

EXPLORING DIFFERENCES IN FINANCIAL LITERACY ACROSS COUNTRIES: THE ROLE OF INDIVIDUAL CHARACTERISTICS, EXPERIENCE, AND INSTITUTIONS*

Andrej Cupák[†] Pirmin Fessler[‡] Maria Silgoner[§]
Elisabeth Ulbrich[¶]

July 26, 2017

1 Motivation

For several reasons the financial literacy of consumers is likely to become more important for a sound financial system.

First, we are living in a time of fast digitalisation. The financial industry is changing rapidly. This is both a great challenge and a great opportunity. After decades of bank-based finance we are confronted with more direct matching of lenders and borrowers. This leads to a great enlargement of the choice set for households seeking to insure themselves against the contingencies of life.

Second, decades of peace and growth after the second world war allowed for an unprecedented accumulation of wealth. Combined with demographical developments, this implies a large wave of inheritances and rather affluent households in the future, with higher wealth-to-income ratios. In his recent book “Capital in the Twenty-First Century”, [Piketty \(2013\)](#) argues that income loses importance as the critical source of wealth over time, while inheritances become increasingly important. The capital to income ratios are rising. This means

*We are grateful to the OECD/INFE working group for granting access to the individual-level micro data on financial literacy. The views expressed in the paper do not necessarily reflect the views of the National Bank of Slovakia, Austrian Central Bank, or the Eurosystem. Andrej Cupák was a visiting researcher at the Austrian Central Bank when carrying out this research.

[†]Research Department, National Bank of Slovakia, andrej.cupak@nbs.sk.

[‡]Economic Analysis and Research Department, Oesterreichische Nationalbank, pirm.fessler@oenb.at.

[§]Foreign Research Division, Oesterreichische Nationalbank, maria.silgoner@oenb.at.

[¶]Financial Education Unit, Oesterreichische Nationalbank, elisabeth.ulbrich@oenb.at.

that future households will inherit large amounts of wealth which they need to invest.

Third, since the seminal contribution of [Feldstein \(1974\)](#) many have argued that the welfare state crowds out private wealth accumulation. This means, that given the decrease in welfare state spending, the need for wealth accumulation and financial investments will rise. This is especially pronounced with regard to state pension systems, where private pensions are of increasing importance.

Fourth, the European Unions' project of a capital markets union, which aims at a stronger integration of European capital markets to decrease the dependency of enterprises on the European banking system, which translates into a more direct match between savers and investors. The same holds for developments stemming from digitalisation and the fintech industry.

To sum up, more fluent households will face a larger variety of complex and likely more direct and more risky financial products. Given their lack of experience with the stock market and financial products in general, which is especially pronounced in continental Europe, we seek to answer the following research questions in this paper:

- Do individuals possess enough financial literacy to deal with these developments, and how prepared are they across different countries?
- Are observed differences in financial literacy mainly due to differences in observable individual characteristics?
- Does experience with financial products matter for the stock of financial literacy?
- Which differences in institutions are correlated with cross country differences?

In the context of these research questions we identify policy conclusions with regard to (i) enhancing financial literacy in an efficient way and (ii) potential interactions between financial literacy, the macroeconomic and institutional environment and financial stability.

Previous Literature The importance of financial literacy as an important ingredient of informed choices and sound financial behavior of consumers has been recognised by the literature during the last years (see, e.g. [Campbell, 2006](#); [Jappelli, 2010](#); [Hastings et al., 2013](#); [Fernandes et al., 2014](#); [Lusardi and Mitchell, 2014](#)). Moreover, the literature shows that poor outcomes in household finance and questionable investment decisions mostly occur for households with low levels of income and financial literacy ([Campbell, 2006](#); [Badarinsa et al., 2016](#)). The results of recent descriptive studies, comparing levels of financial literacy of individuals, show substantial differences across countries. For example, according to the [Standard and Poor's \(2014\)](#) survey, the average percentage of adults correctly answering 3 out of 4 financial literacy questions is 56% in the old EU member states; 63% in Australia;

USA, and Canada; and 45% in the Central and Eastern European (CEE) new EU member states. Likewise, results of the OECD PISA survey show worse results for high-school students from CEE countries compared to other Western European countries (OECD, 2013). Recently, the OECD (2016) showed substantial differences in financial literacy of the adult population across the world, but also across European countries. Differences in financial literacy across countries have been predominantly studied in a descriptive way (Lusardi and Mitchell, 2011; Atkinson and Messy, 2011; OECD, 2016). An exception is a study by Jappelli (2010) who analyses the relationship between macroeconomic variables and financial literacy using international panel data on 44 countries over the period 1998-2008. Yet the differences in the observed distribution of financial literacy across households and individuals have not been studied in a cross-country framework using comparable individual-level survey data. We deliver such an analysis by answering the question what (possibly) determines the observed differences in financial literacy of individuals between countries by employing microeconomic tools from the policy-evaluation and decomposition literature.

