

The gender gap in financial literacy: income, education, and experience offer only partial explanations

By **Antonia Grohmann**

In most countries, women have a lower level of financial literacy than men on average. This report demonstrates that differences in income and education and less experience in financial matters only provide a partial explanation for the gender gap. Data from various countries show that cultural differences may also play a role.

In order to close the gender gap in financial literacy, schools should do a better job of imparting general knowledge and numerical proficiency. Lessons on the subject of finance must attempt to involve girls so they learn to view financial matters as part of “their job” from an early age. Overall gender equality would also narrow the gender gap in financial literacy.

Financial literacy is becoming more important as more and more people have to rely on private funds for financial security after retirement. At the same time, many financial products are becoming increasingly complex. Of course both men and women must be financially literate in order to make good financial decisions.¹ However, looking at the changes in the social welfare system, it becomes apparent that “good” financial behavior—specifically, providing for an adequate pension—is especially important for women for two reasons. First, women have a higher life expectancy than men, which means they will have to rely on retirement benefits longer. Second, women interrupt their careers more often than men in order to take care of the children and family, which is why they often contribute less to the national pension system and are more likely to succumb to poverty in old age than men.²

Many previous studies have shown that good financial literacy leads to improved financial behavior.³ People who know more about financial matters save more money for old age, are more wealthy, and use more sophisticated investment products.

However, these studies have also found that women have lower financial literacy than men.⁴ This difference in financial literacy is called the financial literacy gender gap.⁵ In this *Economic Bulletin*, we will explore the reasons why women have a lower level of financial lit-

¹ Antonia Grohmann and Lukas Menkhoff, “Schule, Eltern und finanzielle Bildung bestimmen das Finanzverhalten,” *DIW Wochenbericht* no. 28 (2015).

² Katja Möhring, “Der Einfluss von Kindereziehungszeiten und Mütterrente auf Alterseinkommen von Müttern in Europe,” *Vierteljahresheft der Wirtschaftsforschung*, 2 (2014): 139–55.

³ Annamaria Lusardi and Olivia S. Mitchell, “The Economic Importance of Financial Literacy,” *Journal of Economic Literature*, 52(1) (2014): 5–44.

⁴ Tabea Bucher-Koenen et al., “How Financially Literate Are Women? An Overview and New Insights,” *Journal of Consumer Affairs* (forthcoming) and Lisa Xu and Bilal Zia, “Financial Literacy around the World: An Overview of the Evidence with Practical Suggestions for the Way Forward,” *World Bank Policy Research Working Paper* 6107 (2012).

⁵ Annamaria Lusardi and Olivia S. Mitchell, “Planning and Financial Literacy: How Do Women Fare?” *American Economic Review Papers and Proceedings* 98(2) (2008): 413–17.

eracy than men. Based on the discussion, we will suggest ways in which everyone’s financial literacy can be improved.

Measuring financial literacy: three questions test knowledge of interest, inflation, and diversification

Studies that measure financial literacy typically use data from household surveys focused on a specific country. As part of the household surveys, the financial literacy of the household’s primary decision-maker is captured. In the report at hand, we measure financial literacy by asking respondents three questions. The first question tests their knowledge of interest rates, the second asks what they know about inflation, and the third is aimed at their knowledge of mutual funds and stocks in addition to their understanding of diversification of risk (Box). Since it is, unfortunately, impossible to measure actual levels of financial literacy accurately, and household surveys are often very expensive and time-consuming, the three questions provide an opportunity to capture the financial literacy level of many people quickly and easily.

In this report, we mainly use the results of three surveys: a representative survey from Germany and one from the US⁶, and a survey of Bangkok’s middle class conducted by DIW Berlin.⁷ The survey from Thailand’s capital focuses exclusively on the middle class: participants had to earn the equivalent of at least €400 per month. This is the minimum income for people with a bachelor’s degree. In addition, the respondents had to be (co-)decision-makers in household financial matters. All of the respondents were Bangkok residents between 18 and 60. The results for Germany and the US came from studies that used the same questions adjusted for the respective country’s currency (Box).

In most countries, men outperform women on financial literacy tests

The studies from Germany, the US, and Bangkok show that fewer women than men answered the three questions correctly (Figure 1). In Germany, the more difficult the question, the larger the knowledge gap between women and men. The difference is small for Question 1, which 83 percent of men and 81 percent of women answered correctly. Question 3, the most difficult question, has fewer correct answers among all respondents. The difference between men (68 percent) and women (57 percent) is the

6 Bucher-Koenen et al., "How Financially Literate Are Women? An Overview and New Insights," *Journal of Consumer Affairs* (forthcoming).

