The Effects of Financial and Economic Literacy on Individual Policy Preferences

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Abstract

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Literacy on Individual Policy Preferences

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In a time of growing support for welfare-reducing, protectionist policies, such as those opposing immigration, free trade, and EU integration, my dissertation is among the first studies to explore the role that financial and economic literacy, and its interaction with information, plays in shaping voters' policy preferences. The hypothesis tested in my first essay is that financial literacy affects economic policy preferences. I analyze data from the British Election Study and test my theory on support for free trade in the United Kingdom. Findings suggest that financial literacy does affect economic policy preferences. On average, financially literate individuals are more likely to think that free trade is good for the British economy. Furthermore, this is true regardless of economic self-interest, as both financially literate winners and losers from globalization are more likely to support free trade than their illiterate counterparts.

In my second essay I analyze original survey data collected in Italy and show that financially and economically literate individuals, regardless of their economic self-interest, are more likely to prefer remaining in the Eurozone, to favor free trade, EU immigration, non-EU immigration, and the Fornero pension reform. I provide preliminary evidence that the lack of differential effects between financially and economically literate winners and losers

from globalization and pension reform is driven by longer time horizons. Finally, I examine different ways to measure financial and economic literacy and find that there is no evidence of a similar effect when looking at general education, suggesting that financial and economic literacy has distinctive features that more closely capture an individual's ability to evaluate policies.

In the third essay I add an important mediator in the relationship between financial and economic literacy and policy preferences: discount rates. The findings from my second essay on Italy suggest that financially and economically literate individuals have significantly lower discount rates, which may explain differential preferences across literacy levels in policy scenarios with intertemporal trade-offs. To further investigate this relationship, in my third essay, I conducted a classroom experiment at the University of Washington, where I found that learning concepts such as interest compounding, the time value of money, and risk in the capitalization process lowers discount rates, and there is not a selection effect into economics and finance.

Finally, in my fourth essay, I investigate what type of information economically literate and illiterate individuals rely on to form their preferences. I use a survey experiment on price controls in Italy and show that voters are less likely to rely on party cues and more likely to rely on policy information when they are financially and economically literate, while the opposite is true of financially and economically illiterate individuals.

My dissertation has implications for electoral democracies in general, and for the current wave of populism. Most protectionist and populist policies harm social welfare; if most people lack the framework for comprehending the effects that a specific policy has on society, then they are also more likely to be susceptible to appeals by populists to adopt distortionary policies in the name of seemingly beneficial outcomes such as national sovereignty and greater equality. Conversely, if they can recognize the potential for mutual gains, this may get them close enough to welfare enhancing behavior.

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DEDICATION

to my family

Chapter 1

INTRODUCTION

As preferences for welfare-reducing policies, such as those promoting anti-immigration, anti-free trade, and anti-EU positions increase, my dissertation is among the first studies to explore the role that financial and economic literacy plays in shaping policy preferences. The motivation for my dissertation topic came from my collaboration with the former Italian Minister of Labor, Social Policy and Gender Equality, Elsa Fornero, during my MA at the Collegio Carlo Alberto. She had just returned to academia after devising the Italian pension reform in 2011 and the labor market reform in 2012. Her reforms encountered tremendous public opposition and this led me to ask a question: does understanding policies aid their support? Political economy theories use economic self-interest to tell us who will favor or oppose a policy. But this is often not true on many policy areas, including free trade, immigration, EU membership, and pensions. Recent phenomena like the rise of populism, protectionism and nationalism are hardly explained by self-interest. Why don't political economy theories hold in the real world and why do people vote in favor of policies that hurt them? Elsa Fornero's work on financial literacy helped me advance a new theory. She inspired me to study the effects of financial and economic literacy on policy preferences.

In my dissertation, I examine the consequences of financial and economic literacy on individuals' accuracy at predicting the effects of a specific economic policy on their economic well-being. The role of financial and economic literacy in a political context has never been investigated. I argue that financial and economic literacy requires having the knowledge, skills and confidence to understand and evaluate economic concepts not only as they relate to our personal finance, but also our political systems. Financial and economic literacy provides a toolkit to understand how the economy influences our lives. Some key components

of this toolkit include: numeracy, scarcity, costs and benefits, opportunity costs, demand and supply.

My research has significant implications for electoral democracies in general, and for the current wave of populism. A key task for citizens in modern democracies is to vote for candidates and policies that represent their interests. This begs the question of the extent to which citizens are informed about and understand the policies on which they decide. As a matter of fact, there are fundamental measurement errors with many existing measurement strategies to capture citizen understanding of economic policies. Specifically, I discuss how current measures of political sophistication are unlikely to directly influence policy preferences, due to their failure to measure policy-specific information. I argue instead that a measure capturing one individual's ability to evaluate the costs and benefits of an economic policy on their well-being may be more likely to influence policy preferences. While financial literacy comes close to this task, with its ability to measure an individual's understanding of basic economic concepts, such as compound interest and inflation, this is unlikely to be sufficient in a political context, as it does not necessarily capture policy- and country-specific knowledge. Hence, in building a financial and economic literacy index, along with financial literacy, I add an 'economic literacy' dimension, which captures policy-specific knowledge. To test my hypotheses, I use a multi-method approach that includes observational data from an existing survey, the British Election Study (BES), original data collection in Italy, including a survey experiment, and a classroom experiment at the University of Washington.

In my first essay I investigate why, despite overall benefits to national economies, some people still oppose economic openness[1]. Several theories have been formulated about which factors are more likely to explain such policy preferences. Various scholars have investigated what shapes people's attitudes towards trade (Burgoon and Hiscox, 2008; Hainmueller and Hiscox, 2006; Mansfield and Mutz, 2009; O'Rourke and Sinnott, 2001; Scheve and Slaughter, 2001b; Walstad, 1997) and despite nuances, these theories agree that preferences for economic

[1]On free trade see: http://www.igmchicago.org/surveys/free-trade and Frankel and Romer (1999) and Alcala and Ciccone (2004)

openness are largely driven either by self-interest considerations or by cultural concerns. Departing from extant works, the hypothesis tested in this paper is that financial literacy affects economic policy preferences. In order to clarify the underlying theoretical mechanisms, I introduce a heuristic model that describes how financial literacy impacts policy preferences. Financial literacy affects the accuracy with which an individual evaluates the short-term and long-term expected costs and benefits of a certain policy. When financial literacy increases, voters who are harmed or helped by certain economic policies are expected to weigh the costs and benefits of that policy with more precision and less bias. This allows financially literate individuals to make better predictions about the effects of a specific public policy on their economic well-being. Conversely, financially illiterate individuals are less likely to be accurate at evaluating the costs and benefits of a policy. Instead, they may be more likely to rely on other factors such as political ideology, or cues from reference groups to make their policy decisions. In doing so, I draw on a growing literature (Lusardi, 2009; Lusardi and O. S. Mitchell, 2014b). Recent studies have analyzed the effects of financial literacy on retirement choices and savings decisions, however the literature investigating the relationship between financial literacy and policy and political preferences in still in its early stages.

To empirically support the argument, I analyze data from the British Election Study and test my theory on preferences on free trade. Financially literate winners from globalization (i.e. those with high incomes, with tertiary education, performing non-routine jobs, or living in areas not highly exposed to the Chinese import shock) should be more likely to support free trade than similarly financially illiterate individuals. Conversely, financially literate losers from globalization (those with low incomes, with secondary education or less, performing routine jobs, or living in areas highly exposed to the Chinese import shock) should be less likely to support free trade than similar financially illiterate individuals. The findings suggest that financial literacy does affect preferences for free trade. However, surprisingly, there is not a differential effect between winners and losers from globalization, as hypothesized. Financially literate individuals, regardless of self-reported economic self-interest, are more likely to favor free trade with the EU. The findings are unchanged when financial literacy is

interacted with an objective measure of globalization, which is measured through the Chinese import shock.

As a robustness check, to make sure that my results are not driven by the choice of this specific economic policy, I test the hypothesis on other economic policy preferences, specifically for EU membership and immigration. Financially literate individuals, regardless of economic condition, are more likely to favor remaining in the European Union, and to think that immigration is good for the British economy. Furthermore, a second concern addressed in the robustness checks is that financial literacy may have little to do with self-interest and the ability to conduct accurate cost-benefit calculations; rather it may be a proxy for more liberal views in general, both economic and social, including tolerance for out-groups. I address this possibility by looking at the relationship between financial literacy and social policy preferences. Once I condition on potential confounders, financial literacy has no relationship with social policy preferences, suggesting that financial literacy is not a proxy for tolerance for out-groups and progressivism.

The hypothesis tested in my second essay is that financial and economic literacy influences economic policy preferences. While financially and economically literate (from here on FEL) individuals are more likely to be accurate at predicting the effect of a specific economic policy on their economic well-being, financially and economically illiterate (from here on FEI) 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 political ideology or cues from reference groups to make their policy decisions, which may lead them to support policies that in the end do not reflect their interests. Furthermore, in the presence of inter-temporal policy trade-offs, I expect FEL individuals to put more weight on the long run, since recent evidence shows that they have lower discount rates and that financial literacy changes people's time preferences (Lahav, Rosenboim, and Shavit, 2015; Magistro, 2020a).

Following the theory, this paper looks at five economic policy preferences: remaining in or leaving the Eurozone, favoring free trade, favoring EU immigration, favoring non-EU im-

migration, and favoring the Fornero pension reform in Italy, using an original representative national survey of the Italian population. First, I test whether on average FEL individuals are more likely to prefer economic openness, and second, whether this holds true across winners from globalization (those with high incomes, high education, and non-routine jobs) and losers from globalization (those with low incomes, low education, and routine jobs). Similarly, I test whether FEL pension reforms winners and losers are more likely to favor the Fornero pension reform than their illiterate counterparts. Finally, to investigate the potential mechanism behind the lack of heterogeneous policy preferences between FEL winners and losers, I also test whether FEL individuals have lower subjective discount rates.

Findings from multinomial logit models indicate that financial and economic literacy does influence economic policy preferences as predicted: FEL individuals, regardless of their economic condition, are more likely to prefer remaining in the Eurozone, to favor free trade, EU immigration, non-EU immigration, and the Fornero pension reform. Finally, findings from a multiple linear regression and the Mann-Whitney U test show that indeed FEL individuals have significantly lower subjective discount rates, providing preliminary evidence that the mechanism behind the lack of heterogeneous effects between FEL winners and losers may be longer time horizons: when analyzing policy issues with long-term implications, FEL short-term losers may be more likely to make sacrifices today in exchange for benefits in the long run.

I also conduct sensitivity analyses to show that my results are not driven by financial literacy or economic literacy alone, and that indeed the two are additive and capture different dimensions of one's ability to evaluate policies. The findings show that each index individually has the predicted effect on the policies under analysis, however, the sizes of the effects are often smaller, suggesting that in general the composite financial and economic literacy index is a better proxy of an individual's ability to assess the costs and benefits of a policy. I also consider the role of general education alone, distinguishing between people with a high school diploma or less and those with an undergraduate degree or more, as an alternative measure of financial and economic literacy and find no relation between it and

policy preferences, suggesting that financial and economic literacy has distinct features that years of schooling do not capture.

The findings from my second essay on Italy suggest that financially and economically literate individuals have significantly lower discount rates, which may explain differential preferences across literacy levels in policy scenarios with intertemporal trade-offs. To further investigate this relationship, in my third essay I investigate the role that one aspect of education, specifically financial education, has on affecting subjective discount rates (SDRs). Does financial literacy make people more patient? If so, how does financial literacy affect SDRs? Financial literacy, through learning concepts like the time value of money, compound interest, inflation, capital budgeting, risk and return in financial markets, and risk diversification, is expected to decrease SDRs.

