females. This result was to be expected, since a fuzzy approach attaches a lower weight to a question, the greater the number of individuals who have given a correct answer to this question.

We also note that, whatever the country and for both weighting schemes, men do better than women and the resulting gender gap in financial literacy is always statistically significant, although at different degrees, depending on the country and the weighting scheme considered. It is worthy to note, however, that Table 2 indicates that in Argentina, Chile, and Paraguay, the gender difference is small in size and less than 10%, in relative terms, which seems to be a feature of Latin American countries and, more broadly, of developing countries (see, for example, Cupák et al., 2018; Ooi, 2020).

Table 2: Financial literacy in Argentina, Chile, and Paraguay, and gender differences, considering two different weighting structures. *Sources*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Panel I: using equal weights

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.473	0.004	0.484	0.006	0.463	0.006	-0.021*	0.96
Chile	0.601	0.004	0.616	0.006	0.586	0.006	-0.029***	0.95
Paraguay	0.422	0.004	0.432	0.006	0.413	0.006	-0.019*	0.96

Panel II: using fuzzy weights, considering the three domains together

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.346	0.005	0.359	0.007	0.332	0.006	-0.027**	0.92
Chile	0.433	0.005	0.455	0.007	0.412	0.006	-0.043***	0.90
Paraguay	0.293	0.004	0.302	0.006	0.285	0.005	-0.017*	0.94

Notes: survey weights used; SE: standard error at 95% confidence level; *, **, ***: the difference is statistically significant at 5%, 1%, and 0.1%, respectively.

3.3 A graphical representation of gender differences in financial literacy

We adapt here the notion of poverty incidence curve (see, Atkinson, 1987; Foster and Shorrocks, 1988; Fields, 2001). This concept was extended by Duclos et al. (2008) to

analyze multidimensional poverty but their approach is useful mainly in the case where only two domains of financial literacy are considered. If more than two domains are assumed, no graphical representation may be given. We will therefore apply the traditional tool and define a financial illiteracy incidence curve but it should be remembered that the individual financial literacy score is derived from a multidimensional approach to financial literacy measurement.

More precisely, on the horizontal axis, plot these individual financial literacy scores ranked by increasing values. On the vertical axis, for each score, plot the proportion of individuals who have a financial literacy score smaller than or equal to a_h if using equal weights or to s_k if using "fuzzy weight". You then obtain an increasing curve which could be called financial illiteracy incidence curve and it is drawn separately for men and women. If, for example, the curve for men is never below that of women but at least once above that of women, we can conclude that financial literacy is higher among men than among women.

Figure 1 shows the financial illiteracy incidence curve for each of the three countries, assuming "fuzzy weights". It appears that as a whole financial illiteracy is higher among women than among men. For financial literacy scores ranging between 0.25 and 0.8 this gender gap seems to be higher in Chile than in Argentina and Paraguay. For Argentina a gap is observed for financial literacy scores ranging from 0.15 to 0.8 while for Paraguay gender differences seem to exist only for financial literacy scores lying between 0.3 and 0.7.

It is also possible to look separately at each of the three financial literacy domains distinguished and draw the corresponding incidence curves. Appendix D presents the corresponding graphs and results for each of the three countries, as well as the conclusions that may be drawn from such an analysis.
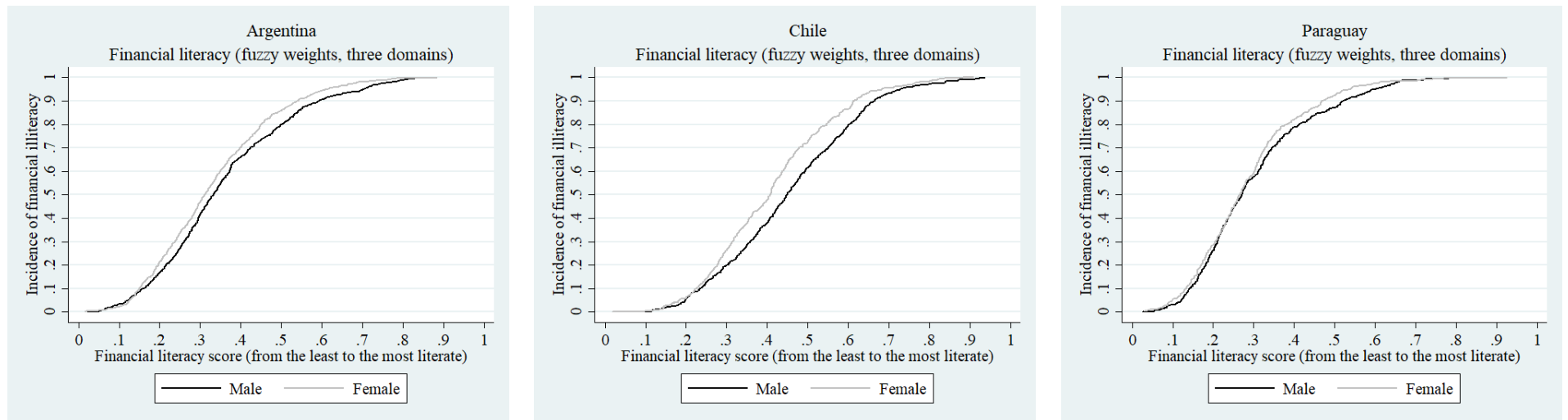
Figure 1: Financial Illiteracy Incidence Curves with "Fuzzy Weights". *Source*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

3.4   Trying to understand the gender gaps in financial literacy: an econometric analysis

Overall, the descriptive analysis presented previously shows that Chile has the highest and Paraguay the lowest level of financial literacy, while Argentina appears to be in the middle. This analysis also suggests that there are statistically significant gender differences in financial literacy in the three Southern Cone countries analyzed, although the size of these gaps, in relative terms, is small and less than 10%, regardless of the weighting structure used.

However, so far we have only taken into account the actual gaps in financial literacy between males and females; but are these gaps still observed when we take into account gender differences in demographic and economic characteristics? To answer such a question we now turn to an econometric analysis.

We first run ordinary least squared (OLS) models, overall and separately for each gender, for the three countries as a whole ("pooled regressions") but also for each of them, Argentina, Chile, and Paraguay. In these regressions the dependent variable is "the number of correct answers out of 27 questions". In the regressions which include males and females, we added a dummy variable equal to 1 for females. In all regressions there is also a set of covariates that the literature on financial literacy has shown to be theoretically and empirically important and that could explain gender differences in this domain (Lusardi and Mitchell, 2011; Fonseca et al., 2012; Cupák, 2018; Bucher-Koenen, 2017; Karakurum-Ozdemir et al., 2019; Preston and Wright, 2019). We therefore included as covariates demographic characteristics: the age (and the square of age), area of residence (a dummy variable equal to 1 for rural areas) and information on the marital status and number of dependent children (three dummy variables corresponding respectively to those married with children, married without children, and divorced with children). We included also socio-economic explanatory variables: the highest level of education achieved (four dummy variables corresponding to the primary, secondary, tertiary and university levels of education), the current labor market status (three dummy variables for those employed full-time, part-time and for those retired), variables related to the individual's

income level (a dummy variable equal to 1 if the individual is poor from a monetary point of view)[5] and to the household's income stability (a dummy variable equal to 1 if the individual's household income is stable). We also included two additional covariates. The first one accounts for who is responsible for the day-to-day money management decisions (two dummy variables or the cases where the decision maker is the individual's partner and when it is someone else). The second covariate introduced in the pooled regressions controls for the individual's country of residence, using Argentina as the base country (two dummy variables for the cases where the individual lives in Chile or in Paraguay). The explanatory variables included in our regressions consider variables typically included in wages equations modelled within a "human capital framework". We therefore consider that "financial literacy is a form of human capital (see, Preston and Wright, 2019, p. 5). The choice of these explanatory variables took also into account the literature on the determinants of financial inclusion in developing countries (Zins and Weill, 2016).

Tables 3 presents the regression results for the three countries as a whole (pooled regressions) while Tables E1, E2 and E3 in Appendix E gives the results for each country separately. In each table, the "All" column reports the results of the regression which includes males and females and hence a dummy variable for the gender (equal to 1 for women), while the "Males" and "Females" columns show the results of separate regressions for men and women.

Let us focus first on the results of the pooled estimates. The "All" column in Table 3 shows that most of the covariates included are statistically significant at 5% or less when the three countries studied, as well as males and females, are pooled together, and the R-square and the adjusted-R-square values indicate that 41% of the variance of the number of correct answers may be explained by these variables, with an F-statistic statistically significant at 0.1%. The coefficient of the gender variable is negative, relatively small in magnitude but highly statistically significant.

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[5]Individuals are considered to be monetarily poor if their income is below the median of the income distribution; in our analysis, we have also considered as monetarily poor those individuals who did not provide information on their income (those under the category "No response"), so that here we are somewhat overestimating monetary poverty.

