



BANCA D'ITALIA
EUROSISTEMA

Questioni di Economia e Finanza

(Occasional Papers)

On the drivers of financial literacy:
the role of intergenerational mobility

by Sara Lamboglia and Massimiliano Stacchini

April 2023

Number

766



BANCA D'ITALIA
EUROSISTEMA

Questioni di Economia e Finanza

(Occasional Papers)

On the drivers of financial literacy:
the role of intergenerational mobility

by Sara Lamboglia and Massimiliano Stacchini

Number 766 – April 2023

The series Occasional Papers presents studies and documents on issues pertaining to the institutional tasks of the Bank of Italy and the Eurosystem. The Occasional Papers appear alongside the Working Papers series which are specifically aimed at providing original contributions to economic research.

The Occasional Papers include studies conducted within the Bank of Italy, sometimes in cooperation with the Eurosystem or other institutions. The views expressed in the studies are those of the authors and do not involve the responsibility of the institutions to which they belong.

The series is available online at www.bancaditalia.it.

ON THE DRIVERS OF FINANCIAL LITERACY: THE ROLE OF INTERGENERATIONAL MOBILITY

by Sara Lamboglia* and Massimiliano Stacchini*

Abstract

Individual characteristics, such as educational background, are important but insufficient to explain variation in financial skills among people. Using repeated cross-sectional survey data on over 145,000 individuals aged 50+ and resident in 20 European countries and Israel combined with historical country-level data, we explore the role that selected country characteristics play in stimulating financial awareness. We find a lasting effect of social mobility on financial skills: individuals who spent early adulthood in countries characterized by high intergenerational mobility proved to be more financially literate than their peers as they age. The effect is economically sizable, especially among women and individuals from disadvantaged backgrounds. The results hold in models that use country-specific cohort effects to absorb context confounders and common shocks. Our findings suggest that promoting equality of opportunities across generations is not only ethically desirable but can also enhance socially valuable spillovers such as the accumulation of skills among vulnerable citizens.

JEL Classification: G53, J52.

Keywords: financial literacy, intergenerational mobility, gender gap.

DOI: 10.32057/0.QEF.2023.0766

Contents

1. Introduction	5
2. Empirical analysis	7
2.1. Financial literacy and personal characteristics	8
2.1.1. Blinder-Oaxaca decomposition.....	9
2.2. Financial literacy and country characteristics.....	10
2.2.1 Priors	10
2.2.2 An exploratory analysis of the role of country characteristics	11
2.2.3 A formal econometric analysis of the role of intergenerational mobility.....	12
3. Conclusions	14
4. Tables	15
5. Figures.....	19
References	21
Appendix	25
Additional tables and figures.....	26

* Bank of Italy, Directorate General for Consumer Protection and Financial education.
Email: sara.lamboglia@bancaditalia.it; massimiliano.stacchini@bancaditalia.it.

1 Introduction¹

The importance of financial literacy for personal well-being is well known and has been recently reaffirmed among scholars. Its practical role in favouring households’ and entrepreneurs’ resilience against shocks emerged clearly during the pandemic; moreover, a responsible management of financial and payment services can be difficult when basic financial skills are lacking².

While recognition for financial awareness is now greater than ever, financial illiteracy is widespread and significant gaps are observed even among citizens of developed countries³. Only a third of adults are familiar with the so-called ‘big three’ questions according to a survey conducted in 140 countries in 2014⁴; among developed countries the figure ranges from 37% in Italy to 68% in Canada. Analyses based on the the P-Fin index – an indicator measuring knowledge and understanding that enable sound financial decisions⁵ – show that adults in the U.S. answer 50% of questions correctly; the percentages decrease for women (45), Gen Z (42) and low-educated adults (31).

The literature on the drivers of financial literacy is vast and points to both individual- and country-level variables. Financial skills may be characterized as outcomes of investments in human capital⁶ and the costs of these investments can be low for well-educated individuals⁷; the benefits can decrease in countries where (extremely generous) social security systems attenuate the need for financial planning, or where underdeveloped financial markets hamper opportunities for financial investments⁸.

Despite the advances in the literature, the causes of financial illiteracy are not entirely understood, which may be due to the nature of most studies. Micro-level empirical analyses are often single country studies, hence, generalising their validity can be challenging; on the other hand, researches exploiting aggregate data allow international comparisons but can hardly capture heterogeneities among individuals or population groups.

This paper combines micro- and country-level data to analyse the drivers of financial skills in a cross-country perspective. After reviewing the explanatory capacity of individual characteristics, we explore the role of a selected group of country characteristics that might influence the incentives to accumulate financial skills. In particular, we analyse the role of intergenerational mobility. Several studies show how mobility can promote economic activity and the development of human capital⁹. We verify whether intergenerational mobility can also stimulate the propensity to improve financial skills¹⁰.

¹We are grateful to Paolo Angelini, Riccardo De Bonis, Daniela Marconi, Angela Romagnoli, Sauro Mocetti and Mariacristina Rossi for valuable discussions. We also thank Alessio D’Ignazio, Marco Marinucci and Pietro Vassallo for helpful advice and Giulia Cantarini for proofreading. All remaining errors remain our own. The views expressed in this study are those of the authors and do not involve the responsibility of the Bank of Italy.

²See Lo Prete (2022), for the case of Italy see Lusardi et al. (2020) and Rapporto-Edufin (2021).

³OECD (2020a), De Beckker et al. (2019), OECD (2020b), Lusardi et al. (2020), GFLEC (2017).

⁴Klapper and Lusardi (2020).

⁵Yakoboski et al. (2022).

⁶See De Bonis et al. (2022) for an introduction to financial education.

⁷Lusardi and Mitchell (2014, 2011); Guiso (2011); Guiso and Jappelli (2009); van Rooij et al. (2011, 2012); Rinaldi (2011), Rapporto-Edufin (2021); Lusardi et al. (2020); G20/OECD-INFE (2021); D’Ignazio et al. (2022).

⁸Jappelli and Padula (2013), Lusardi and Mitchell (2014).

⁹Güell et al. (2018).

¹⁰Acciari et al. (2022); Corak (2013); Chetty et al. (2014); Cannari and D’Alessio (2018).

The Survey of Health, Ageing and Retirement in Europe (SHARE) provides our sample. This is a micro-level dataset on around 145,000 individuals aged 50+, resident in 21 European countries and Israel and interviewed over the period 2004–15. Countries include Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and Switzerland. The large number of observations and a detailed questionnaire make this dataset particularly suitable for our analysis. Importantly, the repeated observation of a large group of countries with highly comparable characteristics, as the majority of European countries, is not available in other datasets containing information on adults’ financial competences¹¹.

We hypothesise that experiences occurred during late adolescence and early adulthood are of major importance in shaping attitudes and behaviours adopted later in life. We refer to the so-called ‘impressionable years’ hypothesis proposed by social psychologists: individuals’ values and worldviews receive an imprinting from experiences faced during early adulthood and they become resistant to changes later in life¹². These lasting effects are indeed documented: adults who experienced economic uncertainty or recessions between the age of 18 and 25 are less prone to invest in the stock market¹³, they are more likely to believe that success depends on luck rather than effort¹⁴, and to manifest distrust in the European institutions¹⁵. Bearing these facts in mind, the country characteristics analysed in this paper are those experienced by each sampled individual during their early adulthood.

We resort to a formal Blinder-Oaxaca decomposition (BOD) to measure the explanatory capacity of individual characteristics and to explore correlations between the country-level variables and financial skills. To enforce causality, we resort to models that use individual-level data and employ fixed effect strategies to absorb country-level confounders and common shocks, as in Hovi (2021) and Gavresi and Litina (2021).

Our results are threefold. We show that individual characteristics, such as educational attainments, are important but insufficient to explain variation in financial skills. The BOD shows that individual traits explain less than 40% of variation of financial skills for the majority of the countries. With regard to country characteristics, we document a positive effect of intergenerational mobility on financial literacy: individuals who spent their ‘impressionable years’ in high-mobility countries proved to be more literate than their peers once they become older. The effect is sizable, especially for women and individuals from disadvantaged backgrounds. Our findings are in line with Kearney and Levine (2016) who claim that greater rates of income inequality lead individuals to perceive a lower rate of return on investments in their own human capital hampering individual motivation.

Our study has important policy implications. Promoting equality of opportunities and mobility across generations is not only ethically desirable but can also enhance valuable complementarities in the development of human capital and stimulate financial awareness, especially among vulnerable citizens.

¹¹For instance, large economies are under-represented in the OECD/INFE International Survey of Adult Financial Literacy, which was administered by 23 and 26 countries in 2017 and 2020, respectively.

¹²Krosnick and Alwin (1989).

¹³Fagereng et al. (2017).

¹⁴Giuliano and Spilibergo (2014).

¹⁵Gavresi and Litina (2021).

2 Empirical analysis

We need micro-level data about adults' financial literacy and individual characteristics and historical information on the characteristics of the country where individuals spent their 'impressionable years'. Our dataset combines different sources of information. The repeated cross-sectional data from the Survey of Health, Ageing and Retirement in Europe (SHARE) provides our sample of adults. The original survey includes information on around 140.000 individuals aged 50 or older from 21 European countries and Israel interviewed in 8 waves since 2004 (Table A1 in Appendix).

