Political participation and financial education: understanding policy content across-countries

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Abstract

This study explores the nexus between financial education and political participation in aggregate data, documenting that the ability to understand the contents of socio-economic policies, that indicators of financial literacy can capture, spurs voter turnout. The results are robust to the inclusion of institutional, geographical, historical control variables, and are causal. A nexus between voter turnout and education at school can also be detected, controlling for geographical location, in the case of secondary education and average years of schooling.

Keywords: financial literacy; school education; voter turnout; political participation.

JEL Classification: D72, G53, I21.

1. Introduction

According to a large literature on political behavior, education facilitates the participation to political life and citizens' engagement in political activities (Wolfinger and Rosenstone, 1980; Rosenstone and Hansen, 1993; Putnam, 2001). From a theoretical point of view, this could be the case in a framework where education is a process of accumulation of civic skills whereby people develop civic behaviors, a sense of sharing a collective civic identity, and awareness about what they vote for (McNamara and Musgrave, 2020). The cost of voting can be also lower for better educated citizens, because they can more easily gather information on the policy agendas they vote for (Filer et al., 1993).

Empirically, in individual data, citizens who spend more time at school are more likely to turn out and vote (see, e.g., Dee, 2004; Milligan et al., 2004; Tenn, 2007). Instead, across countries, the level of education in the population and average voter turnout do not seem related. Political scientists attribute this so-called paradox to the influence of other societal changes: education may not exert a positive effect on political participation when the bases of a civil society are weakening, the complexity of politics reduces the ability to gauge their contents, education itself is less effective due to its poor contents, education matters in relative terms as a proxy for social status, etc. (Delli Carpini, 1997; Persson, 2013 and 2015). In macroeconomics, empirical models just control for the possibility that voter turnout is higher on average in countries with more educated people, without focusing on the association between education and voter turnout *per se* (Mueller and Stratman, 2003; Fumagalli and Narciso, 2012).

This work contributes to the literature by exploring if different levels and kinds of education are related to people participation to parliamentary elections across countries. More specifically, it compares in the role of indicators of education, measures of financial education and measures of education at school. It documents that basic financial education influences voting behavior. Across countries observed over the period 1990-2014, the ability to understand the contents of socio-economic policies that indicators of financial literacy capture, spurs political participation in parliamentary elections. As for education at school, its association with political participation is milder. A nexus can be found, only in the case of secondary education and years of schooling, when geographical location controls are included in the analysis.

There is a case for financial literacy - the specific type of literacy which refers to a set of basic economic and financial skills needed to take well-informed financial decisions, - as a determinant of voter turnout, that this study first advocates. From the growing empirical literature on financial education, we already know that financial literacy matter to personal finance. In individual data, financial literacy helps explain differences in stock market participation, and in planning for retirement behavior (see, e.g., Lusardi and Mitchell, 2007; van Rooij et al., 2011). In aggregate data,

it is associated to decreasing income inequality, to the extent that the ability to understand economic and financial concepts helps investors to use financial instruments (Lo Prete, 2013 and 2018).

In this study, the focus of the analysis shifts from considering the behavior of individuals as investors, to considering the behavior of individuals as citizens of democratic societies. Financial literacy can be a proxy of people ability to understand the content of economic and social policies. This was the case studying the electoral cost of major pension reforms (Fornero and Lo Prete, 2019): the probability of a government to be re-elected in the aftermath of a reform is higher in countries where the level of financial literacy is higher. Indeed, if financial literacy accounts for the set of skills that enable people to take more informed political choices (see also Murtinu et al., 2022), it may arguably represent a relevant determinant of political participation, too.

Interestingly, most analysis on the nexus between political participation and voter turnout focused on education length, considering education a process of accumulation of generic human capital, whereby the more time spent at school guarantees a higher level of civic skills. Finding that basic financial education spurs political participation in aggregate data, and comparing this nexus with the one between political participation and education at school at different grades, complements evidence from recent studies which do document that differences in the type of education matter to the decision to turn out and vote. For instance, using data on Danish municipal and regional elections, Bhatti (2017) shows that turnout is higher only for individuals who enrolled in a political bachelor degree program with a high civic education content, while enrolling in a bachelor degree *per se* does not seem to matter to the decision to vote. Hillygus (2005), analyzing college education in the USA, finds that political participation is higher for students in social sciences and humanities, than for students in biology, chemistry, and engineering.

The present analysis considers primarily the long-term variation in voter turnout across countries. The availability of a new indicator of financial literacy, based on the Standard & Poor's Ratings Service Global Financial Literacy Survey, allows for a rich cross-country analysis of the relevance of this specific form of education in comparison with indicators of general education at the primary, secondary, and tertiary level. A panel analysis of the medium-term determinants of voter turnout is also performed, exploiting the admittedly limited information available on time variation of the education measures.

The paper proceeds as follows. Section **2** describes the variables used in the empirical analysis, and the empirical strategy. Section **3** presents cross-sectional estimates of the association between voter turnout, financial literacy, and education at school. Section **4** tests the robustness of the results to the inclusion of institutional, geographical, and historical characteristics, addresses causality issues, and discusses the information content of the indicators of financial literacy. Section **5** presents

results from panel estimations, to characterize the medium-term determinants of voter turnout. Section **6** concludes.

2. Data and empirical strategy

The dataset for this study includes information on education and electoral participation for a sample of 91 advanced and developing countries, observed over the period 1990-2014.[1]

Electoral participation. The dependent variable in all regressions, *voter turnout*, measures the percentage of eligible voters casting a ballot in parliamentary elections. Following previous studies on electoral participation worldwide, it is important is to distinguish between countries where the basic standards of political rights and liberties apply, and countries where people do not enjoy them. Accordingly, the country-sample in this study includes countries where voting behavior is not constrained by government coercion, and which can be considered (free or partially free) democracies on the basis of the Freedom House average indicator of political rights and civil liberties – this is the case if the index, that ranges between one (free) and seven (not free), is less or equal to five (Persson and Tabellini, 2004; Fumagalli and Narciso, 2012).

Data electoral participation, as well as data on electoral rules and forms of government, are drawn from the 2020 version of the Voter Turnout Database compiled by the International Institute for Democracy and Electoral Assistance (IDEA, 2018).