To answer this question empirically, I use a classroom experiment among undergraduate students in economics and finance, and political science. In doing this I also attempt to address some endogeneity concerns that have undermined some past studies (Lahav, Rosenboim, and Shavit, 2015). The first question I tackle is whether learning financial concepts such as the time value of money and basic capitalization contributes to changing time preferences and making people more patient. Secondly, I test whether there is a selection effects of students choosing to study economics and finance, and hence whether they have lower SDRs to start with. Finally, I examine whether more education in general, not necessarily financial or economic, decreases SDRs or not. Findings show that financial literacy decreases subjective discount rates significantly; there is not a selection effect into economics and finance, as students enrolling in these fields do not have significantly lower SDRs than other students when they start college; and finally that more schooling in general does not change time preferences, only financial education does.

Finally, in my fourth essay I investigate whether financially and economically literate (FEL) and financially and economically illiterate (FEI) individuals respond differently when exposed to new information about a policy and its effects. I investigate whether: 1) FEL individuals are more likely to form their policy views using factual information on the costs

and benefits of a policy; 2) FEI individuals, due to their lower ability to conduct accurate cost-benefit analyses, are more likely to rely on cues from their party leaders. To do this, I use a survey experiment in Italy involving a hypothetical policy proposal for price controls for domestic olive oil producers. Respondents are randomly exposed to either a political statement coming from the respondent's party leader (a party cue), a cost-benefit exercise on the short-term effects of price controls (policy information), or neither.

The findings show that, when given factual information on the societal costs and benefits of a policy, FEL individuals are more likely to understand that the total economic effect of that policy on society is negative, and to correctly estimate the size of this effect, than FEI individuals. Furthermore, FEL individuals treated with the cost-benefit exercise are significantly less likely to support price controls than FEL individuals in the control group, while this effect is not significant for FEI individuals. Moreover, FEI individuals treated with the party cue are significantly more likely to support price controls than similar FEI individuals in the control group, while this effect is not significant for FEL individuals. These findings have significant implications. When politicians are misleading their electorate, voters that choose to rely on party cues are more likely to support policies that directly hurt them. Conversely, policy information can successfully shift opinions, but only provided that citizens understand this information. The results suggest that financial and economic education may have the potential to increase support for welfare-enhancing reforms and to aid detecting welfare-reducing ones.

Chapter 2

FINANCIAL LITERACY AND SUPPORT FOR FREE TRADE IN THE UK

2.1 Introduction

Western liberal democracies and open economies are under stress. Nationalist parties have achieved significant power in several European countries, such as France, the Netherlands and Italy. The United Kingdom voted to leave the European Union. Donald Trump was elected president of the United States on a platform of economic protectionism and has engaged in a trade war with China. This shift towards isolationist and nationalist policy ultimately reflects preferences held by individuals, many of them economic in nature.

Why, despite overall benefits to national economies, some people still oppose free trade[1]? Several theories have been formulated about which factors are more likely to explain such policy preferences. Various scholars have investigated what shapes people's attitudes towards trade (Burgoon and Hiscox, 2008; Hainmueller and Hiscox, 2006; Mansfield and Mutz, 2009; O'Rourke and Sinnott, 2001; Scheve and Slaughter, 2001b; Walstad, 1997) and despite nuances, these theories agree that preferences for economic openness are largely driven either by self-interest considerations or by cultural concerns.

I depart from extant theories in important ways. I hypothesize that financial literacy affects trade policy preferences. Apart from a few exceptions (Fornero and Lo Prete, 2019; Mansfield and Mutz, 2009; Walstad, 1997), none of the existing studies has investigated the effects of financial literacy on economic policy preferences. None has articulated a theory with strong microfoundations or formalized their intuitions, let alone tested them in a rigorous

[1]On free trade see: http://www.igmchicago.org/surveys/free-trade and Frankel and Romer (1999) and Alcala and Ciccone (2004)

manner.

In order to clarify the underlying theoretical mechanisms, I introduce a heuristic model that describes how financial literacy impacts policy preferences. Financial literacy affects the accuracy with which an individual evaluates the short-term and long-term expected costs and benefits of a certain policy. When financial literacy increases, voters who are harmed or helped by certain economic policies are expected to weigh the costs and benefits of that policy with more precision and less bias. This allows financially literate individuals to make better predictions about the effects of a specific public policy on their economic well-being. Conversely, financially illiterate individuals are less likely to be accurate at evaluating the costs and benefits of a policy. Instead, they may be more likely to rely on other factors such as culture, political ideology, identity, or cues from reference groups to make their policy decisions.

In doing so, I draw on a growing literature. Recent studies have analyzed the effects of financial literacy on retirement choices and savings decisions (Lusardi, 2009; Lusardi and O. S. Mitchell, 2014b), however the literature investigating the relationship between financial literacy and policy and political preferences in still in its early stages (Fornero and Lo Prete, 2019; Montagnoli et al., 2016). Financial literacy may be important not only for household decisions, but also for public decisions, facilitating the introduction of welfare-enhancing reforms (Fornero, 2015). As Stigler (1970, p. 79) wrote in 1970, advocating for economic literacy, 'economic logic does not tell us what to do, but it teaches us to look for the non-obvious costs and benefits of various policies'.

To empirically support the argument, I start with an analysis of the British Election Study (BES) data, the most comprehensive available dataset that has questions on both financial literacy and policy preferences. I test the hypothesis that financial literacy affects trade policy preferences. Financially literate winners from globalization (i.e. those with high incomes, with tertiary education, performing non-routine jobs, or living in areas not highly exposed to the Chinese import shock[2]) should be more likely to support free trade

[2]The Chinese import shock refers to the sudden increase in the Chinese share of total manufacturing

than similarly financially illiterate individuals. Conversely, financially literate losers from globalization (those with low incomes, with secondary education or less, performing routine jobs, or living in areas highly exposed to the Chinese import shock) should be less likely to support free trade than similar financially illiterate individuals.

The findings suggest that financial literacy does affect preferences for free trade. However, surprisingly, there is not a differential effect between winners and losers from globalization, as hypothesized. Financially literate individuals, regardless of self-reported or objective economic self-interest, are more likely to think that free trade with the EU is good for the British economy, than similar financially illiterate individuals.

As a robustness check, to make sure that my results are not driven by the choice of this specific economic policy, I test the hypothesis on other economic policy preferences, specifically for EU membership and immigration. Financially literate individuals, regardless of economic condition, are more likely to favor remaining in the European Union, and to think that immigration is good for the British economy. Furthermore, a second concern addressed in the robustness checks is that financial literacy may have little to do with self-interest and the ability to conduct accurate cost-benefit calculations; rather it may be a proxy for more liberal views in general, both economic and social, including tolerance for out-groups. I address this possibility by looking at the relationship between financial literacy and social policy preferences. Once I condition on potential confounders, financial literacy has no relationship with social policy preferences, suggesting that financial literacy is not a proxy for tolerance for out-groups and progressivism.

My theory and findings carry important implications. As recent events in the developed world have illustrated to researchers, voters' economic policy preferences matter. They affect trade flows, immigration policy, and whether to leave or remain in the European Union. The current backlash against globalization and European integration could lead to major welfare losses for the overall population. The results suggest that financial and economic education

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imports in the United Kingdom from the end of the 1980s until 2007 as measured by Colantone and Stanig (2018).

may have the potential to increase support for welfare-enhancing reforms and to aid detecting welfare-reducing ones.

The remainder of the paper is organized as follows. Section 2 reviews prior approaches in the literature, section 3 lays out the theoretical argument, section 4 presents the data and models, section 5 contains the findings, section 5 includes robustness checks, section 6 discusses the results, and section 7 concludes.

2.2 Prior approaches

2.2.1 Trade-policy preferences

Several scholars have investigated what shapes people's support for free trade. Economists agree that the free movement of goods is beneficial at the aggregate level[3]. However, there are distributional consequences: although the majority of people in a country benefits from free trade, some individuals do suffer economic harm (Acemoglu, D. H. Autor, et al., 2016; Fajgelbaum and Khandelwal, 2016; Feyrer, 2019; Irwin, 2015). One key question then regards what shapes people's attitudes towards trade. Most studies have focused on testing models predicting that trade preferences are shaped by self-interest and hence they examine how trade affects individuals' incomes, mostly using the Heckscher-Ohlin and the Ricardo-Viner models (Scheve and Slaughter, 2001b). Recently, several scholars have argued and found support for the claim that fragmented production has changed the competitive pressures from trade, which now happen at the level of individual jobs, rather than at the sectoral or firm levels (Acemoglu and D. Autor, 2011; Owen and Johnston, 2017; Ebenstein et al., 2014; Matias Cortes, 2016). The routine content of tasks may be key in determining differences across occupations (Acemoglu and D. Autor, 2011). Routine tasks are characteristic of middle-skilled cognitive and manual jobs, and because the main job tasks of these occupations rely on precise, repetitive procedures, they can be automated or outsourced easily. Indeed, findings suggest that greater task routineness leads workers to be more supportive of

[3]See for example http://www.igmchicago.org/surveys/free-trade on free trade.

protectionist measures (Acemoglu and D. Autor, 2011; Owen and Johnston, 2017; Ebenstein et al., 2014; Matias Cortes, 2016). Other studies show that preferences for free trade are not driven by pocketbook evaluations, but rather by sociotropic perceptions and cultural concerns. Mansfield and Mutz (2009) find that educational effects almost disappear once individuals' anxieties about involvement with out-groups in their countries and abroad are accounted for. Mansfield and Mutz (2009) also find that people form their trade preferences following sociotropic perceptions, not self-interest. It is thus more likely that people's attitudes towards trade are influenced by how much they think it affected their country as a whole rather than how much it affected them. All of these models start from the assumption that all individuals know what their self-interest is and how the policy in question will affect it.

2.2.2 The state of the art on financial literacy

In a landscape where the complexity of financial and economic decisions is increasing, the level of financial literacy held by individuals and their ability to make sound financial and economic decisions has also become more important. 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'. Financial literacy has been consistently measured by 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 (Lusardi, 2009). These questions aim to measure a person's understanding of how to balance a budget, how compound interest works, how inflation affects one's income. Financial literacy has been determined to be a key factor in affecting savings, employment, and retirement choices. However, individuals increasingly have to make decisions not just on their personal finances but often also on public ones. Many countries have asked citizens to vote on economic reforms (be they Brexit, or pension reforms, etc.) (Lusardi, 2015). One area where research has considerably grown is that on the relationship between financial literacy and household decisions. Several studies find

that financial literacy affects the ability of individuals to save and to secure a comfortable retirement (Lusardi, 2009; Lusardi and O. S. Mitchell, 2014b). In a political context, a recent study by Montagnoli et al. (2016) finds that there is a link between financial literacy and political orientation in Great Britain: financially literate individuals are between 11 and 19 percent more likely to orientate at the center-left or center-right of the political spectrum rather than at the extremes. They also find that financially literate individuals are more likely to have a stable political orientation over time. The authors interpret these findings as suggesting that greater financial literacy leads to greater stability of moderate political views and orientation. Finally, Fornero and Lo Prete (2019) investigate how financial literacy affects voting in the aftermath of a pension reform and they find that pension reforms take less of a toll on the politicians that passed them in countries with higher financial literacy scores. The complex nature of pension reforms requires some basic financial knowledge, such as notions of accumulation, compound interest, debt, and risk diversification. Furthermore and importantly, the authors also find that financial and economic knowledge has distinctive features that more general dimensions of education, including math literacy and years of schooling, do not capture (Fornero and Lo Prete, 2019).