The survey includes questions testing numeracy skills applied to percentages, interest rates on savings accounts, and calculus of discounted prices. There is a large literature showing how the accuracy of responses to simple mathematical questions strongly predicts the level of financial competences as well as the likelihood of desirable behaviour in the management of personal finance, such as repayment behaviour, retirement planning, and participation to stock and housing markets¹⁶. For these reasons, math skills have been often used to proxy - or instrument - financial skills. Following Christelis et al. (2010), Romiti and Rossi (2012) and Gousia (2016), we proxy financial literacy by aggregating the (four) mentioned questions into an indicator ranging from 1 to 5 (see the Appendix for detailed information). Our sample includes adults for whom this indicator is available; these are around 135.000 individuals interviewed in the years 2004, 2006, 2011, 2013 and 2015.

Among individual characteristics, we consider educational attainments, income, age and cohort, occupational and marital status; we take into account whether the respondent is responsible for financial decisions in the family and has purchased a house. The list of variables is reported in Table A2 (Part 1).

The distribution of financial literacy by country is illustrated in Figure A1. Observations from all individuals and waves are pooled. The countries showing the highest scores are Switzerland (3.8), Austria (3.7) and the Netherlands (3.6) while Italy (3.0), Portugal (2.7) and Spain (2.6) are among the worst¹⁷. These differences in aggregate data reflect differences in the distributions of individual outcomes: adults who are not able to manage percentages, thus scoring 1 or 2, are less than 10 per cent in Switzerland; the figures increase to 30 and 40 in Italy and Spain, respectively (Figure A2). On the other hand, adults able to manage compound interests and calculate the original prices of discounted values, hence scoring 4 or 5, are 70 per cent in Switzerland and Austria, and 30 and 15 per cent in Italy and Spain, respectively. The data indicate that a gender gap does exist. It is statistically significant in all the countries even if its magnitude is heterogeneous (Figure A1).

The distribution of individual characteristics by country is presented in Table A3. Individuals with a university degree are 42 per cent in Ireland, 39 in Denmark, and 28 per cent in Germany; lower percentages refer to Portugal (11 per cent), Spain (10), Italy and Poland (8 and 9). In our sample, the percentage of adults responsible for financial decisions in their family equals 69 on average and it is broadly homogeneous across the countries. Finally, the percentage of those who purchased a home ranges from 78 (Israel and Hungary) to 43 (Austria and Germany).

¹⁶Lusardi (2012), Christelis et al. (2010), Smith et al. (2010), Romiti and Rossi (2012), Gerardi et al. (2013), Skagerlund et al. (2018).

¹⁷These figures are in line with other sources of information; for instance, Italy and Austria rank respectively among low and top performers countries in the OECD (2020) International Survey of Adult Financial Literacy.

Country characteristics are obtained from several datasets: the intergenerational Mobility database (World Bank), the Financial Soundness Indicators (IMF) and the OECD Statistics data-warehouse. The complete set of variables and summary statistics are shown in Table A2 (Part 2) and Table A4.

2.1 Financial literacy and individual characteristics

This section revisits the link between financial literacy and individual characteristics by combining micro-level data from 21 European countries and Israel.

We consider the following baseline model:

$$Flit_{i,c,t} = \beta IndCar_{i,c,t} + \gamma_{i,c} + \delta_t + \epsilon_{i,c,t} \quad (1)$$

where $Flit_{i,c,t}$ is the level of financial literacy of the i -th individual in the c -th country interviewed in wave t , $IndCar_{i,c,t}$ is a vector of individual characteristics and $\gamma_{i,c}$ is a set of cohort and country fixed effects¹⁸ specific to individual i in country c . The model includes a dummy δ_t for each wave and an error $\epsilon_{i,c,t}$ having the classical properties.

We start by considering a parsimonious model which is progressively augmented by adding individual characteristics (Table 1). Cohort, country and wave dummies are included additively in all specifications. In the last regression we exploit a more severe specification: we use cohort-specific country dummies (multiplicative country*cohort dummies) to better distinguish the relevance of individual characteristics from cohort-specific context effects.

As expected, financial literacy is increasing in education. Looking at the complete model (column 7 in Table 1), we have that compared to adults which have not concluded secondary school, the score increases by around 0.5 (15 per cent) for those who have concluded it and by 0.7 (21 per cent) for those with a university degree. The coefficient for female is equal to -0.3 implying a gender gap in financial literacy of 9 per cent of the average score (3.31). Occupational status also matters. Compared to unemployed individuals, literacy is higher for employees (5 per cent) and adults who retired (2 per cent). Financial literacy relates to individual income (in logarithm) as the coefficient is positive and statistically significant in all specifications.

Other results enlarge our picture. Married adults are likely to perform better than singles. Moreover, and as expected, adults who are responsible for financial decisions in the household show higher skills than their peers (Finresp). A similar result holds for those who purchased a house (Boughthouse).

Overall, our analysis has documented the link between individual financial literacy and several individual characteristics in a cross-country context. Among the covariates, educational attainment is the most important as it provides the largest contribution to the R2 and the coefficients show the largest magnitude. In the subsequent section, the explanatory capacity of individual characteristics is quantified formally.

¹⁸Individual level dummies cannot be exploited as repeated measure of financial literacy for the same adults are not available (each adult has been asked the related questions in only one wave).

2.1.1 Blinder-Oaxaca decomposition

We resort to the Blinder-Oaxaca Decomposition (BOD) to assess the importance of individual characteristics. The BOD has been originally used by labour economists to characterise wage differentials across population groups¹⁹. It has been also used to analyze individual financial choices in cross-country contexts²⁰; recently Cupák et al. (2021) and Cupák et al. (2018) resort to the BOD to assess cross-country differences in financial skills.

We apply the BOD on a cross-country dataset of 20 European countries and Israel. Our focus is analysing to what extent the variation of financial skills can be explained by variation in individual characteristics. The logic of the exercise is the following. We quantify the average financial literacy gap between the citizens of a country and those of the country ranking the best (Switzerland in our dataset). The average gap is decomposed in two parts: (i) the ‘composition’ component measures the contribution of the differences in individual characteristics between the countries; (ii) the ‘coefficient’ component measures the contribution of country specific links between financial skills and individual characteristics²¹. Intuitively, the higher the former component, the higher the explanatory capacity of individual characteristics.

Formally, let C and T indicate the C -th country and, respectively, the benchmark country and let $AvgGap_C = E(Flit_T) - E(Flit_C)$ be the average gap in financial literacy between citizens of countries T and C . The gap is decomposed as (see Jann (2008)):

$$AvgGap_C = \overbrace{(E(IndCar_T) - E(IndCar_C))\beta_T}^{\text{‘composition’ component}} + \overbrace{E(IndCar_C)(\beta_T - \beta_C)}^{\text{‘coefficient’ component}} \quad (2)$$

where $E(IndCar_T)$ and $E(IndCar_C)$ are vectors of averages of individual characteristics of citizens of the two countries and β_T and β_C are country-specific vectors of coefficients linking individual characteristics and financial skills. For each pair of countries (C , T) the elements of the BOD are estimated through a regression based on model (1) run on individual data.

The results are illustrated in Table 2 and Figure 1. The ‘composition’ effects are significant for most countries. It means that a part of the gap can be attributed to differences in individual characteristics. With regard to magnitude, the ‘composition’ effect is negligible for Denmark and Germany and it is small in several countries: for instance, the percentages of the gap explained by individual characteristics are equal to 34, 28 and 27²² in Spain, Portugal and, respectively, Italy; as for these countries, the gap in financial literacy with the top-performer is equal to 1.3, 1.1 and 0.8 points.

In summary, the BOD indicates that, on average, approximately a third of the gap in financial literacy between the country and the top performer can be attributed to differences in individual characteristics or, in other terms, that a relevant part of the gap would remain unexplained even assuming cross-country homogeneity in the distribution of individual characteristics.

¹⁹Blinder (1973), Oaxaca (1973), Stanley and Jarrell (1998), Weichselbaumer and Winter-Ebmer (2005).

²⁰Christelis et al. (2013), Sierminska and Doorley (2013), Bover et al. (2014).

²¹Under the hypothesis that the two countries are homogeneous in terms of composition of individual characteristics.

²²The educational attainment is the variable providing the greater contribution to the ‘composition’ effect.

2.2 Financial literacy and country characteristics

So far we documented how variation in individual characteristics, even if important, are insufficient to characterise variation in financial skills. Motivated by this empirical finding, we extend our exploration to a set of country-level (common) components which might potentially influence financial awareness, and contribute to explain the (unexplained) ‘co-efficient’ component estimated by the BOD.

Country-level characteristics under investigation are those experienced by adults during their early adulthood. As already explained in the introduction we follow the ‘impressionable years’ hypothesis according to which attitudes are sensitive to circumstances experienced between the age of 18 and 25, when human brain is still in the process of developing (Steinberg (2014)) and while worldviews and behaviours tend to be less sensitive to what happens later in life (Giuliano and Spilibergero (2014); Krosnick and Alwin (1989)). We first discuss our priors about the links between our selected country characteristics and the individual incentive to accumulate financial skills, then we verify their empirical soundness.