Financial education. Financial literacy is the level of financial education that refers to the set of basic economic and financial competences relevant to manage personal financial matters over the life cycle, and make political decisions as citizens (Fornero et al., 2021). Its level can be assessed on the basis of a set of three main questions about compound interest, inflation, and risk diversification, and other questions that consider related skills (Lusardi and Mitchell, 2007). Data on financial literacy are available at the microeconomic level, mainly. At the macroeconomic level, the first indicators of ''economic literacy'' and "education in finance" were compiled by the IMD World Competitiveness Yearbook for 55 countries, over the period 1995–2008, based on interviews to senior representatives of the national business community. Starting from 2015, the OECD has assessed the financial literacy of 15-year-old students, introducing specific items to the Programme on International Student Assessment (see OECD, 2020). These data, which cover a small number of countries and economies (15 in the 2015 assessment, 20 in the 2018 assessment, 26 in the 2000 assessment), will not be used in the present study due to the scarce cross-sectional information available, and the time coverage –

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[1] The time coverage reflects the availability of information on education. The results would not change if the last value of these indicators was kept constant, and empirical models were run over the longer period 1990-2018 - for which data on electoral participation and socio-economic conditions are available.

which falls out of the period under analysis. Finally, on macroeconomic measures of financial literacy, the most recent worldwide survey is the Standard & Poor's Ratings Services Global Financial Literacy Survey (2014).

Provided that the Standard & Poor's data allow for the largest cross-country comparison ever, they will be used in the main specifications of this work to perform cross-country analyses, and will be complemented by other IMD indicators having at least a limited time variation in the last section of the paper to perform panel analyses. The Standard & Poor's survey gathers information through 150.000 interviews and includes four questions over the concepts of basic numeracy, interest compounding, inflation, and risk diversification. A person is defined financially literate if she correctly answered to three out of four questions, and the financial literacy index considers the percentage of financially literate people in a country. With respect to the other measures of financial literacy available for cross-country comparisons, the Standard & Poor's survey, administered in 2014, has the great advantage to provide information on a large sample of 140 advanced and developing countries. Figure 1, from Klapper et al. (2015), is a global map of the values of financial literacy around the world. On average, only one third of people globally are defined financially literate. Financial literacy is higher in advanced countries, where the darker blue areas appear, but significant disparities can be detected even within the group of the richer and more developed countries.

General education. To measure general education, the dataset includes the international measures of schooling years and quality available in the Education Attainment Dataset compiled by Barro and Lee (2013). They include school attainment and school completion figures for the population aged 15 and above at the primary, secondary, and tertiary level. In this work, education at school will be measured using school attainment rates, which account for the percentage of people for whom the highest grade of education attended falls in one of the available categories, and a measure of school completion, namely the number of years of schooling achieved by the average person at all levels of schooling combined. Barro and Lee (2013) also estimated completion rates at the primary, secondary, and tertiary level. They measure the ratio of people who completed a level of schooling but did not enter the next level to people who entered that school, thus accounting for school drop-out rates. The results from specifications including completion rates, mainly not significant and not reported in the paper, are available upon request.

Other determinants of voter turnout. The dataset includes information on socio-economic, institutional, historical, and geographical variables. They will control for determinants of voter turnout that are not related to education or political participation. Definition and sources are described when introducing these variables (in sections from **3** to **5**).

2.1. Empirical strategy and timing

The primary interest of the study is to analyze the role of education as a long-term determinant of voter turnout. The association of interest is analyzed in empirical models that read

$$VT_j = \alpha_0 + \alpha_1 EDU_j + \boldsymbol{X_j'\beta} + \varepsilon_j. \tag{1}$$

Voter turnout (VT) in country j is regressed on the level of financial or school education (EDU), and on a vector of socio-economic and institutional determinants ($\boldsymbol{X}$). To study long-run associations, the observations are in average values over the period 1990-2014, and model (1) is estimated using OLS estimators and IV techniques in sections **3** and **4**. Panel regression techniques will be used to study medium-term associations, in section **5**, exploiting the little time variation of measures of both financial and school education.

3. Political participation and financial education

This section documents an empirical regularity in raw aggregate data. Figure 2 shows that basic knowledge of economic and financial concepts, that the Standard & Poor's indicator of financial literacy measures on the horizontal axis, is positively and significantly associated to electoral participation, measured on the vertical axis. In the sample of 91 countries under analysis, the percentage of adults financially literate ranges from 14 percent in Albania and Afghanistan, to 71 percent in Denmark, Norway, and Sweden. Electoral participation is high on average (69 percent), and records the minimum value in Gabon (34 percent), and the maximum value in Malta (95 percent).

Interestingly, financial literacy represents a specific type of education. For instance, previous studies document that it captures a dimension of human capital that helps explain differences in inequality across countries, a feature it has not in common with other indicators of education at school (Lo Prete, 2018). And that it could be an important element when assessing the implication of digitalization for individual investors, since digital literacy alone is not associated to well-informed personal finance choices (Lo Prete, 2022). Yet, this might not be the case when studying electoral participation. For instance, one may argue that the same skills that financial literacy measures, can be related to education at school, where pupils learn numeracy, reading, accounting, and civic values.

To explore this possibility, it is useful to start considering the correlations between financial literacy and education at school (in table A2 of the Appendix). Financial literacy is negatively correlated to education at the primary level, and positively correlated to indicators of education at the secondary and tertiary level, as well as to years of schooling. The correlations between financial literacy and education at school are low on average. Differences can also be found in the correlations

between measures of education at school. For instance, school attainment at the primary level, which is mandatory in all countries, is negatively correlated to school attainment at higher levels.

A closer look at the data uncovers interesting differences between financial literacy and education at school as explanatory variables for political participation, too. Figure 3 compares bivariate associations of voter turnout with school attainment rates at different grades and year of schooling. It shows that education at the primary school (first panel) and tertiary education (third panel) are mildly and positively associated to voter turnout, but, as discussed below, do not help explain it at conventional levels. Instead, electoral participation is significantly higher in countries where the population has attended at least the secondary school (second panel), and where the number of years of schooling achieved, that in the sample averages to 8 years and is highly correlated to secondary education, is higher (fourth panel).

The coefficients and standard errors of these bivariate associations are reported in panel A of table 1. In the data, not only different levels of education are differently related to voter turnout. If school attainment at the secondary level and years of schooling seem to capture a level of reading, writing, logical, and mathematical skills that is associated to political participation, so does the indicator of financial literacy, that measures a different (and more specific to economic and financial skills) kind of human capital. And the association between financial literacy and voter turnout is stronger with respect to other measures of education at school.

Moreover, by looking at the table, panel B shows that financial literacy is the only dimension of education that is robustly associated to voter turnout in empirical models that include a set of control variables accounting for various aspects of economic, social, and institutional heterogeneity across countries. The (log) level of GDP per capita and (log) openness to international trade capture differences in economic conditions. The (log) size of the population is a proxy for the weight of a single vote in a country and, thus, for the probability of a voter to be pivotal. Dependency ratios provide information on the age structure of the population (data are from the Penn World Table 9.0 described in Feenstra et al., 2015). Finally, the empirical models in table 1 consider if voting is compulsory by law, which is the case in 18 countries in the sample (data from IDEA, 2018), and if a country is a member of the OECD.