Contribution Our study makes several contributions to the empirical literature on financial literacy and household finances. To our knowledge, we are the first analysing in more detail the newest wave of the OECD/INFE database on financial competencies of individuals, which has been made available in the summer of 2017. The advantage of this database is its broad base, focusing on an extended set of financial knowledge questions as well as aspects of financial attitudes and behavior. We are also the first to employ counterfactual decomposition techniques to analyse the observed differences in financial literacy in a cross-country perspective. In our framework, we consider individuals from Finland as a benchmark (reference) for financial literacy of individuals from other countries available in our dataset (i.e. Austria, Brazil, Canada, Croatia, Honk Kong, Hungary, Germany, Jordan, Netherlands, Russia, and UK).¹ Our findings could help to better understand the potential determinants of gaps in financial literacy between countries which can be even more than 20% in some cases (e.g. Finland vs. Croatia/Russia). Specifically we are able to decompose the differences in to parts, which are purely due to different individual characteristics across countries, parts which might have to do with different experience and remaining parts. These remaining parts we use to analyse the potential linkage to institutions and the macroeconomic environment.

¹The choice of Finland as a reference category is reasonable not only for the data availability, but also from other reasons. For example, Finish population (both adults and high-school students) rank among the best in different financial literacy surveys (e.g. OECD, 2013, 2016) compared to the population from other European countries. Furthermore, in Finland households show an intense interaction with financial markets as nearly 39% of households hold risky financial assets in their portfolios (Bover et al., 2016).

2 Data

The data used for the analysis of financial literacy gaps across countries come from the OECD/INFE international survey of adult financial literacy competencies. While the survey was conducted in almost 30 countries around the world, only a few countries made the data available for research purposes. Hence, we have managed to access individual-level data from Austria, Brazil, Canada, Croatia, Finland, Germany, Honk Kong, Hungary, Jordan, Russia, and UK making together around 15,000 observations. A unique feature of this survey is that the questions are asked in a harmonised way across countries, making the results comparable, with a major advantage as compared to previous surveys on financial literacy. Also, the set of financial literacy questions is much broader than in common previous studies.² The data also contains standard socio-economic demographic characteristics.

The financial literacy score of individuals is computed similarly to the extant literature on financial literacy (e.g. [Lusardi and Mitchell, 2014](#)). Hence, the financial literacy score is computed as a sum of all (seven) correctly answered questions asked in the survey. In our empirical analysis, we first use a set of exogenous socio-economic individual characteristics as predictors for the stock of financial literacy (i.e. labour status, age, gender, education, and marital status). In the second step, we also include a set of endogenous variables capturing the investment behaviour of respondents (e.g. having a budget, holding savings instruments, holding stocks or bonds). This is done to test the hypothesis whether financial literacy gaps would diminish after accounting for the experience with financial products in general.

3 Empirical Strategy

We study gaps in financial literacy between countries and type of individuals by means of modified Blinder-Oaxaca framework ([Blinder, 1973](#); [Oaxaca, 1973](#)). The Blinder-Oaxaca decomposition technique has been predominantly used in the labour economics literature to study gaps in wages and employment. Recently, this method has also been applied in the field of household finance to study differences in stock-holdings between US and euro-area households ([Christelis et al., 2013](#)), wealth differences in selected euro-area countries ([Mathä et al., 2014](#)), or to study financial literacy gaps between male and female population in the US ([Fonseca et al., 2012](#)). In our case, the Blinder-Oaxaca decomposition defines the mean difference in financial literacy scores of individuals from the particular studied country and individuals from the reference group, Finland. The mean difference is divided into two main

²In the previous surveys, usually three/four basic financial literacy questions on interest rates, inflation and diversification/riskiness were asked ([Lusardi and Mitchell, 2014](#)). In the OECD/INFE survey, questions include concepts such as time value of money, interest paid on loan, interest and principal, compound interest, risk and return, inflation, and risk diversification.

parts - one explained by group differences in observable individual characteristics under consideration, and another that cannot be accounted for by differences in observed individual characteristics - i.e. differences in coefficients, or how literacy is produced in the particular country.