2.2.1 Priors

Financial literacy and social security systems. The incentive to accumulate financial skills can be lower for individuals who grew up in countries characterised by generous social security systems. Jappelli (2010) claims that systems based on high mandatory contributions reduce the amount of resources available for financial investments and the need of financial planning. To proxy the size of social security systems, we use `Contr_rate`, a variable that measures compulsory payments to general government, as a percentage of GDP²³, that confer entitlement to receive future benefits (OECD (2021)).

Financial literacy and financial development. Financial skills can be perceived as useful by individuals who grew up in countries where financial markets are developed and opportunities for financial investments available. To account for financial market deepening we use the stock market capitalization as a share of GDP (`Stkmktcap`).

Financial literacy and intergenerational mobility. Social mobility is a key aspect of fair societies and its level can proxy the extent to which efforts and abilities are rewarded (Acciari et al. (2022); Chetty et al. (2014)). Hence, social mobility may create incentives for the accumulation of skills. Linkages between social mobility, economic activity and the development of human capital have been documented by scholars (Güell et al. (2018)). Similarly, we expect the incentives to accumulate financial skills to be greater in countries where social mobility is more pronounced.

We consider intergenerational mobility in educational achievements, which is a key aspect of social mobility. In fact, “social mobility is largely limited by the persistence of incomes across generations, for which persistence of education is a fundamental driving factor” (World Bank²⁴, 2018). Our indicator (`Igm`) summarizes to what extent the educational attainments of individuals are independent of those of their parents²⁵. The interest

²³The aggregate includes unemployment and insurance benefits, supplements, accident, injury and sickness benefits, old-age, disability and survivors’ pensions, family allowances, reimbursements for medical and hospital expenses or provision of hospital or medical services.

²⁴Narayan et al. (2018).

²⁵It measures the correlation between the number of years of schooling of an individual and her parents

in this variable arises from the fact that this independence, i.e. the possibility of improving for those who start from a disadvantaged background, but also of worsening for those who start out advantaged, signals that merit and efforts matter. This stimulates incentives, economic growth as well as the absolute upward mobility, that is the extent to which living standards of a generation are higher than those of their parents²⁶.

The World Bank’s Global Database on Intergenerational Mobility (GDIM) is our source of information.

Financial literacy and participation to labour market. Involvement in formal economic life can increase the need of financial planning and encourage the development of financial skills. Klapper and Lusardi (2020) show that financial skills are higher among employed and self-employed individuals. On the same vein, Bianco et al. (2022) document how labour market participation can promote financial inclusion. We use the participation rate to labor markets (Lab_force) to verify whether the incentive to accumulate skills are correlated with involvement in formal economic life.

2.2.2 An exploratory analysis of the role of country characteristics

To explore the relevance of country characteristics we draw on the results of the Blinder-Oaxaca decomposition. Section 2.1.1 decomposes the average gap in financial literacy between each country and the top-performer in ‘composition’ and ‘coefficient’ components. Here we verify whether the ‘coefficient’ component - the part that cannot be attributed to individual characteristics - correlates with the country characteristics discussed in Section 2.2.1.

In our model the ‘coefficient’ component of model (2) estimated for a country c in wave t , $\widehat{\text{Coefficient-comp}}_{c,t}$, is regressed on a specific country variable, $X_{c,t}$. For each variable under investigation²⁷ the regression includes the country-level Gdp and wave-level dummies δ_t as controls:

$$\widehat{\text{Coefficient-comp}}_{c,t} = \alpha + \beta X_{c,t} + \delta_t + \epsilon_{c,t} \quad (3)$$

The variables have been normalized (mean and standard deviation equal to 0 and 1 respectively) to easily compare the importance of indicators having different scales.

The results are shown in Table 3. The ‘coefficient’ component shows a statistically significant correlation with Igm. The higher the level of intergenerational mobility (Igm), the lower the magnitude of the unexplained gap in financial skills. Conversely, the ‘coefficient’ component does not present significant correlations with the other country-level variables

(relative mobility); the data are available at country level and by cohort.

²⁶“Lack of relative mobility is not only deeply unfair and perpetuates inequality across generations, but it is also harmful to economic growth because of wasted human potential, which leads to misallocation of resources, which are harmful for growth. A lack of relative mobility over time, in other words, may constrain absolute upward mobility” (World Bank, 2018). This linkages are supported by empirical evidence: “On average, economies with a higher share of adults who are more educated than their parents are also economies in which the educational attainment of individuals is less dependent on the educational attainment of their parents” (World Bank, 2018).

²⁷The country characteristics included in the model are computed in the following way: for every country present in a given wave t we consider all adults interviewed in that wave and for which financial skills are available. For each of these adults, we identify the historical value of the country characteristic at the age of 25. Then, we average information at the country and wave level.

under investigation. In the subsequent section, we build on this evidence and give a closer look at the links between intergenerational mobility and financial skills.

2.2.3 A formal econometric analysis of the role of intergenerational mobility

This section deepens the analysis of the link between intergenerational mobility (Igm) and financial skills. The issue is analyzed in graphical terms and through a formal econometric analysis.

Figure A3 contrasts Igm average conditions prevailing during early adulthood of sampled adults (x-axis) with average financial literacy for the same individuals observed when they are 50 or older (y-axis). The graph suggests a positive relation between intergenerational mobility experienced during early adulthood and financial literacy observed later in life.

The use of historical (predetermined) data on Igm preserve the analysis from reverse causality²⁸. However, other issues need to be addressed to enforce causality. We need to control for other country level counfounders, common trends or shocks experienced by each cohort of individuals during their life cycle in their specific country, which could have played a role in shaping individuals skills. Specifically, we need controls for: (i) common trends faced by residents of a specific country (such as the long-term slowdown in productivity occurred in Italy in the last decades²⁹); (ii) global shocks experienced by specific cohorts (such as the global financial crisis); (iii) other shocks to which a specific cohort in a specific country could have been exposed (such as the change in the pension system occurred in Italy in the 90's). Moreover, we want to control for heterogeneities at the individual level.

We address these issues through an econometric model which combines individual data on financial skills and individual characteristics with historical aggregated data on intergenerational mobility. The strategy by Hovi (2021) and Gavresi and Litina (2021) is adopted to fully control for the cases (i-iii) discussed above: we use country-specific cohort effects (cohort×country dummies). This effects make the specification particularly severe and absorb the cohort- and country-dummies that, if included additively in the model, would have only controlled for the cases specified in (i) and (ii).

Importantly, our specification permits to analyze whether the effects of mobility vary across individuals who are supposed to be ‘exposed’ on a different extent to its effects: we include women among the ‘exposed’ group and individuals from well-educated families among the less ‘exposed’ ones.

The empirical model is the following:

$$Flit_{i,c,t} = \gamma_1 Igm_i + \gamma_2 Igm_i * Exposed_i + \gamma_3 Exposed_i + IndCar_{i,c,t} + \alpha_{c,cohort} + \delta_t + \epsilon_{i,c,t} \quad (4)$$

$Flit_{i,c,t}$ is the level of financial skills for the i-th adult in the c-th country interviewed in wave t; Igm_i is the level of mobility in education during early adulthood, which is specific for the cohort and the country to which the individual belongs to; $Exposed_i$ are dummies equal to 1 if the individual is ‘exposed’ to the effects of Igm. As said, among ‘exposed’

²⁸In principle, reverse causality could affect the association as higher financial skills could accelerate mobility across generations. As said, the variable Igm refers to conditions prevailing during early adulthood while financial literacy is measured when the individual is 50 or older.

²⁹Bugamelli et al. (2018).

individuals we include women or, alternatively, individuals with a poor family background: Poorback-1 (Poorback-2) equals 1 if only a small number of books - lower than 25 - were available in the individual's family of origin when she was 10 (if the breadwinner had a 'low skilled' occupation, i.e. non qualified/elementary jobs). Finally, the term $\alpha_{c,cohort}$ indicates the inclusion of (additive or multiplicative) cohort- and country- dummies.

The results are presented in Table 4. Column 1 shows the effect of intergenerational mobility on financial literacy. The coefficient of Igm, positive and significant, shows that historical mobility positively influences financial skills. Columns 2 and 3³⁰ show that the dummy female is significantly negative (-0.39) and the coefficient for Igm*female is significantly positive (0.37): these results confirm a gender gap in financial literacy which penalizes women; however, they also indicate that the gap is reduced among individuals who experienced high mobility during early adulthood. Columns 4 and 5 show a qualitatively similar results: column 4 indicates that financial skills are lower among women (-0.31) and individuals with a poor family background (-0.52); however, the coefficient for Poorback-1*Igm is statistically positive (1.16) and indicates that the gap is reduced if these individuals experienced high mobility during early adulthood.

Triple interactions are exploited to study the combined effects of being a woman and an individual from a disadvantaged family (column 6). The coefficient for Igm*Female*Poorback-1 is positive (1.075) and it indicates that the positive effect of mobility is sizable especially for women from disadvantaged families. The same holds when the term Igm*Female*Poorback-2 is considered.

