The effects of financial and economic literacy on policy preferences in Italy

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Abstract

As populist and protectionist sentiments across the world continue to increase, this paper explores the role that financial and economy literacy play in shaping individual economic policy preferences. Through a causal diagram, the theory suggests that financial and economic literacy affects individual economic policy preferences in a direct way and in an indirect manner, through discount rates. To test my hypotheses, I analyze original survey data collected in Italy. Findings suggest that financially and economically literate individuals have significantly lower discount rates. Moreover, financially and economically literate individuals, regardless of their economic condition, are more likely to prefer remaining in the Eurozone, and to favor immigration from the EU, immigration from outside the EU, free trade, and the Fornero pension reform.

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1 Introduction

As we are witnessing a backlash against globalization, many theories have tried to explain such nationalist and protectionist policy preferences. My hypothesis is that financial and economic literacy affects economic policy preferences. In order to clarify the underlying theoretical mechanisms, I build a causal diagram (or directed acyclic graph - DAG) that describes how financial and economic literacy affects policy preferences. Financial and economic literacy is expected to have both a direct and an indirect effect on economic policy preferences. Directly, financial and economic literacy is expected to affect the accuracy with which an individual evaluates the short-term and long-term expected costs and benefits of a certain policy. I assume that any individual will choose the policy that she thinks will give her the highest expected utility. Hence, financially and economically literate individuals are more likely to more accurately predict the effect of a specific economic policy on their economic well-being. On the contrary, financially and economically illiterate individuals are less likely to be accurate at estimating the effects of a policy on their economic well-being and, as a result, they may be more likely to rely on other factors, such as core personal values (for example culture, political ideology, identity, etc.) rather than on cost-benefit analyses to make their policy decisions. Indirectly, financial and economic literacy is expected to have an effect on policy preferences through discount rates. Meier and Sprenger, and Lahav et al. show that financially literate individuals have longer time horizons, hence the expectations is that financial and economic literacy may help settle decisions in which there is a trade-off between the short run and the long run in favor of the long run[1]. The DAG helps to visually represent the causal assumptions and to clearly identify which variables to control for in order to accurately estimate the total causal effect

1. Meier and Sprenger 2008; Lahav, Rosenboim, and Shavit 2015.

of financial and economic literacy on economic policy preferences .

More specifically, this paper looks at five economic policy preferences: 1) remaining or leaving the Eurozone, 2) favoring free trade, 3) favoring immigration from the EU, 4) favoring immigration from outside the EU, 5) and favoring the Fornero pension reform in Italy, using a representative national survey of the Italian population collected by the author through the company Cint. The decision to focus on Italy stems from several reasons. A recent survey by the Bank of Italy on financial literacy in Italy[2] has found that Italy is the least financially literate country in Europe. Only one in three Italians know at least three of these four basic financial concepts: inflation, interest compounding, interest rates, and risk diversification. In 2011 Italy also passed a very contested pension reform, the so-called Fornero reform, which raised the retirement age to 67 years old and shifted the system from defined benefit (DB) to defined contribution (DC). This reform encountered considerable opposition and there is a risk that the current Five Star and League government might backtrack on the reform, with huge consequences for the public budget and intergenerational equity[3]. Issues such as free trade, immigration, and Eurozone membership have also been especially salient in Italy, given its struggle to get back on track after the recent financial and economic crisis.

Following the theory, the first hypothesis that the paper tests is whether financially and economically literate individuals indeed have lower discount rates than their illiterate counterparts, with a multiple linear regression and with the Mann-Whitney U test. Secondly, using Bayesian multinomial logit models, it tests whether financially and economically literate winners from globalization (those with high incomes, high education, and non-routine jobs) and losers (those with

2. Di Frischia 2017.

3. http://www.igmchicago.org/surveys/aging

low incomes, low education, and routine jobs) are more likely to prefer economic openness than their illiterate counterparts. The expectation of a non-differential preference for economic openess between winners and losers stems from the fact that previous studies[4] have found that financially literate losers from globalization are more likely to favor economic openness than financially illiterate losers. One speculation was that this could be due to financially literate individuals having lower discount rates. Since data is available to assess this claim, I will indeed test if these individuals might be weighing the long run gains more than the short-term losses from a more open economy. Similarly, financially literate pension reforms winners (age groups 18-55 and 67-88) and losers (people close to retirement in age group 56-66), are expected to both be more likely to favor the Fornero pension reform than their illiterate counterparts.

The findings suggest that financially and economically literate individuals have significantly lower discount rates. Furthermore, the Mann-Whitney U test shows significant results, suggesting that discount rates for financially and economically literate losers are significantly lower from those for financially and economically illiterate losers. Moreover, the findings from the Bayesian multinomial logit models also suggest that financial and economic literacy does affect economic policy preferences as predicted: financially and economically literate individuals, regardless of their economic condition, are more likely to prefer remaining in the Eurozone, and to favor immigration from the EU, immigration from outside the EU, free trade, and the Fornero pension reform.

This paper contributes to several literatures. The first is the literature on financial literacy. While the literature on the effects of financial literacy on personal financial decisions, such as retirement, savings, and investment, is thriving and expanding[5], studies looking at how financial

4. Magistro 2018.

5. Behrman et al. 2010; Lusardi 2008; Lusardi and Mitchell 2017; Monticone 2010; Van Rooij, Lusardi, and Alessie

literacy affects the public sphere are limited. Some examples include Montagnoli et al., who find that there is a correlation between financial literacy and political orientation in the U.K.[6]; Fornero and Lo Prete, who find that pension reforms take less of a toll on the politicians that passed them in countries where financial literacy is higher[7]; and Magistro, who finds that financial literacy is linked to policy preferences in the U.K.. This study does not only focus on financial literacy, which measures the possession of a set of skills which allow an individual to make sound financial decisions, but it also adds an important element to the current literature, which is the concept of economic literacy. The latter also captures country-specific knowledge about policies and how well a person understands how a policy affects them. Furthermore, it analyzes different policy preferences in Italy, and adds a further mechanism to the theory, investigating the role played by subjective discount rates as well. The second literature this paper contributes to is that on economic policy preferences. Currently, most studies on preferences for free trade investigate how trade affects an individual's income, and more specifically they look at the distributional consequences of trade using sectoral, factoral, and more recently individual task-level models[8]. Similarly, the majority of studies on preferences for immigration test two competing hypotheses, one in relation to its effect on self-interest, and the other focusing on the role of concerns for the cultural impacts of immigration on the country in question[9]. Very few studies investigate the role of financial and

2012.

6. Montagnoli et al. 2016.

7. Fornero and Lo Prete 2019.

8. Acemoglu and Autor 2011; Owen and Johnston 2017; Ebenstein et al. 2014; Kambourov and Manovskii 2009; Matias Cortes 2016; Mayda and Rodrik 2005; Scheve and Slaughter 2001b; Blonigen and McGrew 2013.

9. Citrin et al. 1997; Chandler and Tsai 2001; Card, Dustmann, and Preston 2012; Daniels and Von der Ruhr 2003; Hainmueller and Hopkins 2012; O'Rourke and Sinnott 2006; Scheve and Slaughter 2001a.

economic literacy on preferences for free trade or immigration, and none, to my knowledge, uses these sets of questions and theoretical and empirical specifications[10]. Finally, this paper, for certain aspects, with its addition of the questions measuring economic literacy, also contributes to the literature on the role of knowledge in affecting policy preferences, where the current findings are mixed at best[11].

The remainder of the paper is organized as follows. Section 2 contains a literature review, section 3 lays out the theoretical argument, section 4 introduces the data, section 5 presents models, section 6 contains the results and their discussion, and section 7 concludes.

2 Literature review

2.1 Financial and economic literacy

Financial literacy is defined by the OECD as 'a combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being'[12]. Financial literacy has been determined to be a key determinant of personal decisions regarding retirement, savings, and investments. Recently, some studies have shown that financial literacy may be fundamental not only in the private sphere but also in the public one. Montagnoli et al. find that there is a correlation between financial literacy and political orientation in the U.K. as financially literate individuals are more likely to orientate at the center-left or center-right of the

10. Mansfield and Mutz 2009; Walstad 1997.

11. Boeri, Boersch-Supan, and Tabellini 2002; Boeri and Tabellini 2012; Bolsen and Druckman 2016; Kahan et al. 2012; Kuklinski et al. 2000; Nyhan and Reifler 2010.

12. Atkinson and Messy 2012.

political spectrum rather than at the extremes[13]. Investigating the relationship between financial literacy and public policies, Fornero and Lo Prete find that pension reforms take less of a toll on the politicians that passed them in countries where financial literacy is higher[14]. Magistro also finds that financial literacy is linked to policy preferences in the U.K.: financially literate individuals are more likely to be in favor of economic openness (immigration, free trade, remaining in the EU) than illiterate individuals, regardless of economic self-interest[15]. Studies on financial literacy have been measuring the concept in a consistent manner, using questions on basic financial concepts, such as the working of interest compounding, the difference between nominal and real values, and the basic risk of diversification[16]. These questions are supposed to measure one's understanding of how to balance a budget, how compound interest works, how inflation affects one's income. The OECD study by Atkinson and Messy argues that financial literacy questions provide a good overview of a person's basic financial knowledge and of their ability to apply that knowledge to particular issues. However, these questions do not capture country-specific knowledge, such as understanding how the tax system or the pension system in one's country work, and how they affect one's economic well-being. For this reason, in this study I not only include a measure of financial literacy, but also questions that tap what I define as economic literacy, which measure a person's country-specific knowledge on certain policies and their effects on one's welfare. In this regard, some studies have investigated the role of knowledge on policy preferences, however evidence on this relationship has been mixed at best. While Boeri and Tabellini do find a positive effect of information on public

13. Montagnoli et al. 2016.

14. Fornero and Lo Prete 2019.

15. Magistro 2018.

16. Lusardi 2008.

support for pension reform, Nyhan and Rifler, and Kuklinski et al. find that, in general, citizens tend to resist facts[17]. Furthermore, Kahan et al. and Bolsen and Druckman find that views on climate change are affected more by partisan lines rather than knowledge[18].

Finally, recent studies suggest that discount rates also play a key role in the relationship between financial literacy and policy preferences, although the direction of the relationship has been a cause of debate. Meier and Sprenger suggest that discount rates affect financial literacy, and hence that more future-oriented respondents are more likely to participate in free financial conunseling programs[19]. However, Lahav et al. conduct a lab experiment to test the relationship between financial literacy and time preference and they find that financial literacy, through learning financial concepts like compound interest, the time value of money, and the risk of capitalization, affects subjective discount rates by dramatically decreasing preference for the present[20].

2.2 Trade, immigration, Italexit, and pension policy preferences

Economic policies often end up with redistributive outcomes, which result in winners and losers. Although there is near consensus among experts that free trade and immigration have positive aggregate effects, and that the gains in the long run are much larger than any effects on employment, these come with distributional consequences at least in the short run, where a minority loses while the majority wins, hence explaining why we may not see overwhelming support for open borders[21].

17. Boeri and Tabellini 2012; Nyhan and Reifler 2010; Kuklinski et al. 2000.

18. Bolsen and Druckman 2016; Kahan et al. 2012.

19. Meier and Sprenger 2008.

20. Lahav, Rosenboim, and Shavit 2015.

21. http://www.igmchicago.org/surveys/free-trade; http://www.igmchicago.org/surveys/migration-within-europe

As discussed in the section above, few if any studies have analyzed the effects of financial and economic literacy on economic policy preferences. The literature on free trade has focused for the most part on its distributional consequences using sectoral, factoral, and more recently individual task-level models[22]. According to these models, respectively, people who own factors of production that are abundant in supply relative to the rest of the world, people working in exporting industries, and people perfoming non-routine taks, which are harder to outsource and automate, should be more likely to favor open borders. Conversely, those owning scarce factors, working in industries facing competition from imports, and performing routine-tasks should be more likely to be protectionist. Other scholars, like Mansfield and Mutz find little support for the sectoral and factoral models using two U.S. surveys[23]. They find that the effect of education disappears once they incorporate out-group anxiety into their models. Their findings also suggest that sociotropic perceptions of how trade affects the country as a whole are more important than egotropic perceptions of one's self.

Similarly, a review of the literature, examining immigration in advanced economies, shows that there are large gains to be made if migration barriers were reduced, that immigrants have a modest and temporary negative impact on the wages of low-skilled natives, that it has no direct impact on unemployment in the host country, and that it actually increases total factor productivity[24]. As immigration has increased, so has research on natives' attitudes towards immigrants. Two main theories dominate the research: one from political economy and the other from political

22. Acemoglu and Autor 2011; Owen and Johnston 2017; Ebenstein et al. 2014; Kambourov and Manovskii 2009; Matias Cortes 2016; Mayda and Rodrik 2005; Scheve and Slaughter 2001b; Blonigen and McGrew 2013.

23. Mansfield and Mutz 2009.

24. Leeson and Gochenour 2015; Coppel, Dumont, and Visco 2001; Foged and Peri 2013; Hamilton and Whalley 1984; Ottaviano and Peri 2006; Ottaviano, Peri, and Wright 2010; Peri 2009; Sequeira, Nunn, and Qian 2017.

psychology[25]. The former explains preferences for immigration in relation to its effect on self-interest, in a very similar way as in the trade preferences literature[26]. The latter approach emphasizes the role of concerns for the cultural impacts of immigration on the country. The findings from Haimueller and Hiscox's review of the literature suggest that preferences for immigration do not seem to be linked much to personal economic circumstances. Rather, they seem to depend on cultural concerns for the nation as a whole[27].