The results from the empirical exercises in panel B indicate that voter turnout is significantly higher in countries where a larger share of the population is financially literate (column 1), confirming the findings in figure 2, and in panel A of table 1. The correlations between education at school and voter turnout, however, are not significant at conventional levels. Across advanced and developing countries observed over the period 1990-2014, electoral participation is not robustly associated to general schooling at the primary, secondary, and tertiary level, nor to the average number of years of

schooling. Thus, the paradox of a missing link between education at school and voter turnout seems to emerge, as in previous studies reviewed in Persson (2013), in the sample under analysis too. The results from this preliminary analysis require of course a further qualification, offered in the sections to follow.

4. Robustness tests

The study of the determinants of electoral participation at the macroeconomic level, is an area of research that is receiving increasing attention. In addition to the determinants of voter turnout considered in the previous section, there could be other factors that differ across countries in ways that may matter to cross-country differences in electoral participation. The first part of this section considers institutional, geographical, and historical characteristics, to allow a comparison with previous studies in the literature. The second part of the section addresses causality issues. The last part discusses the information content of the indicators of financial literacy.

4.1.   Other explanatory variables

Table 2 reports the result from a battery of empirical models that add, to the set of control variables that appear in panel B of table 1, information on other country-specific characteristics. To include as much information as possible on the variables of interest, table 2 reports estimates for the indicators of financial and school education, only. It can be read as follows. Each row corresponds to empirical specifications including the same set of control variables, and different measures of education: in the first column, it presents the coefficient and the standard error of education, when it is measured by financial literacy; in column 2, the coefficient and the standard error for education when it is measured by primary school attainments; and so on. The sixth column, instead, tells the reader which additional variable model (1) includes. The economic meaning and econometric estimates of the additional explanatory variables will be discussed in what follows.

The specifications in rows 1 and 2 of table 2, study the relevance of education in models that include indicators of political institutions. Electoral participation may differ across countries that have different forms of government and electoral rules (Persson and Tabellini, 2004; Fumagalli and Narciso, 2012). In the sample, 57 countries have a presidential form of government. The coefficient of the dichotomous variable that measure this dimension, not reported, is negative and significant in all models, indicating that electoral participation is lower in presidential regimes, consistently with what found, among others, by Lijphart (2001) and Fumagalli and Narciso (2012). The specifications in the second row of table 2, instead, include a "majoritarian" system dummy, which takes value 1 in

the 29 countries where electoral rules are based on the majority principle. Its coefficient, not reported, is positive but not significant in all specifications.

The specifications in rows 3 and 4, include variables related to a country's story and historical characteristics. The variable "ethnic fragmentation" accounts for the possibility that electoral participation is lower in more ethnically fragmented societies, as suggested by Alesina et al. (2003). The sample includes countries where this index is close to zero, such as South Korea and Japan, and countries where the population is highly fragmented, as in Kenya, Uganda, and other African countries. In the fourth row of table 2, the models include a dummy variable that takes value 1 if the country was ever a colony, and zero otherwise, following Acemoglu et al. (2001)'s suggestion that colonial history can be a relevant determinant of citizens' engagement in political life, too. Both these two control variables, ethnic fragmentation and colonial history, are negatively but not significantly related to voter turnout in the sample.

The last two rows of table 2 turn to characteristics related to geography and civil liberties. The results from specifications including the set of geographic dummy variables for World Bank's continental location are in the fifth row of table 2. In the data, the countries located in Latin American and the Caribbean, and the ex-socialist European countries, record a lower level of voter turnout. Finally, the index of civil liberties, namely the "freedom of expression" indicator from the IDEA's database on the Global State of Democracy (see Skaaning, 2020), included in the specification of the last row of table 2, is not significantly related to voter turnout.

As regards the education variables of interest, the results confirm that financial literacy is significantly (and positively) associated to voter turnout. This is the only robust empirical findings in all specifications. Experimenting with these and other specifications, the inclusion of information on geographical location is crucial to detect a significant relationship between voter turnout, secondary education, and years of schooling. To try to seize the maximum amount of information on the role of education at school from the data, the specifications to follow include, along with the presidential system dummy that was significant in all specifications in the first row of table 2, the set of geographical location control variables.

4.2. Causality issues

This section applies instrumental variables methods to relax the conditional independence assumptions behind the cross-country regressions in tables 1 and 2. Different sources of historical, geographical, or socio-economic variation may influence both education and voter turnout. Among the geographical variables experimented as instruments, were the Frankel and Romer (1999)'s indicator of natural openness, and information on the intensity of ultraviolet radiation – a higher

exposure to sunlight is, indeed, related to a range of diseases and, thereby, to the quality of institutions, to economic activity, and to education (Ang et al., 2018, Barnebeck Andersen et al., 2016). However, these instruments were not good enough to make causal inference.

The identification strategy exploits, instead, as exogenous drivers of financial literacy, the historical origin of a country's legal institutional set-up. In the literature, legal origins can be good predictors of economic outcomes, by influencing persistent elements incorporated into regulations, legal rules, and educational policies. The legal origin dummies coded by La Porta et al. (1999), can be good and strong instruments for financial literacy, too. Indeed, the basic level of financial education that financial literacy measures is arguably a country-specific characteristic that has varied not vary much over time in the past decades (Lo Prete, 2018). Since education programs did not include financial literacy in school curricula until recently, and in a limited number of countries, the knowledge of basic economics and finance do seem to be rooted in a country's population as a persistent element. The results from the first the stage regression, in column 1 of table 3, show that financial literacy is significantly associated to legal origins. The percentage of financially literate people is higher in countries that have an Anglo-Saxon common law set up, in Scandinavian and in Socialist – civil law - countries.

Second-stage estimates, in column 2 of table 3, indicate that the exogenous – to electoral participation - component of financial literacy has a positive and significant effect on voter turnout. Other indicators of education at school, instead, has no causal effect on voter turnout. This section reports estimates for secondary education and education length only (columns 4 and 6), being the results from primary and tertiary grades never significant. The test statistics at the bottom of the table indicate that the exclusion restrictions are valid in all regressions. Legal origins are not systematically related to electoral participation in recent elections, as they were not related to politics (Ben-Bassat and Dahan, 2008; La Porta et al., 1999). Financial education and education at school are statistically not endogenous, and the instruments are strong enough to foster confidence on the precision of the estimates in regressions including financial literacy (column 2), while their power is lower in models that include indicators of secondary education and years of schooling (columns 4 and 6).

The results in table 3 confirm and strengthen the main findings from the previous analyses. The association between financial literacy and voter turnout is also causal, while the association between electoral participation and education at school is weaker in all models.