Figure 2 illustrates graphically the results. According to the estimates of column 2 (blue line), the higher the level of Igm (x-axis), the lower the gender gap in financial literacy (y-axis): for instance, the gender gap in literacy lowers by 31 per cent (from 0.29 to 0.20) if we contrast individuals grown up in a low-mobility country such as Italy (1940 cohort) with those grown up in a high-mobility one such as Denmark (1950 cohort). We plot the result of column 6 (orange line) and compare the effects estimated for all adults with those obtained for those being from a disadvantaged family. The steepness of the two lines indicates that the reduction of the gender gap is more pronounced among the latter group. Quantitatively, the decrease of the gap reaches 61 per cent (from 0.35 to 0.12) when the increase of mobility refers to individuals from disadvantage families³¹.

Finally, we perform a placebo exercise as a robustness check. The logic is the following: if the correlation between financial literacy and Igm were spurious, it would also appear when placebo values for intergenerational mobility were used. In our case, the country values of Igm (the placebo) are allocated among sampled adults at random and, as expected, the term Igm loses its statistical significance after the randomization³².

³⁰Column 2 considers the whole sample while column 3 only exploits adults for which data also used in the remaining regressions are available.

³¹The results in Table 4 represent the direct effects of historical mobility on current individual financial skills. We cannot exclude that indirect channels are also at work: for example, historical Igm might have influenced educational attainments or individual choices in early adulthood, which might have changed in the course of life and shaped financial skills in turn. We are agnostic about the relevance of these indirect potential channels; conversely, the relevance of the direct channel is supported by the economic and statistical significance of Igm in models controlling for a large set of individual characteristics observed for sampled adults later in life - such as education or earnings - through which the indirect channels can be suppose to operate.

³²The regression tables for this exercise, not presented here, are available upon request.

3 Conclusions

Financial literacy is key for personal well-being but illiteracy is widespread and significant gaps still exist among citizens of developed countries. Our work shows that individual characteristics, such as educational attainments, are important but insufficient to characterise financial skills.

Building on this evidence, we extend the analysis to country-level drivers of financial skills. Our main result documents the positive role of intergenerational mobility in education on financial literacy. Individuals who experienced transition to adulthood in high-mobility countries grow up to become more literate than their peers. The effect is sizable especially for women and individuals from a disadvantaged background.

Our results are in line with Kearney and Levine (2016), who show that income inequality can offset individual motivation and aspirational effects coming from educational wage premium, especially for low-income young individuals. We also contribute to the literature on the linkage between mobility and income inequality (also known as ‘Great Gatsby’ curve, Krueger (2012), Corak (2013), OECD (2011)): the incentives to accumulate skills and the recognition of efforts and abilities, which are more pronounced in high-mobility contexts, can improve opportunities for disadvantaged individuals, thus reducing the levels of inequality. The investigation of the combined influence of social mobility and inequality on financial awareness is left for future research.

Our paper has important policy implications. Promoting equality of opportunities and mobility across generations can enhance valuable complementarities in the development of human capital and stimulate financial awareness, especially among vulnerable citizens.

4 Tables

Table 1: Financial literacy and personal characteristics

Dep var: Financial literacy (range: 1-5)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.357*** (0.029)	-0.287*** (0.033)	-0.252*** (0.033)	-0.235*** (0.029)	-0.235*** (0.030)	-0.267*** (0.027)	-0.280*** (0.007)
Secondary Ed.		0.617*** (0.066)	0.587*** (0.060)	0.583*** (0.060)	0.560*** (0.056)	0.559*** (0.058)	0.468*** (0.008)
University		0.942*** (0.058)	0.890*** (0.052)	0.883*** (0.053)	0.833*** (0.051)	0.819*** (0.053)	0.745*** (0.010)
Retired			0.225*** (0.029)	0.217*** (0.032)	0.191*** (0.032)	0.143*** (0.044)	0.073*** (0.017)
Employed			0.263*** (0.024)	0.258*** (0.024)	0.214*** (0.023)	0.183*** (0.025)	0.156*** (0.017)
Homemaker			0.032 (0.055)	0.023 (0.053)	0.011 (0.051)	-0.036 (0.050)	-0.030 (0.019)
Married				0.176*** (0.025)	0.128*** (0.027)	0.078*** (0.026)	0.078*** (0.014)
Finresp				0.131*** (0.023)	0.127*** (0.022)	0.137*** (0.022)	0.166*** (0.022)
Income (log)					0.081*** (0.020)	0.087*** (0.019)	0.057*** (0.003)
Boughthouse						0.084* (0.041)	0.175*** (0.008)
Wave	YES	YES	YES	YES	YES	YES	YES
Cohort FE	YES	YES	YES	YES	YES	YES	
Cohort*Country FE							YES
Observations	132724	132724	132724	132724	132724	85648	85541
R2-Adj.	0.099	0.203	0.212	0.216	0.222	0.243	0.289

This table presents estimates of model (1). Robust standard errors in parentheses ***p<0.01, **p<0.05, *p <0.10. Dummies omitted: lowedu, single, unemployed, house rented. See Table A2(Part 1) for variables description. Source: our elaboration on SHARE data.

Table 2: Blinder-Oaxaca decomposition

	AUT	BEL	CZE	DEU	DNK	ESP	EST	FRA	GRC	HRV
Benchmark (CHE) Flit	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)
Country Flit	3.681*** (0.013)	3.362*** (0.009)	3.456*** (0.012)	3.595*** (0.011)	3.593*** (0.013)	2.518*** (0.010)	3.225*** (0.014)	3.122*** (0.011)	3.368*** (0.012)	3.310*** (0.019)
Difference	0.108*** (0.019)	0.427*** (0.017)	0.333*** (0.018)	0.194*** (0.018)	0.196*** (0.019)	1.271*** (0.017)	0.564*** (0.020)	0.667*** (0.018)	0.421*** (0.018)	0.479*** (0.023)
Explained (composition)	0.012 (0.013)	0.064*** (0.010)	0.205*** (0.022)	-0.031*** (0.010)	-0.085*** (0.010)	0.340*** (0.017)	0.083*** (0.023)	0.144*** (0.011)	0.218*** (0.016)	0.178*** (0.029)
Unexplained (coefficients)	0.096*** (0.022)	0.363*** (0.018)	0.129*** (0.028)	0.224*** (0.019)	0.282*** (0.020)	0.931*** (0.023)	0.480*** (0.029)	0.523*** (0.019)	0.203*** (0.022)	0.301*** (0.038)
N	12121	17345	13096	14580	11956	14683	11254	14896	13300	7206

	HUN	IRL	ISR	ITA	LUX	NLD	POL	PRT	SVN	SWE
Benchmark (CHE) Flit	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)	3.789*** (0.014)
Country Flit	3.352*** (0.021)	3.386*** (0.035)	3.305*** (0.017)	2.977*** (0.011)	3.361*** (0.026)	3.635*** (0.013)	2.997*** (0.021)	2.717*** (0.023)	3.160*** (0.014)	3.607*** (0.011)
Difference	0.437*** (0.025)	0.403*** (0.037)	0.484*** (0.021)	0.812*** (0.018)	0.428*** (0.029)	0.154*** (0.019)	0.792*** (0.025)	1.072*** (0.027)	0.629*** (0.020)	0.182*** (0.018)
Explained (composition)	0.137*** (0.029)	0.035* (0.020)	0.090*** (0.014)	0.265*** (0.014)	0.074*** (0.013)	0.114*** (0.011)	0.237*** (0.031)	0.275*** (0.027)	0.068*** (0.018)	0.041*** (0.010)
Unexplained (coefficients)	0.300*** (0.038)	0.367*** (0.038)	0.394*** (0.023)	0.546*** (0.021)	0.354*** (0.030)	0.039** (0.020)	0.555*** (0.040)	0.798*** (0.037)	0.562*** (0.027)	0.141*** (0.019)
N	7978	5908	10243	14452	6879	12818	7651	6973	10055	13537

The Blinder-Oaxaca method decomposes the gap in financial literacy between the country and the benchmark country (see model 2). The gap is allocated to a ‘composition’ and a ‘coefficient’ component. The ‘composition’ component measures the gap explained by differences in the distribution of personal characteristics between the country and the benchmark country; the ‘coefficient’ component measures the gap due to country differences in the coefficients linking financial literacy and personal characteristics. ‘Benchmark (CHE) Flit’ is the score in financial literacy of the benchmark country (Switzerland); ‘Country Flit’ is the score of the country in the column; ‘Difference’ is the gap in financial literacy between the two countries. The coefficients are obtained from individual-level regressions linking financial literacy and personal characteristics for each country (model 1). Standard errors in parentheses ***p<0.01, **p<0.05, *p <0.10. Source: our elaboration on SHARE data.

Table 3: Financial literacy and country characteristics

Dep. var: 'Coefficient' effect	(1)	(2)	(3)	(4)	(5)
Gdp	-0.222*** (0.0536)	-0.254*** (0.0668)	-0.083** (0.407)	-0.237*** (0.0782)	-0.060* (0.0330)
Contr_rate		-0.0149 (0.0334)			
Lab_force			-0.0280 (0.0338)		
Stkmkt_cap				-0.051 (0.0527)	
Igm					-0.068** (0.0269)
Wave FE	YES	YES	YES	YES	YES

The table reports estimates of model (3). The dependent variable is the 'coefficient' component returned by the Blinder-Oaxaca decomposition (model 2). Each regressor has been standardised (mean equal to 0 and standard deviation equal to 1). Wave fixed effects are included. The variable Igm is in log. Standard errors in parentheses ***p<0.01, **p<0.05, *p <0.10. Source: our elaboration on SHARE data.