2.3 Theoretical argument

2.3.1 Heuristic Model

I use a heuristic model to illustrate the theory[4]. The model assumes that individuals are guided by self-interest. Financial literacy is expected to have an impact on an individual's accuracy at calculating the effects of a specific policy on their expected utility. For simplicity, I consider two types of individuals: financially literate and financially illiterate. Each individual has their own priors over the utility that an economic policy will bring. If the utility can take any value between zero and one, I assume that for each individual all possible values are equally likely a priori, as they have no prior information and cannot distinguish

[4]See Appendix A for details on how the model was derived.

between them.

Each individual then observes a signal, which contains information about the utility of the policy in question. The utility inferred from the signal may vary across different individuals: its content depends on the true, but hidden, utility of the policy, and on the individual's accuracy in interpreting it.

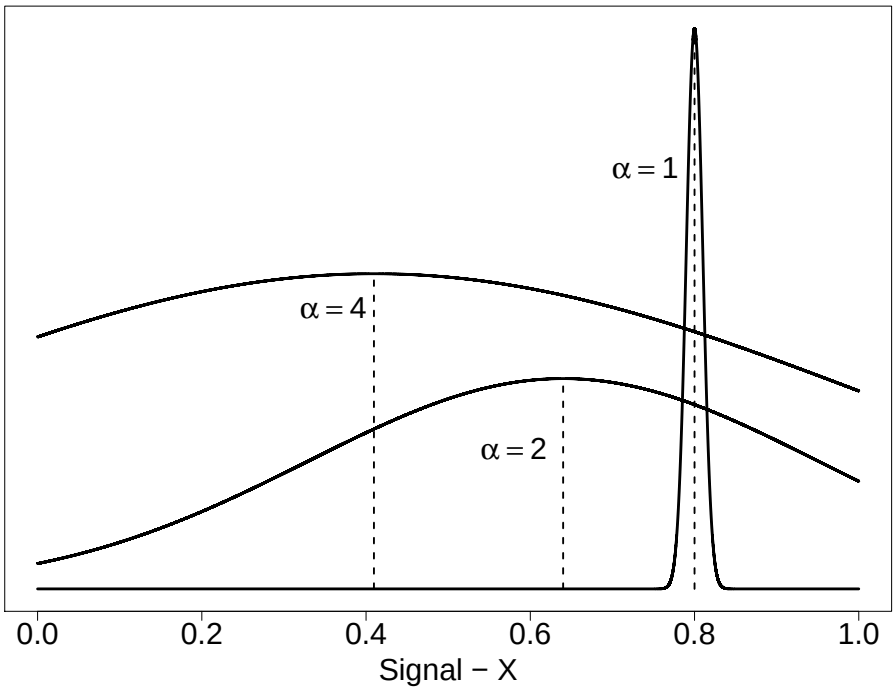

Figure 2.1: Truncated normal distributions of signal X when inaccuracy α=1, 2, 4 and true utility u=0.8. In this example, the true utility of the policy is set to u=0.8. For a financially literate individual ($\alpha = 1$), the utility inferred from the signal equals 0.8, and variance is set to 0.0001. For a financially illiterate person, when $\alpha = 2$, their inferred utility from the signal is about 0.6 and the variance increases with α. Finally, when $\alpha = 4$ the signal wrongly indicates that u is equal to 0.4, with larger uncertainty.

I expect the signal to be more informative for financially literate people, as they can

conduct more accurate cost-benefit analyses. Conversely, it will be less informative for financially illiterate people, who are less likely to be accurate at estimating the effects of a policy on their individual economic well-being and who may be more likely to rely on other decision making factors such as core personal values (for example culture, political ideology, identity, etc.), or cues from reference groups, and on less correct cost-benefit analyses to make their decisions.

As the individual's inaccuracy at evaluating the policy in question increases, the distance between the perceived utility and the true one increases, and so does the uncertainty about it. Inaccuracy will be low for financially literate individuals as their ability to do more sophisticated cost-benefit analyses will give them a more precise and unbiased estimate of the expected utility of the policy, hence the verdict from the signal will most likely be very close to the true utility of the policy (see Figure 2.1 for an example). Conversely, for financially illiterate individuals inaccuracy will be larger and they will be more uncertain about the expected utility of the policy. As a result of this, the more inaccurate the person is, the further the signal is likely to be from the true utility of the policy, and the more uncertainty around it.

The reasons why financially illiterate individuals will have different levels of inaccuracy could be several and they are not the topic of investigation here: besides not conducting correct cost-benefit analyses, they may be getting biased but inexpensive cues from certain interested reference groups (such as politicians, employers' associations, or labor unions), or they may rely on ideology or other core personal values to make their decisions and these may not necessarily be reflecting their objective individual economic interest.

After observing the signal, each individual updates their prior. As inaccuracy decreases, the updated belief about the expected utility of the policy is more likely to be closer to the true utility of the policy. Conversely, as inaccuracy increases, the distance between the expected utility and the true utility of the policy increases.

2.3.2 Individual preferences for free trade

The heuristic model suggests that when financial literacy increases, voters who are harmed or helped by certain economic policies are expected to weigh the costs and benefits of that 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. However, although there may be near consensus on the aggregate effects of a certain policy, there may be disagreement, even among experts, on its distributional impacts. This is the case for the policy under investigation here, as discussed in depth in the sections above. Although there is near consensus among experts that free trade has positive aggregate effects, and that the gains in the long run are much larger than any effects on employment, these policies come with distributional consequences at least in the short run, where there are winners and losers, hence explaining why we still see preferences for protectionism[5].

Hence, although I expect that on average financially literate individuals will be more likely to favor free trade, I also expect the presence of heterogeneous effects across winners and losers. Following the sectoral, factoral, and more recently individual task-level models, the winners from globalization are people who own abundant factors of production, working in export-oriented sectors, and performing non-routine tasks. Conversely, the losers are people who own scarce factors of production, working in import-competing sectors, and performing routine tasks. When using the objective measure of self-interest, following Colantone and Stanig (2018), the winners are people living in areas not highly exposed to the Chinese import shock, while the losers are people living in areas highly exposed to the Chinese import shock. A financially literate winner from economic openness is expected to be more likely to favor the policy that gives her the highest expected utility than a financially illiterate individual, as the distance between her expected utility and the true utility of the policy

[5]On experts' consensus see: http://www.igmchicago.org/surveys/free-trade; on the aggregate gains from trade see for example Alcala and Ciccone (2004) and Frankel and Romer (1999); on the distributional consequences see for example Atkin, Faber, and Gonzalez-Navarro (2018), D. H. Autor, Dorn, and Hanson (2013), and Trefler (2004); for a review of these economic concepts and of the predictions from economic theory see Bowles, Carlin, and Stevens (2017).

is smaller for her than for similar financially illiterate individuals. Hence, the financially literate winner from globalization is more likely to favor the policy with the highest true utility, i.e. economic openness, than the financially illiterate. Conversely, financially literate losers from globalization are expected to be more likely to support protectionist measures than similar financially illiterate individuals. From these follow my hypotheses:

- H1: On average, financially literate individuals are more likely to think that free trade with the EU is good for the British economy, than financially illiterate individuals;

- H2: Financially literate winners from economic openness are more likely to think that free trade with the EU is good for the British economy, than financially illiterate winners;

- H3: Financially literate losers from economic openness are more likely to think that free trade with the EU is bad for the British economy, than financially illiterate losers.

2.4 Methodology

2.4.1 Data

The British Election Study (Fieldhouse et al., 2018) contains data on financial literacy in the United Kingdom and allows me to test the hypotheses. The BES internet panel data includes over 25,000 individuals and is conducted twice a year. However, the financial literacy questions were asked in Wave 2 (2014) to a sub-sample of 5,555 British respondents and in Wave 4 (2015) to a different sub-sample of 5,399 Scottish respondents only. I use the BES Wave 2 for the core of my empirical analysis [6]. The BES follows some of the individuals in the next waves, this allows me to use Wave 7 (2016) too, as some of the variables are only available in later waves. However, not all respondents are followed through in subsequent

[6] I analyzed the BES Wave 4 as an additional test and findings are similar, results are available upon request.

waves. Depending on the variable of interest, the total number of observations ranges between 3,000 to 5,555[7].

The dependent variable comes from wave 7 and is: 'Is this good or bad for Britain: Free trade with Europe'[8]. Table 2.1 shows descriptive statistics for the dependent variable.

My covariate of interest is financial literacy and it is measured by the number of correct answers to three questions, which are reflecting knowledge about interest compounding, inflation, interest rates, and risk diversification (Lusardi, 2009; Lusardi and O. S. Mitchell, 2014b). Table 2.2 shows descriptive statistics for my covariates of interest. The first 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, and

5) Prefer not to say.

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

[7]I used multiple imputation with the R package Amelia in order to deal with missing observations.

[8]Due to data availability, the question on free trade asks the respondent what she thinks is best for Britain. It is possible that these people may actually have a different personal preference on the issue. Mansfield and Mutz (2009) use five survey questions to generate their dependent variable on support for free trade, ranging from questions which ask about personal preferences on various facets of international economic relations to questions that ask the respondent what she thinks is best for her country, and they find that although those items do not address the same issues, people's preferences are very consistent.

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, and

5) Prefer not to say.

The third question asks: 'Which one of the following do you think is the riskier asset to invest in?' The answers are:

1) An individual share in a company,

2) A portfolio of different company shares,

3) The risk is the same in both cases,

4) Don't know, and

5) Prefer not to say.

The variable of interest combines these three questions and measures the number of correct answers to the questions:

1) 0 correct answers,

2) 1 correct answer,

3) 2 correct answers, and

4) 3 correct answers.

In order to investigate the effect of subjective and objective economic self-interest, following the most recent research on the determinants of individual trade preferences, I include measures of the respondent's skill level and occupational task that they perform and interact them with financial literacy. Owners of relatively abundant factors of production benefit from trade, and in the case of the U.K., the abundant factors are highly skilled labor and capital. Due to do data availability, I use household annual income as a proxy of capital endowment and level of education to measure skill endowment (Hays, Ehrlich, and Peinhardt, 2005; Mansfield and Mutz, 2009). In order to distinguish occupational tasks based on the risk of displacement, I rely on the recent literature's distinction between routine and non-routine tasks (Acemoglu and D. Autor, 2011; Matias Cortes, 2016; Halikiopoulou and Vlandas, 2018). *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 (undergraduate or postgraduate)[9]. The variable *routine* is derived from a variable that reports NS-SEC analytic classes, operational categories, and sub-categories. Following the recent literature (Acemoglu and D. Autor, 2011; Matias Cortes, 2016; Halikiopoulou and Vlandas, 2018), I classify occupations into two groups based on whether the occupation is intensive in routine tasks, which are more likely to be traded and replaced by technology, or not.[10] *Income* is an ordinal variable that indicates in which bracket the household's respondent gross income is. I have recoded this variable so that it takes three values based on whether the respondent's income is below the 25th percentile, between the 25th and 75th percentile, and above the 75th percentile. Furthermore, I also exploit region-level measures of globalization (Colantone and Stanig, 2018). Colantone and Stanig (2018) identify losers from globalization as individuals concentrated in regions that

[9]I use two education groups as it is the conventional division in labor economics, however, the results' significance does not change by using three groups (no qualifications, secondary education, and tertiary education)

[10]As a result of the fact that we do not have detailed occupational data, there might be a significant amount of heterogeneity in each occupation group.

have been historically specialized in manufacturing activities that have been overtaken by China. Areas more exposed to Chinese competition have witnessed a fall in employment not just in the affected industries, but more in general across industries, as local labor markets have not adjusted fast enough (D. H. Autor, Dorn, and Hanson, 2013; Colantone and Stanig, 2018). Hence, I use their measure of the Chinese import shock to determine winners and losers from globalization at the regional level[11].