Table 3: Ordinary least squares (OLS) pooled regressions. *Source*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Outcome: The number of correct answers out of 27 questions	All	Male	Female
Gender: 1 are women, and 0 are men	-0.3818**		
	(0.1340)		
Age	0.0786**	0.0668	0.0928*
	(0.0257)	(0.0356)	(0.0369)
Age, squared	-0.0010***	-0.0008	-0.0014**
	(0.0003)	(0.0004)	(0.0004)
Rural	-0.0987	-0.0680	-0.1081
	(0.1792)	(0.2601)	(0.2437)
Country: Chile	2.9650***	2.6578***	3.1884***
	(0.1632)	(0.2366)	(0.2278)
Country: Paraguay	-1.4128***	-1.4163***	-1.3854***
	(0.1725)	(0.2558)	(0.2328)
Marital status: Married with children	0.4838*	0.2615	0.6799*
	(0.1957)	(0.2710)	(0.2876)
Marital status: Married without children	0.3899*	0.2658	0.4813
	(0.1746)	(0.2468)	(0.2497)
Marital status: Divorced with children	0.3883	0.5046	0.3024
	(0.2252)	(0.3781)	(0.2893)
Education: Primary	1.3253***	1.4220***	1.2982***
	(0.2396)	(0.3265)	(0.3424)
Education: Secondary	2.5123***	2.9342***	2.1264***
	(0.2514)	(0.3479)	(0.3512)
Education: Tertiary	3.9996***	4.6589***	3.3290***
	(0.2760)	(0.3920)	(0.3801)
Education: University	4.7989***	5.3436***	4.2114***
	(0.3323)	(0.4649)	(0.4700)
Income groups: 0 monetarily non-poor; 1 monetarily poor	-1.2888***	-1.5348***	-1.0418***
	(0.1375)	(0.1945)	(0.1930)
Income household stability: 1: Stable; 0: Non-stable	1.0008***	0.8195***	1.2476***
	(0.1592)	(0.2342)	(0.2155)
Decision maker: Partner	-1.2306***	-1.0796**	-1.3853***
	(0.2610)	(0.3917)	(0.3516)
Decision maker: Other	-0.6263**	-0.8344**	-0.3121
	(0.1955)	(0.2747)	(0.2832)
Status: Employed full-time	0.5110**	0.2410	0.7154**
	(0.1576)	(0.2316)	(0.2277)
Status: Employed part-time	0.4086*	-0.1606	0.9072***
	(0.1957)	(0.2942)	(0.2697)
Status: Retired	0.3003	-0.1712	0.7350
	(0.3251)	(0.4833)	(0.4499)
Constant	9.0760***	9.3978***	8.3634***
	(0.6124)	(0.8532)	(0.8779)
Observations	3,651	1,821	1,830
R-squared	0.4167	0.4311	0.4081
Adjusted R-squared	0.413	0.425	0.402
F	104.9	66.29	48.78
p-value	0.0000	0.0000	0.0000

Notes: surveys weights used; robust standard errors in parentheses. Significance levels: ***, **, and * indicate significance at 0.1%, 1%, and 5% respectively.

After holding constant a large number of covariates, on average, financial literacy, as measured by the number of correct answers, is 4.21% (0.3818 points) lower for women than for men, meaning that even after controlling for demographic and economic characteristics, there is a gender gap in financial literacy in the Southern Cone of Latin America.

Table 3 also indicates that the age of individuals is statistically significant at 5% and the sign of the coefficients of the variables age (+) and age-squared (-) suggest an inverted U-shape relationship between age and financial literacy, which is in line with the literature (see, e.g., Karakurum-Ozdemir et al., 2019; Klapper and Lusardi, 2019; Preston and Wright, 2019; Robson and Peetz, 2020). The area of residence of individuals ("Rural" variable) is not statistically significant at 5%, but the marital status variables are collectively statistically significant at 5% [F-test (3, 3630) = 2.73, p-value = 0.0423], and being married seems to have a positive, albeit small, impact on financial literacy. Finally, the results confirm our descriptive analysis in so far as, for the three South America countries analyzed, when introducing dummy variables for the countries, Chile is the country with the highest and Paraguay the one with the lowest level of financial literacy.[6] One reason might be that of the three countries Chile has the highest per capita GDP and Paraguay the lowest.[7]

As expected, the level of education attained is highly statistically significant and has a clear positive effect on financial literacy, confirming thus previous findings in the literature (Karakurum-Ozdemir et al., 2019).[8] On average, *ceteris paribus*, individuals who have not

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[6]These results confirm those of Klapper et al. (2015). The survey they used did not include Paraguay but they found that among the South American countries Chile had the second highest score (41) of adult financial literacy, Uruguay having the highest (45). The scores of the other South American countries were as follows: Argentina: 28; Brazil: 35; Colombia: 32; Costa Rica and the Dominican Republic: 35; Ecuador: 30; Guatemala: 26; Honduras: 23; Nicaragua: 20; Peru: 28. The score of Chile is much smaller than that of countries in Western Europe but it is similar to that of Poland which had a score of 42.

[7]Here are data on the 2020 per capita GDP (in US $): Argentina, 8,433; Chile, 12,612; Brazil, 6,450; Colombia, 5,205; Costa Rica, 11,626; Dominican Republic, 7,445; Ecuador, 5,316; Guatemala, 4,240; Honduras, 2,412; Nicaragua, 1,832; Peru, 5,845; Uruguay, 15,332; Panama, 14,090; Paraguay, 4,909. For more details, see https://en.wikipedia.org/wiki/List_of_Latin_American_and_Caribbean_countries_by_GDP_(nominal).

[8]According to the joint significance F-test [(4, 3630) = 85.35, with a p-value = 0.0000] performed, all education-related variables are collectively significant at 0.1%.

completed any level of education have a lower level of financial literacy, and the financial literacy scores increase strongly (by more than one point) with the level of education. The coefficients of the income-related variables included in our analyses are also highly statistically significant [F-test (2, 3630) = 75.75, p-value = 0.0000]. The results suggest also that being monetarily poor and having an unstable income has a negative effect on financial literacy. Table 3 also indicates that, *ceteris paribus*, financial literacy appears to be lower for individuals who are not responsible for day-to-day money management decisions in their households than for those who are [F-test (2, 3630) = 15.71, p-value = 0.0000], while being employed has a positive effect on financial literacy, although this effect is relatively small.[9]

The regression estimates for men and women are shown separately in Table 3. They suggest that age and marital status do not affect males' financial literacy, but do affect slightly females' financial literacy;[10] education is highly statistically significant and has a strong effect on financial literacy, whether among men or women. Interestingly, in the Southern Cone region of South America, *ceteris paribus*, men seem to benefit more from education than women, a result similar to what the literature has found in other contexts (see, for instance, Fonseca et al., 2012). Having a relatively low income affects men's financial literacy more negatively than women's, while a stable household income has a much more positive impact on female's financial literacy. If the individual's partner is responsible for day-to-day monetary decisions, this situation affects women's financial literacy more negatively than men's; finally, other things equal, being employed seems to have a positive impact, only for women.[11] In Appendix E we present the results of the

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[9]All the labor market status variables included in the model are collectively significant at 1% [F-test (3, 3630) = 3.81, p-value = 0.0096].

[10]By far, marital status variables are not collectively statistically significant at 5% for males [F-test (3, 1801) = 0.83, p-value = 0.4757], and they are for females only at 10% significance level [F-test (3, 1810) = 2.14, p-value = 0.0936]. Therefore, for females, we calculated the variance inflation factor (VIF) to measure multicollinearity; in general, we obtained a VIF of less than 4, except for age and age squared that, by definition, are correlated. In particular, for the marital status variables, we obtained a VIF of less than 2, which means that multicollinearity is not a problem in our model. We also ran a model without the age squared variable and found that age and marital status are still not statistically significant for males at 5%.

[11]The labor market variables are not collectively statistically significant for males at 5% [F-test (3,

regression estimates, separately for Argentina, Chile and Paraguay.

In the final state of our analysis, we implemented the decomposition method developed by Blinder (1973) and Oaxaca (1973), and generalized by Neumark (1988) and Oaxaca and Ransom (1988, 1994), which allowed us to decompose our outcome variable (the number of correct answers out of 27 questions), in each country, between two groups into a part explained by differences in observed characteristics and a part attributable to differences in the estimated coefficients. Table 4 summarizes the Oaxaca-Blinder (O-B) decomposition at the mean of the number of correct responses for men and women, considering the three countries as a whole and separately.

Considering the pooled results, we observe that both the explained and unexplained parts are statistically significant at 5% and that the unexplained part of the estimated gender difference (-0.6411) is larger than the part of the gap explained by differences in the characteristics of the individuals: 59.3% of the overall gender gap is due to these unexplained factors, while 40.7% of the gap is "explained" by differences between men and women in the mean values of the independent variables included in our regressions, i.e., this "explained part" can be attributed to "observable characteristics". These results suggest first that the average human capital (in the large sense of human capital) of men is significantly different from that of the women. Second the statistically significant unexplained component implies that the rates of return on the components of the human capital of men, in the large sense of it, are significantly different from those experienced by women.

Looking at the O-B decomposition by country, Table 4 indicates that in Argentina, only the unexplained part of the gender gap is statistically significant at 5%, and in this country 85.1% of the gap is due to differences in the coefficients (unexplained factors); on the contrary, the table shows that in Chile, only the explained part is statistically significant, and 62.9% of the observed gender difference in this country is due to differences in the ("observable") characteristics of the Chilean people. In Paraguay, unlike the other two countries, the gender gap, as well as the explained and unexplained parts, are not statistically significant at 5%.