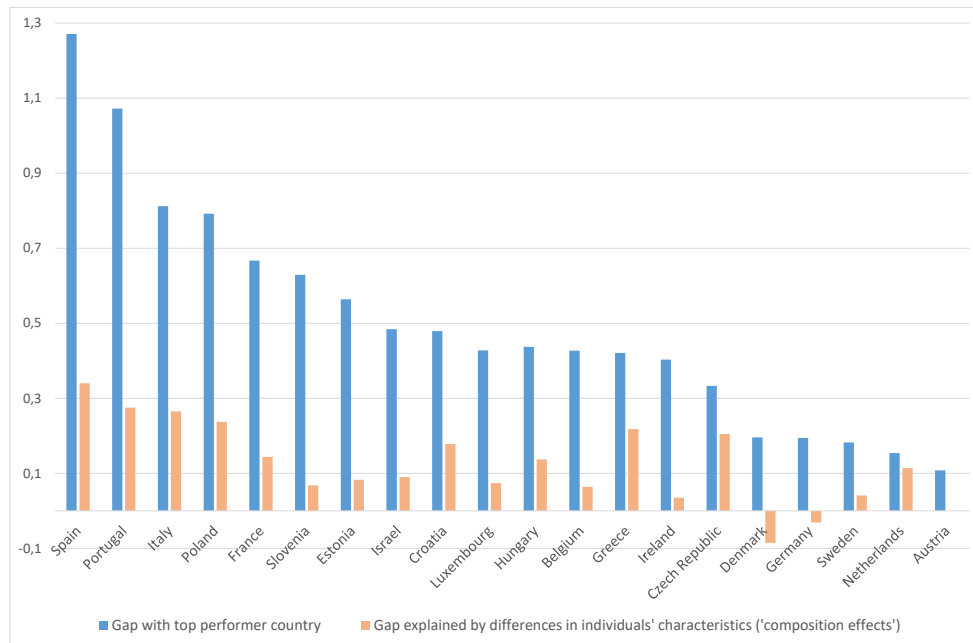
Table 4: The importance of intergenerational mobility for financial literacy of women and individuals from disadvantaged background

Dep var: Financial literacy (range 1-5)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Igm	0.564*** (0.173)						
Female	-0.224*** (0.006)	-0.397*** (0.076)	-0.540*** (0.020)	-0.311*** (0.025)	-0.302*** (0.026)	-0.224** (0.071)	-0.275*** (0.029)
Female*Igm		0.370** (0.125)	0.584*** (0.076)			-0.209 (0.134)	-0.022 (0.076)
Poorback-1				-0.528*** (0.065)		-0.530*** (0.067)	
Poorback-1*Igm				1.166*** (0.375)		0.558* (0.219)	
Poorback-2					-0.643*** (0.080)		-0.404*** (0.048)
Poorback-2*Igm					1.093** (0.254)		0.584*** (0.067)
Female*Poorback-1*Igm						1.075** (0.237)	
Female*Poorback-2*Igm							0.980*** (0.081)
Baseline controls	YES	YES	YES	YES	YES	YES	YES
Cohort FE	YES						
Country FE	YES						
Cohort*Country FE		YES	YES	YES	YES	YES	YES
Wave FE	YES	YES	YES	YES	YES	YES	YES
R2-squared	0.21	0.21	0.24	0.25	0.25	0.25	0.25
Observations	129981	129975	39329	39329	39329	39329	39329

The table shows the results of the regressions based on model (4). Robust standard errors in parentheses ***p<0.01, **p<0.05, *p<0.10. The dependent variable is the financial literacy score. The main regressors, aside the gender dummy, are Poorback-1 and Poorback-2. They proxy the background of the family of origin. The first, Poorback-1, is a dummy equal to 1 in case the family owned less than 25 books when the individual was 10. The second, Poorback-2, is a dummy equal to 1 when the main breadwinner of the family of origin had a 'low profile' occupation (non qualified/elementary job or agricultural occupation). All regressions control for all variables in model 1. The last two columns include all main effects and double interactions not absorbed by fixed effects. Source: our elaboration on SHARE data.

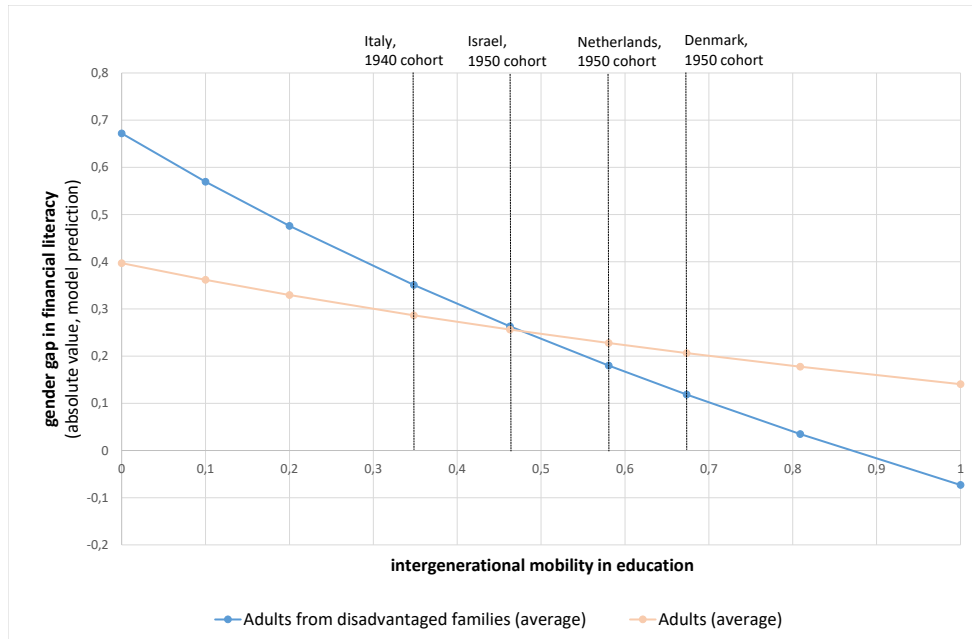
5 Figures

Figure 1: Financial literacy. Average gap with the top-performer country and ‘composition’ effects



The figure illustrates the results presented in Table 2. The blue histograms indicate the (average) gap in financial literacy between each country (x-axis) and the top performer country (Switzerland); the orange histograms plot the contribution of the ‘composition’ component returned by the Blinder-Oaxaca decomposition (see model (2)). The ‘composition’ component measures the gap in financial literacy between the country and the benchmark country (Switzerland) explained by differences the distribution of individual characteristics between the country and the benchmark country. Source: our elaboration on SHARE data.

Figure 2: Intergenerational mobility and gender gap in financial literacy



On the y-axis the (absolute value of the) gender gap in financial literacy as a function of Igm as predicted by OLS models run on individual-level data (see Table 4, columns 2 (orange line) and 6 (blue line)). On the x-axis the values of intergenerational mobility in education (Igm). The top of the figure reports values of Igm at specific countries and cohorts (e.g. the 1940 cohort refers to adults born between 1940 and 1949). The dependent variable of OLS models is the score in financial literacy of the individuals interviewed in one of the following waves: 2004, 2006, 2011, 2013 and 2015; covariates include (the log of) Igm, controls for individual characteristics, cohort*country (multiplicative) and wave-level dummies. Igm data used in the OLS model refer to the cohort and country to which the individual belongs to. Source: our elaboration based on SHARE data and the GDIM dataset (World Bank).

References

- Acciari, P., A. Polo, and G. L. Violante (2022). “And Yet It Moves”: Intergenerational Mobility in Italy. *American Economic Journal: Applied Economics* 14(3).
- Bianco, M., D. Marconi, A. Romagnoli, and M. Stacchini (2022). Challenges for financial inclusion. *Bank of Italy Occasional Papers, No. 723*.
- Blinder, A. S. (1973). Wage Discrimination: Reduced Form and Structural Estimates. *The Journal of Human Resources* 8(4), 436–455.
- Bover, O., P. Du Caju, P. Tzamourani, E. Villanueva, E. Sierminska, Y. McCarthy, J. Casado, S. Costa, and T. Zavadil (2014, February). The distribution of debt across euro area countries: the role of individual characteristics, institutions and credit conditions. Working Paper Series 1639, European Central Bank.
- Bugamelli, M., F. Lotti, M. Amici, E. Ciapanna, F. Colonna, F. D’Amuri, S. Giacomelli, A. Linarello, F. Manaresi, G. Palumbo, et al. (2018). Productivity growth in Italy: a tale of a slow-motion change. *Bank of Italy Occasional Paper* (422).
- Cannari, L. and G. D’Alessio (2018). Istruzione, reddito e ricchezza: la persistenza tra generazioni in Italia. *Bank of Italy Occasional Papers, No. 476 (only in italian)*.
- Chetty, R., N. Hendren, P. Kline, and E. Saez (2014). Where is the land of Opportunity? The Geography of Intergenerational Mobility in the United States. *The Quarterly Journal of Economics* 129(4).
- Christelis, D., D. Georgarakos, and M. Haliassos (2013). Differences in Portfolios across Countries: Economic Environment versus Household Characteristics. *The Review of Economics and Statistics* 95(1), 220–236.
- Christelis, D., T. Jappelli, and M. Padula (2010, January). Cognitive abilities and portfolio choice. *European Economic Review* 54(1), 18–38.
- Corak, M. (2013). Income Inequality, Equality of Opportunity, and Intergenerational Mobility. *Journal of Economic Perspectives*.
- Cupák, A., P. Fessler, A. Schneebaum, and M. Silgoner (2018, July). Decomposing gender gaps in financial literacy: New international evidence. *Economics Letters* 168, 102–106.
- Cupák, A., P. Fessler, M. Silgoner, and E. Ulbrich (2021, December). Exploring Differences in Financial Literacy Across Countries: The Role of Individual Characteristics and Institutions. *Social Indicators Research* 158(2), 409–438.
- De Beckker, K., K. De Witte, and G. Van Campenhout (2019, September). Identifying financially illiterate groups: An international comparison. *International Journal of Consumer Studies* 43(5), 490–501.
- De Bonis, R., M. Guida, A. Romagnoli, and A. Staderini (2022). Educazione finanziaria: presupposti, politiche ed esperienza della banca d’italia. *Bank of Italy Occasional Paper, No. 726 (only in italian)*.