In order to avoid confounding bias, I control for income, education, age, gender, and whether the respondent lives in an area highly exposed to the Chinese import shock or not[12].

Table 2.3 shows descriptive statistics for interaction terms and control variables, from one of the imputed datasets (N = 5,555).

2.4.2 Models

To test my hypotheses, I use multinomial logit models. Let Y_i be the unordered categorical dependent variable for individual i which takes an integer values $j = 1, ..., J$. I model respondent i's policy preference using multinomial logistic regression:

$$Y_i \sim Multinomial(Y_i \mid \pi_{i,j}) \tag{2.1}$$

[11]More precisely, I identify winners as those living in areas with import shock equal to mean - 1 standard deviation, and losers as those living in areas with import shock equal to mean + 1 standard deviation. Moreover, the analysis is performed at the NUTS-3 level of regional disaggregation. The NUTS-3 measure for each individual was matched based on the available measure of local authority unit in the BES. In the dataset there are in total 167 NUTS-3 British regions, the most disaggregated level. For more information on the import shock measure see Colantone and Stanig (2018).

[12]If the goal is to prevent confounding bias, it is often argued that we should control for any variable that is correlated with both our dependent and our independent variable, but this is not necessarily true. In fact, we do not want to control for a collider, which is a variable with two arrows pointing into it, otherwise we would find a relationship between two variables when there is not one. We do instead want to control for confounders, which represent common causes to our treatment and outcome variables (Elwert, 2013; Pearl and Mackenzie, 2018). Political ideology and cultural conservatism, although affecting the outcome variable, do not affect financial literacy and hence should not be controlled for. This is also tested with the R package *daggity*, which tests conditional independence parametrically. The findings from this test suggest that political ideology and cultural conservatism are independent of financial literacy once we condition on age, gender, income, education, and living in high import shock area.

Table 2.1: Descriptive statistics of the dependent variables for the imputed dataset (N = 5,555)

	Relative frequency, %
Free trade with Europe is	
Good for Britain	58
Neither good nor bad for Britain	22
Bad for Britain	8.5
Don't know	11.5

Table 2.2: Descriptive statistics of the covariate of interest for the imputed dataset (N = 5,555)

Financial literacy index				
# Correct answers	3	2	1	0
%	47.2	28.5	15.3	9.0
Financial literacy questions				
	% Correct	% Incorrect	% Don't know	% Refuse to answer
Interest rate	84.2	7.4	6.0	2.4
Inflation	74.7	9.9	12.5	2.9
Risk diversification	55.0	24.1	18.9	2.0

Table 2.3: Descriptive statistics of the controls for the imputed dataset (N = 5,555)

	Rel. frequency, %	
Education		
Low education	55.6	
High education	44.4	
Income		
Low income	30	
Middle income	43.8	
High income	26.2	
Occupation W2 (W7)		
Non-routine	73.4 (71.7)	
Routine	26.6 (28.3)	
Male	50.8	
	Mean	Sd
Age	52.6	15.1
Import shock	0.32	0.13

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

$$\pi_{i,j} = \frac{exp(\mu_{i,j})}{\sum_{k=1}^{J} exp(\mu_{i,j})} \tag{2.2}$$

$$\mu_{i,j} = \beta_{j0} + \sum_{k=1}^{P} \beta_{j,k} x_{i,k}, \tag{2.3}$$

where 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. I estimate all models using this specification, with different outcome variables, interaction terms, and controls. The outcome variable for the main models is free trade. The main covariate of interest is financial literacy when testing H1, while it is interacted with education, income, routine occupation, and the Chinese import shock respectively to test H2 and H3.

Individual respondents are clustered by region. However, the number of clusters is very small. There are only 11 regions: North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East, South West, Wales and Scotland. When the number of clusters is small, cluster-robust standard errors (CRSEs) can produce misleading inferences, where confidence intervals are too narrow and false positive rates too common, even though the model is consistent and there are several observations in each cluster (Angrist and Pischke, 2009; Esarey and Menger, 2016; Green and Vavreck, 2008). As a result, in all models I apply pairs clustered bootstrapped t-statistics (PCBSTs) with CRSE replicates[13].

2.5 Findings

2.5.1 Financial literacy and support for free trade

I first test H1, specifically whether on average financially literate individuals are more likely to think that free trade with the EU is good for the British economy, than similar financially

[13]I used the R package *clusterSEs* to estimate cluster-robust p-values and confidence intervals using PCBSTs for multinomial logit models and I used the CRSE replicates to plot all the figures. The R package documentation suggests that I drop the fixed effects for regions because they are absorbed into cluster-level coefficients

illiterate individuals. Figure 2.2 shows the expected probabilities of favoring or not favoring free trade with the EU, with 95 percent confidence intervals[14].

As financial literacy increases so does the probability that the respondent thinks that free trade with the EU is good for the British economy. To understand the substantive significance of these findings, it is helpful to compare a financially literate individual (someone who got all three questions correct) to a financially literate individual (who got no correct answers). A financially literate individual is 32 percent more likely than a financially illiterate individual to think that free trade is good for the British economy.

2.5.2 Heterogeneous Effects

I then test H2 and H3, specifically whether: financially literate winners from economic openness are more likely to think that free trade with the EU is good for the British economy than similar financially illiterate individuals; and financially literate losers from economic openness are more likely to think that free trade with the EU is bad for the British economy than similar financially illiterate individuals.

Figure 2.3 shows the first differences of favoring or not favoring free trade with the EU, based on financial literacy and education, routine occupation, income, and the Chinese import shock, with 95 percent confidence intervals[15].

What emerges is that financially literate individuals, regardless of self-reported economic self-interest, are more likely to support free than financially illiterate individuals. To understand the substantive importance of these findings, looking at figure 2.3, a financially literate individual with high education is 30 percent more likely to think that free trade with the EU is good for the British economy than a similar financially illiterate individual. On the contrary, financially literate individuals with low education are not more likely to be opposed to free trade, they are actually 32 percent more likely to support economic openness than their illiterate counterpart.

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[14]Appendix A shows log-odds with standard errors in parentheses, and cluster bootstrapped p-values.

[15]Appendix A shows log-odds with standard errors in parentheses, and cluster bootstrapped p-values.

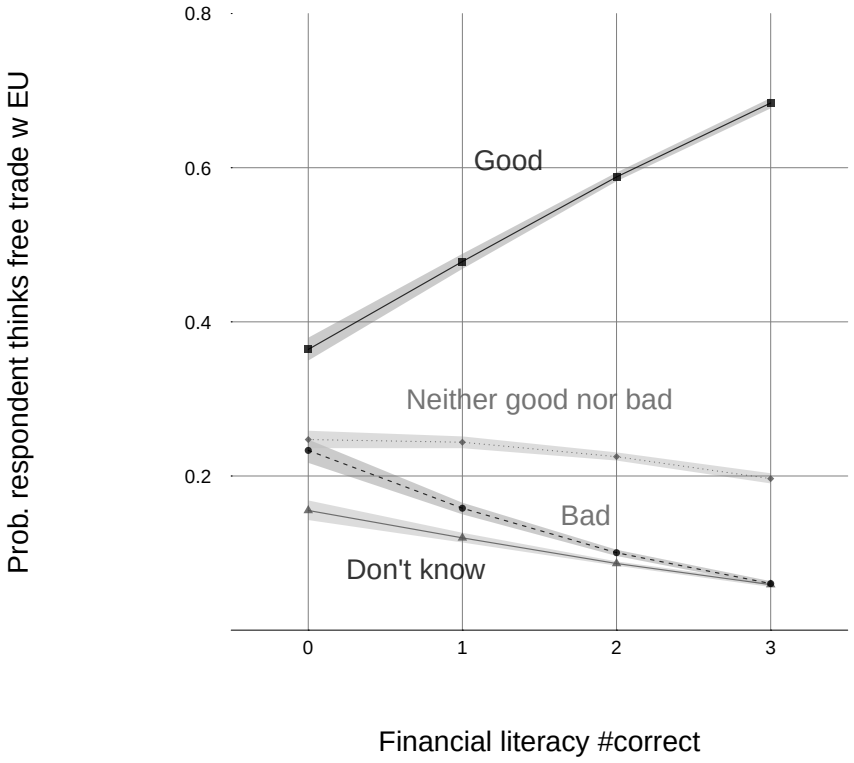

Figure 2.2: Expected probabilities of thinking free trade is good for the British economy with 95% confidence intervals

These results are similar in size and direction for all of the interacted variables (i.e., income, education, job routineness, and import shock) suggesting that financially literate winners from globalization are significantly more likely to support free trade than their illiterate counterparts. However, financially literate losers from globalization are not more likely to oppose free trade than their illiterate counterparts, they are actually more likely to favor it.

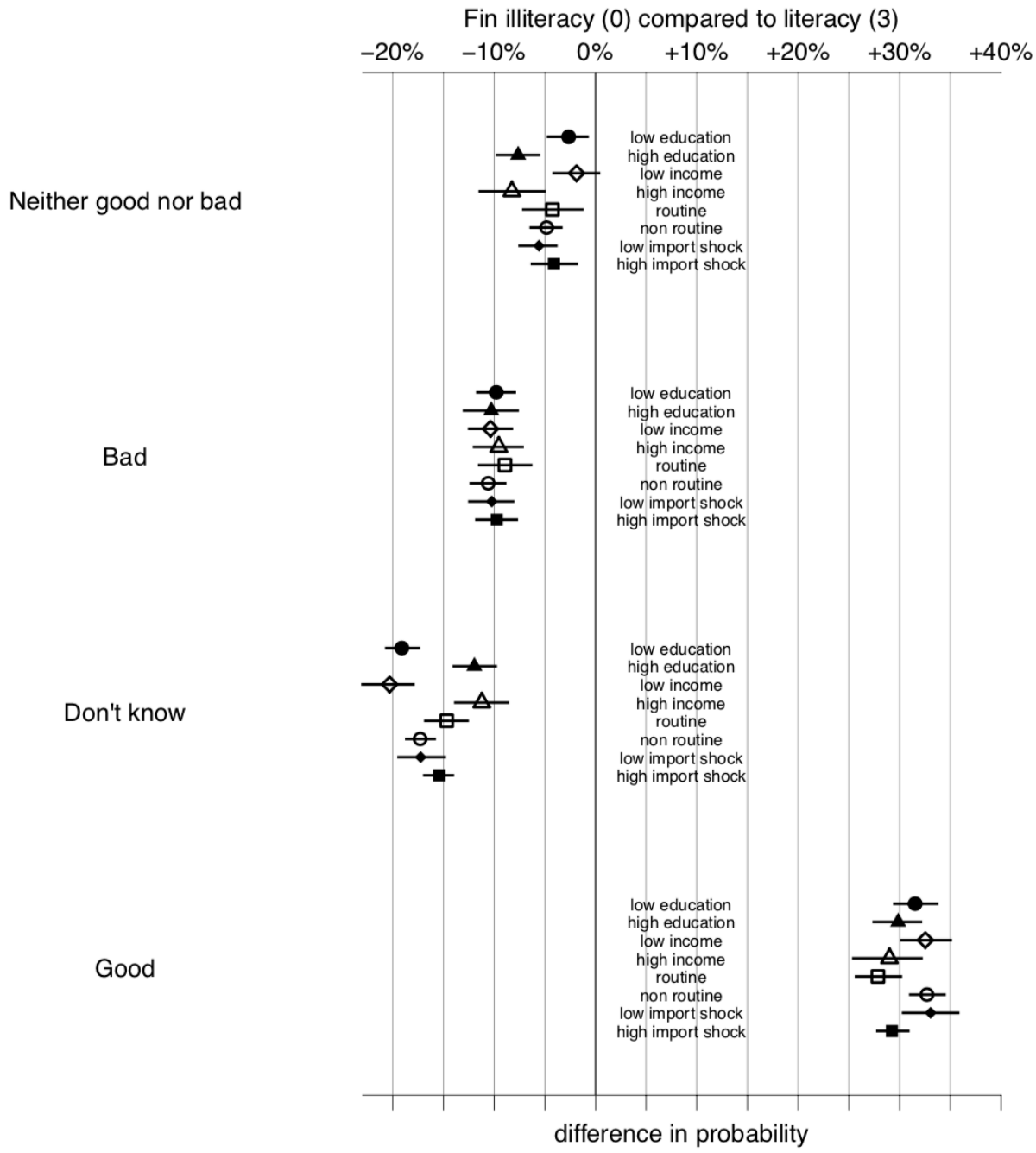

Figure 2.3: First differences in probability of thinking free trade is good for the British economy with 95% confidence intervals between financially illiterate individuals (0 correct answers) and financially literate individuals (3 correct answers), by education, income, job routineness, and import shock