7 Antonia Grohmann, Olaf Hübler, Roy Kouwenberg, and Lukas Menkhoff, "Financial Literacy: Thai Middle Class Women Do Not Lag Behind," *DIW Working Paper Series* no.16 15 (2016).

Box

Bangkok survey on financial literacy

1. Imagine that you borrow 10,000 baht at an interest rate of 2 percent per month. How much will you owe at the end of three months?
 - a) less than 10,200 baht
 - b) more than 10,200 baht
 - c) exactly 10,200 baht

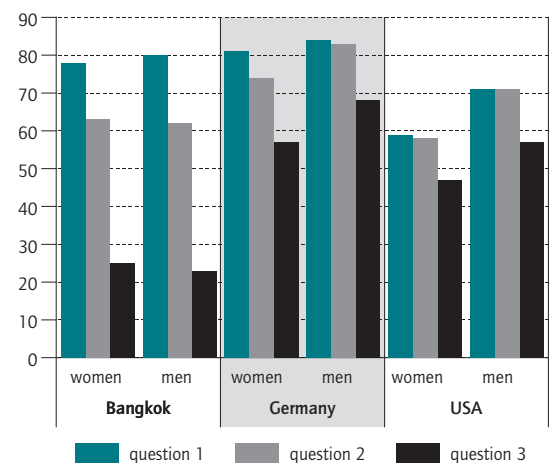
2. Imagine that you have 10,000 baht on an account and the interest rate for the account is 1 percent per year. The price for all goods and services increases by 2 percent per year. How much can you buy in one year?
 - a) less than I can buy today
 - b) more than I can buy today
 - c) exactly the same as I can buy today

3. It is safer to buy a single stock than a stock mutual fund.
 - a) true
 - b) false

It is also possible to answer any question with "I don't know" or "I refuse to answer."

Figure 1

Household surveys on financial literacy
In percent



Notes: See box for questions.

Source: Bucher-Koenen et al. and DIW Berlin survey in Bangkok.

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In Germany, the difference in financial literacy between women and men increases as the questions get more difficult.

largest for this question. In the US, the difference between men and women for each question is greater than ten percentage points. Men outperform women on all three questions. The results from Bangkok stand out in comparison. There are no differences in the number of correct answers for men and women. On the answers to two of the questions, women even slightly outperform men.

In addition to the data from various household surveys, a dataset containing statistics on the level of financial literacy in 144 countries has been available since last year.⁸ It lists the share of the population that answered at least three out of four questions correctly. The results for women and men are available separately. These statistics confirm the results described above, indicating that in 135 of the 144 countries, more men are considered financially literate than women (Figure 2).

⁸ Leora Klapper, Annamaria Lusardi, and Peter van Oudheusden, *Financial Literacy Around the World: Insights from the Standard and Poor's Ratings Services Global Financial Literacy Survey*, <https://www.finlit.mhfi.com>.

Possible causes

This report examines three possible reasons for the financial literacy gender gap: differences in socio-demographic characteristics, varying levels of financial responsibility, and cultural differences.

Socio-demographics are not the sole factor ...