4.3. Information on financial literacy

The Standard & Poor's indicator of financial literacy used in the analysis measures the percentage of adults who are financially literate by country. Since the primary interest of the present work is to

study the long-run association between political participation and different levels and types of education across countries, the Standard & Poor's indicator has the notable advantage to be available for a large sample of countries. Admittedly, it has limits, too.

First of all, it would be interesting to understand what type of financial literacy matters, by disaggregating the Standard & Poor's measure used in the paper. Unfortunately, information on its four categories, that distinguish between understanding the concepts on basic numeracy, interest compounding, inflation, and risk diversification, is not publicly available. If the same is true for information on age differences among the survey's participants, table 4 shows the results from considering worldwide differences in financial literacy by gender.

The S&P Global Financial Literacy Survey shows a significant gender gap in financial literacy (Klapper et al., 2015), that emerges also in the 91 country-ample under analysis, where only 36% of women are financially literate on average, compared with 43% of men. Table 4 explores if there is a connection between electoral participation and the gender gap in financial literacy. Missing information on voter turnout by gender, the analyses consider if total turnout depends on financial education of women and men, separately. Interestingly, the results from both OLS and IV regressions indicate that both the average level of financial literacy of women (columns 1 and 3) and men (columns 4 and 6) have a positive effect on political participation in national elections.

The second limit of the indicator is its cross-sectional nature. The Standard & Poor's survey was administered for the first time in 2014. At the time of writing, these are the only data available. For the empirical analyses, the level of financial literacy was assumed constant over the period 1990-2014. This assumption should not affect the results, and is arguably reasonable, to the extent that the relative position of countries along this dimension does not change over time. Previous studies in the literature do document that financial literacy does not vary a lot over time, possibly due to the lack, over the past decades, of policies specifically targeted to increase the stock of knowledge of economic and financial subjects (Lo Prete, 2018). The next section offers a test of the reliability of this assumption, by using an indicator of economic literacy compiled by the IMD World Competitiveness Yearbook, to characterize medium-term variations in electoral participation.

5. Panel estimates

Information on time variation for the measures of financial education and education at school is quite scarce. The Standard & Poor's indicator of financial literacy has no time variation. The IMD World Competitiveness Yearbook compiled information on ''economic literacy'' from 1995 to 2008, and for "education in finance" for the shorter period 1999-2008, and for 55 countries, only – out of which, 52 belong to the sample under analysis. The Barro-Lee Educational Attainment Dataset has records

on school education at 5-year intervals from 1950 to 2010. To perform the panel analysis, data are interpolated when missing, and the last value kept constant up to 2014 - the results do not change significantly if the data are assumed constant over five-year intervals. The panel contains five sub-periods, and considers non-overlapping 5-year averages of the variables of interest.

Table 5 reports the results from specifications including different indicators of financial literacy. To compare results from models including time invariant and time-varying indicators of financial literacy, the analysis is run on the 52 country-sample for which data from the IMD World Competitiveness Yearbook are available. The first two specifications use the time-invariant Standard & Poor's indicator of financial literacy. The results from OLS regressions with geographical location controls (in column 1), and OLS regressions with geographical location controls and time effects (in column 2), document a strong and positive association between financial literacy and voter turnout - these findings hold also when the 91 country-sample is considered (results not reported).

Given the cross-sectional nature of the Standard & Poor's indicator, the model assumes implicitly that cross-country heterogeneity in voter turnout is explained by differences in financial literacy. To relax this assumption, the next specifications include the IMD indicator of financial literacy with the greater time variation, that is "economic literacy". It measures the level of economic knowledge based on interviews to senior representatives of the national business community who were asked to evaluate if the level of economic literacy among the population is high on a 1 to 10 scale. Despite its different information content, its correlation with the time-invariant S&P indicator of financial literacy is quite high (0.65).

In the country sample under analysis, economic literacy is positively and significantly associated to voter turnout in OLS panel regression including regional control variables (columns 3). The results hold when time effects are included to control for time trends in voter turnout (column 4), and in models where fixed effects control for any unobserved country-specific heterogeneity (column 5). The analyses in columns from 3 to 5 are run on five 5-year sub-periods. The results hold, although the precision of the estimates is lower, also when the sample period 1995-2010 is considered, thus using data only on the three 5-year sub-periods for which time variation in the IMD indicator is available – that is, without assuming its value constant before 1995 and after 2008 as done in table 5.

The findings of a positive nexus between financial literacy and voter turnout, are reasonably robust. Despite the scarcity of information on time variation in financial literacy, and the size of the sample available to run panel analyses, they consistently point to a positive and significant association between electoral participation and basic knowledge of economic and financial concepts.

Interestingly, in table 6, secondary education (columns 1-3) and of years of schooling (columns 4-6) do not help capture the variation of interest in voter turnout in the same 52-country sample, unless

in column 2, which reports the results from a model including geographical location dummies and time effects. To find a significant association between indicators of education at school and voter turnout, the full 91 country sample should be considered. In results not reported, secondary education and years of schooling are positively and significantly associated to voter turnout, when controls for geographical location and time effects are included in OLS panel regressions. In fixed effect regression, instead their coefficients turn negative, and are significant in the case of secondary school attainment. Thus, panel estimates do not solve the paradox on the nexus between education at school and political participation across countries. Yet, they indicate that the results on education at school are sensitive to the inclusion of a larger number of developing countries, where arguably the returns from school education are higher, and the influence of the societal changes, listed in the introduction, which may hinder the nexus is lower.

6. Concluding remarks

Finding that basic knowledge of economic and financial concepts helps explain voting behavior - namely, has a positive causal impact on electoral participation, - represents an important element to understand the complex process whereby people choose to express a preference at polls or to abstain from voting in modern societies. Complemented by the evidence on school education at the secondary level and on education length, the results suggest that education at school is important but may not be enough to spur electoral participation in modern economies. There is arguably more than civic skills and responsibility – taught at school - that matters to civic and political engagement, such as the skills needed to gauge the contents of policies and policy agendas that indicators of financial literacy capture (Fornero et al., 2021).

The evidence presented in this work may have relevant policy implications. It provides policymakers with further guidance on how to foster citizens' participation to political life. If citizens' understanding of economics and finance concepts is among the determinants of the decision to turn out to vote, investing in financial education programs, and possibly including financial literacy modules in school curricula, can help to effectively increase political participation.

References

Acemoglu, D., Johnson, S., Robinson, J.A. (2001). The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review* 91(5): 1369-1401.

Ang, J.B., Fredriksson, P.G., bin Nurhakim, A.L., Tay, E.H. (2018). Sunlight, Disease, and Institutions. *Kyklos* 71(3): 374-401.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth* 8: 155-94.