Italy's struggle to recover from the Eurozone crisis has led many of its citizens to blame the country's woes on the single currency, the euro. More and more people claim that they would favor leaving the single currency to regain monetary policy independence. However, a majority of economists agree that Italy's problems lie elsewhere, more specifically in its low productivity[28]. Pellegrino and Zingales investigate why Italy's productivity stopped growing twenty years ago. They find that this has very little to do with the introduction of the euro or with China joining the WTO, but is rather related to Italy's incapability to take full advantage of the information and communications technology (ICT) revolution due to widespread familism and cronyism[29]. Schivardi and Schmitz also analyze why productivity growth in Southern Europe has been lagging behind and they argue that this divergence is partly caused by inefficient management practices, which limited Southern Europe's gains from the IT revolution[30]. Many people attribute Italy's

25. Hainmueller and Hopkins 2012.

26. Daniels and Von der Ruhr 2003; O'Rourke and Sinnott 2006; Scheve and Slaughter 2001a.

27. Citrin et al. 1997; Chandler and Tsai 2001; Card, Dustmann, and Preston 2012.

28. Bugamelli et al. 2018; Calligaris et al. 2016; Hassan and Ottaviano 2013; Manasse and Manfredi 2014; Mody and Riley 2014; Schivardi and Schmitz 2018; Pellegrino and Zingales 2014; Pinelli, Szekely, and Varga 2015.

29. Pellegrino and Zingales 2014.

30. Schivardi and Schmitz 2018.

poor economic performance to euro membership, and argue that if Italy could leave the euro, a flexible exchange rate and devaluation would bring long lasting benefits. Demertzis et al. suggest that before joining the euro, Italy devalued the lira relative to the German deutschmark many times, however, these re-alignments were never accompanied by long-term improvements in the labor market[31]. Furthermore, leaving the Eurozone would not just imply a devaluation of the new lira. The economic costs of exiting the euro would far outweigh the benefits[32]. In the short-term, some of the consequences of an Italexit would be bank runs, bank closures, capital controls, a decline in the value of deposits, and a steep decline in real wages and in the real value of pensions. Another question revolves around the complexity that would follow from the introduction of the new currency, and the redenomination of contracts[33]. It is not clear what would happen to euro-denominated debt, as more and more firms would be unable to repay their euro-denominated debt and would default. Uncertainty would also surround the medium to long-term: Italy could be cut out of international financial markets for several years, and even if it were not, its credit ratings would be downgraded, and its sovereign spreads would increase, as investors would anticipate and react to government's actions[34]. Furthermore, an Italexit would also entail political consequences, by posing a threat to future cooperation, and by potentially leading to an exit contagion[35]. As to preferences for or against the EU, most studies on Euroscepticism have tested two main competing hypothesis on its determinants. One is that of economic insecurity, more specifically between the

31. Demertzis, Efstathiou, and Matera 2017.

32. Eichengreen 2010; Aslett and Caporaso 2016.

33. Aslett and Caporaso 2016.

34. Eichengreen 2010.

35. Aslett and Caporaso 2016.

winners and losers of globalization, while the other one concerns the cultural cleavage also created by more economic openness, which increasingly links Euroscepticism to public attitudes towards immigrants[36].

Finally, the last policy under analysis is pension reform. Population aging is one of the key factors that has caused the necessity for public pension reforms. Other factors include declining productivity growth, and declining employment rates, which imply less people paying in to fund current retirees' pensions. Most public systems are financed on a pay-as-you-go (PayGo) basis, which means that contributions from current workers are directly used to pay for current retirees' pensions. Often, this implies little to no accumulation of funds and extra funding from the public budget is necessary to cover the annual deficits. A common solution across European countries has been that of raising the retirement age, since as people live longer, they should also work longer[37]. In December 2011, as public finances were getting close to collapse, a pension reform (the so-called Fornero reform) was passed in Italy. The pension introduced the defined contributions system for everyone, it harmonized eligibility conditions between men and women, and linked eligibility conditions to changes in life expectancy, raising the retirement age. This pension reform encountered tremendous public opposition and the current government has promised to bring the retirement age back down, regardless of its unsustainability. Although the need to reform pension systems is clear to experts, public opinion does not seem to agree[38]. Boeri, Boersch-Supan and Tabellini examined citizens' opinions on different areas of the welfare state. They find that citizens

36. Van der Brug and Van Spanjie 2009; Kriesi et al. 2006, 2008; Van Elsas, Hakhverdian, and Van der Brug 2016; Inglehart and Norris 2016.

37. http://www.igmchicago.org/surveys/aging

38. Fornero 2015.

are aware of the unsustainability of pension systems, but they are unaware of the costs of the PayGo system. Preferences on policy options seem to reflect both economic self-interest and personal normative views about the role of the state. Opposition to reform is very high even among people who have knowledge about the costs and unsustainability of the current systems[39]. In a subsequent study, Boeri and Tabellini investigate why it is so difficult to reform European pension systems and they analyze the role of information with respect to support for pension reform. They find that citizens who are more informed about the costs and functioning of pension systems are more willing to accept reforms[40]. Finally, Fornero and Lo Prete investigate how financial literacy affects voting in the aftermath of a pension reform and they find that the electoral cost of a pension reform is significantly lower in countries where the level of financial literacy is higher[41].

3 Theory

The theory argues that financial and economic literacy affects economic policy preferences both in a direct and in an indirect manner. In a direct way, financial and economic literacy affects the accuracy with which an individual calculates the effects of a specific policy on their expected utility. Financially and economically literate people are expected to be able to conduct more accurate cost-benefit analysis, while financially and economically illiterate people are less likely to be accurate at estimating the effects of a policy on their individual economic well-being and may be more likely to rely on other decision-making factors such as core personal values (for example

39. Boeri, Boersch-Supan, and Tabellini 2002.

40. Boeri and Tabellini 2012.

41. Fornero and Lo Prete 2019.

culture, political ideology, identity, etc.), or cues from reference groups, to make their decisions. Indirectly, recent findings from the literature on financial literacy suggest that financially literate individuals have longer time horizons. Hence, it is possible that these individuals, in presence of clear policy trade-offs between the short and the long run, might weight the long-term effects more heavily. As a result, the argument is that financially and economically literate individuals' ability to do more sophisticated cost-benefit analyses will give them a more precise and unbiased estimate of the expected utility of the policy. Conversely, for financially illiterate individuals, I expect that there is more uncertainty over the expected utility of the policy. Hence, I argue that individuals who are financially and economically literate are expected to weigh the short-run and long-run costs and benefits of an economic policy with more precision and less bias and as a result, they are more likely to accurately estimate what effect that policy is going to have on their expected utility than a financially and economically illiterate individual[42].

The theory can be represented by a causal diagram (or directed acyclic graph - DAG). DAGs are visual representations of qualitative causal assumptions[43]. These causal assumptions are mapped into statements about probability distributions through simple rules. Identification analysis is aimed at determining under which conditions we can strip an observed association of all its spurious components[44]. However, identification is clearly different from estimation: causal models are not the same thing as statistical models. Often it may not be possible to specify a parametric statistical model to estimate the parameters of a causal model.

Arrows represent potential direct causal effects between two variables and they order the

42. For a formal model of the theory see Magistro 2018

43. Pearl and Mackenzie 20018; Elwert 2013.

44. Elwert 2013.

variables in time. Missing arrows represent the lack of a causal effect between a pair of variables. DAGs are non-parametric in the sense that they make no claims on the distribution of variables, the functional forms the direct effects may take, or the magnitude of the causal effects. A collider on a path is a variable with two arrows pointing into it, otherwise they are non-colliders. Confounding bias arises when we fail to condition on a common cause, hence the solution is to condition on the common cause. Overcontrol bias occurs when we condition on a variable on a causal path between treatment and outcome, if we do so we would not be able to consistently estimate the total causal effect of the independent variable on the outcome, hence we should not be conditioning on that variable. Endogenous selection bias results from conditioning on a collider on any path that connects treatment and outcome, the solution is not to condition on such variables, otherwise we would see a relationship where there is not one.

As to determinants of financial and economic literacy, prior studies reveal that younger and older respondents are more financially illiterate, while middle-aged respondents exhibit higher levels of financial knowledge[45]. Differences in financial literacy by education are also remarkable and so are those by gender: people without a college degree and women exhibit much lower levels of financial literacy[46]. As far as household resources are concerned, which will be proxied by income in this study, it is possible that causality may go in both directions. Having higher incomes might incentivize people to acquire financial literacy in order to make better financial decisions, but higher financial literacy could also be welfare-enhancing, as it might make people identify ways to increase their income. Monticone examines the link between financial behavior and financial knowledge in Italy. She asseses the direction of this relationship. Being male is associated with

45. Lusardi and Mitchell 2014.

46. Lusardi and Mitchell 2014.

greater financial knowledge in Italy[47]. She also finds that people living in Southern regions tend to show less financial literacy[48]. Age, similar to other studies[49], shows a concave shape: financial literacy increases up to ages 41-60 and then it declines. Similarly to Guiso and Jappelli, she finds that wealth and financial literacy are positively associated[50]. However, she also uses an IV approach to estimate the causal relationship. She finds that, although small, wealth has a positive effect on financial literacy. Conversely, other studies find that financial literacy causes higher wealth accumulation[51]. For instance, Behrman et al. use an IV approach to deal with endogeneity and they seek to isolate the causal effects of financial literacy and schooling. They find that financial literacy has a significant effect on wealth accumulation, even after controlling for schooling. They also argue that there are no other endogenous variables beyond financial literacy and education that could directly determine wealth.

Income may also be affected by age, gender, education, type of job, and region of residence. Similarly to income, education may also be determined by demographic variables like age, gender, and region of residence. The routineness of jobs tend to be associated with skills, which we will proxy with education. As suggested by the literature review, economic policy preferences may be affected by income, education, the routine content of jobs, demographic factors, political ideology, and cultural conservatism. In a similar way, political ideology and cultural conservatism may be affected by education, income, and demographic variables. Both cultural conservatism and political

47. Guiso and Jappelli 2006; Monticone 2010; Lusardi and Mitchell 2014.

48. Monticone 2010.

49. Lusardi and Mitchell 2014.

50. Guiso and Jappelli 2006.

51. Behrman et al. 2010; Lusardi and Mitchell 2014; Van Rooij, Lusardi, and Alessie 2012.

ideology may affect economic policy preferences[52] Additionally, another possibility, as suggested by Montagnoli et al. is that financial and economic literacy also affect political ideology, which indirectly affects economic policy preferences. Finally, research shows that subjective discount rates are determined by education, income, and financial and economic literacy[53], however, age and gender do not show consistent results.

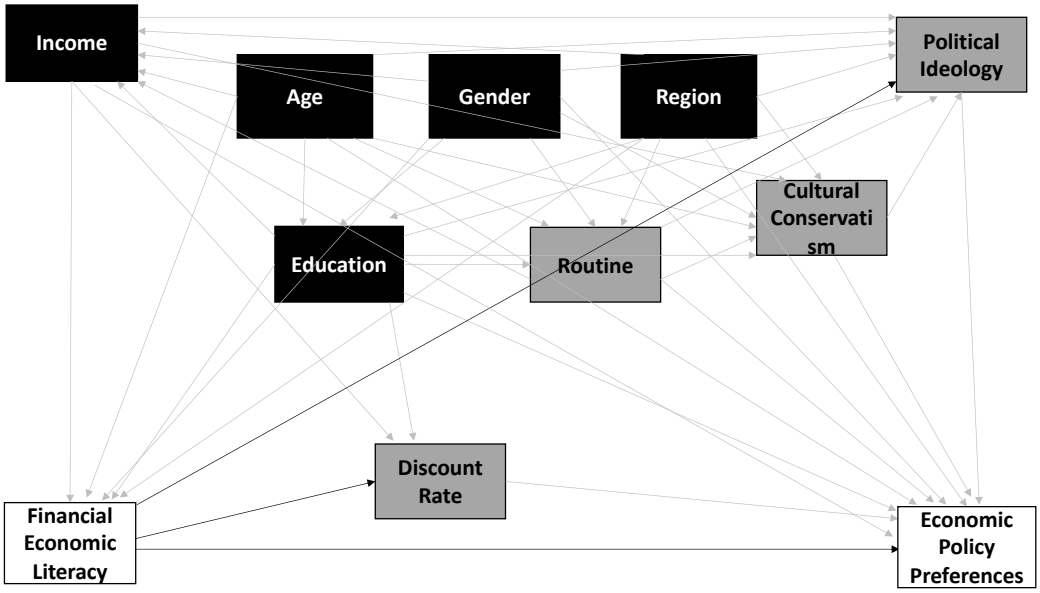
Given the rules mentioned above and the current literature on determinants of our variables of interest, we can look at Figure 1 and infer that in order to estimate the total causal effect of financial and economic literacy on economic policy preferences we should condition on demographic variables (age, gender, region), income, and education[54]. Moreover, to make sure that the causal assumptions that were made are consistent with the data, we test the restrictions identified in the form of conditional independencies. If at least one implied independence does not hold in the dataset, this means that the causal processes encoded by the DAG cannot have generated these data. If the independencies are not refused by the data, this will give credibility to the data, but it

52. In the causal DAG approach, arrows cannot be bidirectional. However, there are situations in which each variable may cause the other - for instance the arrow connecting economic policy preferences and political ideology may go in either direction, since it is possible that political ideology is just a proxy for one's policy preferences. These more complex situations are simplified by introducing a time dimension. Hence, there is a variable for policy preferences at time 1, political ideology at time 1, policy preferences at time 2, political ideology at time 2.

53. Enzler, Diekmann, and Meyer 2014; Lahav, Rosenboim, and Shavit 2015.

54. In our case, in order to avoid overcontrol bias we should not control for the variable measuring discount rates and for political ideology, which are mediating variables and as such they would bias our total effect. Furthermore, we do not need to control for routine jobs and cultural conservatism since controlling for income, education, and demographic variables already blocks all backdoor paths from the treatment to the outcome. In order to double-check that these are the variables that should be controlled for, the DAG can be reproduced on daggity.net

still does not mean that the DAG is necessarily correct[55].All of the testable implications have been found to be consistent with the dataset[56].



Note: The white squares represent the covariate of interest, financial and economic literacy, and the outcome variable, economic policy preferences. The gray arrows represent biasing paths, while the black ones represent the causal paths. The gray squares are variables that should not be adjusted for, while the black squares represent the variables that we should adjust for.