2.6 Robustness checks

In order to alleviate concerns about the generalizability of this finding to other economic policies, I test the hypothesis on other issues, specifically Brexit vote intentions and immigration preferences. Similarly to free trade, EU membership and immigration lead to aggregate efficiency gains. More specifically, Coppel, Dumont, and Visco (2001), Foged and Peri (2016), Hamilton and Whalley (1984), Leeson and Gochenour (2015), G. I. P. Ottaviano and Peri (2012), G. I. Ottaviano, Peri, and Wright (2013), Peri (2012), and Sequeira, Nunn, and Qian (2020) suggest that increased immigration leads to net gains in GDP, small but temporary negative impacts on the wages of low-skilled natives, more specifically on those without a high school diploma, it has no direct impact on unemployment in the host country, and it actually increases total factor productivity. On Brexit, the Institute for Fiscal Studies (IFS) estimated that the United Kingdom could lose 4 percent of its GDP by 2030 if it loses access to the European Union single market (Emmerson et al., 2016).

Analogously to free trade, these policies entail distributional consequences, and winners and losers from globalization are expected to have different preferences. Hence, I hypothesize that on average, financially literate individuals are more likely to vote Remain in the Brexit referendum and to think that immigration is good for the British economy, than financially illiterate individuals; financially literate winners from economic openness are more likely to vote Remain in the Brexit referendum and to think that immigration is good for the British economy, than similar financially illiterate individuals; and financially literate losers from economic openness are more likely to vote Leave in the Brexit referendum and to think that immigration is bad for the British economy, and test whether this is indeed the case.

Figures 2.4 and 2.5 show the expected probabilities of voting for or against Brexit,and favoring or not favoring immigration, with 95 percent confidence intervals. Figures 2.6 and 2.7 show the first differences of voting for or against Brexit, and favoring or not favoring immigration, based on financial literacy and education, routine occupation, income, and the

Chinese import shock, with 95 percent confidence intervals [16].

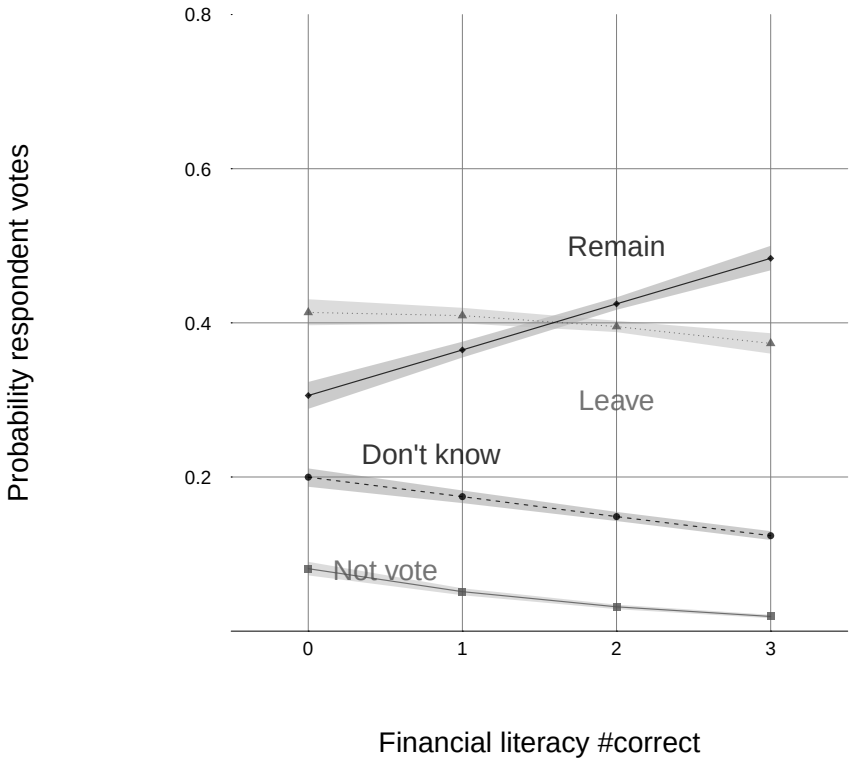

Figure 2.4: Expected probabilities of voting Remain or Leave in Brexit referendum with 95% confidence intervals

These results are in line with those for free trade. As figures 2.4 to 2.7 show, as financial literacy increases so does the probability that the respondent votes Remain in the Brexit referendum and that she thinks that immigration is good for the British economy, regardless of one's economic self-interest. The results are again very substantial, since a financially

[16]Appendix A shows log-odds with standard errors in parentheses, and cluster bootstrapped p-values.

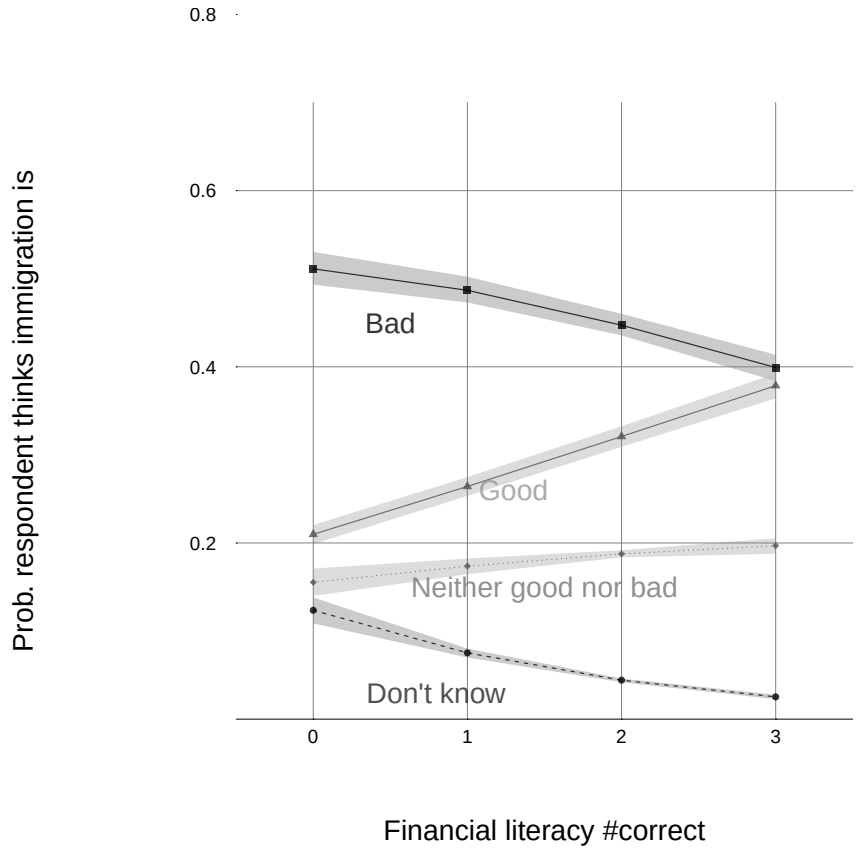

Figure 2.5: Expected probabilities of thinking immigration is good for the British economy with 95% confidence intervals

literate individual is respectively 18 percent and 17 percent more likely than a financially illiterate individual to vote Remain in the Brexit referendum, and to think that immigration is good for the British economy.

2.6.1 Financial literacy and social policy preferences

There is a possibility that financial literacy may have little to do with self-interest, but rather it may be a proxy for liberal views in general, including tolerance for out-groups, which are

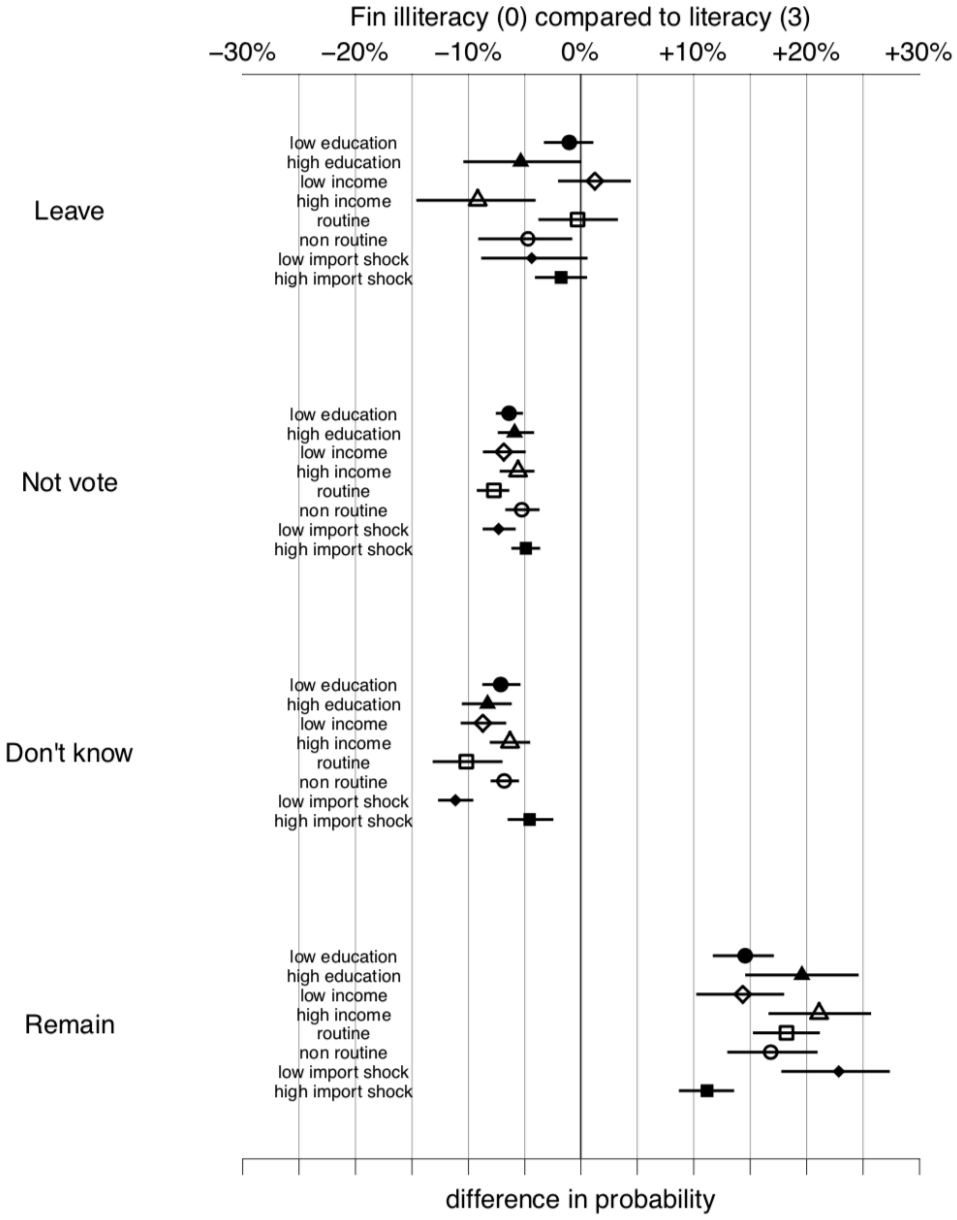

Figure 2.6: First differences in probability of voting Remain or Leave in Brexit referendum with 95% confidence intervals between financially illiterate individuals (0 correct answers) and financially literate individuals (3 correct answers), by education, income, job routineness, and import shock