- D'Ignazio, A., P. Finaldi Russo, and M. Stacchini (2022). Micro-entrepreneurs' financial and digital competences during the pandemic in Italy. *Bank of Italy Occasional Papers*, No. 724.
- Fagereng, A., C. Gottlieb, and L. Guiso (2017, April). Asset Market Participation and Portfolio Choice over the Life-Cycle: Asset Market Participation and Portfolio Choice over the Life-Cycle. *The Journal of Finance* 72(2), 705–750.
- G20/OECD-INFE (2021). G20/OECD-INFE report. Navigating the storm: MSMEs' Financial and Digital Competencies in COVID-19 times. <https://www.oecd.org/daf/fin/financial-education/Navigating-the-storm-MSMEs-financial-and-digital-competencies-in-COVID-19-times.pdf>.
- Gavresi, D. and A. Litina (2021). Past Exposure to Macroeconomic Shocks and Populist Attitudes in Europe. *CESifo Working Paper No. 9451*.
- Gerardi, K., L. Goette, and S. Meier (2013). Numerical ability predicts mortgage default. *Proceedings of the National Academy of Sciences* 110(28), 11267–11271.
- GFLEC (2017). The TIAA Institute-GFLEC Personal Finance Index (P-Fin Index). <https://gflec.org/initiatives/personal-finance-index/>.
- Giuliano, P. and A. Spilbergo (2014). Growing up in a Recession. *The Review of Economic Studies* 81(2).
- Gousia, K. (2016). Financial literacy and long-term care insurance coverage. *SHARE Working Paper Series 26*.
- Guiso, L. (2011). Educazione finanziaria e scelte finanziarie. In *Il risparmio degli italiani: tendenze e nuove sfide*. Bancaria Editrice.
- Guiso, L. and T. Jappelli (2009, January). Financial Literacy and Portfolio Diversification. Technical Report 212, Centre for Studies in Economics and Finance (CSEF), University of Naples, Italy.
- Güell, M., M. Pellizzari, G. Pica, and J. V. Rodríguez Mora (2018, July). Correlating Social Mobility and Economic Outcomes. *The Economic Journal* 128(612), F353–F403.
- Hovi, M. (2021, October). The Lasting Well-Being Effects of Early Adulthood Macroeconomic Crises. *Review of Income and Wealth*, roiw.12551.
- Jann, B. (2008). The Blinder–Oaxaca decomposition for linear regression models. *Stata Journal* 8(4), 453–479.
- Jappelli, T. (2010, November). Economic Literacy: An International Comparison. *The Economic Journal* 120(548), F429–F451.
- Jappelli, T. and M. Padula (2013, August). Investment in financial literacy and saving decisions. *Journal of Banking & Finance* 37(8), 2779–2792.

- Kearney, M. S. and P. B. Levine (2016). Income inequality, social mobility, and the decision to drop out of high school. *Brookings Papers on Economic Activity*, 333–380.
- Klapper, L. and A. Lusardi (2020, September). Financial literacy and financial resilience: Evidence from around the world. *Financial Management* 49(3), 589–614.
- Krosnick, J. A. and D. F. Alwin (1989). Aging and susceptibility to attitude change. *Journal of Personality and Social Psychology* 57(3).
- Krueger, A. B. (2012, December). The Rise and Consequences of Inequality in the United States.
- Lo Prete, A. (2022, April). Digital and financial literacy as determinants of digital payments and personal finance. *Economics Letters* 213, 110378.
- Lusardi, A. (2012). Numeracy, financial literacy, and financial decision-making. Technical report, National Bureau of Economic Research.
- Lusardi, A. and O. S. Mitchell (2011, May). Financial Literacy and Planning: Implications for Retirement Wellbeing. Working Paper 17078, National Bureau of Economic Research.
- Lusardi, A. and O. S. Mitchell (2014, March). The Economic Importance of Financial Literacy: Theory and Evidence. *Journal of Economic Literature* 52(1), 5–44.
- Lusardi, A. M., A. Caretta, D. Costa, P. Colombo, F. D. Leo, A. D. Marchi, C. Rampazzi, A. Romagnoli, and P. Soccorso (2020). Emergenza COVID 19-gli italiani tra fragilità e resilienza finanziaria. <http://www.quellocheconta.gov.it/export/sites/sitopef/modules/img/news/news095/Rapporto-Comitato-Doxa.pdf>.
- Mehrbrodt, T., S. Gruber, and M. Wagner (2019). Scales and multi-item indicators in the survey of health, ageing and retirement in europe. Technical report, SHARE Working Paper Series 45-2019. 2019.
- Narayan, A., R. Van der Weide, A. Cojocaru, C. Lakner, S. Redaelli, D. G. Mahler, R. G. N. Ramasubbaiah, and S. Thewissen (2018, May). *Fair Progress?: Economic Mobility Across Generations Around the World*. Washington, DC: World Bank.
- Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review* 14(3), 693–709.
- OECD (2011). Divided we stand: why inequality keeps rising. <https://www.oecd.org/els/soc/dividedwestandwhyinequalitykeepsrising.html>.
- OECD (2020a). OECD/INFE 2020 International Survey of Adult Financial Literacy.
- OECD (2020b). PISA 2018 Results (Volume IV): Are Students Smart about Money?, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/48ebd1ba-en>.
- OECD (2021). Labour force participation rate (indicator). <https://data.oecd.org/emp/labour-force-participation-rate.htm>.

- Rapporto-Edufin (2021). Rapporto edufin 2021. L'educazione finanziaria come anticorpo alla vulnerabilità economica. http://www.quellocheconta.gov.it/export/sites/sitopef/modules/quaderni_ricerca/Rapporto-Edufin-2021.pd. Technical report.
- Rinaldi, A. (2011). Auto-Enrolment in Private, Supplementary Pensions in Italy. In *Improving Financial Education Efficiency: OECD-Bank of Italy Symposium on Financial Literacy*. OECD.
- Romiti, A. and M. Rossi (2012). Housing wealth decumulation, portfolio composition and financial literacy among the European elderly. *Carlo Alberto Notebooks* 289.
- Sierminska, E. and K. Doorley (2013, December). To Own or Not to Own? Household Portfolios, Demographics and Institutions in a Cross-National Perspective.
- Skagerlund, K., T. Lind, C. Strömbäck, G. Tinghög, and D. Västfjäll (2018). Financial literacy and the role of numeracy—how individuals' attitude and affinity with numbers influence financial literacy. *Journal of Behavioral and Experimental Economics* 74, 18–25.
- Smith, J., J. McArdle, and R. Willis (2010). Financial decision making and cognition in a family context. *Econ J (London)*.
- Stanley, T. and S. B. Jarrell (1998). Gender Wage Discrimination Bias? A Meta-Regression Analysis. *Journal of Human Resources* 33(4), 947–973.
- Steinberg, L. (2014). Age of opportunity: Lessons from the new science of adolescence. *Houghton Mifflin Harcourt*.
- van Rooij, M., A. Lusardi, and R. Alessie (2011). Financial literacy and stock market participation. *Journal of Financial Economics* 101(2), 449–472.
- van Rooij, M. C., A. Lusardi, and R. J. Alessie (2012). Financial Literacy, Retirement Planning and Household Wealth. *The Economic Journal* 122(560), 449–478.
- Weichselbaumer, D. and R. Winter-Ebmer (2005, July). A Meta-Analysis of the International Gender Wage Gap: Meta-Analysis of the International Wage Gap. *Journal of Economic Surveys* 19(3), 479–511.
- Yakoboski, P. J., A. Lusardi, and A. Hasler (2022). The 2022 TIAA Institute-GFLEC Personal Finance Index. Technical report.