Figure 1: DAG of the relationship between financial and economic literacy and policy preferences

3.1 Effect heterogeneity: winners and losers from different policies

Finally, a common misconception is that DAGs cannot represent effect heterogeneity. However, these are nonparametric constructs, hence they make no claims about distributions or functional

55. Textor et al. 2016.

56. These have been tested with the R package dagitty following Textor et al. 2016. When testing independencies it emerges that age and gender are not independent. This might have to do with the fact that the online survey is not entirely representative of the Italian population.

form, their only restriction is the structure of dependencies and independencies[57]. DAGs generically presume that all causal effects vary across units unless otherwise stated. They also permit effect modification and interaction effects[58]. We know that different policies may create different sets of winners and losers, hence we need to establish who wins and who loses from the policies under analysis, in order to formulate the hypotheses. More specifically, in our case, in line with consistent findings from the literature, on the one hand, economically and financially literate winners from globalization (individuals with higher income, higher education, and non-routine jobs) are expected to be more likely to favor the policy with the highest true utility for them, hence economic openness, than their illiterate counterparts. On the other hand, it is uncertain whether economically and financially literate losers from globalization (individuals with lower income, lower education, and routine jobs) would be more likely to favor the policy with the highest true utility for them in the short run, i.e. protectionism, or in the long run, i.e. economic openness. Findings from previous studies[59] suggest that financial literacy is associated with higher preferences for economic openness, regardless of economic condition. As a result, if we assume that part of the mechanism through which financial and economic literacy affects economic policy preferences is via lower discount rates, we might not find a differential preference between financially and economically literate winners and losers, as they would both be more likely to favor economic openness than their illiterate counterparts. Economists agree that freer trade improves productive efficiency and offers consumers better choices, and in the long run these gains are much larger than any effects on

57. Elwert 2013.

58. Elwert 2013; VanderWeele 2009.

59. Magistro 2018.

employment[60]. Similarly, although some findings suggest that immigration has short-term negative effects for certain groups of natives, its effects in the long run are positive[61]. Hence, it is plausible that, if financially and economically literate individuals indeed have longer time horizons, they might be weighting costly short run adjustments less, in expectation of reaching a new equilibrium with larger and broader gains in the long run. Similarly, with respect to pension reform, we may expect financially and economically literate people closer to retirement age (age group 57-66) to be more likely than illiterate individuals to be opposed to a pension reform that increases retirement age since it will affect them more directly and immediately. However, again if the assumption that financially and economically literate individuals indeed have lower discount rates is true, we might not find a differential preference across the two different financially and economically literate age groups if we expect financially and economically losers from pension reform to put more weight on the long run gains from reform on the state coffers, also given population aging and declining productivity.

From these follow my hypotheses:

1. Financially and economically literate individuals are more likely to have lower subjective discount rates.

2. Financially and economically literate winners and losers from economic openness are more likely to favor remaining in the Eurozone, immigration from the EU, immigration from outside the EU, and free trade than their financially and economically illiterate counterparts;

60. http://www.igmchicago.org/surveys/free-trade

61. Leeson and Gochenour 2015; Coppel, Dumont, and Visco 2001; Foged and Peri 2013; Hamilton and Whalley 1984; Ottaviano and Peri 2006; Ottaviano, Peri, and Wright 2010; Peri 2009; Sequeira, Nunn, and Qian 2017.

3. Financially and economically literate winners and losers from pension reform are more likely to favor the Fornero pension reform than their financially and economically illiterate counterparts;

4 Data

Using a representative online survey of the Italian population, I attempt to overcome some of the limitations of the current research on the relationship between financial and economic literacy and policy preferences. To my knowledge, there is no available dataset in Italy with questions on financial and economic literacy, subjective discount rates, and policy preferences. The data used to test the hypotheses was collected by the author through the company Cint. A representative survey of the Italian population was conducted online in July 2018, including a total of 1,128 individuals[62].

4.1 The dependent variables

The first dependent variable measures a respondent's intention to leave or remain in the Eurozone: 'If there was a referendum on Italy's membership in the Eurozone (and as a consequence in the European Union), how do you think you would vote?'

1. Remain (reference category)
2. Leave
3. Don't know

62. I used multiple imputation with the R package Amelia to deal with missing values, but the analysis was also run with listwise deletion and findings do not change.

The second dependent variable asks the respondent whether they are in favor or against free trade with the EU: 'Are you in favor of free trade with the EU?':

1. Against (reference category)
2. In favor
3. Don't know

The third and fourth dependent variables measure a respondent's attitude towards immigrants from EU and from non-EU countries. The third and fourth questions ask respectively 'Are you in favor of immigration from countries within the EU?' and 'Are you in favor of immigration from countries outside of the EU?':

1. Against (reference category)
2. In favor
3. Don't know

The fifth dependent variable asks the respondent what they think of the recent Fornero pension reform: 'Are you in favor of the Fornero pension reform?':

1. Against (reference category)
2. In favor
3. Don't know

4.2 The independent and control variables

Financial and economic literacy is my main covariate of interest and it is measured by the number of correct answers to three questions on financial literacy and three questions on economic literacy. The financial literacy questions reflect knowledge about interest compounding, inflation, interest rates, and risk diversification[63]. The economic literacy questions reflect knowledge of the effects of certain public policies in the country. The first financial literacy question is: 'Suppose you have €100 in a savings account with an interest rate of 2% per year. If you never withdrew any money from this account, how much do you think there would be after 5 years?' The answers are: 1) More than €102, 2) Exactly €102, 3) Less than €102, 4) Don't know. The second question is: 'Suppose inflation is 2% per year and you have put money into a savings account with an interest rate of 1% per year. Assuming that you buy the same things today and in one year's time, do you think you would be able to buy more with the money in this account in one year than today, less in one year than today, or do you think you would be able to buy exactly the same things in one year as today?' The answers are: 1) More than today, 2) Exactly the same as today, 3) Less than today, 4) Don't know. The third question asks: 'The following statement:'An individual share in a company is usually a less risky asset to invest in than a portfolio of different company shares' is':. 1) True, 2) False, 3) Don't know. The first economic literacy question asks: 'According to you, for which purpose are pension contributions paid for'?" 1) Only to pay for future pensions, 2) Only to pay for current pensions, 3) To pay for both current and future pensions, 4) Don't know. The second question asks: 'If Italy adopts public policies that restrict imports from another nation that is a major trading partner, then in Italy:' 1) The cost of producing products will decrease, 2) Job

63. Lusardi 2008; Lusardi and Mitchell 2014; Montagnoli et al. 2016.

opportunities in export industries will increase, 3) Consumers will pay higher prices for products, 4) Don't know. The third question asks: 'Economic research agrees on the effects of immigration on advanced economies. More specifically': 1) In the short run there may be a decline in wages and employment of unskilled natives, but these would be offset by rising wages and employment in the long run, 2) In the short run there may be an increase in wages and employment of unskilled natives, but these would be offset by declining wages and employment in the long run, 3) Native workers lose, in terms of wages and employment, in both the short run and the long run in all sectors, 4) Don't know. The variable of interest combines these six questions and measures the number of correct answers to the questions: 0) 0 correct answers, 1) 1 correct answer, 2) 2 correct answers, 3) 3 correct answers, 4) 4 correct answers, 5) 5 correct answer, and 6) 6 correct answers.

In order to analyze the heterogenous effects between economic self-interest and financial and economic literacy, I include measures of the respondent's skill level and occupational task that they perform. Following the Heckscher-Ohlin, Ricardo-Viner models and the recent literature on the effects of the routine content of tasks, owners of relatively abundant factors of production should benefit from trade, and in the case of Italy, the abundant factors are highly skilled labor, capital and non-routine tasks. Hence, I use household annual income as a proxy of capital endowment and level of education to measure skill endowment[64]. Furthermore, since I have disaggregated data on the type of occupation that each individual conducts, I am able to construct a more accurate routine variable. I rely on the recent literature's distinction between routine and non-routine tasks[65]. *Education* is a dummy variable indicating the respondent's qualification, low education includes anyone who has a secondary education or less and high education anyone who has a university degree

64. Hays, Ehrlich, and Peinhardt 2005; Mansfield and Mutz 2009.

65. Acemoglu and Autor 2011; Matias Cortes 2016; Halikiopoulou and Vlandas 2018.

(undergraduate or postgraduate): 1) low education (reference category), 2) high education. The variable *routine* is a dummy variable and it is derived from two variables: one that asks respondents what their main occupation is, and the other that asks them more broadly which sector they work in, so that the constructed variable can be as accurate as possible. In general, routine jobs include clerical/administrative/sales occupations, production, craft and operative positions. Non-routine occupations include professional, managerial, technical occupations and production, operative, and service positions. The variable *routine* indicates whether the respondents' occupation is: 0) non-routine (reference category), 1) routine. Finally, income is an ordinal variable that indicates in which bracket the household's respondent gross income is. The variable was recoded so that, based on values below the 25th percentile, between the 25th and 75th percentile, and above the 75th percentile, it takes three values: 0) low-income (below 10,000 €, reference category), 1) middle-income (between 10,000 and 29,999 €), and 2) high-income (above 30,000 €).

Furthermore, the demographic controls are also included (gender, region of residence, age). Table 1 shows descriptive statistics for the dependent variables, Table 2 shows descriptive statistics for the constructed measure of financial and economic literacy, and Table 3 shows descriptive statistics for the other independent and control variables, from one of the imputed datasets (N = 1,228).

4.3 Measures of subjective discount rate

In order to investigate the relationship between financial and economic literacy and subjective discount rates I included a question in the survey that allows me to infer an individual's subjective discount rate. The question asks: 'You are supposed to receive 15,000 €in your bank account

Table 1: Descriptive statistics of the dependent variables for the imputed dataset (N = 1,128)

	Relative frequency, %
Vote intention on Italexit	
Stay in the Eurozone	59.2
Leave the Eurozone	26.8
Don't know	14
Views on immigration from EU	
Oppose	10.5
Favor	85
Don't know	4.5
Views on immigration from outside EU	
Oppose	47.7
Favor	42
Don't know	10.3
Views on free trade with the EU	
Oppose	12.5
Favor	80.9
Don't know	6.6
Views on Fornero pension reform	
Oppose	61.2
Favor	24.8
Don't know	14

Table 2: Descriptive statistics of the financial and economic literacy measures for the imputed dataset (N = 1,128)

Financial and economic literacy index							
# Correct answers	6	5	4	3	2	1	0
%	2.6	14.5	25	24.4	19.8	9.8	3.9
Financial literacy questions							
	% Correct		% Incorrect		% Don't know		
Interest rate	71.4		22.8		5.8		
Inflation	68.3		20.8		10.9		
Risk diversification	54.5		13.6		31.9		
Economic literacy questions							
	% Correct		% Incorrect		% Don't know		
Pay as you go pensions	33		61.5		5.5		
Effects of protectionist measure	53.1		33.2		13.7		
Effects of immigration	30		51.6		18.4		

immediately. Instead, we offer you the option of receiving a sum of money one year from now. Fill in the amount that you are willing to receive one year from now, instead of 15,000 €today. Insert minimum amount' [66]. The annual discount rate for delaying payment was calculated as follows:

$$SDR = \left(\frac{P}{X} - 1\right) \cdot \frac{12}{t} \tag{1}$$

where P is the amount the subject is willing to accept in t months for delaying the receiving of the amount X today. This hyperbolic model has been found to descriptively model discounting data better than the exponential model[67][68].

5 Models

5.1 The relationship between financial and economic literacy and subjective discount rates

One of the main findings in Magistro[69] is that financial literate losers from globalization are more likely than the financially illiterate to be in favor of economic openness, not against as predicted by the model. It was speculated that one reason why this could be happening is that financial literate people might have longer time horizons, and hence they might be weighing the long run

66. I excluded individuals that reported numbers below 15,000 €, implying negative discount rates, as they likely resulted from misentering numbers.

67. Hardisty et al. 2011.

68. The discount rate variable had significant outliers, as a result the models were run both with the outliers using the robust and resistant regression method, and without outliers.

69. Magistro 2018.

Table 3: Descriptive statistics of the other independent and control variables for the imputed dataset (N = 1,128)

		Rel. frequency, %	
Education			
	Low education	66.9	
	High education	33.1	
Income			
	Low income	31	
	Middle income	46.2	
	High income	22.8	
Occupation			
	Non-routine	45	
	Routine	54.9	
Female		50.6	
Region			
	North	44	
	Center	19.2	
	South	36.8	
		Mean	Sd
Age		45	14.4
Discount rate (without outliers)		1218.4 (0.7)	21399.8 (1.8)

gains more than the short-term losses from a more open economy. In this paper, since data on subjective discount rates is available, I test the relationship between financial and economic literacy and subjective discount rates in two ways. First, I run a multiple linear regression:

$$y_i = \beta_0 + \beta_k x_{i,k} + \epsilon_i \tag{2}$$

where i stands for the i^{th} individual, k stands for the k^{th} predictor, y, the response variable, is subjective discount rate, and the various predictors, x_k, are financial and economic literacy, the main covariate of interest, and income and education, as controls. The error term, ϵ, is normally distributed with mean 0 and variance σ^2. However, in this case, the latter condition only holds approximately, in that it describes the majority of observations, but some observations follow a

different pattern. This can have a large distorting influence if we fit the regression using least squares. As a result, since the response variable includes very significant and extreme outliers, which may or may not be the result of misentered numbers, I run a robust and resistant regression[70], which eliminates the influence of outliers. Furthermore, I also run an OLS regression on a dataset that excludes the most extreme outliers.

The second test I run consists in looking specifically at potential losers from the policies under analysis and compare mean subjective discount rates between financially and economically literate and illiterate individuals. However, the t-test is not appropriate if one is unsure about the distribution of the variables, if the variance is unequal across groups, and if some groups are very small. As a result, I used the Mann-Whitney U test, a non-parametric test. In this case, significant results can be reported as 'Values for group 1 were significantly different from those of group 2'. I am interested in knowing whether values for group 1 are significantly lower than those for group 2. The Mann-Whitney U test is run for both the imputed dataset with no missing values and for the dataset which excludes extreme outliers.

5.2 The relationship between financial and economic literacy and policy preferences: Bayesian multinomial logit models

Let Y_i be the unordered categorical dependent variable for observation i which takes an integer values $j = 1, ..., J$. I model respondent i's policy preference using multinomial logistic regression:

$$Y_i \sim Multinomial(Y_i \mid \pi_{i,j}) \tag{3}$$

70. I use the MM method in R, which uses the Biweight influence function initialized by a resistant S-estimator

where $\pi_{i,j} = Pr(Y_i = j)$ for $j = 1, ..., J$.

$$\pi_{i,j} = \frac{exp(\beta_j x_i)}{\sum_{k=1}^{J} exp(\beta_j x_i)}, for j = 1, ..., J-1 \tag{4}$$

x is a vector of k explanatory variables for observation i and β is a vector of coefficients for category j. Category J is assumed to be the baseline category.