We also use recentered influence function regressions (Firpo et al., 2009) to go beyond the mean and analyse differences in the unconditional distributions across countries.

4 Preliminary results

Preliminary results suggest that the gap in financial literacy between compared pairs of countries is substantial. The biggest, statistically significant, gap (around 23%) is observed between individuals from Finland and Russia. On the other hand, the smallest gap of around 8%, albeit significant, is observed between Finish and Austrian population. The gap for other country pairs ranges between 11% and 15%. Only a small part of the gap is explained by the differences in the observed socio-economic factors such gender, age, labour status, education and family status. The remaining part of around two-thirds (varying between 60% and 80%) of the gap is attributed to unexplained factors. Interestingly, the gap in financial literacy does not shrink substantially when we include additional covariates on the financial behaviour of individuals.

Similarly to Christelis et al. (2013), we argue that the unexplained component of the gap in financial literacy can be driven by different economic environments of countries. As an example, one could think of the educational system's quality in the particular country which can have important implications for population's financial literacy. According to Ciaian and Pokrivčák (2005), crucial sectors for economic development and human capital accumulation including the development of educational system in many transition countries have been lagging behind compared to Western European countries during the transition from a centrally-planned to a market economy. The unexplained part could also be interpreted as impacts of historic (behavioural) experiences with market economy which in turn could influence the financial literacy of individuals (e.g. Jappelli, 2010).

References

Atkinson, A. and F.-A. Messy (2011). Assessing financial literacy in 12 countries: an OECD/INFE international pilot exercise. *Journal of Pension Economics and Finance* 10(04), 657–665.

- Badarinza, C., J. Y. Campbell, and T. Ramadorai (2016). International comparative household finance. *Annual Review of Economics* 8, 111–144.
- Blinder, A. S. (1973). Wage discrimination: reduced form and structural estimates. *Journal of Human Resources* 8(4), 436–455.
- Bover, O., M. Schürz, J. Slacalek, and F. Teppa (2016). Eurosystem Household Finance and Consumption Survey: Main Results on Assets, Debt, and Saving. *International Journal of Central Banking* 12(2), 1–13.
- Campbell, J. Y. (2006). Household finance. *The Journal of Finance* 61(4), 1553–1604.
- Christelis, D., D. Georgarakos, and M. Haliassos (2013). Differences in portfolios across countries: Economic environment versus household characteristics. *Review of Economics and Statistics* 95(1), 220–236.
- Ciaian, P. and J. Pokrivčák (2005). Why Some Sectors of Transition Economies are less Reformed than Others? The Case of Research and Education. Technical report, EERI Research Paper Series.
- Feldstein, M. (1974). Social security, induced retirement, and aggregate capital accumulation. *Journal of Political Economy* 82, 905–926.
- Fernandes, D., J. G. Lynch Jr, and R. G. Netemeyer (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science* 60(8), 1861–1883.
- Firpo, S., N. M. Fortin, and T. Lemieux (2009). Unconditional quantile regressions. *Econometrica* 77(3), 953–973.
- Fonseca, R., K. J. Mullen, G. Zamarro, and J. Zissimopoulos (2012). What explains the gender gap in financial literacy? The role of household decision making. *Journal of Consumer Affairs* 46(1), 90–106.
- Hastings, J. S., B. C. Madrian, and W. L. Skimmyhorn (2013). Financial Literacy, Financial Education, and Economic Outcomes. *Annual Review of Economics* 5(1), 347–73.
- Jappelli, T. (2010). Economic literacy: An international comparison. *The Economic Journal* 120(548).
- Lusardi, A. and O. S. Mitchell (2011). Financial literacy around the world: an overview. *Journal of Pension Economics and Finance* 10(04), 497–508.
- Lusardi, A. and O. S. Mitchell (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature* 52(1), 5–44.

- Mathä, T. Y., A. Porpiglia, and M. Ziegelmeyer (2014). Wealth differences across borders and the effect of real estate price dynamics: evidence from two household surveys. Technical report, ECB Working Paper.
- Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International economic review* 14(3), 693–709.
- OECD (2013). Results: Students and Money: Financial Literacy Skills for the 21st Century (Volume VI), PISA.
- OECD (2016). *OECD/INFE International Survey of Adult Financial Literacy Competencies*. Organisation for Economic Co-operation and Development.
- Piketty, T. (2013). *Capital in the Twenty-First Century*. Harvard University Press.
- Standard and Poor's (2014). Global Financial Literacy Survey.