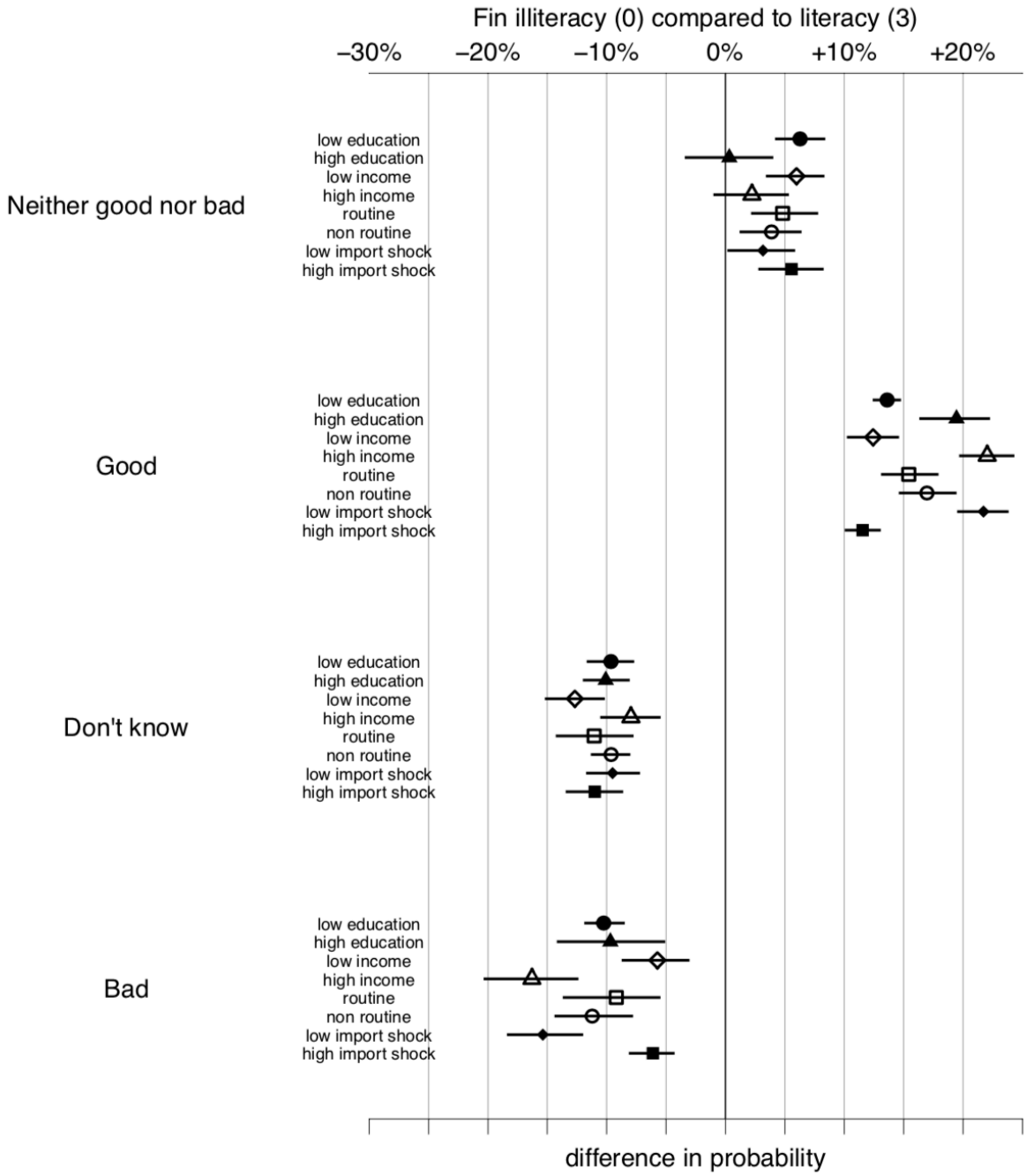

Figure 2.7: First differences in probability of thinking immigration is good for the British economy with 95% confidence intervals between financially illiterate individuals (0 correct answers) and financially literate individuals (3 correct answers), by education, income, job routineness, and import shock

not measured in the survey. More educated people may be more financially literate and also more likely to be more progressive and tolerant not only in their economic views but also in their social views. More specifically, I investigate whether financial literacy predicts attitudes towards gay and lesbian civil rights. I expect there to be no direct relationship between financial literacy and social policy preferences, as people are not expected to make decisions on social policies based on costs and benefits calculations. However, both financial literacy and social policy preferences are expected to be affected by the same set of variables: age, gender, education, and income. This means that any relationship that may exist between financial literacy and social policy preferences can be explained by the confounders (i.e. income, education, gender, and age). Hence, financial literacy and social policy preferences may appear related if these confounders were not considered, but if we control for them by holding them constant, then any apparent relationship between financial literacy and social policy preferences should disappear.

Findings from figures to 2.8 and 2.9 suggest that financially literate individuals are 3.2 percent more likely to think that attempts to give equal opportunities to gays and lesbians have been just about right, they are 3.7 percent more likely to think that they have not gone far enough, but they are also 2.3 percent more likely to think that they have gone too far, compared to financially illiterate individuals. Furthermore, financially literate individuals are not any more likely than financially illiterate individuals to think that these attempts have not gone nearly far enough or to think that these attempts have gone way too far, as these effects are not statistically significant at the 95 percent confidence level and hence not distinguishable from zero. This suggests that once we condition on confounders, financial literacy has no relationship with social policy preferences, hence financial literacy is unlikely to be a proxy for liberal and progressive values.

2.7 Discussion

The finding that financially literate winners from globalization, measured both objectively and subjectively, are more likely to support free trade with the EU than similar financially

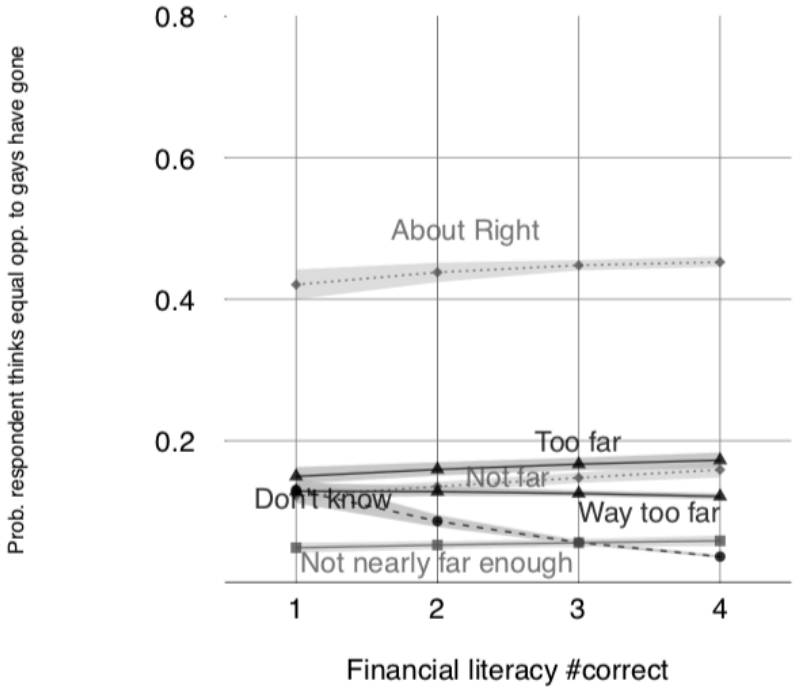

Figure 2.8: Expected probabilities of thinking attempts to give equal opp. to gays have gone with 95% confidence intervals

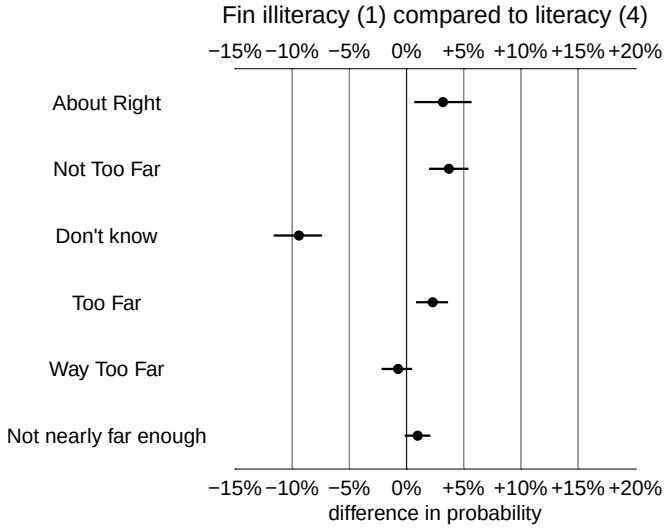

Figure 2.9: First differences in probability of thinking attempts to give equal opp. to gays have gone with 95% confidence intervals

illiterate individuals supports hypothesis 2 and suggests that financially literate winners from more economic openness are more likely to recognize its economic benefits than their illiterate counterparts. However, the finding that, for the most part, financially literate people who supposedly stand to lose from openness in the short-term are more likely to support free trade with the EU compared to similar financially illiterate individuals, does not support hypothesis 3 and raises some interesting questions.

Given data availability, we can only speculate as to the mechanisms through which this may be happening. One possibility has to do with discount rates. Some studies find that learning financial concepts like compound interest, the time value of money, and the risk of capitalization affects subjective discount rates by effectively lowering them (Lahav, Rosenboim, and Shavit, 2015). If indeed financially literate people have longer time horizons, it is possible that in the presence of a trade-off between the short run and the long run they may put more weight on the long-term effects. More specifically in this case, economists agree that freer trade improves productive efficiency and offer consumers better choices, and in the long run these gains are much larger than any effects on employment[17]. As a result, it is possible that if it is true that financially literate individuals have lower discount rates, then they might be weighting costly short run adjustments less, in the expectation of larger and broader gains in the long run. Alternative explanations are also possible. One is that those we often consider to be losing from globalization actually realize that most manufacturing jobs are lost to technological change, largely to automation, and not to trade, as one study suggests this has been the case in the U.S. (Hicks and Devaraj, 2015). Another possibility is that financially literate losers from globalization may weigh the benefits that they gain as consumers more, compared to losses in the job market, since Fajgelbaum and Khandelwal (2016) suggest that people at the lower end of the social ladder concentrate spending on more traded sectors. Future research should address these questions more thoroughly, potentially looking at the relationship between financial literacy and discount factors.