The prior for β is given by:

$$\beta_j \sim Normal_k(b_0, B_0^{-1}) for j = 1, ..., J-1, \tag{5}$$

where b_0 is the vector of means for the k explanatory variables and B_0 is the $k \times k$ precision matrix (the inverse of a variance-covariance matrix). I use a weakly informative prior with b_0 equal to 0 and B_0 equal to 0.001[71].

71. As suggested by McElreath 2015; Gelman et al. 2014; Gelman 2018; Ghosh, Li, and Mitra 2018 I use weakly informative priors. The idea is that we want the prior to rule out unreasonable parameter values, but we do not want it to be so strong as to rule out values that might make sense. Gelman 2018 also suggests that the loss in precision we incur from making the prior weaker is less serious than what we gain in robustness by including parts of parameter space that might be relevant. Different precision values were also tried and results do not change significantly.

6 Results

6.1 Results for the relationship between financial and economic literacy and subjective discount rates

The first hypothesis that is tested is whether financially and economically literate individuals do indeed have lower discount rates. Table 4 shows that this is the case for both the regression estimated with the MM method, which includes outliers, and the OLS regression that excludes extreme outliers. The coefficients for financial and economic literacy are negative and statistically significant, and Figure 2 shows the expected values of subjective discount rates by different levels of financial and economic literacy for both regressions.

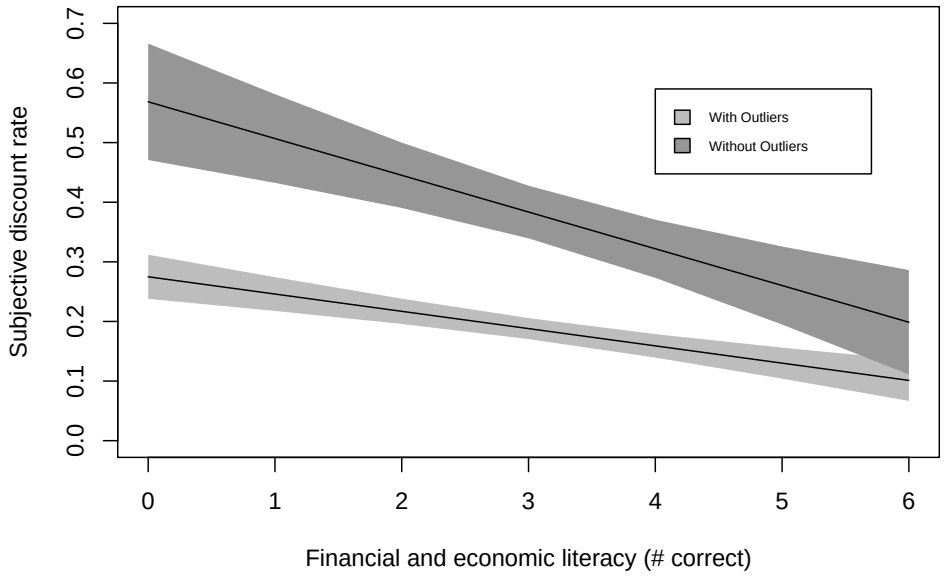


Figure 2: Expected values - Subjective discount rates by financial and economic literacy

The first hypothesis was also tested in a second way. The second test I run, the Mann-Whitney U test, consists of comparing the mean subjective discount rates of financially and economically

Table 4: Regression table with MM estimates,OLS estimates, and standard errors in parentheses

	DV: Subjective Discount Rate	
	MM Estimate With Outliers	*OLS Estimate* Without Outliers
	(1)	(2)
Financial and Economic Literacy (# correct)	-0.029^{***}	-0.062^{***}
	(0.006)	(0.014)
Income group	-0.041^{***}	-0.102^{***}
	(0.011)	(0.026)
Education	0.007	0.042
	(0.017)	(0.040)
Constant	0.349^{***}	0.627^{***}
	(0.031)	(0.067)
Observations	999	884
Residual Std. Error	0.227 (df = 995)	0.540 (df = 880)
F Statistic		13.838^{***} (df = 3; 880)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 5: Summary statistics and Mann-Whitney Test for imputed dataset (for dataset without outliers in parentheses)

Group	Count	Mean	Median	Standard Deviation	Mann-Whitney test	
					W	p-value
Low income						
High FEL	7 (7)	0.12 (0.12)	0.03 (0.03)	0.15 (0.15)	5668	0.000
Low FEL	24 (14)	4124 (0.61)	1 (0.33)	8981 (0.58)	(1567.5)	(0.000)
Low education						
High FEL	7 (7)	0.14 (0.14)	0.07 (0.07)	0.14 (0.14)	4959.5	0.000
Low FEL	23 (16)	2131 (0.65)	0.67 (0.33)	4980 (0.71)	(1868)	(0.000)
Routine						
High FEL	6 (6)	0.06 (0.06)	0.05 (0.05)	0.04 (0.04)	2323.5	0.000
Low FEL	5 (3)	2845 (1.67)	2.33 (2.33)	6354 (1.15)	(865)	(0.000)
Age (56-66)						
High FEL	9 (9)	0.15 (0.15)	0.07 (0.07)	0.22 (0.22)	2650	0.000
Low FEL	5 (2)	11155 (0.33)	3068 (0.33)	16364 (0)	(1130)	(0.000)

literate and illiterate potential losers from the policies under analysis. Table 5 shows the summary statistics for the Mann-Whitney U test for the imputed dataset with outliers, with values for the dataset without outliers in parentheses. The Mann-Whitney U test is significant for both datasets and shows that the subjective discount rates of financially and economically literate losers are significantly lower from those of their financially and economically illiterate counterparts[72].This suggests that it is possible that financially and economically literate short-term losers from certain policies may be weighting the long-term gains more than the short run losses.

6.2 Results for the relationship between financial and economic literacy and policy preferences

The second and third hypotheses, arguing that financially and economically literate winners and losers from globalization and pension reform are more likely to favor economic openness and

72. Results are significant even when running the standard t-test.

pension reform as opposed to financially and economically illiterate winners and losers, are tested using Bayesian multinomial logit models. The following figures show the expected probabilities and first differences with 95% confidence intervals of voting for or against Italexit, favoring or not favoring immigration from the EU, immigration from outside the EU, and free trade with the EU, and favoring the Fornero pension reform, for winners and losers by level of financial and economic literacy[73]. The online appendix shows the empirical mean and standard deviation for each variable, plus standard error of the mean.

The results are both statistically and substantively significant for the question on remaining or leaving the Eurozone. Financially and economically literate individuals, regardless of them being winners or losers from globalization, are significantly more likely to vote remain in a potential Italexit referendum. Looking at first differences, the results look even more striking. When looking at first differences we are comparing individuals who got no questions correct (financially and economically illiterate individuals from now on) to individuals who got all questions correct (financially and economically literate individuals). Among individuals with low education, financially and economically literate individuals are 38% more likely to vote remain than similar financially illiterate individuals, while for those with high education, the financially and economically literate are 46% more likely to vote remain than the financially and economically illiterate. Income and the routineness of one's job tell a similar story: financially and economically literate individuals with low and high incomes are respectively 46% and 46% more likely to vote remain than similar financially illiterate individuals; while financially and economically literate individuals performing non-routine and routine jobs are respectively 51% and 30% more likely to vote remain than their

73. The sample size is significantly smaller when doing the interaction between routine jobs and financial and economic literacy, since only people who are currently employed are included.

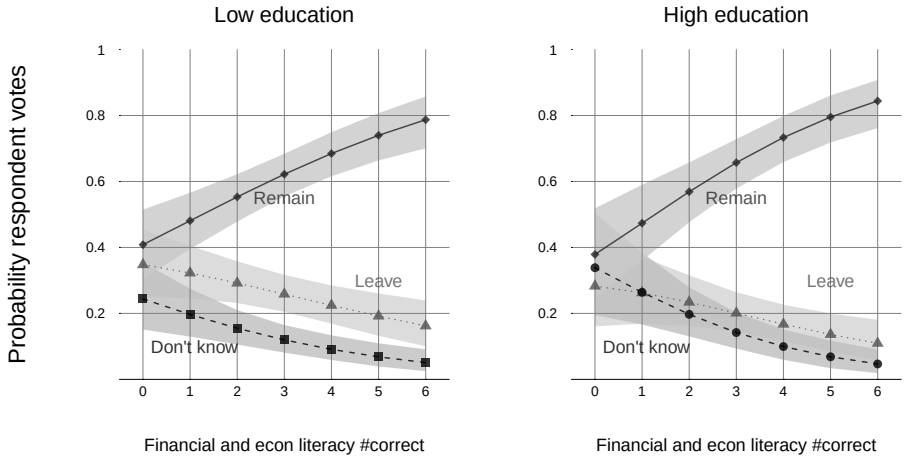


Figure 3: Expected probabilities of voting Remain or Leave in Italexit referendum - Education

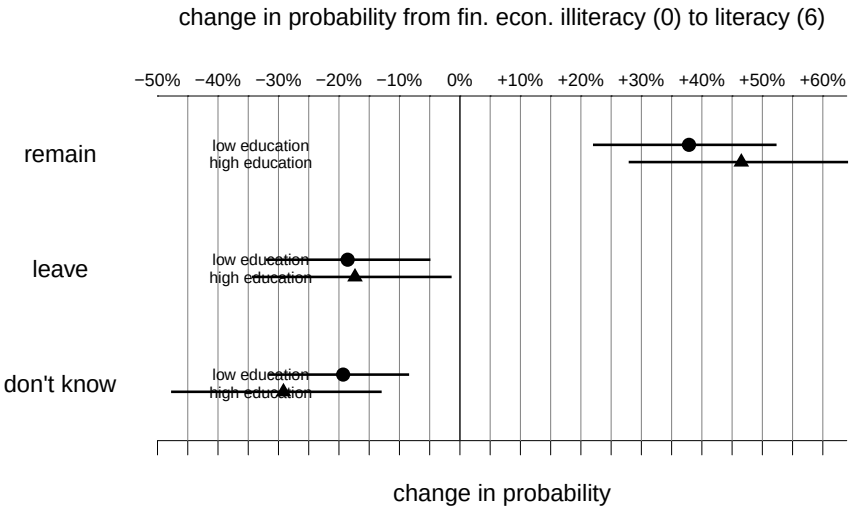


Figure 4: First differences in probability of voting Remain or Leave in Italexit referendum - Education

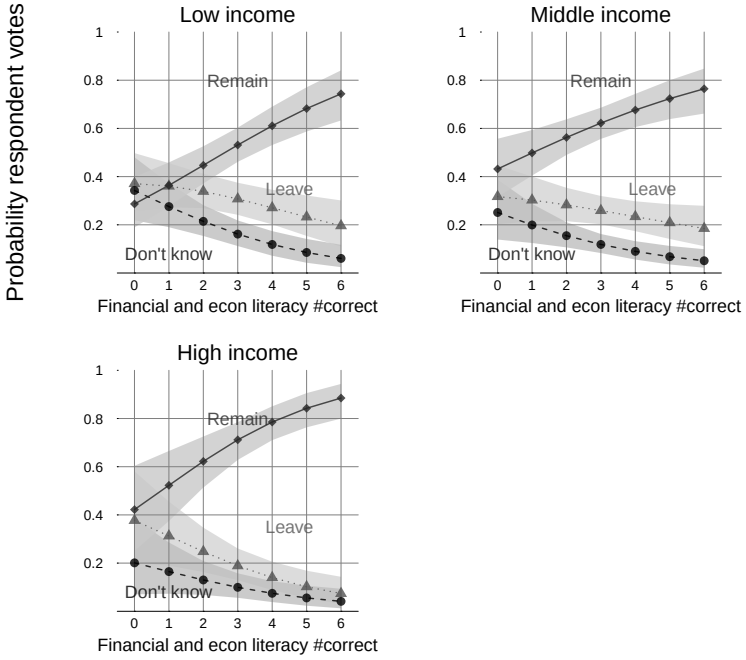


Figure 5: Expected probabilities of voting Remain or Leave in Italexit referendum - Income

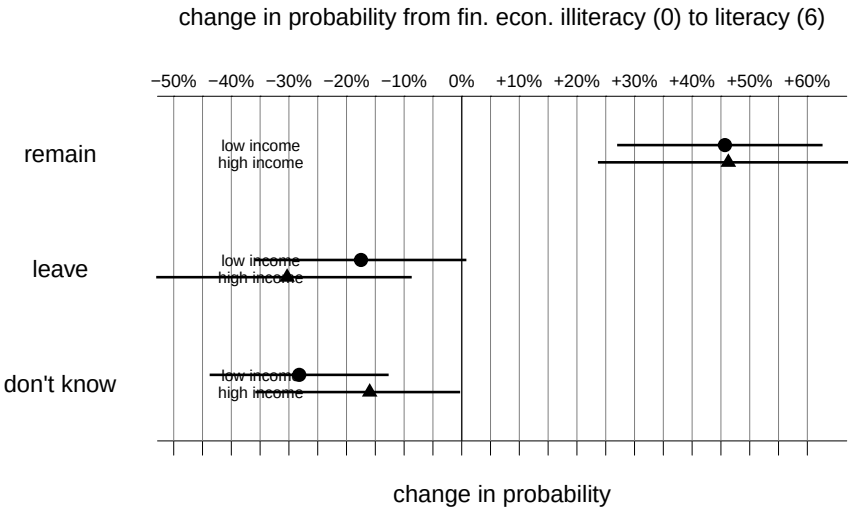


Figure 6: First differences in probability of voting Remain or Leave in Italexit referendum - Income