Barnebeck Andersen, T., Dalgaard, C., Selaya, P. (2016). Climate and the Emergence of Global Income Differences. *The Review of Economic Studies* 83(4): 1334–1363.

Barro, R.J., Lee, J.W. (2013). A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics* 104: 18–198.

Ben-Bassat, A., Dahan, M. (2008). Social rights in the constitution and in practice. *Journal of Comparative Economics* 36(1): 103–119.

Bhatti, Y. (2017). Type of education and voter turnout – Evidence from a registered-based panel. *Electoral Studies* 49: 108-117.

Dee, T.S. (2004). Are there civic returns to education? Journal of Public Economics 88:1697-1720.

Delli Carpini, M.X. (1997). Book review: Education and Democratic citizenship in America. *American Political Science Review* 91:971–2.

Fornero, E., Lo Prete, A. (2019). Voting in the aftermath of a pension reform: the role of financial literacy. *Journal of Pension Economics and Finance* 18(1): 1-30.

Fornero, E., Lo Prete, A., Oggero, N. (2021). Now more than ever: Why financial literacy is a key element of post-COVID-19 recovery. In B. J Cude & G. Nicolini (Eds.), *The Routledge Handbook of Financial Literacy*. Routledge, London, pp. 137-152.

Feenstra, R.C., Inklaar, R., Timmer, M.P. (2015). The Next Generation of the Penn World Table. *American Economic Review* 105(10): 3150-3182.

Filer, J.E., Kenny, L.W., Morton, R.B. (1993). Redistribution, Income, and Voting. *American Journal of Political Science* 37(1): 63-87.

Frankel, J.A., Romer, D. (1999). Does trade cause growth? *American Economic Review* 89(3): 379-399.

Fumagalli, E., Narciso, G. (2012). Political institutions, voter turnout, and policy outcomes. *European Journal of Political Economy* 28: 162-173.

IDEA (2018). Codebook for Voter Turnout data. https://www.idea.int/sites/default/files/publications/voter-turnout-database-codebook.pdf.

Klapper, L., Lusardi, A., van Oudheusden, P. (2015). Financial Literacy Around the World: Insights From the Standard & Poor's Rating Services Global Financial Literacy Survey. https://gflec.org/wp-content/uploads/2015/11/3313-Finlit_Report_FINAL-5.11.16.pdf?x27564.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W. (1999). The quality of government. *Journal of Law Economics and Organization* 15(1): 222–279.

Lijphart, A. (2001). Democracy in the 21st century: can we be optimistic? *European Review* 9: 169-184.

Lo Prete, A. (2013). Economic literacy, inequality, and financial development. *Economics Letters* 118(1): 74-76.

Lo Prete, A. (2018). Inequality and the finance you know: does economic literacy matter? *Economia Politica: Journal of Analytical and Institutional Economics* 35(1): 183-205.

Lo Prete, A. (2022). Digital and financial literacy as determinants of digital payments and personal finance. *Economics Letters* 213: 110378.

Lusardi, A., Mitchell, O. (2007). Baby Boomer Retirement Security: The Roles of Planning, Financial Literacy, and Housing Wealth. *Journal of Monetary Economics* 54(1): 205-224.

McNamara, K.R, Musgrave, P. (2020). Democracy and collective identity in the EU and the USA. *Journal of Common Market Studies* 58(1): 172-188.

Milligan, K., Moretti, E., Oreopoulos, P. (2004). Does education improve citizenship? Evidence from the United States and the United Kingdom. *Journal of Public Economics* 88: 1667–95.

Mueller, D., Stratmann, T. (2003) The economic effects of democratic participation. *Journal of Public Economics* 87: 2129-2155.

Murtinu, S., Piccirilli G., Sacchi, A. (2022). Rational inattention and politics: how parties use fiscal policies to manipulate voters. *Public Choice* 190: 365-386.

Nie, Norman H., Junn, J., Stehlik-Barry, K. (1996). *Education and Democratic Citizenship in America*. University of Chicago Press, Chicago.

OECD (2020). OECD/INFE 2020 International Survey of Adult Financial Literacy. www.oecd.org/financial/education/launchoftheoecdinfeglobalfinancialliteracysurveyreport.htm.

Persson, M. (2015). Education and Political Participation. *British Journal of Political Science* 45(3):689-703.

Persson, M. (2013). Is the Effect of Education on Voter Turnout Absolute or Relative? A Multi-level Analysis of 37 Countries. *Journal of Elections, Public Opinion & Parties* 23(2): 111–133.

Persson, T., Tabellini, G. (2004). Constitutional Rules and Fiscal Policy Outcomes. American Economic Review 94(1): 25-45.

Putnam, R.D. (2001). Tuning in, tuning out: the strange disappearance of social capital in America. In R.G. Niemi, H.F. Weisberg (Eds.), *Controversies in Voting Behavior*. CQ Press, Washington.

Rosenstone, S.J., Hansen, J.M. (1993). *Mobilization, Participation, and Democracy in America*. Macmillan Publishers, New York.

Skaaning, S. (2020). The Global State of Democracy Indices Methodology. https://www.idea.int/gsod-indices/sites/default/files/global-state-of-democracy-indices-methodology-v4.pdf.

Tenn, S. (2007). The Effect of Education on Voter Turnout. Political Analysis 15(4): 446-464.

van Rooij, M., Lusardi, A., Alessie, R. (2001). Financial literacy and stock market participation. Journal of Financial Economics 101: 449-472.

Wolfinger, R.E., Rosenstone, S.J. (1980). *Who Votes?* Yale University Press, New Haven.

Data Appendix

Table A.1. Descriptive statistics.

| Variable name	N.	Mean	Std. Dev.	Min	Max
Voter turnout	91	69.1	12.8	34.3	95.1
Financial literacy	91	39.8	14.6	14	71
Primary education	91	27.6	14.6	3.5	65.0
Secondary education	91	45.5	17.7	4.7	79.2
Tertiary education	91	14.1	10.0	0.3	48.7
Years of schooling	91	8.4	2.5	1.5	12.8
GDP per capita	91	16129	19272	345	91500
Trade	91	83.1	50.9	22.4	361.3
Population (millions)	91	42.2	121.4	0.3	1087.5
Dependency ratio	91	36.9	5.8	27.7	51.7
Compulsory	91	0.2	0.4	0	1
OECD	91	0.4	0.5	0	1
Presidential	91	0.6	0.5	0	1
Majoritarian	91	0.3	0.5	0	1
Ethnic fragmentation	91	0.4	0.2	0	0.9
Ever colony	73	0.8	0.4	0	1
Freedom of expression	88	0.7	0.1	0.4	1
Financial literacy, women	91	36.5	14.4	11	70
Financial literacy, men	91	43.2	15.4	16	77
Economic literacy (IMD)	52	4.8	1.4	2.0	7.6

Note. The table reports information on the variables not transformed.