Appendix

The Survey of Health, Ageing and Retirement in Europe (SHARE)³³ provides our sample of adults. The original survey includes information on around 140.000 individuals aged 50 or older from 21 European countries plus Israel interviewed in 8 waves since 2004. Information refer to the socioeconomic and health conditions of the individuals. Following Romiti and Rossi (2012), Christelis et al. (2010), Gousia (2016), we proxy financial literacy by aggregating four questions into an indicator ranging from 1 to 5 (maximum) (Mehrbrodt et al. (2019)). The questions test numeracy skills applied to percentages, interest rate compounding in savings account, calculus of final prices of discounted goods. Our sample refers to adults for whom answers to these questions are available and includes around 135.000 individuals interviewed in the years 2004, 2006, 2011, 2013 and 2015. The questions are the following, note that they are open questions so the interviewer does not read the possible answers:

- 1 (CF012) If the chance of getting a disease is 10 per cent, how many people out of 1,000 (one thousand) would be expected to get the disease? (**100**,10,90,900,Other answer)
- 2 (CF013) In a sale, a shop is selling all items at half price. Before the sale, a sofa costs 300 [local currency]. How much will it cost in the sale? (600,**150**,Other answer)
- 3 (CF014) A second hand car dealer is selling a car for 6,000 [local currency]. This is two-thirds of what it costs new. How much did the car cost new? (**9000**,4000,8000,12000,18000, Other answer)
- 4 (CF015) Let's say you have 2000 [local currency] in a savings account. The account earns ten per cent interest each year. How much would you have in the account at the end of two years? (**2420**,2020,2040 ,2100,2200,2400, Other answer)

³³The data collection method is harmonized with that of the U.S. Health and Retirement Study (HRS) and the English Longitudinal Study of Ageing (ELSA). The SHARE data collection has been funded by the European Commission, DG RTD through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782, SHARE-COVID19: GA N°101015924) and by DG Employment, Social Affairs & Inclusion through VS 2015/0195, VS 2016/0135, VS 2018/0285, VS 2019/0332, and VS 2020/0313. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C, RAG052527A) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

Tables and figures

Table A1: The Sample: number of interviews, by country

	Waves					Total
	2004	2006	2011	2013	2015	
Austria	X	X	X	X	X	7152
Belgium	X	X	X	X	X	12137
Croatia					X	2248
Czech Republic		X	X	X	X	8138
Denmark	X	X	X	X	X	6977
Estonia			X	X	X	6296
France	X	X	X	X	X	9914
Germany	X	X	X	X	X	9591
Greece	X	X			X	8340
Hungary			X			3020
Ireland		X				942
Israel	X	X		X	X	5277
Italy	X	X	X	X	X	9493
Luxembourg				X	X	1796
Netherlands	X	X	X	X		7674
Poland		X	X		X	2693
Portugal			X		X	2014
Slovenia			X	X	X	5089
Spain	X	X	X	X	X	9720
Sweden	X	X	X	X	X	8566
Switzerland	X	X	X	X	X	4703
Total	28899	35348	34505	21744	11284	131780

The table reports the number of individuals responding to questions on financial literacy. The X indicates whether the country participates to the wave. The marginal column (row) reports the total number of individuals per country (wave). Source: our elaboration on SHARE data.

Table A2: Description of variables: personal characteristics (Part 1).

Variable	Description
Flit	Financial literacy score
Lowedu	Dummy variable: 1 if ISCED-1997 level of respondent is 2 or lower
Secondary Ed.	Dummy variable: 1 if ISCED-1997 level of respondent is 3 or 4
University	Dummy variable: 1 if ISCED-1997 level of respondent is 5 or 6
Finresp	Dummy variable: 1 if the respondent answers financial questions on behalf of its household
Employed	Dummy variable: 1 if respondent is employed
Unemployed	Dummy variable: 1 if respondent is unemployed
Retired	Dummy variable: 1 if respondent is retired
Homemaker	Dummy variable: 1 if respondent is homemaker
Income	Logarithm of total household income (in euro, current exchange rates used to translate national currencies in euros). It includes earnings from employments, possible types of pensions, benefits, annual income from rent or sublet and interest/dividend from bank account, bond, stock or mutual funds
Boughthouse	Dummy variable: 1 if respondent is the owner of a house that he/she purchased
Wave1-6	Time dummy variables, one for each wave
Single	Dummy variable: 1 if respondent never got married
Married	Dummy variable: 1 if respondent is married
Divorced	Dummy variable: 1 if respondent is divorced
Widowed	Dummy variable: 1 if respondent is a widow
Female	Dummy variable: 1 if female and 0 otherwise

Table A2: Description of variables: country characteristics (Part 2).

Variable	Description
Gdp	Per-capita GDP. Source: OECD
Contr_rate	Social Security contribution rate (% of GDP). Source: OECD Social security contributions.
Stkmkt_cap	Market capitalization of listed domestic companies (% of GDP). It is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values. Source: World Bank.
Lab_force	The labour force participation rate is calculated as the labour force divided by the total working-age population. The working age population refers to people aged 25 to 64. Source: OECD.
Igm	Intergenerational mobility. It is obtained as 1-COR where COR is the correlation between child's years of schooling on the highest years of schooling of his/her parent. The data is available at cohort and country level. Source: World Bank "Global Database on Intergenerational Mobility (GDIM)".

Table A3: Personal characteristics, by country (Part 1).

	AUT	DEU	SWE	NLD	ESP	ITA	FRA	DNK	GRC	CHE
<i>Education</i>										
PRE PRIMARY	0.14	0.78	0.51	0.80	22.57	6.00	14.11	0.09	9.60	0.19
PRIMARY	14.70	0.59	28.46	13.03	37.43	41.31	25.15	12.77	37.62	12.47
LOWER SECOND	11.83	13.51	15.54	37.77	20.58	23.84	8.43	8.93	9.79	14.80
UPPER SECOND	46.35	54.23	21.01	24.01	8.57	18.66	32.60	39.75	23.59	41.91
POSTSECOND	3.27	3.31	8.66	0.38	1.22	2.61	0.02	0.00	2.47	16.19
UNIVERSITY	23.72	27.58	25.82	24.00	9.61	7.59	19.69	38.47	16.92	14.44
<i>Occupational status</i>										
UNEMPLOYED	3.91	5.96	2.76	4.42	7.03	3.91	4.84	5.23	4.54	2.98
EMPLOYED	22.31	34.48	39.07	33.75	24.34	24.97	32.57	46.50	28.47	43.25
RETIRED	61.91	48.27	55.17	35.92	39.56	47.54	51.16	42.52	40.84	41.90
HOMEMAKER	10.77	8.40	0.61	18.96	24.91	21.54	8.30	1.01	24.55	9.39
PERMANENTLY SICK	1.10	2.89	2.40	6.95	4.17	2.03	3.13	4.75	1.61	2.48
<i>Income and Birth</i>										
INCOME	33162,32	39218,28	46454,62	62056,00	22332,23	27367,24	37130,09	49317,75	16460,23	89083,33
BOUGHTHOME	43	43	71	61	75	61	65	73	64	49
FINRESP	73	67	70	71	67	68	70	68	68	71
<i>Marital status</i>										
NEVER MARRIED	8.13	5.35	5.67	4.11	5.67	6.09	7.74	6.48	4.43	6.21
MARRIED	63.83	76.49	75.97	80.29	79.30	79.45	67.68	70.85	73.63	72.74
WIDOWED	17.23	11.00	9.27	9.72	12.68	11.66	15.38	11.57	17.49	10.41
DIVORCED	10.81	7.16	9.09	5.87	2.36	2.79	9.19	11.10	4.46	10.64
<i>Demographics</i>										
FEMALE	57.88	53.68	53.51	54.33	55.04	55.03	56.73	54.24	56.92	54.52
YEAR OF BIRTH	1944	1945	1942	1944	1943	1945	1944	1946	1945	1944

Percentages (averages for INCOME and YEAR OF BIRTH). See Table A2 for variables description. Source: our elaboration on SHARE data.

Table A3: Personal characteristics, by country (Part 2).

	BEL	ISR	CZE	POL	IRL	LUX	HUN	PRT	SVN	EST	HRV
<i>Education</i>											
PRE PRIMARY	2.05	5.14	0.24	1.33	2.14	2.57	0.13	6.64	4.52	0.12	3.45
PRIMARY	19.31	24.30	14.83	39.43	24.37	32.80	1.83	61.13	4.96	5.40	11.74
LOWER SECOND	22.84	8.73	28.58	1.71	12.38	10.43	29.41	10.84	24.35	22.72	18.10
UPPER SECOND	26.07	25.41	41.75	43.97	10.33	30.47	45.82	9.46	46.22	33.47	50.74
POSTSECOND	0.39	7.42	2.47	4.96	9.16	4.03	6.66	0.96	3.64	16.30	0.00
UNIVERSITY	29.34	29.00	12.13	8.60	41.62	19.70	16.16	10.98	16.31	22.00	15.97
<i>Occupational status</i>											
UNEMPLOYED	6.54	4.28	3.67	8.73	4.00	5.48	6.30	8.50	6.78	4.66	12.27
EMPLOYED	32.19	37.25	27.95	23.23	36.55	25.86	20.82	24.82	19.14	37.58	20.07
RETIRED	43.29	37.48	65.48	53.37	35.19	45.66	63.81	54.22	66.67	51.04	57.10
HOMEMAKER	12.56	14.34	0.38	4.33	18.62	18.24	1.83	10.50	5.99	0.93	9.20
PERMANENTLY SICK	5.41	6.66	2.52	10.34	5.65	4.75	7.25	1.96	1.42	5.79	1.35
<i>Income</i>											
INCOME	49259,32	29799,58	9815,43	6213,97	57631,40	98414,92	8561,78	35991,29	23646,21	8945,66	7522,24
BOUGHTHOUSE	71	78	61	55	71	74	78	60	64	62	67
FINRESP	70	68	67	70	74	75	66	64	71	67	64
<i>Marital status</i>											
NEVER MARRIED	5.34	1.94	2.99	4.02	9.94	4.37	3.20	3.91	4.40	8.18	3.74
MARRIED	71.54	80.07	66.86	77.44	72.81	77.00	70.33	80.95	77.76	64.38	77.26
WIDOWED	13.04	12.29	17.39	15.05	15.01	10.38	18.24	11.03	14.17	15.89	15.11
DIVORCED	10.08	5.70	12.76	3.49	2.24	8.25	8.22	4.11	3.68	11.55	3.90
<i>Demographics</i>											
FEMALE	54.74	55.97	57.78	55.85	54.87	53.76	57.11	55.56	56.20	59.30	55.87
YEAR OF BIRTH	1945	1943	1946	1945	1943	1949	1946	1947	1947	1946	1950