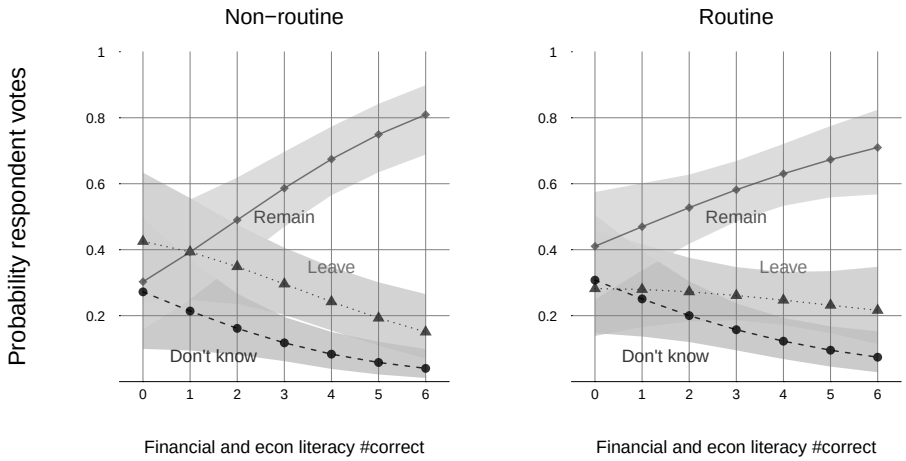


Figure 7: Expected probabilities of voting Remain or Leave in Italexit referendum - Routine

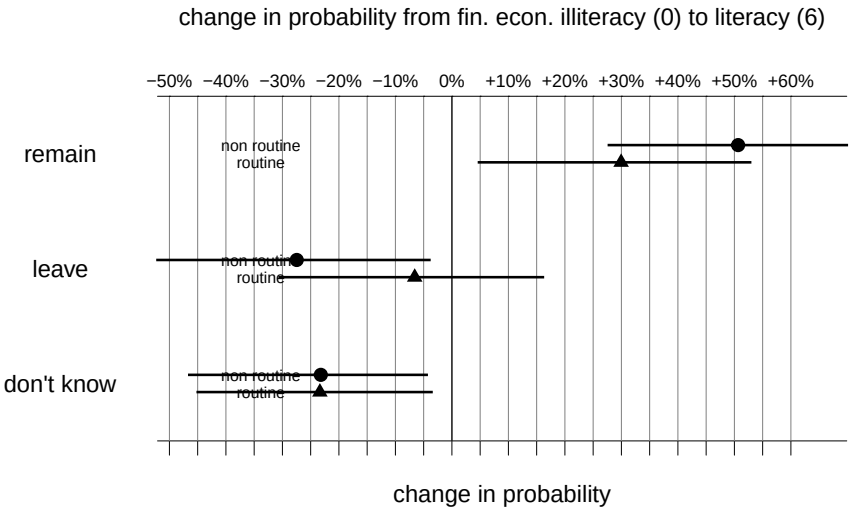


Figure 8: First differences in probability of voting Remain or Leave in Italexit referendum - Routine

illiterate counterparts. Financially and economically literate individuals are also less likely to vote Leave across all groups, but the results are not statistically significant for people on low incomes and for routine workers.

The results for free trade tell a very similar story. Looking at individuals with low education, financially and economically literate individuals are 45% more likely to be in favor of free trade than similar financially and economically illiterate individuals, while for those with high education, the financially and economically literate are 43% more likely be in favor of free trade than the financially and economically illiterate. Income and the routineness of one's job show analogous results: financially and economically literate individuals with low and high incomes are respectively 48% and 55% more likely to be in favor of free trade than similar financially and economically illiterate individuals; while financially and economically literate individuals performing non-routine and routine jobs are respectively 46% and 39% more likely to be in favor of free trade than their illiterate counterparts. Financially and economically literate individuals are also less likely to be against free trade across all groups, but the results are not statistically significant for routine workers.

Findings for immigration both from the EU and from outside the EU also support the hypotheses. Low educated and highly educated financially and economically literate individuals are respectively 38%(43%) and 34%(49%) more likely to be in favor of immigration from the EU(from outside the EU) than similar financially and economically illiterate individuals. Financially and economically literate individuals with low and high incomes are respectively 46%(46%) and 53%(57%) more likely to be in favor of immigration from the EU(from outside the EU) than similar financially and economically illiterate individuals; while financially and economically literate individuals performing non-routine and routine jobs are respectively 57%(55%) and 18%(36%) more likely to be in favor of immigration from the EU(from outside the EU) than their illiterate counterparts.

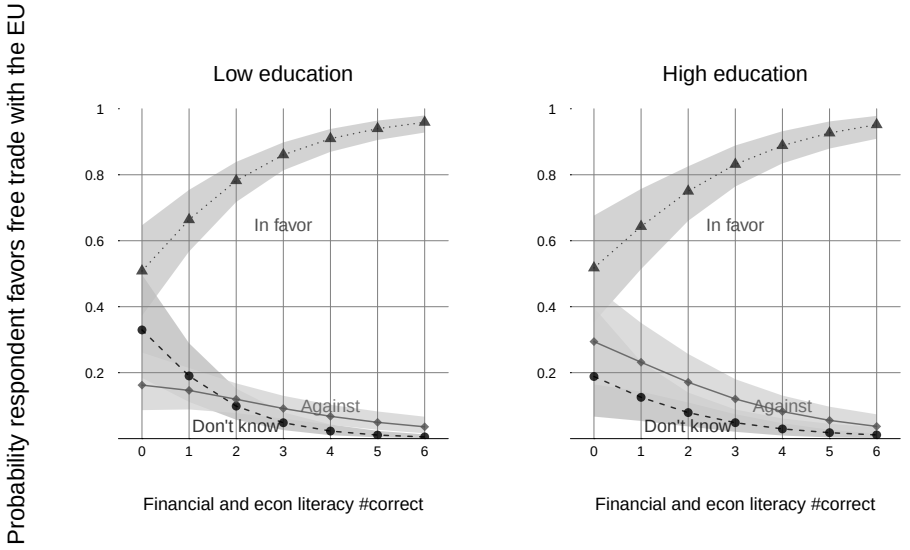


Figure 9: Expected probabilities of favoring free trade with EU - Education

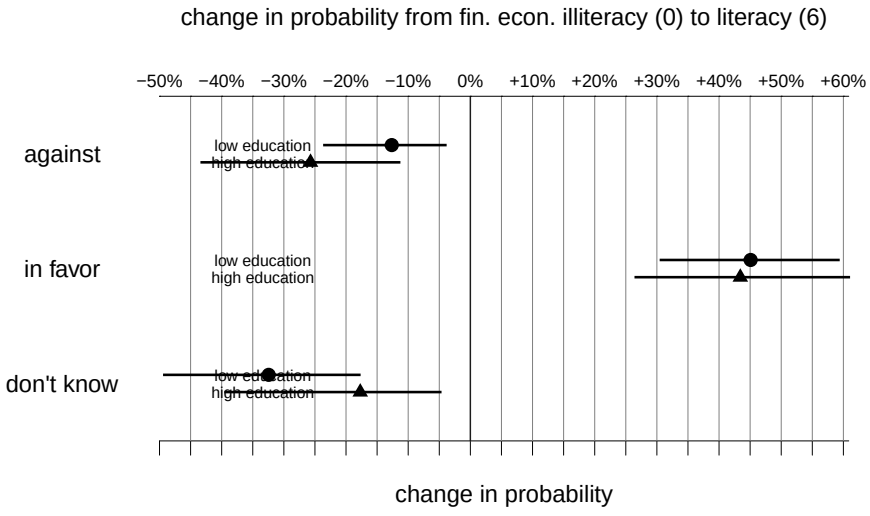


Figure 10: First differences in probability of of favoring free trade with EU - Education

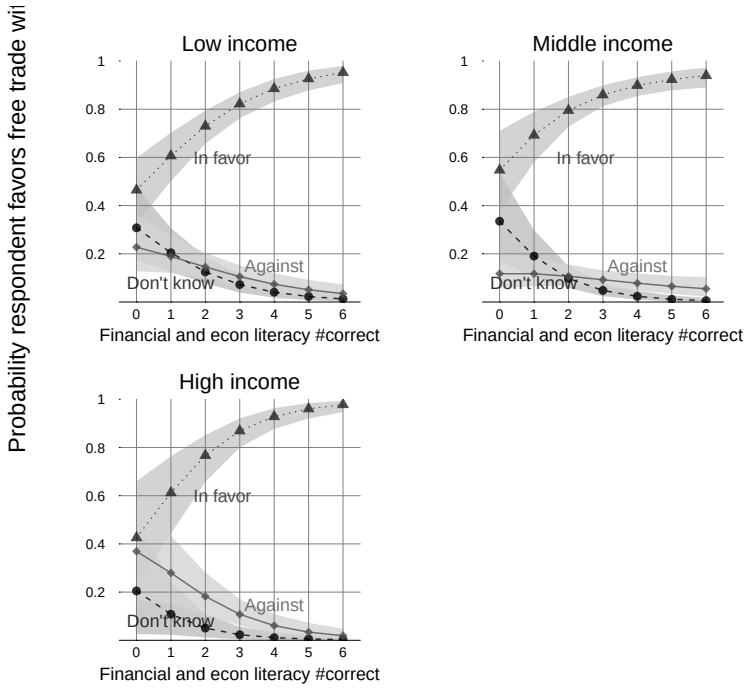


Figure 11: Expected probabilities of favoring free trade with EU - Income

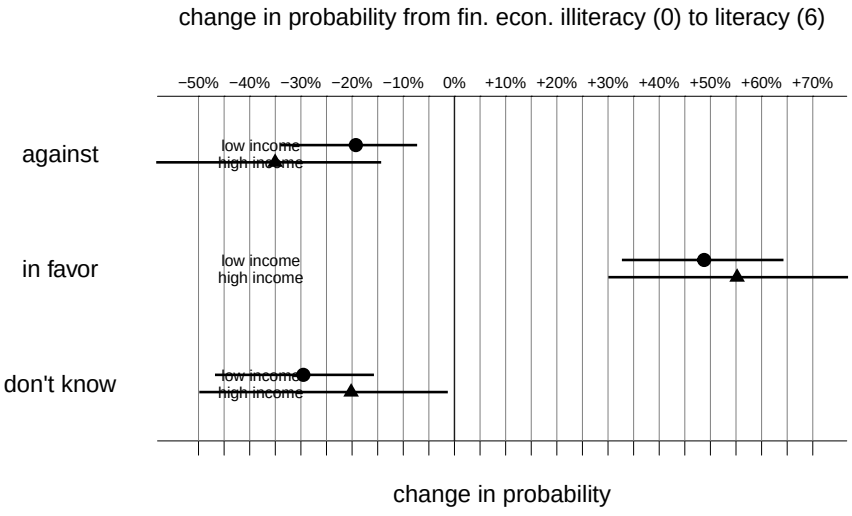


Figure 12: First differences in probability of of favoring free trade with EU - Income

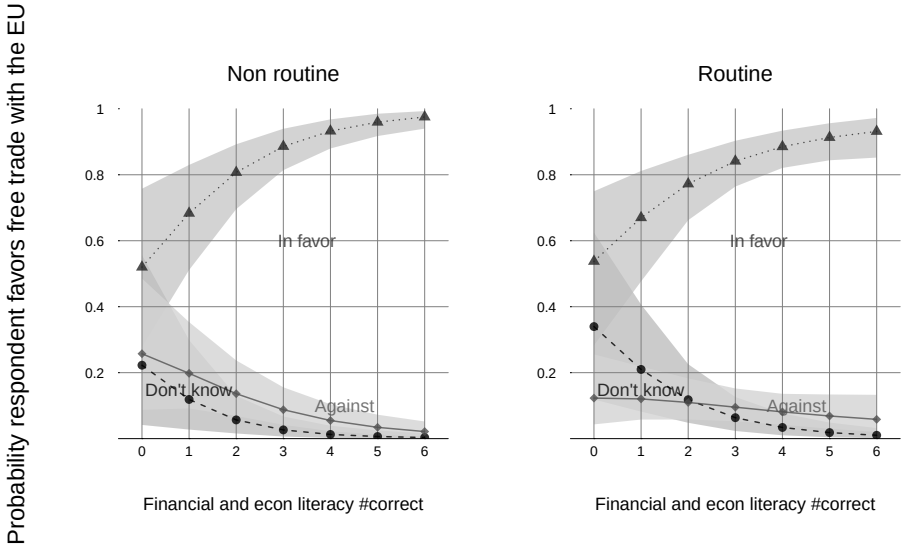


Figure 13: Expected probabilities of favoring free trade with EU - Routine

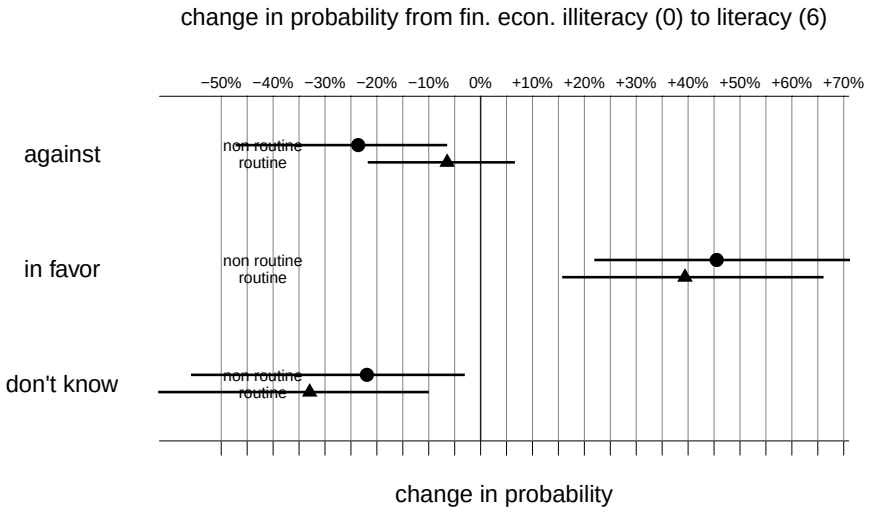


Figure 14: First differences in probability of of favoring free trade with EU - Routine