1801) = 0.95, p-value = 0.4160].

Table 4: Oaxaca-Blinder decomposition of the gender difference in financial literacy in Argentina, Chile, and Paraguay, as well as considering these countries together (pooled estimates). *Source*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Panel I: Gender difference	Pooled		Argentina		Chile		Paraguay	
Mean (females)	13.1652***		12.4889***		15.8342***		11.1575***	
	(0.1153)		(0.1566)		(0.1763)		(0.1868)	
Mean (males)	13.8062***		13.0683***		16.6302***		11.6574***	
	(0.1209)		(0.1658)		(0.1803)		(0.2005)	
Difference (raw)	-0.6411***		-0.5794*		-0.7960**		-0.4999	
	(0.1671)		(0.2280)		(0.2522)		(0.2741)	
Difference (%)	-4.64%		-4.43%		-4.79%		-4.29%	

Panel II: OB Decomposition	Pooled	% of the difference	Argentina	% of the difference	Chile	% of the difference	Paraguay	% of the difference
Explained	-0.2607*	40.7	-0.0864	14.9	-0.5003***	62.9	-0.0582	11.6
	(0.1208)		(0.1420)		(0.1465)		(0.1943)	
Unexplained	-0.3803**	59.3	-0.4929*	85.1	-0.2957	37.1	-0.4418	88.4
	(0.1334)		(0.2183)		(0.2214)		(0.2626)	
Difference	-0.6411***	100.0	-0.5794*	100.0	-0.7960**	100.0	-0.5000	100.0
	(0.1670)		(0.2280)		(0.2522)		(0.2741)	

Notes: surveys weights used; robust standard errors in parentheses. Significance levels: ***, **, and * indicate significance at 0.1%, 1%, and 5% respectively.

Overall, the unexplained part may be related to social norms across the countries, to social and economic environments (Cupák et al., 2018) or to many other factors, including gender stereotypes and beliefs (Driva et al., 2016), as well as self-confidence (Cupák et al., 2021): "for whatever reason, men and women have very different production processes for financial literacy" (Fonseca et al., 2012, p. 100). Bucher-Koenen et al. (2017, p. 257), for example, found "a persistent gender gap in financial literacy that is independent of socioeconomic background". There is clearly room here for additional and important research.

4 Concluding remarks

This paper adopted a multidimensional approach to the study of financial literacy. It was assumed that financial literacy has three components: financial attitude, financial behavior, and financial knowledge. We were particularly concerned with the differences between men and women in terms of financial literacy and its components. Using data from three Southern Cone countries, namely, Argentina, Chile, and Paraguay, we started with a descriptive analysis that showed that Chile has the highest and Paraguay the lowest level of financial literacy, while Argentina appears to be in the middle. This descriptive analysis also indicated that there are statistically significant gender differences in financial literacy in the three countries analyzed, although the size of these gaps, in relative terms, is small and less than 10%, regardless of the weighting structure used.

We then complemented the descriptive analysis with an econometric analysis. When we pooled the three countries we concluded that gender differences were, *ceteris paribus*, significant, with women again being less financially literate. We also implemented a traditional Oaxaca-Blinder decomposition that showed that in Argentina 85% of the gender gap is due to differences in the coefficients (unexplained factors); in contrast, in Chile, only the explained part is statistically significant, and 63% of the observed gender difference in this country is due to differences in the ("observable") characteristics. Finally, in Paraguay, neither the explained nor the unexplained part of the gender gap was statistically significant at 5%.

Regarding the different explanatory variables, it appears that education, household income and its stability are the main determinants of financial literacy, both when looking at the pooled regression and when considering men and women separately, and this is true regardless of the country considered. From a policy point of view, these results clearly show that by improving the educational level of individuals and increasing household income and its stability, governments will succeed in increasing the financial literacy of individuals and decreasing the gender gap in this domain, two achievements that would certainly have an impact on economic growth and inclusion, as well as on the empowerment of women.

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Appendix A: Selecting weights for each question and part of the questionnaire

As mentioned previously let us assume a survey which includes questions on various aspects of financial literacy and suppose that for each question the individual can give either a correct or a wrong answer. Let then a_{hk} be a binary variable, equal to 1 if individual h gives a correct answer to question k, to 0 otherwise.

A-1: Giving the same weight to all the questions

Looking at all the questions together

If, as a whole, there are K questions, the proportion of questions to which a correct answer is given by individual h will be expressed as

$$a_h = \left(\frac{1}{K}\right) \sum_{k=1}^{K} a_{hk} \tag{A-1}$$

If T refers to the total number of individuals participating in the survey, the proportion of individuals who have given a correct answer to question k will be

$$\bar{a}_k = \left(\frac{1}{T}\right) \sum_{h=1}^{T} a_{hk} \tag{A-2}$$

If we now consider the whole questionnaire, the proportion $\bar{a}$ of correct answers will be

$$\begin{aligned}
\bar{a} &= \left(\tfrac{1}{T}\right)\left(\tfrac{1}{K}\right) \sum_{h=1}^{T}\sum_{k=1}^{K} a_{hk} = \left(\tfrac{1}{K}\right)\sum_{k=1}^{K}\left[\left(\tfrac{1}{T}\right)\sum_{h=1}^{T} a_{hk}\right] = \left(\tfrac{1}{K}\right)\sum_{k=1}^{K}\bar{a}_k \\
&= \left(\tfrac{1}{T}\right)\sum_{h=1}^{T}\left[\left(\tfrac{1}{K}\right)\sum_{k=1}^{K} a_{hk}\right] = \left(\tfrac{1}{T}\right)\sum_{h=1}^{T} a_h
\end{aligned} \tag{A-3}$$

Taking a separate look at each of the "P" parts of the questionnaire

Let us now assume that the questionnaire is divided into $''P''$ parts covering different aspects of financial literacy. Let a_{hk}^{p} be a binary variable equal to 1 if individual h gave a correct answer to question k which belongs to part p of the questionnaire, to 0 otherwise. The proportion of individuals who give a correct answer to question k in part p of the questionnaire will then be

$$\bar{a}_k^p = \left(\frac{1}{T}\right) \sum_{h=1}^{T} a_{hk}^p \tag{A-4}$$

As a consequence, individuals will have given a correct answer to a proportion $\bar{a}^p$ of the questions included in part p of the questionnaire, with

$$\bar{a}^p = \left(\frac{1}{T}\right)\left(\frac{1}{K^p}\right) \sum_{h=1}^{T}\sum_{k=1}^{K^p} a_{hk}^p \tag{A-5}$$

where K^p refers to the total number of questions in part p of the questionnaire.

Note then that $\bar{a}$ in (A-3) may be also defined as

$$\bar{a} = \left(\frac{1}{T}\right) \sum_{h=1}^{T} \sum_{p=1}^{P} \left(\frac{K^p}{K}\right) \left(\frac{1}{K^p}\right) \sum_{k=1}^{K^p} a_{hk}^p = \sum_{p=1}^{P} \left(\frac{K^p}{K}\right) \left[\left(\frac{1}{T}\right) \left(\frac{1}{K^p}\right) \sum_{h=1}^{T} \sum_{k=1}^{K^p} a_{hk}^p\right] = \sum_{p=1}^{P} \left(\frac{K^p}{K}\right) \bar{a}^p$$

$$\text{(A-6)}$$

A-2: Giving a different weight to each question

Analyzing the whole questionnaire

Using (2), and following Cerioli and Zani (1990), and Cheli and Lemmi (1995), the weight of question k will be

$$s_k = \frac{ln\left(\frac{1}{\bar{a}_k}\right)}{\sum_{k=1}^{K} ln\left(\frac{1}{\bar{a}_k}\right)} \tag{A-7}$$

so that the weighted proportion of questions answered correctly by individual h will be

$$\lambda(h) = \sum_{k=1}^{K} s_k a_{hk} \tag{A-8}$$

while the weighted proportion of questions to which a correct answer was given in the whole population will be

$$\bar{\lambda} = \left(\frac{1}{T}\right) \sum_{h=1}^{T} \lambda_{(}h) \tag{A-9}$$

Looking at part p of the questionnaire

Using (A-3), the weight of question k in part p of the questionnaire will be

$$s_k^p = \frac{ln\left(\frac{1}{\bar{a}_k^p}\right)}{\sum_{k=1}^{K^p} ln\left(\frac{1}{\bar{a}_k^p}\right)} \tag{A-10}$$

so that the weighted proportion of questions to which individual h gave a correct answer in part p of the questionnaire will be

$$\lambda^p(h) = \sum_{k=1}^{K^p} s_k^p a_{hk} \tag{A-11}$$

while the weighted proportion of questions to which individuals in the whole population gave a correct answer part p will be

$$\bar{\lambda}^p = \left(\frac{1}{T}\right) \sum_{h=1}^{T} \lambda^p(h) \tag{A-12}$$

A-3: Aggregating all k parts

Given $\lambda^p(h)$ as it was defined in (A-11), we can now derive an alternative proportion $\lambda'(h)$ of the questions to which a correct answer was given by individual h in the whole questionnaire where

$$\lambda'(h) = \sum_{p=1}^{P} w_p \lambda^p(h) \qquad \text{(A-13)}$$

where w_p is the weight given to part p. This weight w_p may be defined, in a way similar to that in which we defined in (A-10) the weight of a given question, so that we would write that

$$w_p = \frac{ln\left(\frac{1}{\lambda^p}\right)}{\sum_{p=1}^{P} ln\left(\frac{1}{\lambda^p}\right)} \qquad \text{(A-14)}$$

But it is also possible to assume that this weight (w_p) would be equal to the share of the number of questions in part p in the total number of questions in the whole questionnaire. It is also possible to give the same weight to each part p, no matter how many questions it includes, in which case we would write that $w_p = (1/P)$.