Table A.2. Correlation between measures of education.

	Financial Literacy	Primary education	Secondary education	Tertiary education
Primary education	-0.33			
Secondary education	0.35	-0.68		
Tertiary education	0.52	-0.47	0.36	
Years of schooling	0.58	-0.53	0.82	0.74

Notes: Correlations are computed on the sample of 90 countries. All correlations are significant at the 1 percent level.

Figure 1. Percentage of adults who are financially literate.
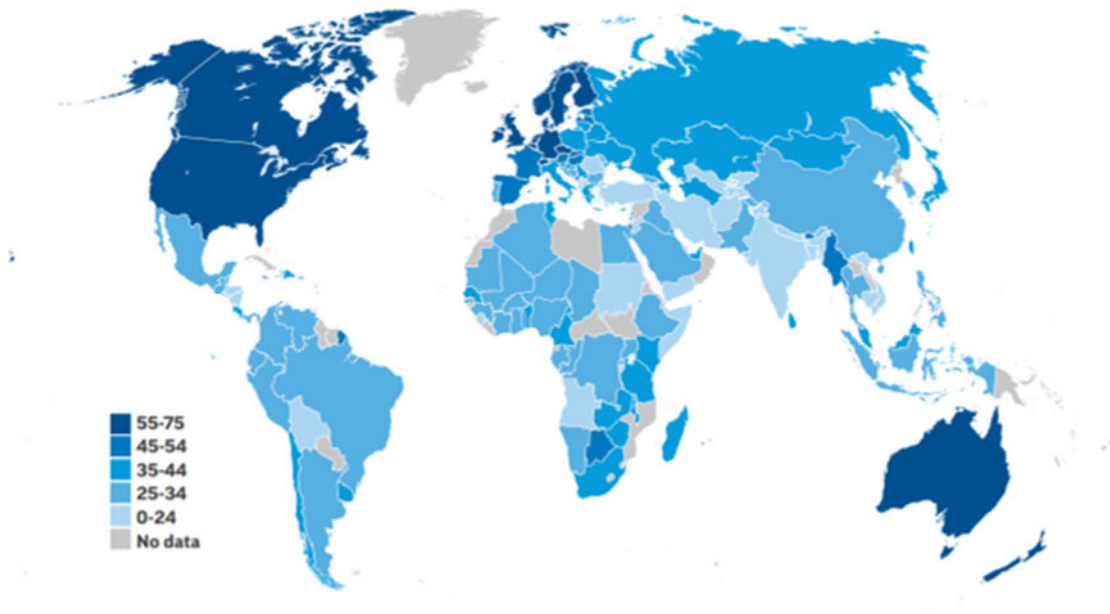
Source: Klapper et al. (2015, map 1, page 7).

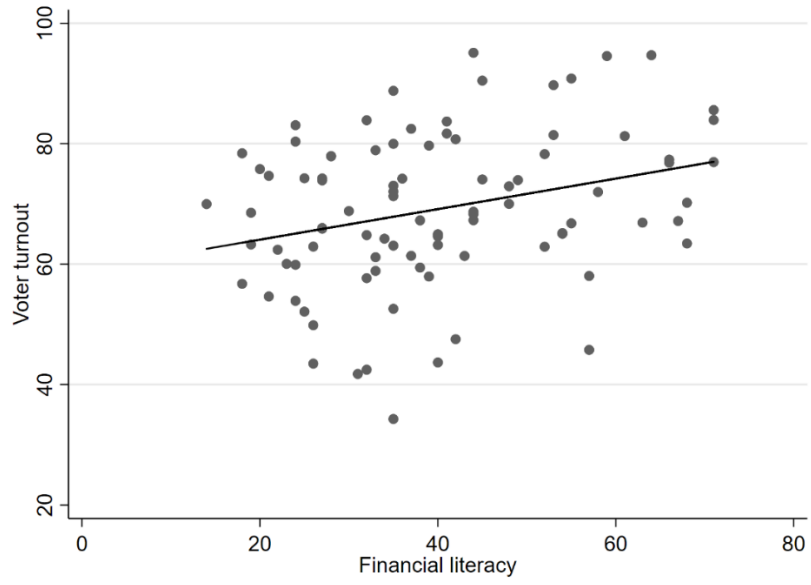Figure 2. Financial literacy and voter turnout across countries.

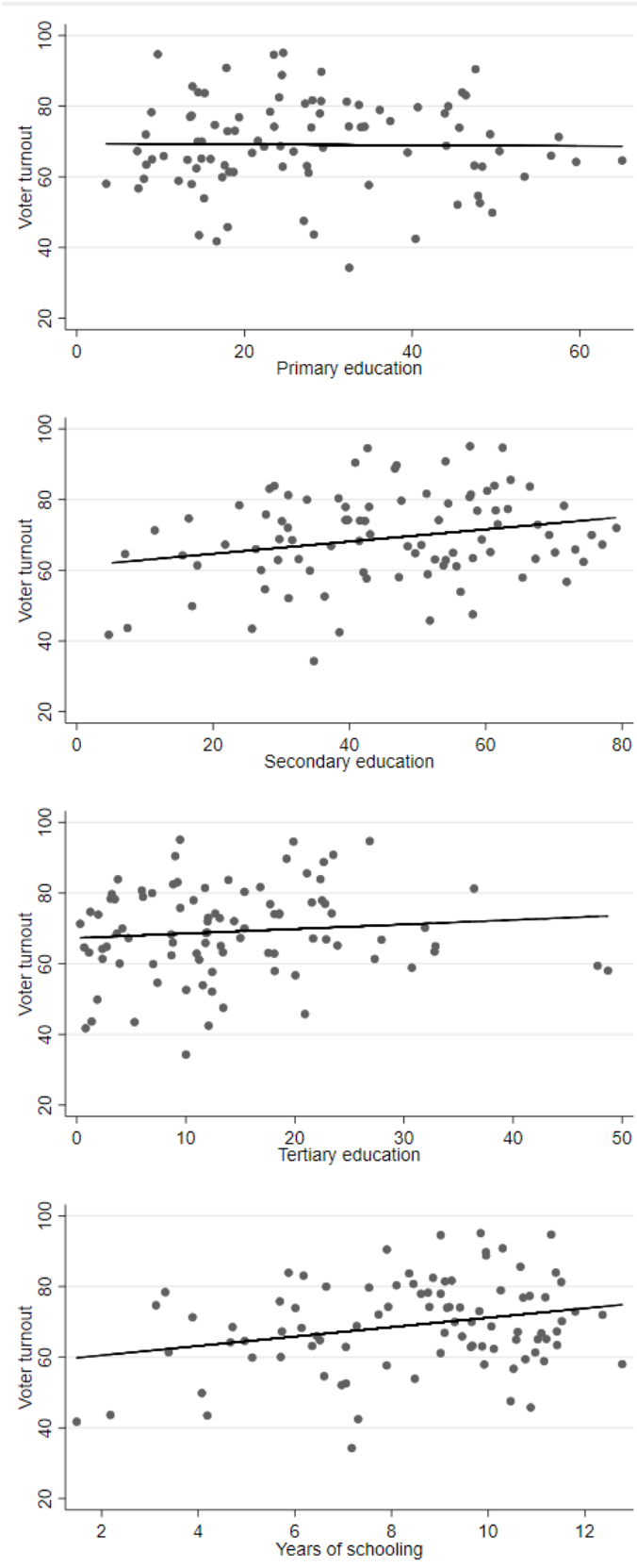Figure 3. Education at school and voter turnout across countries.