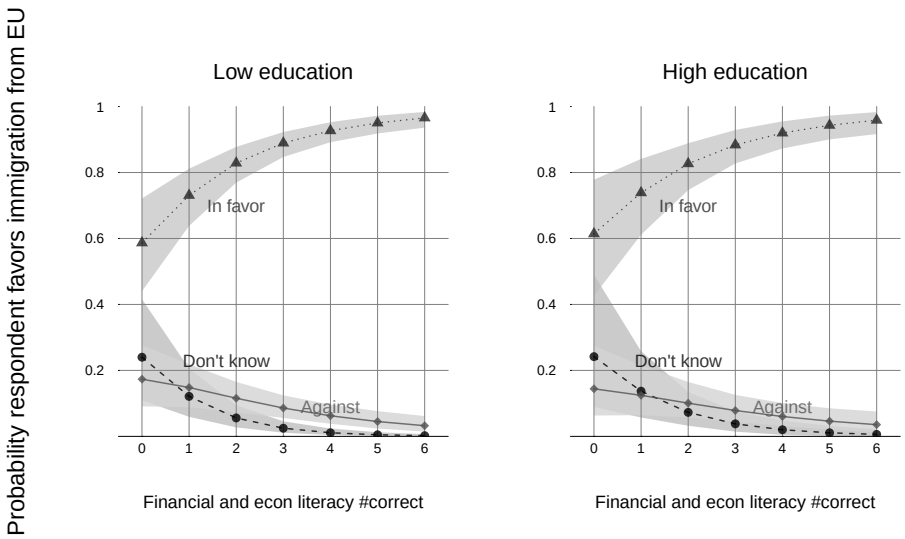


Figure 15: Expected probabilities of favoring immigration from EU countries - Education

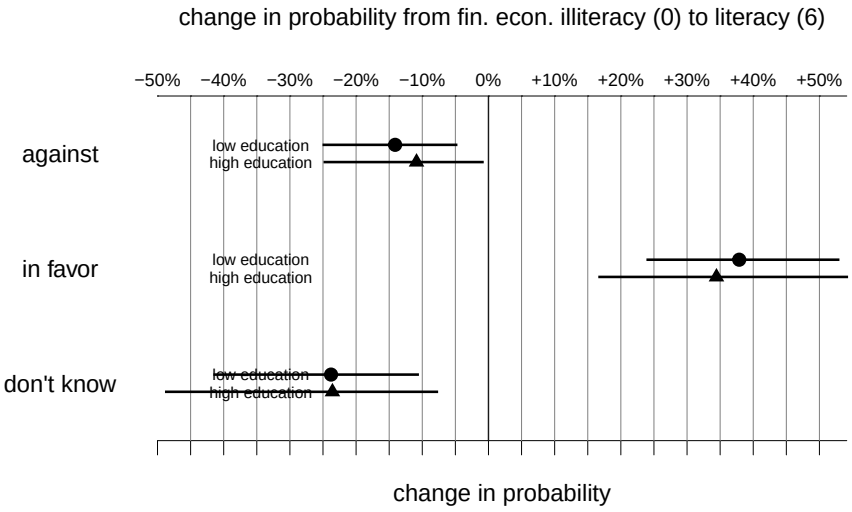


Figure 16: First differences in probability of of favoring immigrations from EU countries - Education

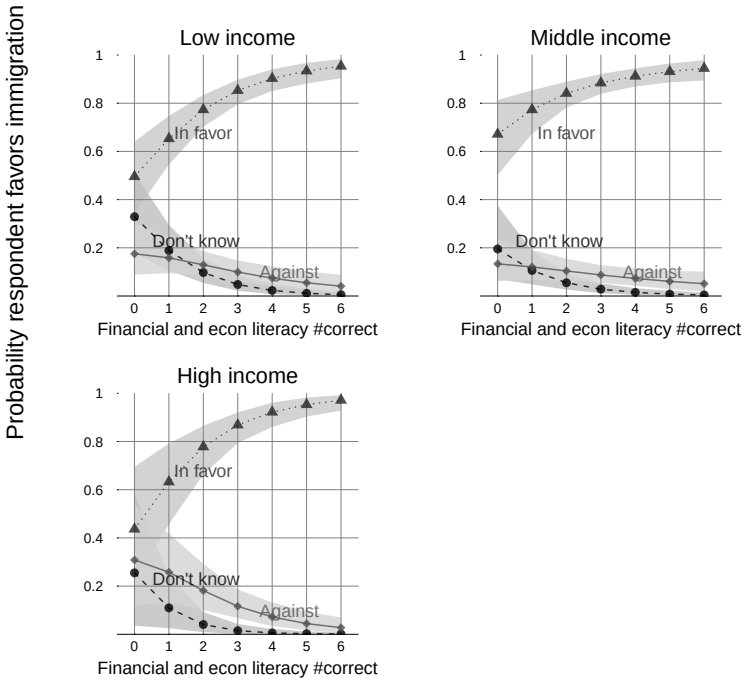


Figure 17: Expected probabilities of favoring immigration from EU countries - Income

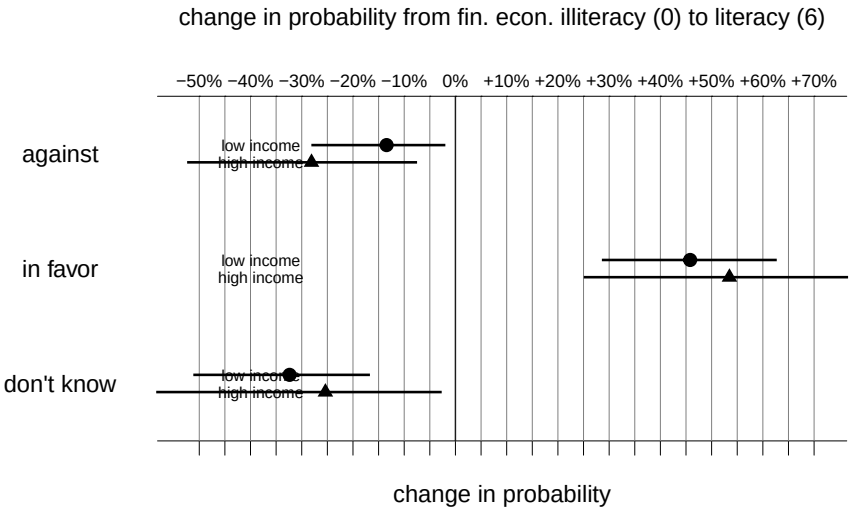


Figure 18: First differences in probability of of favoring immigrations from EU countries - Income

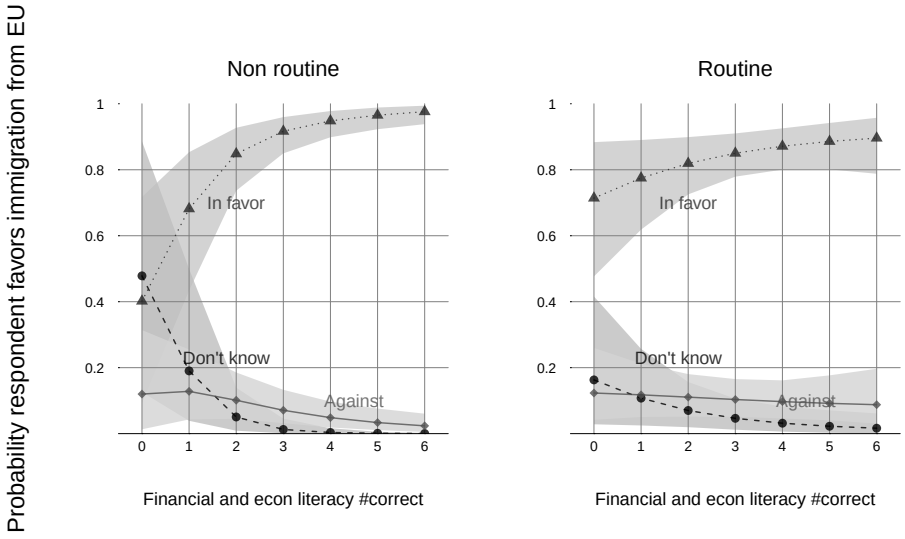


Figure 19: Expected probabilities of favoring immigration from EU countries - Routine

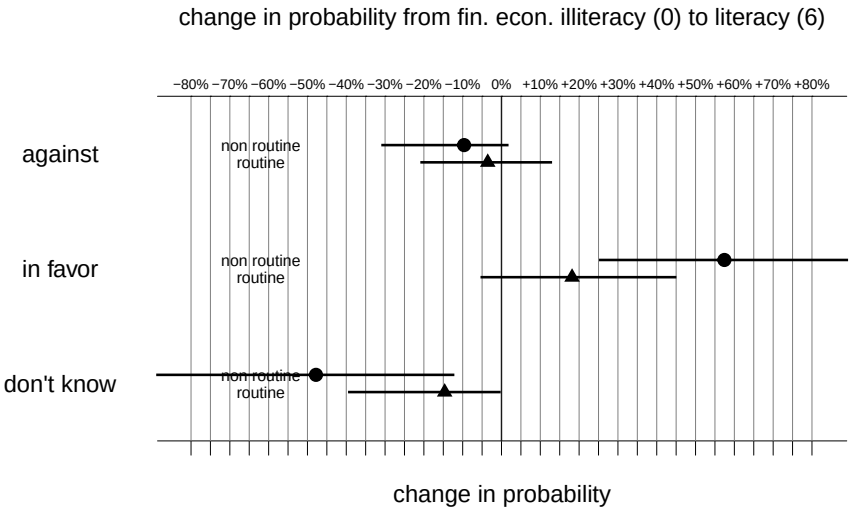


Figure 20: First differences in probability of of favoring immigrations from EU countries - Routine

However, the result for routine workers being more likely to favor immigration from the EU is not statistically significant, hence it is not distinguishable from 0. Financially and economically literate individuals are also less likely to be against immigration from the EU across all groups except for routine workers, for whom the effect is not statistically significant. Financially and economically literate individuals are also less likely to be against immigration from outside the EU across all groups, but the results are not statistically significant for most groups.

Finally, the results from pensions suggest that financially and economically literate individuals in the 56-66 age group and in all other age groups are respectively 26% and 17% more likely to be in favor of the Fornero pension reform than similar financially and economically illiterate individuals. The effect of being against the pension reform actually looks non-linear and it is not statistically significant.

These results support the hypotheses that financially and economically literate individuals, regardless of their self-interest, are more likely to favor remaining in the Eurozone, and they are more likely to favor free trade, immigration from the EU, immigration from outside the EU, and the Fornero pension reform than similar financially and economically illiterate individuals.

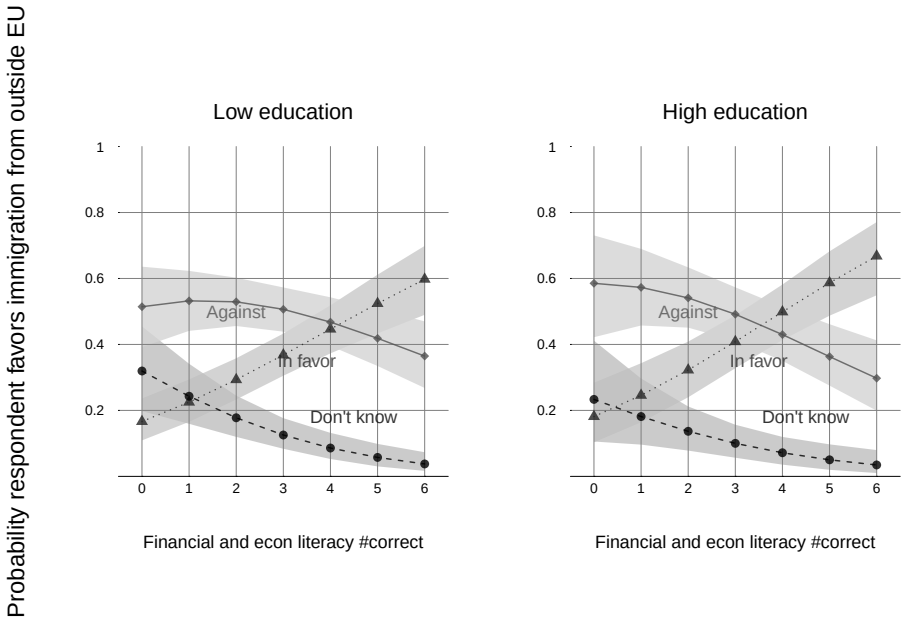


Figure 21: Expected probabilities of favoring immigration from non-EU countries - Education

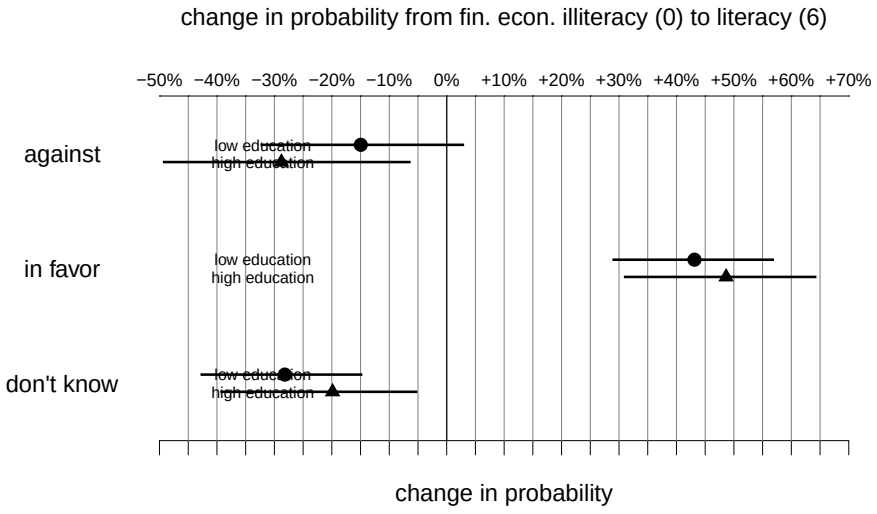


Figure 22: First differences in probability of of favoring immigrations from non-EU countries - Education