No matter which weight is selected, when we proceed in two stages, the alternative measure of the proportion of questions to which individuals in the population gave on average a correct answer will be expressed as

$$\bar{\lambda}' = \left(\frac{1}{T}\right) \sum_{h=1}^{T} \lambda'(h) \qquad \text{(A-15)}$$

Appendix B: The list of questions in each financial literacy domain

B-1: Financial behavior

Q1: Does your family usually make a plan of the expected income and expected expenses in order to organize the purchases and savings of the household? (Equal 1 if yes)

Q2: In the past 12 months, have you been saving money or not, whether or not you have the money yet? (Equal 1 if yes)

Q3: If today you face an important expenditure, equivalent to your personal monthly income, will you be able to cover this expenditure without taking a loan or ask for the help of family members or friends? (Equal 1 if yes)

Q4: And now can you tell me if you currently have any of these financial products ("Individually"- the product is in your name- or "Together with other people"- the product is in your name and that of other people)?

- For Argentina: (at least one of these products) Savings deposits; Deposits in checking account; Time deposits; Deposits in foreign currency accounts; Investment in stocks; Investments in government securities; Investments in mutual funds; Contributions to private retirement funds.

- For Chile: (at least one of these products) Savings account; Fixed deposit; Voluntary Pension Savings (APV); Pension funds (AFP); Stock investment; Mutual funds.

- For Paraguay: (at least one of these products) Savings or checking account; Term Deposit or scheduled savings (CDA); Saving wheel or circle; Investments in shares, public securities or mutual funds; Contributions to private retirement funds (not IPS).

Q5: Which of the following options best describes the way you chose the last financial product you acquired? You compared various products in different financial institutions (1); you compared various products but in the same financial institution (2); you did not compare (3); you intended to compare but could not get information on other products (4). (Variable equal to 1 if the answer given was (1) or (2).

Q6: Did you do the following operations during the past two years?

- For Argentina: Variable equal to 1 if the answer is Yes to one of the following operations: 1) Transfers between bank accounts by home banking, i.e. internet banking, including the use of smart phones; 2) Payment of services by home banking, i.e. internet banking, including the use of smart phones; 3) Payment of services by automatic debit (direct debit). This variable is equal to 0 otherwise.

- For Chile: Question: please indicate the level of use for each of the following items (How often did you use?): Variable equal to 1 if the answer to one of the following illustrations is "Use little; Use moderately; Use a lot; OR Always use": Use of Electronic Transfer ; ATM machine ; Machine for payment with Redcompra or other card (POS); Automatic Payment in Checking Account; Automatic Payment by Credit Card; Telephone banking; Internet (financial or payment activities via Internet Banking). The variable is equal to 0 otherwise.

- For Paraguay: Variable equal to 1 if the answer is Yes to one of the following operations: - 1) Transfers between bank accounts via the Internet, including the use of smart phones or computers; 2) Payment of services through the use of smart phones or computers (money orders, electronic wallet, automatic debit, etc.). The variable is equal to 0 otherwise.

Q7: Did you do the following operations during the past two years?

- For Argentina: Deposits of money in savings or current accounts...

- For Chile: Question: please indicate the level of use for each of the following items (How often did you use?): 1) Cash (attention in bank branch); 2) Premises other than banks, such as cashiers neighbor, Multi-box, etc. (Correspondence)...- This variable is equal to 1 if the answer is "Use little; Use moderately; Use a lot; Always use) are "Use little; Use moderately; Use a lot; or Use always). The variable is equal to 0 otherwise.

- For Paraguay: Deposits of money in savings or current accounts... The variable is equal to 1 if the answer is positive, to 0 otherwise.

Q8: Did you do the following operations during the past two years?

- For Argentina: Variable equal to 1 if at least one of these options was used: In the last two years you carried out purchases in stores with a debit card; Purchases in stores with a credit card in one payment; Online purchases with a credit card; Purchase in installments with a credit card.

- For Chile: Question: please indicate the level of use for each of the following items (How often did you use?): 1) Debit cards; 2) Credit card (bank); 3) Credit Card (Non-Bank). The variable is equal to 1 if the answers to at least one option was "Use little; Use moderately; Use a lot; Use always". The variable is equal to 0 otherwise.

- For Paraguay: Variable equal to 1 if at least one of these options was used:: In the last two years you carried out purchases in stores with a debit card (1), purchases in stores with a credit card (2), internet purchases with a credit card (3). The variable is equal to 0 otherwise.

B-2: Financial attitude

I am going to read some statement about attitudes and behavior toward money. Can you tell me if this statements relates to you? The number 1 refers to "completely disagree" and the number 5 to "completely agree".

Q9: Argentina, Chile and Paraguay: Before you buy something do you carefully check whether you can afford it? (Variable equal to 1 if the answer is 4 or 5).

Q10: Argentina, Chile and Paraguay: I prefer to live on a day to day basis and not bother about tomorrow. (Variable equal to 1 if the answer is 1 or 2).

Q11: Argentina, Chile and Paraguay: I prefer spend the money rather than save it for the future (variable equal to 1 if the answer is 1 or 2).

Q12: Argentina, Chile and Paraguay: I pay on time. (Variable equal to 1 if the answer is 4 or 5).

Q13: Argentina, Chile and Paraguay: I am ready to risk part of my own money to make an investment. (Variable equal to 1 if the answer is 4 or 5).

Q14: Argentina, Chile and Paraguay: I personally monitor my financial issues (Variable equal to 1 if the answer is 4 or 5).

Q15: Argentina, Chile and Paraguay: I set long-term savings goals and strive to achieve them. (Variable equal to 1 if the answer is 4 or 5).

Q16: Argentina, Chile and Paraguay: .The money is there to be spent. (Variable equal to 1 if the answer is 1 or 2).

Q17: Argentina, Chile and Paraguay: Sometimes people find that their income is not enough to cover their expenses. In the last 12 months, has this happened to you? (Variable equal to 1 if the answer is "Yes").

Q18: Argentina, Chile and Paraguay: In the event that you lose your main source of income, how long can you continue to cover your expenses without borrowing money? (The possible answers are: Less than a week (1); At least a week, but less than a month (2); At least one month, but less than three months (3); At least three months, but less

than six months (4); More than six months (5). This variable will be equal to 1 f the answers are (3), (4) or (5)).

B-3: Financial knowledge

Q19: Argentina, Chile and Paraguay: Could you tell me how would you rate your general knowledge of financial matters compared to other adults in Argentina? The possible answers are "Very high" (1), "Quite high" (2), "Average" (3), "Quite low" (4) and "Very low" (5). (Variable equal to 1 if the answer is (1) or (2)). Chile: variable is equal to 1 if the answer is 1 in variable M1.

Q20: Argentina, Chile and Paraguay: Imagine that five siblings receive a gift / inheritance of $ 1,000,000 (1 million pesos). If the brothers have to share the money equally, how much does each receive? (Variable equal to 1 if the answer is 200,000; in Paraguay if the answer is 2,000,000).

Q21: Argentina, Chile and Paraguay: Now imagine that the brothers have to wait a year to get their share of the million pesos out of the safe and inflation remains at 3 percent per year. After one year, will they be able to buy...? The possible answers are: More with their share of the money than they could buy today (1); the same quantity (2); Less than they could buy today (3); it depends on the things they want to buy (4). (Variable equal to 1 if the answer is (3).

Q22: Argentina, Chile and Paraguay: Suppose you loaned $ 500 to a friend one night and he paid you back this $ 500 the next day. Did your friend pay any interest on this loan? (Variable equal to 1 if the answer is 0 in Argentina; K3_Codes2 = 1 in Chile; and K4 = 2 in Paraguay).

Q23: Argentina, Chile and Paraguay: Suppose you put $ 100,000 in a savings account with an interest rate of 2 percent per year. You do not make any other payments to this account and do not withdraw money. How much would be in the account at the end of the first year, once payment of the interest is made? (Variable equal to 1 if the answer is $ 102,000).

Q24: Argentina, Chile and Paraguay: And with the same 2 percent interest rate, how much money would the account have at the end of five years? (Commission and taxes are not included) It would be: More than $ 110,000 (1); exactly $ 110,000 (2); Less than $ 110,000 (3); It is impossible to tell with the information given (4). (Variable equal to 1 if the answer is (1).

Q25: Argentina, Chile and Paraguay: I would like to know if you think the following statement is true or false: An investment with a high return is likely to be high risk. The possible answers are "True" (1); "False" (2). (Variable equal to 1 if the answer is 1).

Q26: Argentina, Chile and Paraguay: I would like to know if you think the following statement is true or false: High inflation means the cost of living is rising rapidly. The possible answers are "True" (1); "False" (2). (Variable equal to 1 if the answer is 1).