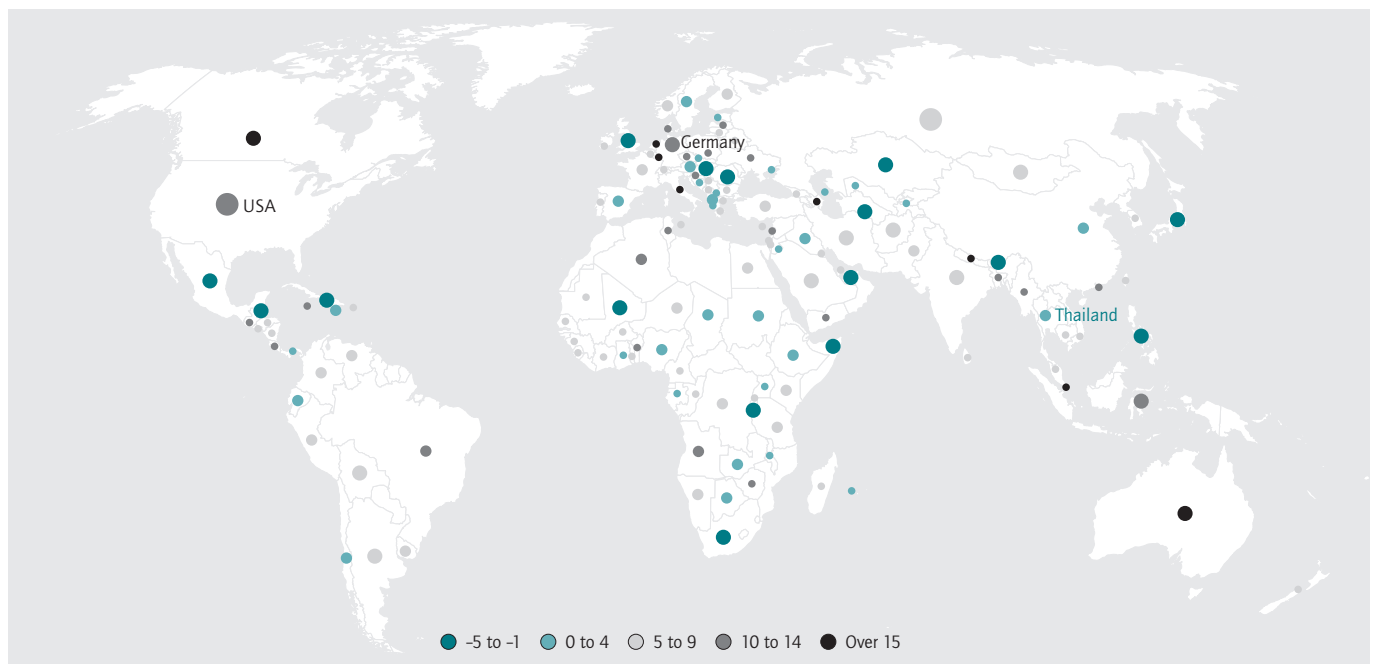
Many studies on the subject of financial literacy have found a link between a person's general education, income, and age and his/her level of financial literacy.⁹ On average, the respondents in Bangkok are young, educated, and—in comparison to the rest of Thailand's population—affluent. This applies equally to women and men. Both have qualities that go hand in hand with higher levels of financial literacy, which could explain the lack of a gender gap in Thailand.

We examined this assumption by dividing the Bangkok sample into two samples, each based on level of educa-

⁹ Annamaria Lusardi and Olivia S. Mitchell, "The Economic Importance of Financial Literacy," *Journal of Economic Literature*, 52(1) (2014): 5-44.

Figure 2

Financial literacy gender gap in 144 countries



Source: Klapper, Lusardi, and van Oudheusden: *Financial Literacy Around the World: Insights from the Standards and Poor's Ratings Service Global Financial Literacy Survey*, <https://www.finlit.mhfi.com>; calculations of DIW Berlin.

In 135 out of 144 countries, men display a higher level of financial literacy than women do.

tion, age, and income. The results show that the high numbers of well-educated, young women or women with high incomes are not the reason behind this gender parity in financial literacy. After all, relative to the rest of the sample, older women with lower educational attainment and income know as much about financial matters as men. Therefore, we can eliminate socio-demographic characteristics as an explanation of why men and women in Bangkok have the same financial literacy.

We followed up on this idea by viewing the datasets from Germany and the US. Unlike the Bangkok data, these datasets are representative of the countries' general populations. This is why the respondents are, on average, less educated, older, and poorer than the respondents in Bangkok. To create datasets with similar socio-demographic structures, we adjusted those from Germany and the US.

For Germany, we used the SAVE data set that the Munich Center for the Economics of Aging (MEA) published in 2009.¹⁰ We reduced the data in a number of regressions, firstly there were regression that only looked at the upper half and the upper third of the income distribution. In the next step, we adjusted the average age of the Bangkok dataset by excluding respondents over 60 and respondents over 50, each in different regressions. The analysis shows that the financial literacy gender gap is smaller for younger, richer, and more educated people than it is for the overall population. However the gap does persist: on average, women always have lower financial literacy than men.

We proceeded using data from the American Life Panel¹¹ in the same way. In various regressions, we analyzed only the upper half and then the upper third of the income distribution. Just as for Germany, we also examined regressions that only looked at people under 60 and under 50, respectively. The results were similar to those of the German dataset: women on average have a lower level of financial literacy, but the gender gap in the US remains.