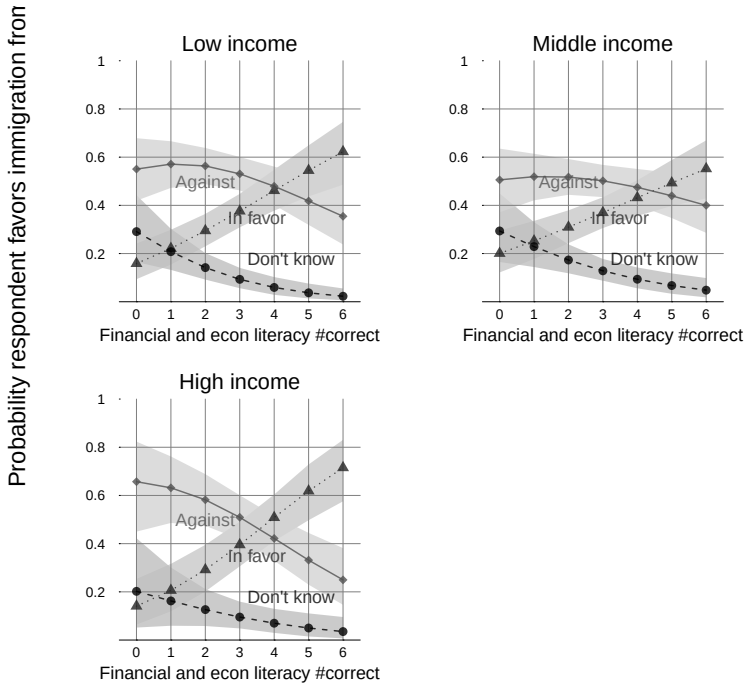


Figure 23: Expected probabilities of favoring immigration from non-EU countries - Income

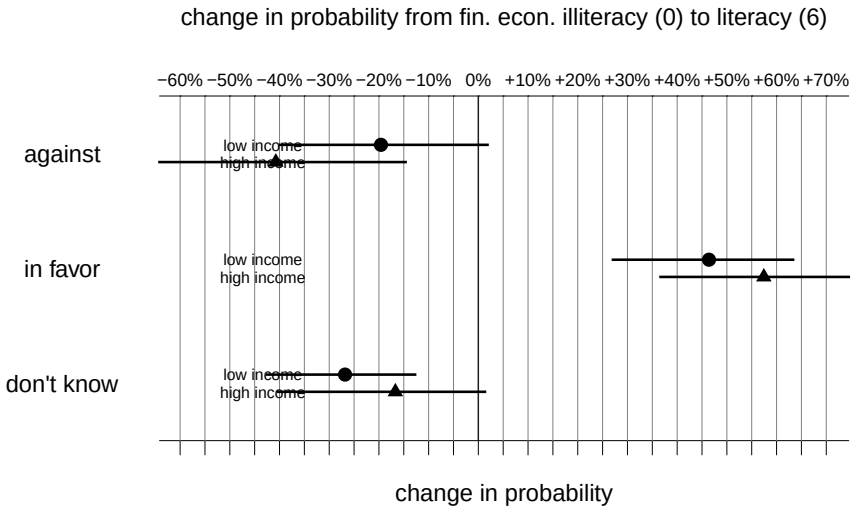


Figure 24: First differences in probability of of favoring immigrations from non-EU countries - Income

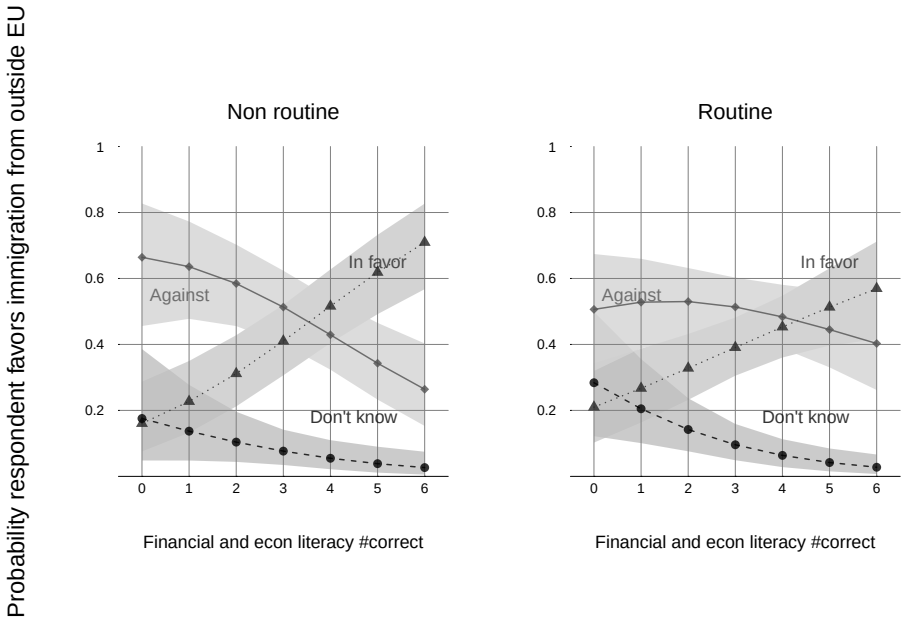


Figure 25: Expected probabilities of favoring immigration from non-EU countries - Routine

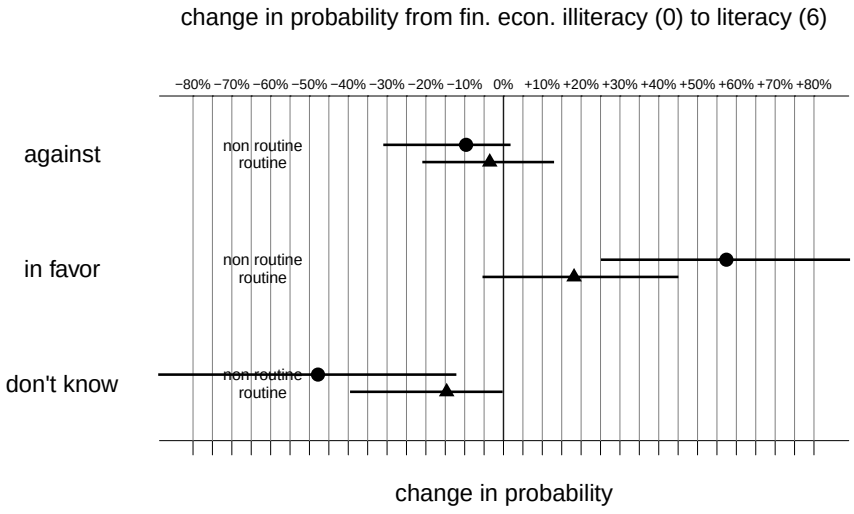


Figure 26: First differences in probability of of favoring immigrations from non-EU countries - Routine

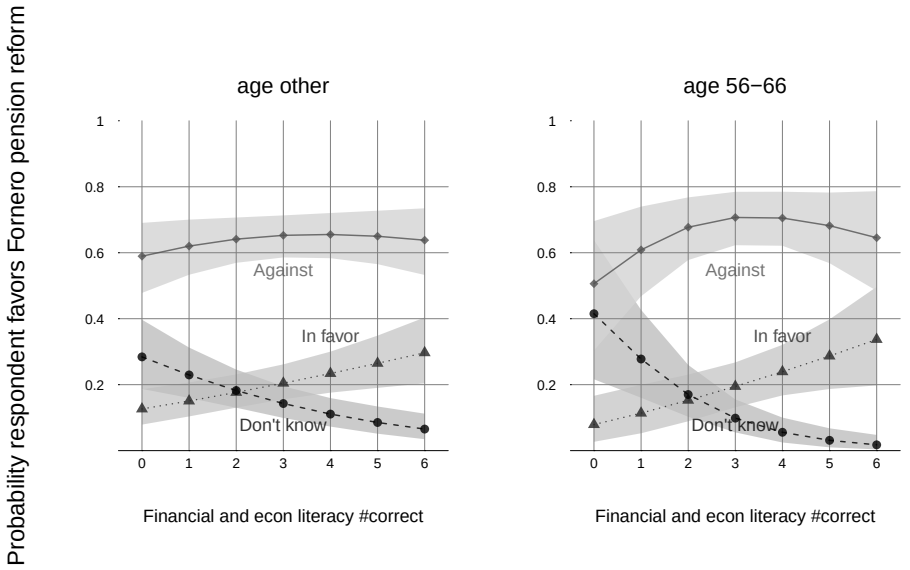


Figure 27: Expected probabilities of favoring Fornero pension reform - Age

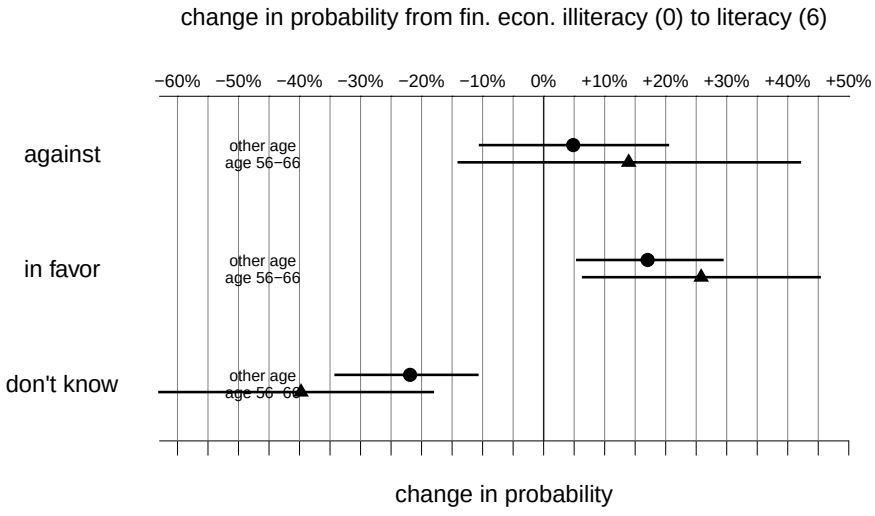


Figure 28: First differences in probability of favoring Fornero pension reform - Age

7 Conclusion

This paper investigates the effect of financial and economic literacy on individual economic policy preferences. It focuses on the case of Italy and examines five policy areas: free trade, Eurozone membership, immigration from the EU and from outside the EU, and the Fornero pension reform. The theory is illustrated by a causal diagram, which outlines the causal relationships between different variables. Economic and financial literacy is expected to have both a direct and an indirect effect on policy preferences. In a direct way, it is expected to affect the accuracy with which an individual calculates the effects of a policy on their expected utility. Financially and economically literate people are expected to be more accurate at calculating the costs and benefits of a policy, and hence at determining whether it will affect them positively or negatively, than financially and economically illiterate individuals. Conversely, financially and economically illiterate individuals are less likely to be accurate at estimating the costs and benefits of a policy, and hence may be more likely to rely on other factors (such as culture, or political ideology) in making their decision. Furthermore, indirectly, financial and economic literacy is expected to affect policy preferences through discount rates. Recent studies suggest that financially and economically literate people have longer time horizons, this may affect how they make judgments in the presence of clear trade-offs between the short and the long run, placing more weight on the long-term effects. Findings suggest that financially and economically literate individuals have significantly lower discount rates. Moreover, financially and economically literate individuals, regardless of their economic condition, are more likely to prefer remaining in the Eurozone, and to favor immigration from the EU, immigration from outside the EU, free trade, and the Fornero pension reform.

These findings, along with those in Magistro, carry significant implications[74]. Issues such as immigration, trade deals and EU membership have been especially salient in recent times and some countries have been called to vote on whether to remain or leave the European Union. Empirical evidence from two countries, the U.K. and Italy, suggests that financial and economic literacy does play a role in affecting individual economic policy preferences, providing novel contributions to the existing literature on the determinants of policy preferences and on financial literacy. Future research should address internal validity issues through the use of randomized controlled trials, and it should investigate in depth the direction of the relationship between discount rates and financial and economic literacy, to further disentangle the causal mechanisms at play.

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8 Appendix A

Table 6: Bayesian multinomial logit models for Italexit with education and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Vote Intention Italexit (Reference Remain)		Mean	SD	Naive SE	Time-series SE
1.00 Leave	Intercept	0.24	0.34	0.003	0.005
	FEL	-0.24	0.07	0.0007	0.001
	High education	-0.14	0.38	0.004	0.006
	Female	-0.35	0.16	0.002	0.002
	Age	0.01	0.01	0.00005	0.00007
	Middle income	-0.33	0.16	0.002	0.002
	High income	-0.82	0.23	0.002	0.003
	Region center	0.29	0.20	0.002	0.003
	Region south	-0.06	0.16	0.002	0.002
	FEL:High education	-0.06	0.11	0.001	0.002
2.00 Don't Know	Intercept	-0.49	0.44	0.004	0.006
	FEL	-0.38	0.09	0.0008	0.001
	High education	0.41	0.44	0.004	0.006
	Female	-0.09	0.20	0.002	0.003
	Age	0.01	0.007	0.00007	0.0001
	Middle income	-0.50	0.21	0.002	0.003
	High income	-0.84	0.29	0.003	0.004
	Region center	0.55	0.24	0.002	0.004
	Region south	-0.30	0.22	0.002	0.003
	FEL:High education	-0.10	0.14	0.001	0.002

Table 7: Bayesian multinomial logit models for Italexit with income and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Vote Intention Italexit (Reference Remain)		Mean	SD	Naive SE	Time-series SE
1.00 Leave	Intercept	0.32	0.39	0.004	0.006
	FEL	-0.27	0.09	0.001	0.001
	High education	-0.33	0.17	0.002	0.002
	Female	-0.35	0.15	0.001	0.002
	Age	0.01	0.01	0.0001	0.0001
	Middle income	-0.58	0.39	0.004	0.006
	High income	-0.39	0.51	0.005	0.008
	Region center	0.29	0.20	0.002	0.003
	Region south	-0.07	0.16	0.002	0.002
	FEL: Middle income	0.08	0.12	0.001	0.002
	FEL: High income	-0.14	0.15	0.001	0.002
2.00 Don't Know	Intercept	-0.27	0.48	0.005	0.008
	FEL	-0.46	0.11	0.001	0.002
	High education	0.13	0.20	0.002	0.003
	Female	-0.09	0.20	0.002	0.003
	Age	0.01	0.01	0.0001	0.0001
	Middle income	-0.74	0.46	0.004	0.007
	High income	-0.98	0.62	0.006	0.01
	Region center	0.55	0.24	0.002	0.004
	Region south	-0.31	0.22	0.002	0.003
	FEL: Middle income	0.09	0.15	0.002	0.002
	FEL:High income	0.06	0.19	0.002	0.003