Q27: Argentina, Chile and Paraguay; you are less likely to lose all your money if you invest it in more than one place. The possible answers are "True" (1); "False" (2). (Variable equal to 1 if the answer is 1).The possible answers are: More with their share of the money than they could buy today (1); The same amount (2); Less than they could buy today (3); It depends on the things that want to buy (4).

Appendix C: Detailed results by country, gender and question for financial behavior, attitude and knowledge

Table C-1: Financial behavior; proportion (Mean) of individuals who give a correct answer to question "Q" and gender difference. Sources: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Argentina

| Question | The whole population | | Male | | Female | | Gender difference | |
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q1	0.550	0.014	0.541	0.020	0.559	0.020	0.018	1.03
Q2	0.292	0.013	0.325	0.019	0.258	0.018	-0.067**	0.79
Q3	0.308	0.013	0.357	0.019	0.257	0.018	-0.100***	0.72
Q4	0.328	0.013	0.328	0.019	0.328	0.019	0.000	1.00
Q5	0.148	0.010	0.139	0.014	0.157	0.015	0.018	1.13
Q6	0.305	0.013	0.297	0.018	0.313	0.019	0.016	1.05
Q7	0.231	0.012	0.259	0.018	0.203	0.016	-0.056**	0.78
Q8	0.608	0.014	0.570	0.020	0.647	0.020	0.077***	1.14
Overall	**0.346**	**0.007**	**0.352**	**0.010**	**0.340**	**0.010**	**-0.012**	**0.97**

Chile

| Question | The whole population | | Male | | Female | | Gender difference | |
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q1	0.824	0.011	0.817	0.016	0.831	0.015	0.014	1.02
Q2	0.625	0.014	0.624	0.020	0.626	0.019	0.002	1.00
Q3	0.498	0.014	0.534	0.020	0.464	0.020	-0.069**	0.87
Q4	0.359	0.014	0.386	0.020	0.332	0.019	-0.053**	0.86
Q5	0.261	0.013	0.303	0.019	0.222	0.017	-0.081***	0.73
Q6	0.805	0.011	0.827	0.015	0.784	0.016	-0.043*	0.95
Q7	0.823	0.011	0.848	0.015	0.798	0.016	-0.050**	0.94
Q8	0.666	0.013	0.696	0.019	0.636	0.019	-0.060**	0.91
Overall	**0.608**	**0.006**	**0.629**	**0.009**	**0.587**	**0.009**	**-0.042*****	**0.93**

Paraguay

| Question | The whole population | | Male | | Female | | Gender difference | |
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q1	0.402	0.014	0.418	0.021	0.388	0.019	-0.030	0.93
Q2	0.282	0.013	0.296	0.019	0.269	0.018	-0.028	0.91
Q3	0.395	0.014	0.421	0.021	0.371	0.019	-0.050*	0.88
Q4	0.138	0.010	0.134	0.014	0.142	0.014	0.008	1.06
Q5	0.113	0.009	0.116	0.013	0.110	0.013	-0.006	0.95
Q6	0.307	0.013	0.326	0.020	0.290	0.018	-0.036	0.89
Q7	0.153	0.010	0.158	0.015	0.148	0.014	-0.010*	0.94
Q8	0.160	0.011	0.179	0.016	0.143	0.014	-0.035*	0.80
Overall	**0.244**	**0.006**	**0.256**	**0.010**	**0.233**	**0.009**	**-0.023***	**0.91**

Notes: survey weights used; SE: standard error at 95% confidence level; *, **, ***: the difference is statistically significant different from zero at 10%, 5%, and 1%, respectively.

Table C-2: Financial attitude; proportion (Mean) of individuals who give a correct answer to question "Q" and gender difference. *Sources*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Argentina

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q9	0.836	0.011	0.814	0.016	0.858	0.014	0.044**	1.05
Q10	0.443	0.014	0.428	0.020	0.459	0.020	0.030	1.07
Q11	0.424	0.014	0.366	0.019	0.484	0.020	0.118***	1.32
Q12	0.696	0.013	0.689	0.019	0.702	0.019	0.013	1.02
Q13	0.428	0.014	0.473	0.020	0.381	0.020	-0.092***	0.81
Q14	0.762	0.012	0.760	0.017	0.764	0.017	0.003	1.00
Q15	0.485	0.014	0.507	0.020	0.461	0.020	-0.046*	0.91
Q16	0.233	0.012	0.188	0.016	0.280	0.018	0.092***	1.49
Q17	0.293	0.013	0.336	0.019	0.247	0.018	-0.089***	0.74
Q18	0.414	0.014	0.442	0.020	0.385	0.020	-0.056**	0.87
Overall	**0.501**	**0.006**	**0.500**	**0.008**	**0.502**	**0.008**	**0.002**	**1.00**

Chile

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q9	0.841	0.010	0.835	0.015	0.846	0.014	0.011	1.01
Q10	0.513	0.014	0.513	0.020	0.513	0.020	0.000	1.00
Q11	0.476	0.014	0.469	0.020	0.484	0.020	0.015	1.03
Q12	0.818	0.011	0.801	0.016	0.835	0.015	0.034	1.04
Q13	0.489	0.014	0.550	0.020	0.430	0.020	-0.119***	0.78
Q14	0.810	0.011	0.799	0.016	0.820	0.015	0.021	1.03
Q15	0.688	0.013	0.701	0.019	0.676	0.019	-0.024	0.97
Q16	0.274	0.013	0.260	0.018	0.288	0.018	0.028	1.11
Q17	0.457	0.014	0.497	0.020	0.419	0.020	-0.079***	0.84
Q18	0.630	0.014	0.667	0.019	0.594	0.020	-0.073***	0.89
Overall	**0.600**	**0.006**	**0.609**	**0.008**	**0.590**	**0.008**	**-0.019***	**0.97**

Paraguay

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q9	0.749	0.013	0.737	0.018	0.760	0.017	0.023	1.03
Q10	0.345	0.014	0.320	0.019	0.369	0.019	0.048*	1.15
Q11	0.431	0.014	0.392	0.020	0.467	0.020	0.075***	1.19
Q12	0.745	0.013	0.716	0.019	0.772	0.017	0.056**	1.08
Q13	0.478	0.014	0.519	0.021	0.439	0.020	-0.080***	0.85
Q14	0.672	0.014	0.662	0.020	0.682	0.019	0.019	1.03
Q15	0.562	0.014	0.569	0.021	0.556	0.020	-0.012	0.98
Q16	0.252	0.013	0.211	0.017	0.289	0.018	0.078***	1.37
Q17	0.361	0.014	0.402	0.020	0.324	0.019	-0.077***	0.81
Q18	0.550	0.014	0.575	0.021	0.527	0.020	-0.048*	0.92
Overall	**0.515**	**0.005**	**0.510**	**0.007**	**0.519**	**0.007**	**0.008**	**1.02**

Notes: survey weights used; SE: standard error at 95% confidence level; *, **, ***: the difference is statistically significant different from zero at 10%, 5%, and 1%, respectively.

Table C-3: Financial knowledge; proportion (Mean) of individuals who give a correct answer to question "Q" and gender difference. *Sources*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Argentina

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q19	0.117	0.009	0.154	0.014	0.079	0.011	-0.074***	0.52
Q20	0.593	0.014	0.679	0.019	0.504	0.020	-0.175***	0.74
Q21	0.648	0.014	0.646	0.019	0.650	0.019	0.004	1.01
Q22	0.868	0.010	0.880	0.013	0.856	0.014	-0.025	0.97
Q23	0.224	0.012	0.270	0.018	0.176	0.016	-0.094***	0.65
Q24	0.369	0.014	0.387	0.020	0.349	0.019	-0.037	0.90
Q25	0.677	0.013	0.714	0.018	0.640	0.020	-0.074***	0.90
Q26	0.912	0.008	0.915	0.011	0.908	0.012	-0.007	0.99
Q27	0.595	0.014	0.605	0.020	0.584	0.020	-0.021	0.96
Overall	**0.556**	**0.005**	**0.583**	**0.007**	**0.527**	**0.007**	**-0.056***	**0.90**

Chile

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q19	0.250	0.012	0.268	0.018	0.233	0.017	-0.035	0.87
Q20	0.695	0.013	0.732	0.018	0.660	0.019	-0.071***	0.90
Q21	0.291	0.013	0.309	0.019	0.275	0.018	-0.034	0.89
Q22	0.983	0.004	0.987	0.005	0.979	0.006	-0.008	0.99
Q23	0.188	0.011	0.246	0.018	0.131	0.014	-0.115***	0.53
Q24	0.495	0.014	0.522	0.020	0.470	0.020	-0.052*	0.90
Q25	0.911	0.008	0.917	0.011	0.905	0.012	-0.013	0.99
Q26	0.895	0.009	0.899	0.012	0.892	0.012	-0.007	0.99
Q27	0.661	0.014	0.628	0.020	0.692	0.018	0.064**	1.10
Overall	**0.597**	**0.004**	**0.612**	**0.006**	**0.582**	**0.006**	**-0.030***	**0.95**

Paraguay

Question	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Q19	0.147	0.010	0.147	0.015	0.147	0.014	-0.001	1.00
Q20	0.581	0.014	0.628	0.020	0.538	0.020	-0.091***	0.86
Q21	0.436	0.014	0.446	0.021	0.427	0.020	-0.020	0.96
Q22	0.836	0.011	0.851	0.015	0.822	0.015	-0.029	0.97
Q23	0.059	0.007	0.088	0.012	0.033	0.007	-0.055***	0.38
Q24	0.388	0.014	0.403	0.020	0.374	0.019	-0.029	0.93
Q25	0.574	0.014	0.601	0.020	0.550	0.020	-0.051*	0.92
Q26	0.723	0.013	0.769	0.018	0.681	0.019	-0.088***	0.89
Q27	0.556	0.014	0.573	0.021	0.540	0.020	-0.033	0.94
Overall	**0.478**	**0.006**	**0.501**	**0.008**	**0.457**	**0.008**	**-0.044***	**0.91**

Notes: survey weights used; SE: standard error at 95% confidence level; *, **, ***: the difference is statistically significant different from zero at 10%, 5%, and 1%, respectively.