The results described here indicate that socio-demographic differences only partially explain the gender gap in financial literacy. They also show that the sample we used in the Bangkok study was not the reason for the high level of financial literacy among men and women.

¹⁰ SAVE (Sparen und AltersVersorgE in Deutschland) is a MEA panel survey focusing on saving and financial planning for the future. More information: <http://www.mea.mpsoc.mpg.de/index.php?id=315&L=1> (Web October 28, 2016). In 2009, MEA collected the answers to particularly detailed questions on financial literacy.

¹¹ The American Life Panel (ALP) is a national, representative, probability-based body of over 6,000 members aged 18 and over collected regularly interviewed via the Internet for research purposes. For more information: <https://alpdata.rand.org/> (Web October 28, 2016).

... and neither is financial experience

The second possible reason for the gender gap in financial literacy could be that women deal with financial matters less frequently and as a result, have less experience. For example, the proportion of women in leadership positions in Germany's financial sector is extremely low.¹² Similarly, a study of the behavior of asset managers in Germany, the US, Japan, and Thailand shows that there are just as many women as men in leadership positions in Thailand, and the portfolios the women manage are just as large as the men's.¹³

At the same time, research suggests that in many countries, men are in charge of household decisions on investments and borrowing. We could posit that men have specialized in financial decision-making in both professional and household environments, and have thus acquired a higher level of financial literacy.¹⁴

If specialization within the household is a reason for women having lower financial literacy than men, the gender gap should only affect (married or unmarried) couples that cohabit. However, studies show that this is not the case.¹⁵ Married women in both the US and Germany know less about financial matters than married men, but unmarried and divorced women also have lower levels of financial literacy than unmarried and divorced men (Figure 3).¹⁶

As marital status is not necessarily independent of financial behavior and experience, whether financial literacy is associated with the responsibility for household finances is interesting to examine. Participants in the Bangkok survey had to be (co-)responsible for their own or the household finances. No one was excluded from the survey for not meeting this condition, which implies that women in Bangkok make financial decisions for the household to the same extent as men.

The studies in Germany and the US included a question on who makes the financial decisions in the household. There were four possible answers: 1) Makes decisions alone and lives with partner, 2) Makes decisions alone and lives without partner, 3) Partner makes the

¹² Elke Holst and Martin Friedrich, "Hohe Führungspositionen: In der Finanzbranche haben Frauen im Vergleich zu Männern besonders geringe Chancen," *DIW Wochenbericht* no. 27 (2016).

¹³ Daniela Beckmann, Lukas Menkhoff, and Megumi Soto, "Does culture influence asset managers' views and behavior?" *Journal of Behaviour and Organisation*, 67 (2008): 624–43.

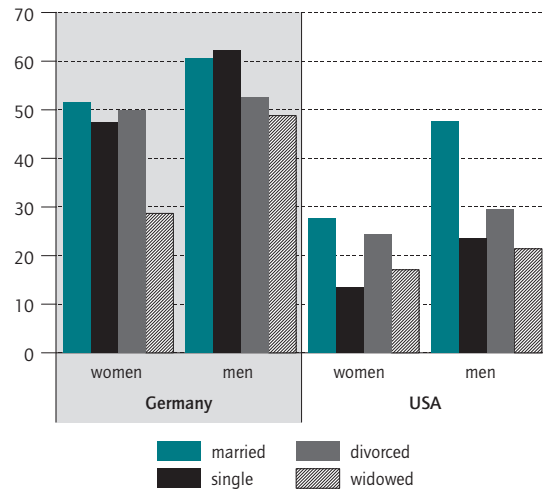
¹⁴ Joanne W. Hsu, "Aging and Strategic Learning: The Impact of Spousal Incentive on Financial Literacy," *Journal of Human Resources* (forthcoming).

¹⁵ Bucher-Koenen et al., "How Financially Literate Are Women? An Overview and New Insights," *Journal of Consumer Affairs* (forthcoming).

¹⁶ Couples who live together but are not married are not grouped separately in the datasets.

Figure 3

Financial literacy of men and women according to marital status



Notes: Percentage of each group that answered all three questions correctly.
Source: Bucher-Koenen et al.

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Single, divorced, and widowed women have lower levels of financial literacy than do men with the same marital status.