Table 1. Education and voter turnout.

Dependent variable: Voter turnout

Panel A – Bivariate associations

Education measure (regressor):	[1] Financial literacy	[2] Primary education	[3] Secondary education	[4] Tertiary education	[5] Years of schooling
Education	0.25***	-0.01	0.17**	0.13	1.33**
	(0.08)	(0.08)	(0.07)	(0.13)	(0.53)

Panel B – OLS estimation with control variables

Education measure (regressor):	[1] Financial literacy	[2] Primary education	[3] Secondary education	[4] Tertiary education	[5] Years of schooling
Education	0.35***	0.05	0.07	-0.16	0.17
	(0.12)	(0.11)	(0.10)	(0.13)	(0.74)
GDP p.c.	-4.54	-1.46	-1.27	-0.89	-1.44
	(2.96)	(2.77)	(2.78)	(2.72)	(2.69)
Trade	0.40	1.75	1.63	1.60	1.68
	(3.04)	(3.38)	(3.37)	(3.34)	(3.34)
Population	-1.45	-1.39	-1.18	-1.24	-1.33
	(1.07)	(1.09)	(1.13)	(1.14)	(1.10)
Dep. ratio	-0.93**	-0.67	-0.46	-0.69	-0.58
	(0.46)	(0.51)	(0.54)	(0.46)	(0.49)
Compulsory	11.50***	8.98**	10.14***	9.48***	9.58***
	(2.91)	(3.56)	(3.35)	(3.09)	(3.15)
OECD	-0.37	4.17	3.77	4.50	3.72
	(3.76)	(3.68)	(3.65)	(3.61)	(3.77)
R-squared	0.28	0.22	0.23	0.22	0.22
Observations	91	91	91	91	91

Notes: OLS estimation. Robust standard errors in parenthesis. The symbols *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 2. Other explanatory variables.

Dependent variable: Voter turnout							
	[1]	[2]	[3]	[4]	[5]		
Education measure (regressor):	Financial literacy	Primary education	Secondary education	Tertiary education	Years of schooling	*Specification including the set of control variables in table 1 panel B, plus:*	Obs. Nr.
	0.32*** (0.12)	0.09 (0.11)	0.04 (0.09)	-0.11 (0.13)	0.23 (0.71)	Presidential	91
	0.33** (0.14)	0.06 (0.10)	0.07 (0.09)	-0.18 (0.13)	0.17 (0.71)	Majoritarian	91
	0.38*** (0.12)	0.05 (0.11)	0.07 (0.10)	-0.16 (0.13)	0.15 (0.75)	Ethnic fragmentation	91
	0.38*** (0.11)	-0.03 (0.12)	0.18 (0.11)	-0.10 (0.14)	0.81 (1.01)	Colonial history	73
	0.35** (0.14)	-0.00 (0.11)	0.27*** (0.09)	-0.14 (0.14)	1.79** (0.78)	Regional controls	91
	0.38*** (0.13)	0.04 (0.11)	0.08 (0.10)	-0.14 (0.13)	0.06 (0.78)	Freedom of expression	88

Notes: OLS estimation. Robust standard errors in parenthesis. The symbols *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Other regressors not shown in the table: GDP per capita, trade, population, dependency ratio, compulsory voting dummy, OECD dummy.

Table 3. Instrumental variables regressions. Determinants of voter turnout.

	[1]	[2]	[3]	[4]	[5]	[6]
	1st stage Financial literacy	2nd stage Voter Turnout	1st stage Secondary education	2nd stage Voter Turnout	1st stage Years of schooling	2nd stage Voter Turnout
Education		0.63**		0.26		2.86*
		(0.25)		(0.22)		(1.68)
GDP p.c.	7.76***	-11.55***	3.07	-6.90*	0.81**	-8.61*
	(1.90)	(4.33)	(2.84)	(4.09)	(0.37)	(4.78)
Trade	5.85*	-3.28	4.60	-1.55	0.31	-1.49
	(3.50)	(2.83)	(3.94)	(3.49)	(0.42)	(3.60)
Population	1.87	-2.99***	0.00	-2.31*	0.03	-2.49**
	(1.15)	(0.93)	(1.57)	(1.28)	(0.14)	(1.11)
Dep. ratio	0.24	-1.69***	-0.93*	-1.18**	-0.08	-1.22**
	(0.28)	(0.55)	(0.48)	(0.59)	(0.07)	(0.55)
Compulsory	-0.60	12.47***	-1.79	11.59***	0.09	11.33***
	(2.83)	(3.63)	(3.25)	(3.63)	(0.46)	(3.75)
OECD	11.04***	-5.78	0.03	0.78	0.99**	-2.18
	(3.15)	(4.15)	(4.26)	(3.74)	(0.41)	(4.28)
Presidential	-2.91	-2.30	-7.42**	-2.38	-0.21	-3.18
	(2.36)	(2.54)	(3.14)	(2.29)	(0.38)	(2.33)
Anglo-Saxon legal origin	7.45***		4.78		1.87***	
	(2.67)		(3.30)		(0.41)	
German legal origin	1.68		8.95*		1.41**	
	(4.65)		(4.54)		(0.62)	
Scandinavian legal origin	18.74***		8.72		1.32**	
	(3.51)		(6.06)		(0.64)	
Socialist legal origin	23.81***		38.23***		2.59**	
	(5.66)		(7.69)		(0.98)	
Regional controls	Yes	yes	Yes	yes	Yes	yes
Over-ident. restrictions		2.08		4.84		2.67
		[0.56]		[0.18]		[0.45]
Specification test		0.47		0.05		0.45
		[0.49]		[0.83]		[0.50]
Weak identification test		12.65		6.23		5.54
Observations	91	91	91	91	91	91

Notes: 2SLS estimation. Robust standard errors in parenthesis. The symbols *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Test of over-identifying restrictions, under the null that all instrumental variables are orthogonal to the second-stage error term. Specification test, under the null: estimates from OLS and IV are both consistent. Weak identification test: Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. error.