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[17]On free trade see: http://www.igmchicago.org/surveys/free-trade and Frankel and Romer (1999) and Alcala and Ciccone (2004).

2.8 Conclusion

This paper investigates the relationship between financial literacy and preferences for free trade in the U.K.. Currently, not many of the existing surveys would allow to empirically test this relationship, as questions on both financial literacy and economic policy preferences are often lacking. The BES, which includes data on political attitudes and behavior in Great Britain, at this time is the most comprehensive dataset in Europe containing questions on the variables of interest. The recent decision to leave the European Union makes the U.K. a case in point to analyze determinants of increasingly nationalist and protectionist policy preferences. As I laid out my model, I argued that any individual is expected to choose the policy that she thinks will give her the highest expected utility. The model suggests that for a financially literate individual the distance between her expected utility and the true utility of the policy is smaller than for similar financially illiterate individuals, since as financial literacy increases, voters are expected to weigh the costs and benefits of that 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. In the case under analysis, I expect that on average financially literate individuals are more likely to be in favor of free trade. However, due to the distributional consequences of these policies, I also anticipate heterogeneous effects. Financially literate winners from globalization (measured both objectively and subjectively) are expected to be more likely than similar financially illiterate individuals to favor the policy with the highest true utility for them, which is free trade. Conversely, financially literate losers from globalization are expected to be more likely to oppose economic openness than similar financially illiterate individuals. Findings only partially support my hypotheses. Financially literate winners from economic openness are more likely to favor free trade with the EU than similar financially illiterate individuals. However, financially literate losers from globalization are not more likely to oppose free trade than their illiterate counterparts, they are actually more likely to favor it. One speculative explanation could be that financial literacy, by drastically reducing preference for the present,

may help potential losers from more economic openness abandon their short-term interests in favor of the long-term benefits. Contrary to claims and studies arguing that an individual who has economic knowledge is more likely to act as a *homo economicus*, and hence more likely to behave in a selfish way and maximize her own well-being only, these findings seem to suggest that, regardless of whether they are actually pursuing their own future self-interest or not, financially literate people are more likely to favor policies that advance the common good - the average welfare of society.

Furthermore, the robustness checks address some external validity and omitted variable bias concerns. The first robustness check involves testing the hypothesis across more policy areas, to make sure that it is generalizable to other economic policy preferences. Due to data availability I also test the hypothesis that financial literacy affects economic policy preferences on vote intentions for Brexit and preferences for immigration. Similarly to free trade, findings suggest that financially literate individuals, regardless of economic self-interest, are more likely to be in favor of remaining in the EU and of immigration than their financially illiterate counterparts. The second robustness check concerns omitted variable bias, and more specifically the possibility that financial literacy may be a proxy for liberal and progressive values. Hence, I test whether financial literacy influences attitudes towards gay and lesbian civil rights. The expectation is that financial literacy has no direct effect on social policy preferences, since people do not decide on social policies based on cost and benefit calculations. If this assumption were wrong, we would find financial literacy to be associated with social policy preferences, after controlling for potential confounders. Findings show that, after conditioning on potential confounders, financial literacy is not associated with social policy preferences, and hence it is unlikely to be a proxy for progressive and more tolerant views.

For future research, if more data on policy preferences and economic and financial literacy were available, this theory could be tested across more countries. In many European countries nationalist and populist parties are crossing significant thresholds at the polls. These parties' political agendas include increasingly protectionist economic policies, and a common

denominator has been their tendency to blame globalization and European integration for their country's woes. If future studies suggested that individuals do end up supporting the introduction of more welfare-enhancing economic policies as they are better able to apply economic reasoning and evaluate both the short-term and long-term costs and benefits of reforms, viewing them as social investments, this may suggest that in the long run, providing economic and financial courses from early education, could potentially increase support for welfare-enhancing economic policies.

Chapter 3

THE INFLUENCE OF FINANCIAL AND ECONOMIC LITERACY ON POLICY PREFERENCES IN ITALY

3.1 Introduction

With populism at an all-time high (Funke, Schularick, and Trebesch, 2020), many theories have tried to explain the determinants of nationalist and protectionist policy preferences. Electoral outcomes in the aftermath of the Eurozone crisis across Europe seem to support the contention that there has been a rise in support for non-mainstream, populist parties (Hobolt and Tilley, 2016). Italy represents a case in point. In March 2018 the anti-establishment Five Star Movement became the largest Italian party, while the anti-immigrant League took over *Berlusconi's Forza Italia* to emerge as the dominant party on the right. Running on a similar populist agenda, centered on promises to reintroduce early retirement, deport migrants, institute a guaranteed minimum income, along with tax cuts, the two parties formed a coalition government in May 2018. Most extant theories have focused on testing two competing hypotheses to explain the rise in preferences for populist, often welfare-reducing, policies: one argues that self-interest considerations drive these policy preferences, while the other claims that such attitudes are to be attributed to a cultural backlash against progressive values, such as cosmopolitanism and multiculturalism. Many of these theories implicitly assume that all individuals know what the effects of a policy on their economic well-being will be. Instead, I argue that individuals are not necessarily aware of how a policy affects them and that financial and economic literacy provides a toolkit to understand how policies impact our lives. Some key components of this toolkit include: numeracy, scarcity, costs and benefits, opportunity costs, demand and supply, and discounting. The hypothesis tested in this paper is that financial and economic literacy influences economic

policy preferences. A recent survey by the Bank of Italy on financial literacy has found that Italy is the least financially literate country in Europe (Di Frischia, 2017). Only one in three Italians know at least three of these four basic financial concepts: inflation, interest compounding, interest rates, and risk diversification. Furthermore, issues such as free trade, immigration, Eurozone membership, and pension reforms have been especially salient in Italy, given its struggle to get back on track after the recent financial and economic crisis.

Based on my theoretical argument, I expect financial and economic literacy to influence the accuracy with which an individual evaluates the impact of a certain policy. Assuming that individuals are rational and will choose the policy that they think will give them the highest expected utility, variation in financial and economic literacy, and hence in the accuracy at predicting the effects of a policy, may lead to drastically different policy choices. While financially and economically literate (from here on FEL) individuals are more likely to be accurate at predicting the effect of a specific economic policy on their economic well-being, financially and economically illiterate (from here on FEI) 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 political ideology or cues from reference groups to make their policy decisions, which may lead them to support policies that in the end do not reflect their interests. Furthermore, in the presence of inter-temporal policy trade-offs, I expect FEL individuals to put more weight on the long run, since recent evidence shows that they have lower discount rates and that financial literacy changes people's time preferences (Lahav, Rosenboim, and Shavit, 2015; Magistro, 2020a).

Following the theory, this paper looks at five economic policy preferences:

1) remaining in or leaving the Eurozone,

2) favoring free trade,

3) favoring EU immigration,

4) favoring non-EU immigration,

5) and favoring the Fornero pension reform in Italy[1],

using a representative national survey of the Italian population. First, I test whether on average FEL individuals are more likely to prefer economic openness, and second, whether this holds true across winners from globalization (those with high incomes, high education, and non-routine jobs) and losers from globalization (those with low incomes, low education, and routine jobs). Similarly, I test whether FEL pension reforms winners (age groups 18-55 and 67-88) and losers (people close to retirement in age group 56-66), are more likely to favor the Fornero pension reform than their illiterate counterparts. Finally, to investigate the potential mechanism behind the lack of heterogeneous policy preferences between FEL winners and losers, I also test whether FEL individuals have lower subjective discount rates.

Findings from multinomial logit models indicate that financial and economic literacy does influence economic policy preferences as predicted: FEL individuals, regardless of their economic condition, are more likely to prefer remaining in the Eurozone, to favor free trade, EU immigration, non-EU immigration, and the Fornero pension reform. Finally, findings from a multiple linear regression and the Mann-Whitney U test show that indeed FEL individuals have significantly lower subjective discount rates, providing preliminary evidence that the mechanism behind the lack of heterogeneous effects between FEL winners and losers may be longer time horizons: when analyzing policy issues with long-term implications, FEL short-term losers may be more likely to make sacrifices today in exchange for benefits in the long run.

I also conduct sensitivity analyses to show that my results are not driven by financial literacy or economic literacy alone, and that indeed the two are additive and capture different dimensions of one's ability to evaluate policies. The findings show that each index

[1]In December 2011, as public finances were getting close to collapse, a pension reform (the so-called Fornero reform) was passed in Italy. The reform 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 Five Star and League government in 2018 decreased the retirement age again, regardless of its long-term unsustainability.

individually has the predicted effect on the policies under analysis, however, the sizes of the effects are often smaller, suggesting that in general the composite financial and economic literacy index is a better proxy of an individual's ability to assess the costs and benefits of a policy. I also consider the role of general education alone, distinguishing between people with a high school diploma or less and those with an undergraduate degree or more, as an alternative measure of financial and economic literacy and find no relation between it and policy preferences, suggesting that financial and economic literacy has distinct features that years of schooling do not capture.

This paper contributes to several literatures. The first is the literature on financial literacy. While works on the effects of financial literacy on household decisions, such as retirement, savings, and investment, are thriving and expanding (Behrman et al., 2012; Lusardi, 2009; Lusardi and O. S. Mitchell, 2014b; Lusardi and O. S. Mitchell, 2017; Monticone, 2010; M. C. v. Rooij, Lusardi, and R. J. Alessie, 2012), studies looking at how financial literacy influences policy and political preferences are limited (Fornero and Lo Prete, 2019; Magistro, 2020b; Montagnoli et al., 2016). Since financial literacy alone may not be strongly related to the task being studied in a political context, such as making a policy choice, this study goes beyond financial literacy only and introduces a new measurement of a person's ability to evaluate policies, which also includes a measure of economic literacy, tapping into knowledge of basic economic concepts, and capturing country-specific and policy-specific knowledge too. Furthermore, this paper provides preliminary evidence on an important mechanism between financial and economic literacy and policy preferences, by investigating the role played by subjective discount rates.

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 its distributional consequences using sectoral, factoral, and more recently individual task-level models, implying that individuals are always aware of their economic condition and of the effects of such policies[2]. Similarly,

[2]See for example Acemoglu and D. Autor (2011), Blonigen and McGrew (2014), Owen and Johnston

the majority of studies on preferences for immigration and EU membership test two competing hypotheses, one in relation to their effects on self-interest, and the other focusing on the role of concerns for the cultural impacts of immigration on the country in question[3]. Very few studies (Mansfield and Mutz, 2009; Walstad, 1997), investigate the influence of financial and economic literacy on a set of economic policy preferences, and none, to my knowledge, uses these sets of questions and theoretical and empirical specifications.

The remainder of the paper is organized as follows. The next section contains the theoretical argument, followed by a description of the data and of the models employed, the findings, sensitivity analyses, and the conclusion.

3.2 Theoretical argument

Economic policies often end up with distributional consequences, 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 policies come with distributional consequences at least in the short run, where there are winners and losers, hence explaining why we may not see overwhelming support for open borders[4]. Similarly, although the need to reform public pension systems is clear to experts, this also entails winners and losers in the short run (Fornero, 2015). Population aging and declining productivity growth are some of the factors that have caused the necessity for reform of public pension systems, most of which are financed on a pay-as-you-go (PayGo) basis, where contributions from current workers are directly used to pay for current retirees' pensions. A common solution across European countries has been that of

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(2017), Ebenstein et al. (2014), Kambourov and Manovskii (2009), Matias Cortes (2016), Mayda and Rodrik (2005), and Scheve and Slaughter (2001b).