Table 8: Bayesian multinomial logit models for Italexit with routine and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Vote Intention Italexit (Reference Remain)		Mean	SD	Naive SE	Time-series SE
1.00 Leave	Intercept	0.52	0.61	0.006	0.01
	FEL	-0.35	0.11	0.001	0.002
	High education	-0.24	0.23	0.002	0.004
	Female	-0.41	0.22	0.002	0.003
	Age	0.01	0.01	0.0001	0.0001
	Middle income	-0.64	0.28	0.003	0.005
	High income	-1.15	0.33	0.003	0.006
	Region center	0.69	0.26	0.003	0.005
	Region south	0.05	0.24	0.002	0.004
	Routine	-0.74	0.55	0.005	0.010
	FEL: Routine	0.21	0.15	0.002	0.003
2.00 Don't Know	Intercept	0.02	0.80	0.008	0.016
	FEL	-0.50	0.15	0.002	0.003
	High education	-0.23	0.29	0.003	0.005
	Female	-0.20	0.28	0.003	0.005
	Age	0.01	0.01	0.0001	0.0002
	Middle income	-0.60	0.34	0.003	0.006
	High income	-0.92	0.42	0.004	0.009
	Region center	0.64	0.32	0.003	0.006
	Region south	-0.32	0.32	0.003	0.006
	Routine	-0.17	0.64	0.006	0.012
	FEL:Routine	0.16	0.20	0.002	0.004

Table 9: Bayesian multinomial logit models for free trade preferences with education and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Free trade (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	0.70	0.43	0.004	0.008
	FEL	0.36	0.09	0.001	0.003
	High education	-0.58	0.43	0.004	0.009
	Female	0.19	0.20	0.002	0.004
	Age	0.001	0.01	0.00007	0.0001
	Middle income	0.24	0.22	0.002	0.005
	High income	0.06	0.27	0.003	0.005
	Region center	-0.34	0.26	0.003	0.005
	Region south	0.11	0.21	0.002	0.004
	FEL: High education	0.09	0.13	0.001	0.002
2.00 Don't Know	Intercept	0.68	0.67	0.007	0.013
	FEL	-0.46	0.15	0.001	0.003
	High education	-1.22	0.65	0.006	0.014
	Female	0.58	0.34	0.003	0.007
	Age	-0.01	0.01	0.0001	0.0002
	Middle income	-0.02	0.33	0.003	0.007
	High income	-0.98	0.53	0.005	0.011
	Region center	0.64	0.41	0.004	0.009
	Region south	-0.21	0.35	0.004	0.007
	FEL: High education	0.31	0.25	0.002	0.007

Table 10: Bayesian multinomial logit models for free trade preferences with income and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Free Trade (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	0.54	0.48	0.005	0.012
	FEL	0.45	0.12	0.001	0.003
	High education	-0.33	0.21	0.002	0.005
	Female	0.20	0.19	0.002	0.004
	Age	0.0001	0.007	0.00007	0.0002
	Middle income	0.85	0.49	0.005	0.013
	High income	-0.59	0.56	0.006	0.013
	Region center	-0.34	0.25	0.002	0.005
	Region south	0.13	0.21	0.002	0.005
	FEL: Middle income	-0.23	0.16	0.002	0.005
	FEL: High income	0.21	0.19	0.008	0.004
2.00 Don't Know	Intercept	0.21	0.72	0.007	0.022
	FEL	-0.23	0.17	0.002	0.004
	High education	-0.52	0.35	0.003	0.009
	Female	0.59	0.33	0.003	0.008
	Age	-0.01	0.01	0.0001	0.0004
	Middle income	0.76	0.63	0.006	0.016
	High income	-1.06	0.98	0.009	0.032
	Region center	0.65	0.39	0.004	0.009
	Region south	-0.19	0.36	0.004	0.009
	FEL: Middle income	-0.35	0.25	0.003	0.007
	FEL: High income	-0.07	0.40	0.004	0.015

Table 11: Bayesian multinomial logit models for free trade preferences with routine and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Free Trade (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	0.53	0.75	0.007	0.023
	FEL	0.54	0.14	0.003	0.009
	High education	-0.40	0.28	0.003	0.009
	Female	-0.15	0.27	0.003	0.008
	Age	-0.004	0.01	0.0001	0.0003
	Middle income	0.40	0.36	0.004	0.011
	High income	0.16	0.39	0.004	0.011
	Region center	-0.13	0.32	0.003	0.009
	Region south	0.07	0.30	0.003	0.009
	Routine	0.79	0.63	0.006	0.018
	FEL: Routine	-0.31	0.19	0.002	0.005
2.00 Don't Know	Intercept	0.15	1.33	0.013	0.045
	FEL	-0.35	0.30	0.003	0.01
	High education	0.06	0.52	0.005	0.016
	Female	-0.05	0.47	0.005	0.014
	Age	-0.01	0.02	0.0002	0.0006
	Middle income	-0.14	0.51	0.005	0.015
	High income	-1.54	0.80	0.008	0.024
	Region center	0.16	0.52	0.005	0.015
	Region south	-1.43	0.65	0.006	0.019
	Routine	1.29	1.01	0.010	0.032
	FEL:Routine	-0.15	0.37	0.004	0.010

Table 12: Bayesian multinomial logit models for immigration from the EU preferences with education and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Immigration from the EU (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	0.98	0.45	0.005	0.010
	FEL	0.37	0.09	0.001	0.002
	High education	0.26	0.48	0.004	0.011
	Female	0.29	0.21	0.002	0.005
	Age	-0.004	0.01	0.00007	0.0001
	Middle income	0.18	0.24	0.002	0.005
	High income	-0.11	0.29	0.003	0.006
	Region center	0.03	0.29	0.003	0.007
	Region south	0.09	0.22	0.002	0.005
	FEL: High education	-0.05	0.15	0.001	0.003
2.00 Don't Know	Intercept	0.56	0.76	0.008	0.018
	FEL	-0.53	0.18	0.002	0.004
	High education	0.19	0.72	0.007	0.018
	Female	0.27	0.39	0.004	0.010
	Age	-0.001	0.01	0.0001	0.0003
	Middle income	-0.43	0.40	0.004	0.011
	High income	-1.02	0.57	0.006	0.015
	Region center	0.27	0.49	0.005	0.013
	Region south	-0.76	0.42	0.004	0.010
	FEL: High education	0.10	0.29	0.003	0.011

Table 13: Bayesian multinomial logit models for immigration from the EU preferences with income and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Immigration from the EU (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	1.04	0.52	0.005	0.014
	FEL	0.37	0.13	0.001	0.004
	High education	0.12	0.24	0.002	0.007
	Female	0.27	0.21	0.002	0.005
	Age	-0.005	0.007	0.00007	0.0002
	Middle income	0.59	0.52	0.005	0.016
	High income	-0.70	0.59	0.006	0.015
	Region center	0.03	0.28	0.003	0.008
	Region south	0.09	0.22	0.002	0.006
	FEL: Middle income	-0.14	0.17	0.002	0.006
	FEL: High income	0.19	0.19	0.002	0.006
2.00 Don't Know	Intercept	0.46	0.82	0.008	0.025
	FEL	-0.47	0.19	0.002	0.005
	High education	0.43	0.40	0.004	0.011
	Female	0.27	0.38	0.004	0.011
	Age	-0.002	0.01	0.0001	0.0005
	Middle income	-0.29	0.74	0.007	0.023
	High income	-0.95	0.99	0.009	0.032
	Region center	0.28	0.47	0.005	0.012
	Region south	-0.77	0.44	0.004	0.013
	FEL: Middle income	-0.04	0.30	0.003	0.009
	FEL: High income	-0.18	0.44	0.004	0.017

Table 14: Bayesian multinomial logit models for immigration from the EU preferences with routine and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Immigration from the EU (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	0.70	0.88	0.008	0.034
	FEL	0.43	0.17	0.002	0.006
	High education	-0.10	0.32	0.003	0.015
	Female	0.21	0.30	0.003	0.011
	Age	0.01	0.01	0.0001	0.0004
	Middle income	0.08	0.44	0.004	0.015
	High income	-0.36	0.47	0.005	0.017
	Region center	-0.09	0.36	0.004	0.014
	Region south	0.02	0.32	0.003	0.013
	Routine	0.52	0.73	0.007	0.029
	FEL: Routine	-0.33	0.22	0.002	0.009
2.00 Don't Know	Intercept	0.37	1.61	0.016	0.074
	FEL	-1.19	0.45	0.004	0.020
	High education	0.47	0.64	0.006	0.030
	Female	-0.10	0.61	0.006	0.028
	Age	0.03	0.03	0.0003	0.0009
	Middle income	-0.31	0.70	0.007	0.030
	High income	-1.16	0.87	0.009	0.036
	Region center	-0.07	0.65	0.007	0.025
	Region south	-2.08	1.01	0.010	0.054
	Routine	-1.34	1.25	0.013	0.062
	FEL:Routine	0.83	0.54	0.005	0.024

Table 15: Bayesian multinomial logit models for immigration from outside the EU preferences with education and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Immigration from outside the EU (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	-0.34	0.32	0.003	0.004
	FEL	0.27	0.06	0.0006	0.0009
	High education	-0.05	0.35	0.004	0.005
	Female	0.09	0.14	0.001	0.002
	Age	-0.02	0.004	0.00005	0.00007
	Middle income	0.006	0.16	0.002	0.002
	High income	0.16	0.20	0.002	0.003
	Region center	-0.12	0.19	0.002	0.003
	Region south	0.32	0.15	0.002	0.002
	FEL: High education	0.06	0.10	0.001	0.001
2.00 Don't Know	Intercept	-0.77	0.49	0.005	0.008
	FEL	-0.31	0.09	0.001	0.001
	High education	-0.48	0.50	0.005	0.008
	Female	0.42	0.23	0.002	0.004
	Age	-0.009	0.01	0.0001	0.0001
	Middle income	0.28	0.24	0.002	0.004
	High income	-0.03	0.35	0.004	0.005
	Region center	0.41	0.28	0.003	0.005
	Region south	0.11	0.25	0.003	0.004
	FEL: High education	0.09	0.17	0.002	0.003

Table 16: Bayesian multinomial logit models for immigration from outside the EU preferences with income and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Immigration from outside the EU (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	-0.43	0.37	0.004	0.006
	FEL	0.31	0.09	0.0008	0.001
	High education	0.15	0.15	0.002	0.003
	Female	0.10	0.14	0.001	0.002
	Age	-0.02	0.005	0.00005	0.00008
	Middle income	0.32	0.39	0.004	0.007
	High income	-0.32	0.48	0.005	0.008
	Region center	-0.12	0.18	0.002	0.003
	Region south	0.33	0.15	0.002	0.003
	FEL: Middle income	-0.10	0.11	0.001	0.002
	FEL: High income	0.14	0.13	0.001	0.002
2.00 Don't Know	Intercept	-0.66	0.53	0.005	0.010
	FEL	-0.37	0.13	0.001	0.002
	High education	-0.23	0.25	0.002	0.004
	Female	0.43	0.23	0.002	0.004
	Age	-0.01	0.01	0.00008	0.0001
	Middle income	0.09	0.47	0.005	0.008
	High income	-0.63	0.71	0.007	0.013
	Region center	0.40	0.28	0.003	0.005
	Region south	0.11	0.25	0.002	0.004
	FEL: Middle income	0.10	0.17	0.002	0.003
	FEL: High income	0.23	0.24	0.002	0.004

Table 17: Bayesian multinomial logit models for immigration from outside the EU preferences with routine and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Immigration from outside the EU (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	-0.88	0.56	0.006	0.009
	FEL	0.41	0.10	0.001	0.002
	High education	0.07	0.20	0.002	0.004
	Female	0.01	0.19	0.002	0.004
	Age	-0.01	0.01	0.0001	0.0001
	Middle income	-0.26	0.26	0.003	0.005
	High income	-0.25	0.30	0.003	0.005
	Region center	-0.21	0.23	0.002	0.004
	Region south	0.17	0.21	0.002	0.004
	Routine	0.56	0.51	0.005	0.009
	FEL: Routine	-0.20	0.14	0.001	0.003
2.00 Don't Know	Intercept	-0.98	0.94	0.009	0.021
	FEL	-0.17	0.17	0.002	0.004
	High education	-0.24	0.35	0.003	0.007
	Female	0.13	0.32	0.003	0.007
	Age	-0.01	0.01	0.0001	0.0003
	Middle income	-0.03	0.39	0.004	0.007
	High income	-0.21	0.48	0.005	0.009
	Region center	0.39	0.37	0.004	0.007
	Region south	0.24	0.34	0.003	0.006
	Routine	0.83	0.71	0.007	0.014
	FEL:Routine	-0.19	0.23	0.002	0.005

Table 18: Bayesian multinomial logit models for pension reform preferences with age group and financial and economic literacy interaction: Empirical mean and standard deviation for each variable, plus standard error of the mean

Fornero pension reform (Reference Against)		Mean	SD	Naive SE	Time-series SE
1.00 In Favor	Intercept	-1.17	0.28	0.003	0.004
	FEL	0.13	0.06	0.0006	0.0008
	High education	0.21	0.16	0.002	0.002
	Female	-0.18	0.16	0.002	0.002
	Age group (56-66)	-0.38	0.52	0.005	0.008
	Middle income	-0.21	0.18	0.002	0.002
	High income	0.52	0.21	0.002	0.003
	Region center	-0.47	0.21	0.002	0.003
	Region south	-0.30	0.16	0.002	0.002
	FEL: Age (56-66)	0.08	0.13	0.001	0.002
2.00 Don't Know	Intercept	-0.65	0.32	0.003	0.005
	FEL	-0.26	0.08	0.0007	0.001
	High education	0.17	0.20	0.002	0.003
	Female	0.25	0.20	0.002	0.003
	Age group (56-66)	0.53	0.50	0.005	0.008
	Middle income	-0.34	0.20	0.002	0.003
	High income	-0.50	0.30	0.003	0.005
	Region center	0.05	0.25	0.003	0.004
	Region south	-0.02	0.20	0.002	0.003
	FEL: Age (56-66)	-0.33	0.18	0.002	0.003

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