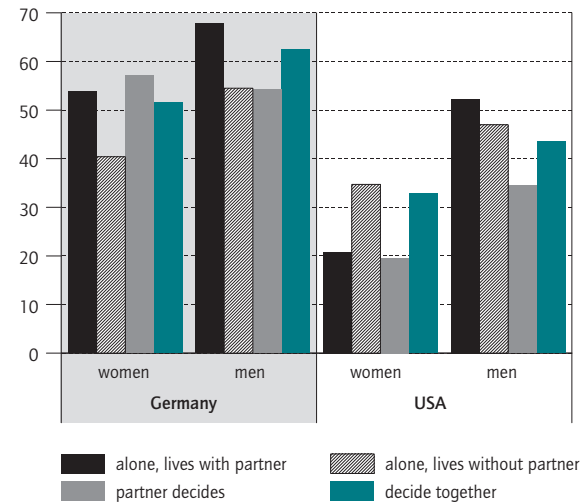
decisions, and 4) Decisions are made together (Figure 4). The study found that regardless of whether or not they are decision-makers, women always know less about financial matters than men with the same role. Women in Germany whose partners make the decisions were the only exceptions. However, their share is small. The results from the US indicate that women who make financial decisions have higher financial literacy than that of women who are not involved in financial decision making. However, even women who make financial decisions for the household themselves still have a lower level of financial literacy than men in the same position. This shows that responsibility for financial household decisions does not explain the gender gap fully.

Cultural factors can strengthen women's roles in the financial sector and minimize the gender gap

We have seen that individual differences between men and women do not fully explain the gender gap. Therefore, in the next step we examined if there are any cultural or country-specific factors that can explain the gap and its size. In order to do this, we look at country level data.

Figure 4

Financial literacy according to role in making financial decisions



Notes: Percentage of each group that answered all three questions correctly.
Source: Bucher-Koenen et al.

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Whether they make financial household decisions or not, women have lower levels of financial literacy.

To find out whether country-specific characteristics are behind the lack of a financial literacy gender gap in Thailand, we first looked at other datasets from Thailand. The National Statistical Office of Thailand together with the Bank of Thailand conducted a survey on financial literacy in Thailand in 2013. On average, women answered 12.8 and men 13.0 of the 22 questions correctly in the representative survey. The second dataset is from a representative survey of the rural population in Northeastern Thailand's Buriram Province, where the majority of people are farmers who are much poorer than the city dwellers of Bangkok. But this data does not show any significant difference in financial literacy between men and women either. The evidence from the two datasets indicates that the gender gap is likely to be the result of country-specific factors. We subsequently analyze the differences between countries without a gender gap, such as Thailand, and countries in which a financial literacy gender gap exists.

It is possible that Thailand does not have a financial literacy gender gap because there is general gender equality. In order to test this hypothesis, we correlate the differences in financial literacy between men and women in several countries, and indicators that measure equality between men and women (Table 1). This report focuses

Table 1

Gender equality and the gender gap in financial literacy

	erwartetes Vorzeichen	1	2	3
		Gender Gap	Gender Gap	Gender Gap
Gender equality index	-	1.073 (7.975)		
Hofstede Masculinity index	+		-0.063** (0.028)	
Female leadership index	-			-0.063 (0.041)
GDP per capita		0.577 (0.422)	0.576 (0.508)	0.764 (0.506)
R ²		0.02	0.07	0.04
Obs.		117	84	101

Correlations between three different gender equality measures and the gender gap in financial literacy. GDP per capita is also controlled for. * and ** indicate significance levels of 5 percent and 10 percent, respectively.

Source: calculations of DIW Berlin.

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on three of the indicators, the first of which is the World Economic Forum Gender Equality Index. The second indicator is the Hofstede Masculinity Index, which measures the extent to which a given society values personal traits that are considered masculine. The third indicator we considered is the Female Leadership Index, which is published by the World Bank and measures the proportion of women in leadership positions. We further controlled for per capita gross domestic product (GDP). Two of the three indicators for gender equality trend in the expected direction. In countries which have higher gender equality the financial literacy gender gap is smaller. However, this relationship is not significant, and there is an unexpected negative correlation with the Hofstede Index.

The relationship between the gender gap in financial literacy and these indicators is weak but goes in the expected direction. Perhaps the role of women in some countries involves a stronger part in the financial domain than in other countries. It is possible that women in countries such as Thailand have been socialized to deal with financial matters to a greater extent than women elsewhere. To examine this hypothesis further, we considered the following five aspects that reveal women's roles in financial matters, looking for a correlation with the gender gap (Table 2). We also controlled for the per capita GDP.