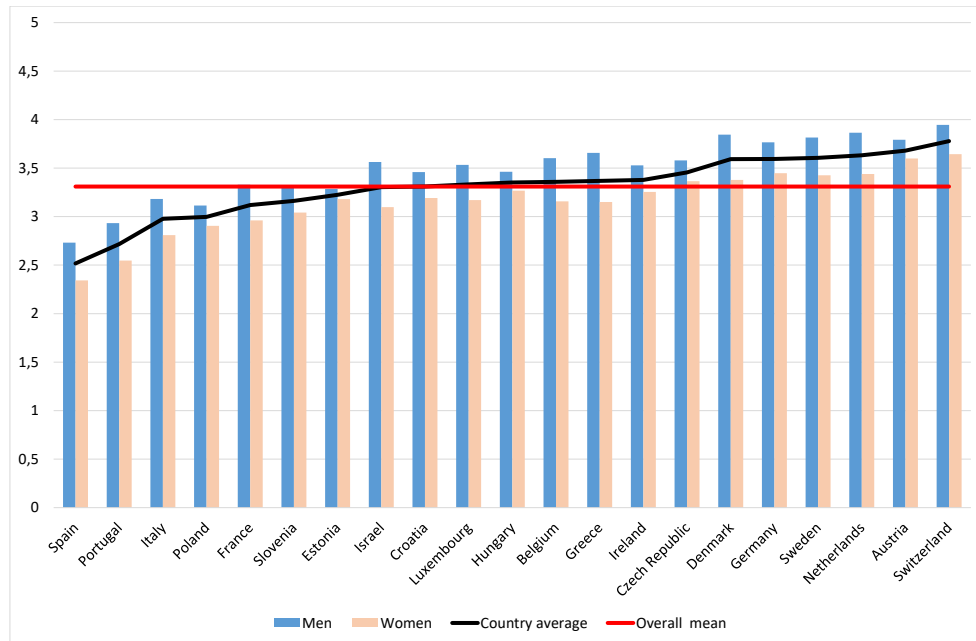
Percentages (averages for INCOME and YEAR OF BIRTH). See Table A2 for variables description. Source: our elaboration on SHARE data.

Table A4: Country characteristics during early adulthood: averages

	Gdp	Contr_rate	Stkmkt_cap	Lab_Force	Igm
AUT	8805,53	10,16			0,53
BEL	9384,26	11,61	0,29	65,01	0,55
HRV					0,39
CZE	13735,39				0,52
DNK	8781,53	0,52	0,12	82,6	0,51
EST				81,74	0,7
FRA	6749,46	14,7	0,16	73,28	0,47
DEU	9315,01	11,32	0,16	68,61	0,57
GRC	7370,97	6,47		64,81	0,38
HUN					0,5
IRL	4645,05	3,17		59,68	0,55
ISR				69,1	0,61
ITA	8648,9	10,15	0,13	60,2	0,4
LUX	13262,77	9		61,61	
NLD	8264,49	13,62	0,34	59,1	0,5
POL					0,58
PRT	5032,49	5,54	0,2	68,89	0,25
SVN					0,53
ESP	6213,12	8,31	0,21	59,76	0,27
SWE	8563,73	7,65	0,18	78,39	0,66
CHE	13515,5	4,37	0,4		0,59

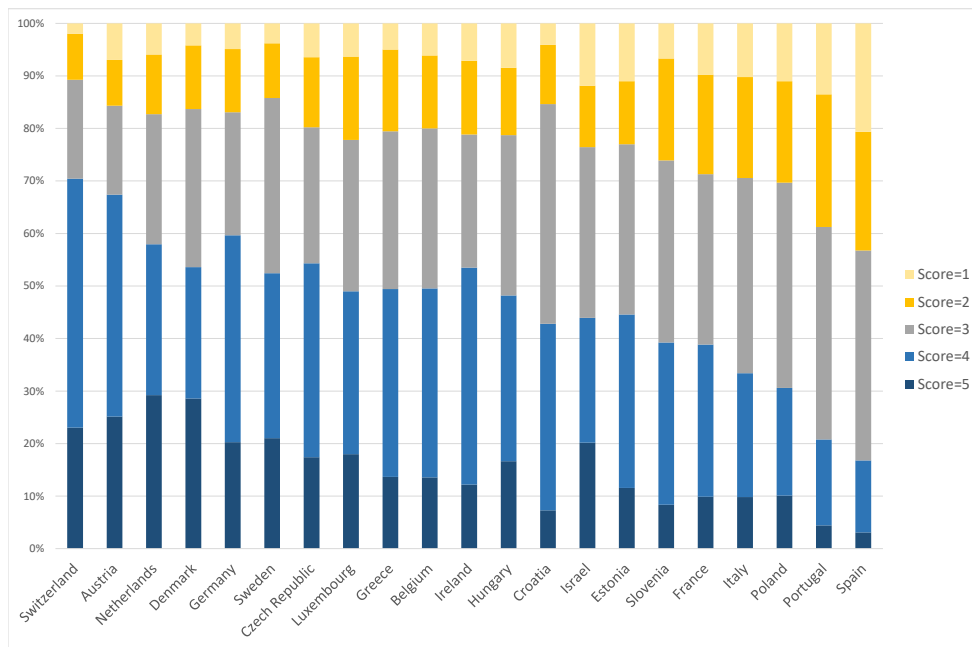
See Table A2 for variables description. Source: our elaboration on SHARE data.

Figure A1: Financial literacy, average scores



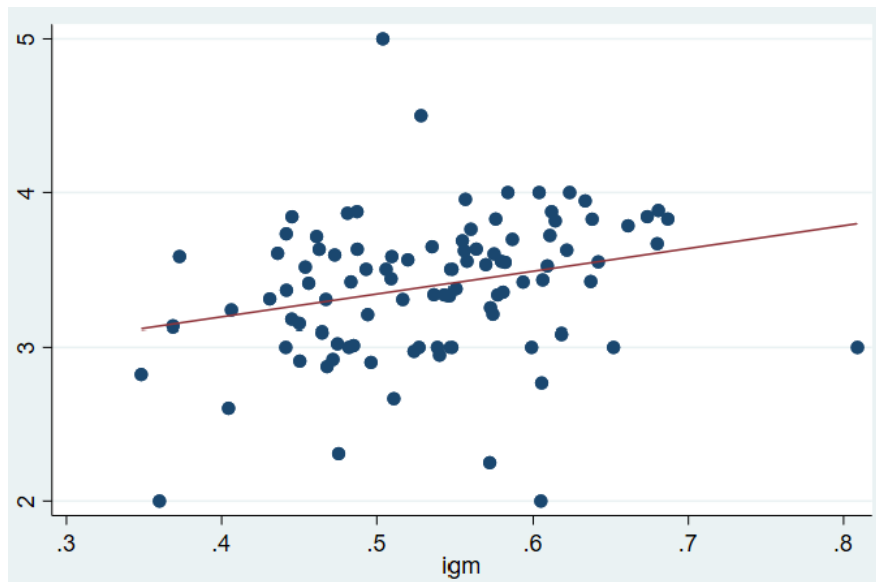
The score in financial literacy ranges from 1 (minimum) to 5 (maximum). The red line refers to the average calculated by pooling all sampled individuals. The black line refers to country-level averages. Source: our elaboration on SHARE data.

Figure A2: Financial literacy: distribution of scores



The score in financial literacy ranges from 1 (minimum) to 5 (maximum). On the y-axis the importance (in percentage points) of each score. Source: our elaboration on SHARE data.

Figure A3: Intergenerational mobility and financial literacy



Data at country and cohort level. On the x-axis the values of intergenerational mobility in education (Igm) during early adulthood; on the y-axis the score in financial literacy (Flit) measured at the time of the interview (min=1; max=5); each dots report averages at the cohort- and country-level. Igm is equal to $1 - \text{COR}$; COR is the correlation between the number of years of schooling of the individual and that of her parents (the highest number between the mother and father); values for Igm equal to 0 (1) indicate that education is perfectly correlated (uncorrelated) with that of the parents. Source: our elaboration on SHARE data and World Bank GDIM dataset.