Appendix D: Looking separately at each of the three financial literacy domains distinguished

Here we followed the approach of the O.E.C.D. that suggested that financial literacy is a combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being (Atkinson and Messy, 2011, 2012). We consequently made a distinction between questions related to financial behavior, knowledge and attitude.

If we use equal weights within a given domain, then obviously the weight of each question will be $\left(\frac{1}{K^d}\right)$ where K^d refers to the number of questions in financial literacy domain d. But if we use "fuzzy weights" and limit the analysis to a specific financial literacy domain d, the weight w_k^d of a given question k in this domain will be:

$$w_k^d = \frac{ln\left(\frac{1}{\bar{a}_k}\right)}{\sum_{k=1}^{K^d} ln\left(\frac{1}{\bar{a}_k}\right)} \tag{D-1}$$

Table D-1 presents the results for equal weights. If we look at the whole population we observe that Chile has always the best score, always around 0.600, whatever the domain. Argentina however does better than Paraguay for financial behavior and knowledge but Paraguay does better than Argentina for financial attitude. Note however that the scores of Argentina (0.346) and Paraguay (0.244) for financial behavior are much lower than those of Chile. The previous observations are also true when we look separately at men and women. As far as gender differences are concerned, men do better than women for financial behavior and financial knowledge, whatever the country, but the gap is not significant for Argentina in the case of financial behavior. For financial attitude men do better than women for Chile and the difference is significant. Women do better than men for financial attitude in Argentina and Paraguay but the gap turns out not to be significant.

Table D-2 presents the results when "fuzzy weights" are used. Note that, as expected, the scores are always lower than those observed with equal weights, since the higher the percentage of individuals giving a correct answer to a question, the lower the weight of this question. If we look at the whole population we observe that, in each of the three financial literacy domains, Chile does best. Paraguay has the third rank for financial behavior and knowledge but does somehow better than Argentina for financial attitude. The best scores are obtained for financial attitude, whichever country we look at. As far as differences between the genders are concerned, men do better than women for financial behavior and financial knowledge, but for financial behavior the gap for Argentina and Paraguay is not significant. For financial attitude men do better than women in Chile and the difference is significant. For Argentina and Paraguay there is no significant difference between the genders.

Table D-1: Financial literacy by domain and gender difference, using an equal weights structure. *Sources*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Financial behavior

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.346	0.007	0.352	0.010	0.340	0.010	-0.012	0.97
Chile	0.608	0.006	0.629	0.009	0.587	0.009	-0.042***	0.93
Paraguay	0.244	0.006	0.256	0.010	0.233	0.009	-0.023*	0.91

Financial attitude

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.501	0.006	0.500	0.008	0.502	0.008	0.002	1.00
Chile	0.600	0.006	0.609	0.008	0.590	0.008	-0.019*	0.97
Paraguay	0.515	0.005	0.510	0.007	0.519	0.007	0.008	1.02

Financial knowledge

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.556	0.005	0.583	0.007	0.527	0.007	-0.056***	0.90
Chile	0.597	0.004	0.612	0.006	0.582	0.006	-0.030***	0.95
Paraguay	0.478	0.006	0.501	0.008	0.457	0.008	-0.044***	0.91

Notes: survey weights used; SE: standard error at 95% confidence level; *, **, ***: the difference is statistically significant at 10%, 5%, and 1%, respectively.

Table D-2: Financial literacy by domain and gender difference, using a fuzzy weight structure. *Sources*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Financial behavior

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.294	0.007	0.304	0.010	0.284	0.010	-0.020	0.94
Chile	0.467	0.007	0.495	0.011	0.440	0.010	-0.055***	0.89
Paraguay	0.210	0.006	0.220	0.009	0.201	0.009	-0.019	0.91

Financial attitude

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.408	0.006	0.408	0.008	0.408	0.008	0.000	1.00
Chile	0.496	0.006	0.507	0.009	0.484	0.009	-0.023*	0.95
Paraguay	0.438	0.005	0.433	0.008	0.444	0.008	0.011	1.03

Financial knowledge

Country	The whole population		Male		Female		Gender difference	
	Mean	SE	Mean	SE	Mean	SE	Abs.	Rel.
Argentina	0.345	0.006	0.379	0.009	0.310	0.007	-0.070***	0.82
Chile	0.349	0.006	0.377	0.009	0.323	0.008	-0.053***	0.86
Paraguay	0.290	0.005	0.309	0.008	0.271	0.006	-0.038***	0.88

Notes: survey weights used; SE: standard error at 95% confidence level; *, **, ***: the difference is statistically significant at 10%, 5%, and 1%, respectively.

In Figures D-1 to D-3, we present financial illiteracy incidence curves separately for financial behavior, attitude and knowledge, for each of the three countries, assuming "fuzzy weights".

It appears that, as far as financial behavior is concerned, financial illiteracy is higher among women but such a gap is observed only for some ranges of the financial literacy score. For Argentina, for example, gender differences exist only for ranges of the financial literacy score lying between 0.25 and 0.8. For Chile the corresponding range is much broader, namely from 0.05 to 1. Finally for Paraguay the range where a gender gap is observed lies mainly between 0.1 and 0.35.

In Figure D-2 we present financial illiteracy incidence curves for financial attitude. Gender differences here are difficult to observe. There is in fact no gender gap in financial illiteracy for Argentina, whatever the financial literacy score. For Chile we observe a gap when the financial literacy score lies between 0.3 and 0.4 or above 0.6 and then it appears that women are more financially illiterate. Finally for Paraguay we observe a gap for financial literacy scores lying between 0.3 and 0.5 and between 0.7 and 08 but here financial illiteracy is higher among men.

Finally in Figure D-3 we drew financial illiteracy incidence curves for the case of financial knowledge. We then observe that in Argentina there is a gender gap, men having more financial knowledge, for the whole range of financial literacy scores (from 0 to 1). The same observation may be made for Chile. For Paraguay we observe that men have more financial knowledge mainly for financial literacy scores lying between 0.1 and 0.7.

Figure E-2: Financial Illiteracy Incidence Curves for financial behavior with "fuzzy weights". *Source*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).