Table 2

Country-specific characteristics and the gender gap in financial literacy

	Expected sign	1	2	3	4	5
		gender gap	gender gap	gender gap	gender gap	gender gap
PISA math score, girls	-	0.021 (0.019)				
Gender gap in secondary school enrollment	+		0.147* (0.07)			
Percentage of female graduates in Economics, Law, and Social Sciences	-			-0.018 (0.048)		
Female labor force participation	-				0.012 (0.027)	
Wage equality	-					0.003 (0.012)
GDP per capita		0.589	0.645 (0.407)	0.574 (0.482)	0.524 (0.365)	0.588 (0.402)
R ²		0.06	0.05	0.01	0.02	0.02
Obs.		58	102	101	136	115

The table shows correlations between the gender gap in financial literacy and finance-related country-specific characteristics. GDP per capita is also controlled for. * and ** indicate significance levels of 5 percent and 10 percent, respectively.

Source: calculations of DIW Berlin.

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Numerical proficiency is a major indicator: financial literacy is strongly dependent on people's ability to use numbers. The PISA studies show that in most countries, boys' numerical proficiency is higher than girls'.¹⁷ In the survey published in 2012, Thailand is one of only two countries in which girls outperform boys on numeracy. The correlation between the financial literacy gender gap and girls' performance on the PISA tests is positive, yet unexpectedly insignificant (Table 2, column 1).

Developing this idea further, the question arises as to whether a difference in education between women and men could be one cause of the gender gap. The correlation with the difference in education—measured here as the gender gap in secondary school enrollment—is as expected positive and significant (Table 2, column 2).

It may also be possible that in some countries, women tend to view dealing with financial matters as part of "their job" to a greater extent than in others. This would become apparent in the types of university courses that women select. The correlation between the share of women who have a university degree in business administration, law, or the social sciences goes in the expected

17 PISA Ergebnisse 2012, Was 15-Jährige wissen und wie sie dieses Wissen einsetzen können, OECD.

direction, but is not significant (Table 2, column 3). The World Bank published these statistics.

The last aspect we considered was the role of men and women in the labor market. As labor market participation by women increases and their earnings increase, they also have more dealings with money. In turn, this should improve women's financial literacy. Women's labor market participation and income equality between men and women and their correlation with the gender gap show the expected relationships: in countries where women are integrated into the labor market and have similar incomes to men, the gender gap in financial literacy is smaller (Table 2, columns 4 and 5).

All these results show that cultural factors reinforce the role of women in financial matters, thereby narrowing the gender gap.

Conclusion

This study examined the reasons behind the gender gap in financial literacy. It explored three possible causes: (1) differences in the socio-demographic characteristics of men and women, (2) differences in the way men and women deal with financial matters and the extent to which women are responsible for finances, and (3) the role of cultural factors measured using country-specific characteristics. None of these causes alone can completely explain the gender gap in financial literacy. Individual differences and differences in experiences with finance only partly explain the gender gap. Country-specific characteristics and the country's culture also play important roles.

These results –especially the role of culture—indicate that the gender gap in financial literacy is deep rooted and hence will, most likely, be difficult to close. Nevertheless, policy makers should try to improve financial literacy in general and that of women in particular. This report offers three approaches for doing this.

First, the general level of education and numeracy of girls and women must be increased. In many countries, women are still less educated than men. Boys outperform girls on mathematics tests. Hence better general education and numeracy would also improve financial literacy.

Second, when teaching about finances, schoolteachers should focus on reinforcing girls' interest in financial matters and their self-confidence in dealing with them. This would raise girls to see financial tasks as part of their "their job,". In turn, this would result in them taking part in financial household decision more actively.¹⁸

Third, women's financial literacy is likely to improve when their role in society changes. When more and more women participate in the labor market and pursue professions in which they have more financial responsibility, their financial literacy will also increase. Gender equality—in the labor market as well—should be a general policy goal. It would also reduce the gender gap in financial literacy.

¹⁸ However, we must point out here that studies examining the effectiveness of special finance-related training courses show that their impact is small and disappears over time. Tim Kaiser and Lukas Menkhoff, "Does financial education impact financial behavior, and if so when?" *DIW Working Paper* no. 15 62 (2016).

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JEL: D14, J16, D91

Keywords: Financial literacy, Financial Behavior, Gender Gaps, Individual Characteristics, Societal Norms



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ISSN 2192-7219

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