Table 4. Financial literacy by gender.

	[1]	[2]	[3]	[4]	[5]	[6]
	OLS	1st stage Financial Literacy women	2nd stage Voter Turnout	OLS	1st stage Financial Literacy men	2nd stage Voter Turnout
Financial literacy, women	0.24*		0.52**			
	(0.14)		(0.22)			
Financial literacy, men				0.25**		0.60**
				(0.12)		(0.25)
GDP p.c.	-7.98*	6.69***	-10.19**	-7.98*	6.50***	-10.62***
	(4.48)	(1.74)	(4.24)	(4.37)	(2.13)	(4.07)
Trade	-1.86	5.34*	-2.50	-1.84	4.60	-2.60
	(3.47)	(3.07)	(2.99)	(3.32)	(4.11)	(2.87)
Population	-2.75**	1.67	-2.78***	-2.69**	1.20	-2.64***
	(1.07)	(1.05)	(0.95)	(1.06)	(1.37)	(0.97)
Dep. ratio	-1.50**	0.12	-1.59***	-1.48**	0.02	-1.56***
	(0.61)	(0.28)	(0.54)	(0.60)	(0.33)	(0.52)
Compulsory	10.84***	1.62	11.37***	10.67***	1.72	11.08***
	(4.07)	(2.71)	(3.72)	(4.01)	(3.24)	(3.68)
OECD	-1.21	8.96***	-3.75	-1.16	8.71**	-4.12
	(4.20)	(3.18)	(3.99)	(4.12)	(3.33)	(4.33)
Presidential	-3.39	-3.14	-2.44	-3.75	-1.37	-3.11
	(2.64)	(2.39)	(2.48)	(2.63)	(2.71)	(2.57)
Anglo-Saxon legal origin		9.17***			9.60***	
		(2.63)			(3.18)	
German legal origin		5.12			2.02	
		(4.05)			(5.73)	
Scandinavian legal origin		21.64***			19.25***	
		(3.63)			(4.05)	
Socialist legal origin		24.83***			21.76***	
		(5.45)			(6.72)	
Regional controls	yes	yes	yes	yes	yes	yes
Over-ident. restrictions			2.19			1.36
			[0.53]			[0.72]
Specification test			1.04			1.44
			[0.31]			[0.23]
Weak identification test			14.53			8.94
Observations	91	91	91	91	91	90

Notes: Robust standard errors in parenthesis. The symbols *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Test of over-identifying restrictions, under the null that all instrumental variables are orthogonal to the second-stage error term. Specification test, under the null: estimates from OLS and IV are both consistent. Weak identification test: Kleibergen–Paap Wald rk F statistic, robust to non-i.i.d. error.

Table 5. Panel estimation: financial education and voter turnout.

	[1]	[2]	[3]	[4]	[5]
	S&P Financial Literacy	S&P Financial literacy	IMD Economic literacy	IMD Economic literacy	IMD Economic literacy
Financial education	0.44***	0.41***	1.98***	1.75**	2.94***
	(0.07)	(0.08)	(0.71)	(0.71)	(1.07)
GDP p.c.	-6.90***	-5.82**	-2.69	-1.45	-1.21
	(2.09)	(2.26)	(1.96)	(2.01)	(4.41)
Trade	-1.66	-0.22	-1.26	0.77	4.92
	(1.59)	(1.64)	(1.73)	(1.85)	(4.45)
Population	-1.73**	-1.22*	-1.36*	-0.67	28.84**
	(0.67)	(0.71)	(0.69)	(0.73)	(12.19)
Dep. ratio	0.32	0.23	0.49	0.34	0.17
	(0.29)	(0.29)	(0.31)	(0.31)	(0.46)
Compulsory	19.89***	19.51***	17.84***	17.50***	
	(1.91)	(1.95)	(1.90)	(1.90)	
Presidential	0.79	0.68	2.51	2.19	
	(2.36)	(2.30)	(2.57)	(2.46)	
OECD	1.04	0.96	-1.71	-1.56	
	(1.75)	(1.76)	(1.59)	(1.57)	
Regional contr.	yes	yes	yes	yes	no
Time effects	no	yes	no	yes	yes
Fixed effects	no	no	no	no	yes
R-squared	0.50	0.51	0.43	0.45	0.26
Observations	255	255	255	255	255

Notes: Panel estimation: OLS specification in columns 1-4; fixed effects specification with time effects in column 5. Robust standard errors in parenthesis. The symbols *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 6. Panel estimation: school education and voter turnout.

	[1]	[2]	[3]	[4]	[5]	[6]
	Secondary education	Secondary education	Secondary education	Years of schooling	Years of schooling	Years of schooling
Education	0.09	0.14**	-0.17	0.19	0.99	0.81
	(0.06)	(0.06)	(0.12)	(0.61)	(0.62)	(1.16)
GDP p.c.	-1.94	-0.92	-2.27	-1.52	-1.53	-1.27
	(2.10)	(2.11)	(5.28)	(2.28)	(2.19)	(4.97)
Trade	-2.39	-0.11	5.23	-1.78	0.86	3.90
	(1.81)	(1.94)	(4.69)	(1.77)	(1.88)	(5.01)
Population	-2.19***	-1.32*	30.90**	-2.03***	-1.18	31.26**
	(0.71)	(0.76)	(12.42)	(0.71)	(0.74)	(12.98)
Dep. ratio	0.50	0.30	0.07	0.52	0.33	0.30
	(0.32)	(0.31)	(0.48)	(0.32)	(0.32)	(0.50)
Compulsory	18.19***	18.00***		17.91***	18.00***	
	(1.99)	(1.94)		(2.10)	(2.03)	
Presidential	3.44	2.49		3.82	2.37	
	(2.83)	(2.64)		(2.72)	(2.50)	
OECD	-1.39	-0.89		-1.78	-1.12	
	(1.65)	(1.61)		(1.66)	(1.68)	
Regional c.	yes	yes	no	yes	yes	no
Time effects	no	yes	yes	no	yes	yes
Fixed effects	no	no	yes	no	no	yes
R-squared	0.42	0.45	0.24	0.42	0.45	0.23
Observations	255	255	255	255	255	255

Notes: Panel estimation: OLS specification in columns 1, 2, 4, and 5; fixed effects specification with time effects in columns 3 and 6. Robust standard errors in parenthesis. The symbols *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.