Figure E-2: Financial Illiteracy Incidence Curves for financial attitude with "fuzzy weights". *Source*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).
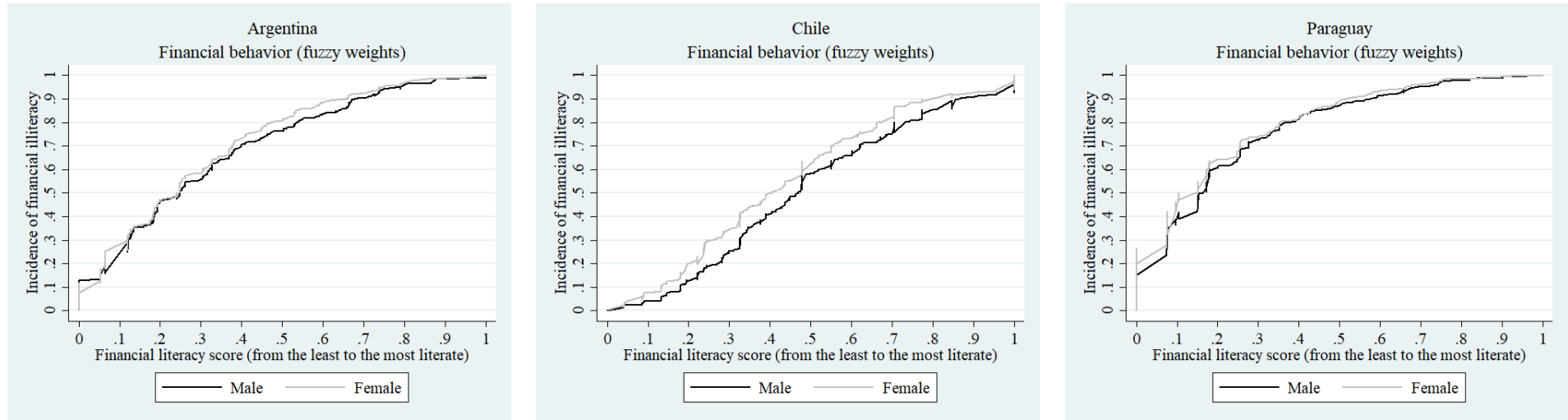
Figure E-2: Financial Illiteracy Incidence Curves for financial knowledge with "fuzzy weights". *Source*: Authors' estimates based on financial capability surveys of Argentina (2017), Chile (2016), and Paraguay (2016).
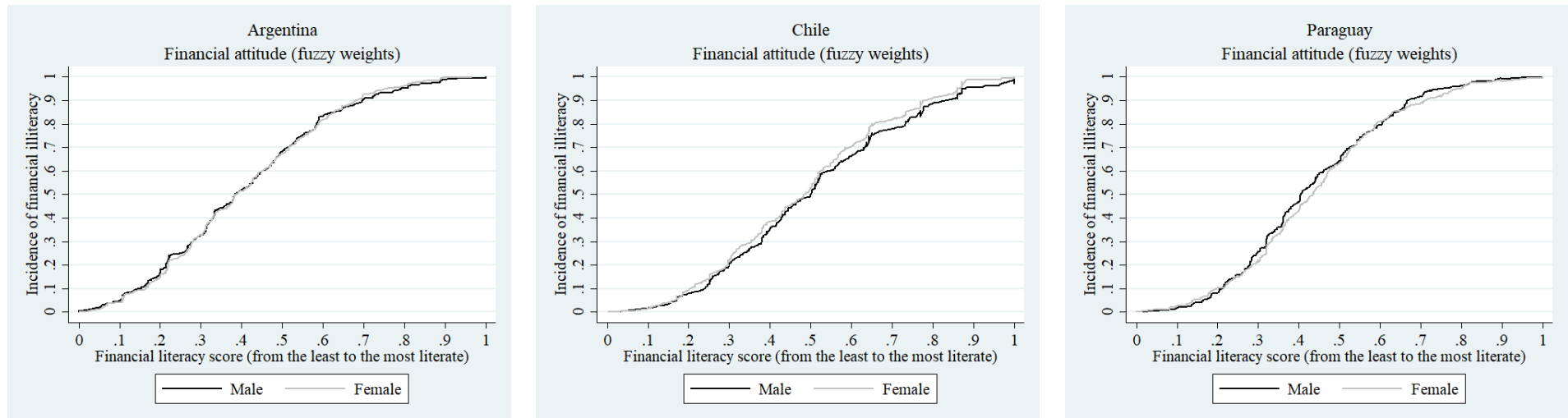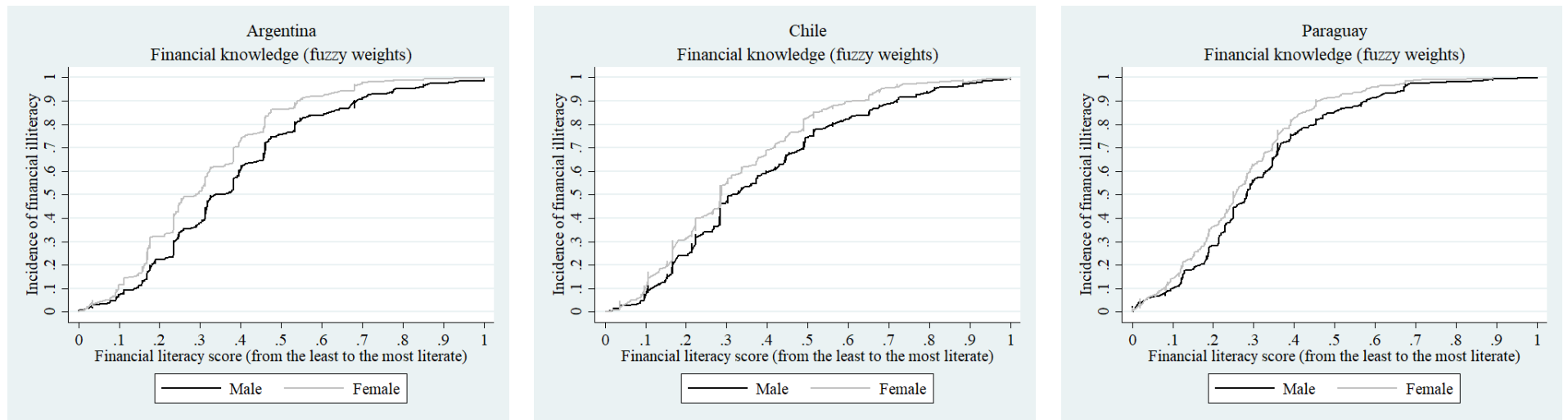
Appendix E: Ordinary least squares regression results for financial literacy, separately for each country

Tables E-1 to E-3 show that after controlling for demographic and economic characteristics, the coefficient of the gender variable is statistically significant at 5% only in Argentina, where, on average, *ceteris paribus*, financial literacy score is 0.4968 point (6.2% in relative terms) lower for females than for males. In other words, the size of the gender gap increases slightly (2.2 percentage point) when compared to the observed (raw) gap (4%) in Panel I of Table 2, while the gender gaps in Chile (5%) and Paraguay (4%) shown in Table 2 disappear after controlling for these covariates.

An inverted U-shaped relationship between age and the number of correct responses is observed in Argentina and Chile, but not in Paraguay, when men and women are considered together, and only among Chilean women, when males and females are analyzed separately. In Argentina and Chile, the marital status of individuals does not seem to contribute to explaining financial literacy,[12] except in the case of those who are married with children among Argentines and among Chilean women; while in Paraguay, being married without children or divorced with children has a positive effect on an individual's financial literacy, when men and women are considered together.[13] When looking separately at men and women in Paraguay, the impact of the marital status (being divorced with children) is only statistically significant for women.

As far as education is concerned, looking at Tables E-1, E-2 and E-3, we can in general, draw conclusions similar to those we had reached previously: education has, *ceteris paribus*, a strong effect on financial literacy; based on F-tests, our results show that education-related variables are collectively highly statistically significant at 0.1%.[14] However, it is worth noting that in Argentina and Chile (only for males and females separately), the coefficient of the dummy variable that accounts for completed primary education is not statistically significant at 5%, meaning that, *ceteris paribus*, on average, financial literacy score is not higher for people who only completed primary education than for those who did not.

The variable related to income is also statistically significant at 1% and has a strong and negative effect on financial literacy, except for Argentine women (the corresponding coefficient is not statistically significant at 5%). More precisely the results show that, *ceteris paribus*, in Argentina, Chile, and Paraguay, financial literacy is lower for individuals who are monetarily poor than for those who are not. It also appears that financial literacy is higher for individuals with a stable household income, except in the case of Chilean males.

Regarding the variables that account for who is responsible of money management in the household, our results suggest that the two corresponding dummy variables are collectively statistically significant at 5%, except in the case of Paraguay when males and females are analyzed separately.[15] It should be observed that in the case of Chile, when

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[12]Collectively, the marital status variables are not statistically significant slightly at 5% in Argentina [F $(3, 1205)$ = 2.56, p-value = 0.0539] and strongly in Chile [F $(3, 1205)$ = 1.34, p-value = 0.2613].

[13]In Paraguay, the marital status variables are collectively statistically significant at 5% [F $(3, 1184)$ = 3.42, p-value = 0.0167].

[14]We obtained the following results for the F-tests performed: Argentina [pooled estimate: F $(4, 1205)$ = 41.08, p-value = 0.0000; males: F $(4, 605)$ = 26.18, p-value = 0.0000; females: F $(4, 583)$ = 15.53, p-value = 0.0000]; Chile [pooled estimate: F $(4, 1205)$ = 33.51, p-value = 0.0000; males: F $(4, 608)$ = 27.76, p-value = 0.0000; females: F $(4, 580)$ = 8.72, p-value = 0.0000]; and Paraguay [pooled estimate: F $(4, 1184)$ = 19.22, p-value = 0.0000; males: F $(4, 554)$ = 12.01, p-value = 0.0000; females: F $(4, 613)$ = 8.53, p-value = 0.0000].

[15]We obtained the following results for the F-tests performed: Argentina [pooled estimate: F $(2, 1205)$ = 8.72, p-value = 0.0000; males: F $(2, 605)$ = 3.45, p-value = 0.0322; females: F $(2, 583)$ = 5.28, p-value = 0.0053]; Chile [pooled estimate: F $(2, 1205)$ = 3.59, p-value = 0.0280; males: F $(2, 608)$ = 3.18, p-value

males and females are grouped together, the coefficients of these two dummy variables are not statistically significant at 5%, which may suggest the presence of data-based multicollinearity; therefore, we computed the variance inflation factor (VIF) and did not detect multicollinearity based on it (we did not obtain any VIF value greater than 4, except in the case of age and age squared, which are, by definition, highly correlated).

The results show that in Argentina, the fact that the individual's partner is the person responsible for money management has a strong and negative effect on the individual's financial literacy, but this is not true in Chile and Paraguay, except in the case of Chilean women and Paraguayans (when men and women are analyzed together). This negative effect on financial literacy is also observed when looking at the coefficient of the second variable related to this topic (Decision maker: Other), but only in the case of Argentines, when men and women are grouped together, and Chilean males; in the rest of the cases, this second variable is not statistically significant at 5%.

Tables E-1 to E-3 also indicate that having a full-time job has a positive, although relatively small, effect on financial literacy, except in Chile and in Argentina and Paraguay in the case of males. Having a part-time job also has a positive individual's financial literacy score, but only in Argentina, when a pooled regression is run, and for females in Argentina and Paraguay, while being retired seems not to affect financial literacy. Assessing the joint statistical significance of the block of variables related to labor market, our results suggest that in Argentina, when a pooled estimation is performed, these variables are collectively statistically significant at 5%, but they are not collectively significant in Chile and Paraguay; neither are they for males in the three countries and for females in Chile, when women and men are analyzed separately.

$= 0.0422$; females: $F_{(2, 580)} = 4.34$, p-value $= 0.0135$]; and Paraguay [pooled estimate: $F_{(4, 1184)} = 3.61$, p-value $= 0.0272$; males: $F_{(2, 554)} = 2.72$, p-value $= 0.0666$; females: $F_{(2, 613)} = 1.21$, p-value $= 0.2981$].

Table E-1: Argentina: Ordinary least squares (OLS) regressions. *Source*: Authors' estimates based on financial capability surveys of Argentina (2017).

Outcome: The number of correct answers out of 27 questions	All	Male	Female
Gender: 1 are women, and 0 are men	-0.4968*	—	—
	(0.2203)	—	—
Age	0.1066*	0.1577*	0.0605
	(0.0424)	(0.0637)	(0.0575)
Age, squared	-0.0012*	-0.0016*	-0.0010
	(0.0005)	(0.0007)	(0.0006)
Rural	-0.8421*	-1.0646*	-0.5152
	(0.3307)	(0.4341)	(0.5025)
Marital status: Married with children	0.8500**	0.8128	0.8161
	(0.3139)	(0.4577)	(0.4519)
Marital status: Married without children	0.3139	0.0383	0.3924
	(0.2836)	(0.3997)	(0.4094)
Marital status: Divorced with children	0.0914	0.5865	-0.1739
	(0.3234)	(0.5860)	(0.4082)
Education: Primary	1.0680	0.9657	1.0301
	(0.5747)	(0.7868)	(0.8457)
Education: Secondary	2.6809***	2.9611***	2.3481**
	(0.5830)	(0.8044)	(0.8666)
Education: Tertiary	4.2032***	4.7021***	3.6141***
	(0.6086)	(0.8565)	(0.8903)
Education: University	5.3065***	5.6434***	4.7420***
	(0.7309)	(1.0159)	(1.0597)
Income groups: 0 monetarily non-poor; 1 monetarily poor	-1.0207***	-1.3642***	-0.6297*
	(0.2176)	(0.3100)	(0.3048)
Income household stability: 1: Stable; 0: Non-stable	0.9109***	0.9598**	0.8427**
	(0.2151)	(0.3107)	(0.3067)
Decision maker: Partner	-1.8241***	-1.5818*	-2.1390**
	(0.4747)	(0.6203)	(0.7512)
Decision maker: Other	-0.6316	-0.3116	-0.9504
	(0.3357)	(0.4681)	(0.4899)
Status: Employed full-time	0.6735*	0.6828	0.7943*
	(0.2713)	(0.4282)	(0.3739)
Status: Employed part-time	1.0807**	0.7741	1.3789**
	(0.3464)	(0.5670)	(0.4416)
Status: Retired	0.5976	0.3033	1.1530
	(0.5167)	(0.8672)	(0.6845)
Constant	8.0079***	6.6579***	8.9308***
	(1.0524)	(1.5150)	(1.5347)
Observations	1,224	623	601
R-squared	0.2497	0.2787	0.2330
Adjusted R-squared	0.2380	0.2580	0.2110
F	23.27	14.33	11.82
p-value	0.0000	0.0000	0.0000

Notes: surveys weights used; robust standard errors in parentheses. Significance levels: ***, **, and * indicate significance at 0.1%, 1%, and 5% respectively.

Table E-2: Chile: Ordinary least squares (OLS) regressions. *Source*: Authors' estimates based on financial capability surveys of Chile (2016).

Outcome: The number of correct answers out of 27 questions	All	Male	Female
Gender: 1 are women, and 0 are men	-0.2959	—	—
	(0.2237)	—	—
Age	0.1126*	0.0395	0.1870**
	(0.0446)	(0.0587)	(0.0629)
Age, squared	-0.0015**	-0.0005	-0.0024***
	(0.0005)	(0.0006)	(0.0007)
Rural	0.0239	0.1087	-0.0549
	(0.3403)	(0.4972)	(0.4437)
Marital status: Married with children	0.6172	0.2305	**1.0376***
	(0.3296)	(0.4344)	(0.4793)
Marital status: Married without children	0.2934	-0.0001	0.5201
	(0.2925)	(0.4157)	(0.4062)
Marital status: Divorced with children	-0.1103	1.1069	-0.6033
	(0.5691)	(0.7098)	(0.7240)
Education: Primary	1.1222*	1.1540	1.1275
	(0.4366)	(0.6568)	(0.5792)
Education: Secondary	2.1905***	2.4911***	1.8239***
	(0.4087)	(0.6458)	(0.5149)
Education: Tertiary	3.8478***	4.6958***	2.8154***
	(0.4271)	(0.6258)	(0.5882)
Education: University	4.4376***	5.0548***	3.6416***
	(0.4760)	(0.6869)	(0.6784)
Income groups: 0 monetarily non-poor; 1 monetarily poor	-1.3836***	-1.7103***	-1.0043**
	(0.2368)	(0.3234)	(0.3481)
Income household stability: 1: Stable; 0: Non-stable	0.6923*	-0.0532	1.3361**
	(0.3043)	(0.4355)	(0.4170)
Decision maker: Partner	-0.8266	-0.0322	-1.5953**
	(0.4273)	(0.6706)	(0.5416)
Decision maker: Other	-0.6419	-1.2973*	0.0037
	(0.3422)	(0.5145)	(0.4644)
Status: Employed full-time	0.2574	0.1028	0.4613
	(0.2584)	(0.3424)	(0.3964)
Status: Employed part-time	-0.1273	-0.4528	0.0875
	(0.4275)	(0.6757)	(0.5290)
Status: Retired	-0.0329	-0.2809	0.1399
	(0.4945)	(0.6740)	(0.6808)
Constant	12.1084***	13.9304***	10.0971***
	(1.0761)	(1.5734)	(1.4749)
Observations	1,224	626	598
R-squared	0.2802	0.3172	0.2745
Adjusted R-squared	0.269	0.298	0.253
F	22.08	15.17	10.39
p-value	0.0000	0.0000	0.0000

Notes: surveys weights used; robust standard errors in parentheses. Significance levels: ***, **, and * indicate significance at 0.1%, 1%, and 5% respectively.

Table E-3: Paraguay: Ordinary least squares (OLS) regressions. Source: Authors' estimates based on financial capability surveys of Paraguay (2016).

Outcome: The number of correct answers out of 27 questions	All	Male	Female
Gender: 1 are women, and 0 are men	-0.4350	—	—
	(0.2655)	—	—
Age	0.0056	0.0226	-0.0127
	(0.0571)	(0.0774)	(0.0910)
Age, squared	-0.0003	-0.0004	-0.0001
	(0.0007)	(0.0010)	(0.0011)
Rural	0.1155	0.2912	-0.0407
	(0.2725)	(0.4097)	(0.3669)
Marital status: Married with children	-0.1297	-0.3424	0.2208
	(0.3660)	(0.4785)	(0.6037)
Marital status: Married without children	0.7472*	0.9017	0.8597
	(0.3512)	(0.4719)	(0.5495)
Marital status: Divorced with children	0.9433*	0.4014	1.1815*
	(0.3928)	(0.6402)	(0.5465)
Education: Primary	1.5445***	1.7234***	1.4629**
	(0.3562)	(0.4747)	(0.5173)
Education: Secondary	2.4568***	3.0964***	1.8335**
	(0.4083)	(0.5455)	(0.6040)
Education: Tertiary	3.6416***	4.0489***	3.2536***
	(0.5043)	(0.7747)	(0.6667)
Education: University	4.6546***	5.0447***	4.2260***
	(0.6562)	(1.0075)	(0.8834)
Income groups: 0 monetarily non-poor; 1 monetarily poor	-1.5174***	-1.5452***	-1.4852***
	(0.2610)	(0.3790)	(0.3565)
Income household stability: 1: Stable; 0: Non-stable	1.2405***	1.1414*	1.4847***
	(0.3385)	(0.5242)	(0.4441)
Decision maker: Partner	-1.0489*	-1.2813	-0.9157
	(0.4546)	(0.7322)	(0.5916)
Decision maker: Other	-0.5034	-0.7299	-0.1251
	(0.3444)	(0.4511)	(0.5518)
Status: Employed full-time	0.7093*	0.1013	0.9221*
	(0.2993)	(0.4711)	(0.4270)
Status: Employed part-time	0.3928	-0.5466	1.1443*
	(0.3086)	(0.4647)	(0.4459)
Status: Retired	-0.4180	-1.3131	0.2267
	(0.8723)	(1.4255)	(1.0660)
Constant	8.7790***	8.6959***	8.4949***
	(1.1324)	(1.5523)	(1.7118)
Observations	1,203	572	631
R-squared	0.2909	0.3072	0.2924
Adjusted R-squared	0.280	0.286	0.273
F	16.85	9.999	9.248
p-value	0.0000	0.0000	0.0000

Notes: surveys weights used; robust standard errors in parentheses. Significance levels: ***, **, and * indicate significance at 0.1%, 1%, and 5% respectively.