[3]See for example Card, Dustmann, and Preston (2012), Chandler and Tsai (2001), Citrin et al. (1997), Daniels and Von Der Ruhr (2003), Hainmueller and Hopkins (2014), Inglehart and Norris (2017), Kriesi et al. (2006), Kriesi et al. (2008), O'Rourke and Sinnott (2006), Scheve and Slaughter (2001a), Van Der Brug and Van Spanje (2009), and Elsas, Hakhverdian, and Brug (2016).

[4]http://www.igmchicago.org/surveys/free-trade; http://www.igmchicago.org/surveys/migration-within-europe

raising the retirement age, since as people live longer, they should also work longer[5].

One large strand of the literature on policy preferences has focused on self-interest considerations as determinants of individual policy choices. The literature on free trade has paid particular attention to its distributional consequences using sectoral, factoral, and more recently individual task-level models (Acemoglu and D. Autor, 2011; Blonigen and McGrew, 2014; Owen and Johnston, 2017; Ebenstein et al., 2014; Kambourov and Manovskii, 2009; Matias Cortes, 2016; Mayda and Rodrik, 2005; Scheve and Slaughter, 2001b). 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 performing non-routine tasks, 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. Similarly, one of the key literatures motivating the research on natives' attitudes towards immigrants is the political economy one, which explains preferences for immigration in relation to its effect on self-interest, in a very similar way as in the trade preferences literature (Daniels and Von Der Ruhr, 2003; O'Rourke and Sinnott, 2006; Scheve and Slaughter, 2001a). Likewise, with respect to preferences for or against the EU, most studies have tested the economic insecurity thesis, which contends that preferences for EU membership are determined by self-interest considerations between winners and losers from globalization (Kriesi et al., 2006; Kriesi et al., 2008; Elsas, Hakhverdian, and Brug, 2016).

However, several studies find that preferences for free trade, immigration, and EU membership do not seem to be linked to economic self-interest. For example, Mansfield and Mutz (2009) find little support for the sectoral and factoral models using two U.S. surveys (Mansfield and Mutz, 2009). 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

[5]http://www.igmchicago.org/surveys/aging

one's self. Recent works also suggest that preferences for trade depend on non-material considerations, such as nationalism, ideology, or ethnocentrism (Rho and Tomz, 2017). Rho and Tomz (2017) suggest that these recent findings are actually explained by people's economic ignorance on protectionism. As people learn more about the distributional effects of trade, the relationship between self-interest and policy preferences becomes stronger. However, their experiments also uncovered significant heterogeneous effects across individuals and do not investigate why some groups appear to be more sensitive to economic information than others. Hainmueller and Hopkins (2014)'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 (Card, Dustmann, and Preston, 2012; Chandler and Tsai, 2001; Citrin et al., 1997). In a similar way, several studies find that Euroscepticism is driven more by cultural considerations, especially public attitudes towards immigrants, than by economic ones (Inglehart and Norris, 2017; Van Der Brug and Van Spanje, 2009; Elsas, Hakhverdian, and Brug, 2016).

Findings on the determinants of pension policy preferences are also mixed. Boeri, Boersch-Supan, and Tabellini (2002) find that opposition to reform is very high even among people who have knowledge about the costs and unsustainability of the current systems. However, Boeri and Tabellini (2012) find that citizens who are more informed about the costs and functioning of pension systems are more willing to accept reforms. Finally, using aggregate-level data, Fornero and Lo Prete (2019) 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.

Departing from most extant theories, I argue that the reason why political economy theories often do not hold up in reality has to do with people's lack of understanding of policy effects. I hence hypothesize that financial and economic literacy influences individual economic policy preferences. Financial and economic literacy influences the accuracy with which an individual calculates the effects of a specific policy on their economic well-being. FEL people are expected to be able to conduct more accurate cost-benefit analysis, while FEI

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 political ideology, or cues from reference groups, to make their decisions.

In the absence of heterogeneous effects or inter-temporal trade-offs across policies, predictions are trivial: FEL individuals are more likely to favor the policy with the highest true utility than FEI individuals. However, in scenarios where certain groups stand to lose in the short run, while only experiencing benefits in the long run, it is unclear what individual policy preferences across FEL and FEI individuals would look like. Recent findings from the literature on financial literacy suggest that financially literate individuals are more patient and have longer time horizons (Lahav, Rosenboim, and Shavit, 2015; Magistro, 2020a). 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 FEL 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, FEI individuals are more likely to be inaccurate at calculating the expected utility of the policy.

3.2.1 Financial and economic literacy

In representative democracies it is important for citizens to be able to evaluate policies and subsequently vote for candidates that pursue policies that reflect their interests. But are citizens sufficiently informed and do they understand the policies they are often called to decide upon? In line with Boudreau (2009), Gilens (2001), and Pietryka and MacIntosh (2013), I argue that most current measures of citizens' knowledge, particularly those pertaining to political sophistication, present significant shortcomings. Instead, I propose a measure of financial and economic literacy, which due to its ability to tap into an individual's capacity to evaluate the effects of an economic policy, addresses some of the limitations of the political sophistication literature and of the financial literacy literature.

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' (Atkinson and Messy, 2012). Financial literacy has been identified as a key determinant of personal decisions regarding retirement, savings, and investments (Boisclair, Lusardi, and Michaud, 2017; Delavande, Rohwedder, and Willis, 2008; Jappelli, 2010; Jappelli and Padula, 2013; Lusardi, 2009; Lusardi and O. S. Mitchell, 2014b; M. C. v. Rooij, Lusardi, and R. J. Alessie, 2012). Although the relationship between financial literacy and household decision making is an expanding area of research, the literature investigating the relationship between financial literacy and political and policy preferences is still in its early stages. In this respect, in a recent paper Montagnoli et al. (2016) 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 political spectrum rather than at the extremes (Montagnoli et al., 2016). Investigating the relationship between financial literacy and public policies, Fornero and Lo Prete (2019) find that pension reforms take less of a toll on the politicians that passed them in countries where financial literacy is higher (Fornero and Lo Prete, 2019). Magistro (2020b) measures winners and losers from globalization both objectively (using a measure of the import shock from China) and subjectively (using education, income, and routineness of occupation) and 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 objective or subjective self-interest (Magistro, 2020b).

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 (Lusardi and O. S. Mitchell, 2014b). The objective of these questions is to measure one's understanding of basic financial concepts, such as how to balance a budget, how compound interest works, or how inflation affects one's income. However, although financial literacy questions provide a good overview of a person's basic financial knowledge, there may be limitations in using

these alone in a political and policy context. These questions fail to capture country-specific and policy-specific knowledge, such as understanding how the tax system or the pension system in one's country work, and how changes in these policies influence one's economic well-being (Atkinson and Messy, 2012). For example, a person may know what inflation is, but if they do not know that tariffs can be inflationary, knowledge about inflation may not be very informative of their trade preferences. For this reason, in this study I not only include a measure of financial literacy, but I also add questions that tap into economic literacy, building an additive index.

Financial and economic literacy requires having the knowledge, skills and confidence to understand and evaluate economic concepts not only as they relate to our personal finance, but also to our political systems. Financial and economic literacy provides a toolkit to understand how policies affect our lives. Some key components of this toolkit include: numeracy, compound interest, inflation, risk diversification, costs and benefits, opportunity costs, and discounting. For instance, in order to understand how a pension reform affects one's economic well-being one needs to have basic numeracy skills, to understand compound interest in order to also understand how pension wealth accumulation works (not only in fully funded pension systems but also in the public NDC systems), to understand what inflation is and whether it will dissipate one's pensions savings, and to understand the concept of risk diversification, especially as voluntary supplementary pension plans become more common, as a way to combine an unfunded and a funded pension. People need to understand the difference between pay-as-you-go systems, where current workers pay for current pensions, and fully funded systems, where each individual has their own pension fund that earns interest over time. The concept of opportunity cost is also important, especially in PayGo systems, which if in deficit require a top-up from the public budget: those funds could have been spent on more productive uses. Finally, it is important to be able to understand the short run and long run costs and benefits of a reform. Here discounting is particular important: people who know about concepts like the time value of money are also more likely to have longer time horizons (lower discount rates) (Lahav, Rosenboim, and Shavit, 2015; Magistro,

2020a), and this is especially important for reforms that entail very clear short run costs and uncertain long term benefits, as is often the case not only for pension reform but for many other structural reforms, including those relating to climate change. I hence build a financial and economic literacy measure that taps into the different concepts of this toolkit, including numeracy, compound interest, inflation, risk diversification, and costs and benefits.

Other measures that have been used to capture similar underlying concepts are political sophistication, numeracy, and education. However, I argue that these are imperfect measures of the underlying concept exposed in this paper. First, political sophistication is usually proxied by an index measuring an individual's ability to answer factual questions about politics, with questions asking respondents to identify key political figures like the vice-president, the party that holds the majority in the House, the relative ideological position of the two parties, the veto override percentage, and judicial review (Delli Carpini and Keeter, 1996). The problem with this measure is that it is not clearly related to the tasks that an individual conducts when making a policy choice, which implies weighting the costs and benefits of a proposal. When it comes to numeracy, although possibly correlated with some measures of financial and economic literacy, it is unlikely to be a substitute for them. Having math skills does not necessarily mean using the economic way of thinking of costs and benefits, trade-offs, and incentives or possessing policy related knowledge, so although it may be a necessary condition for financial and economic literacy, it is far from being sufficient. Previous studies confirm this intuition and suggest that financial and economic literacy is distinct from numeracy (Fornero and Lo Prete, 2019). Lastly, another question pertains to whether financial and economic literacy is actually distinct from general education or not. To this end, multiple studies find that this is the case. Financial and economic literacy has distinctive features that more general dimensions of education do not capture (Caplan, 2002; Fornero and Lo Prete, 2019). As a sensitivity analysis I test this latter hypothesis, specifically whether financial and economic literacy is distinct from education.

3.2.2 Effect heterogeneity: winners and losers from different policies

Although on aggregate the policies under analysis lead to efficiency gains, they also come with distributional consequences, creating different sets of winners and losers. More specifically, in this case, in line with consistent findings from the literature, on the one hand, FEL 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 FEL losers from globalization (individuals with lower income, lower education, and routine jobs) are 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 (Magistro, 2020b) 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 operates on economic policy preferences is via lower discount rates, we might not find a differential preference between FEL winners and losers, as they would both be more likely to favor economic openness than their illiterate counterparts. Experts 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 employment[6]. 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 (Coppel, Dumont, and Visco, 2001; Foged and Peri, 2016; Leeson and Gochenour, 2015; Hamilton and Whalley, 1984; G. I. P. Ottaviano and Peri, 2012; G. I. Ottaviano, Peri, and Wright, 2013; Peri, 2012; Sequeira, Nunn, and Qian, 2020). Hence, it is plausible that, if FEL individuals indeed have longer time horizons, FEL losers from globalization 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 FEL people closer to retirement age (age group 56-

[6]http://www.igmchicago.org/surveys/free-trade

66) to be more likely than FEI individuals to be opposed to a pension reform that increases retirement age since it will affect them more directly and immediately. However, if the assumption that FEL individuals indeed have lower discount rates is true, we might not find a differential preference across the two different FEL age groups if we expect FEL 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. In the next section I explore how subjective discount rates may operate as a mechanism between financial and economic literacy and policy preferences.

3.2.3 Subjective discount rates

Subjective discount rates (SDR) measure the degree to which an individual discounts a future reward. A higher SDR means that the individual is less patient, while a lower one means that the individual is more patient and future oriented. Patience is a topic of great interest in economics, psychology and political science. Studies suggest that more patient people are more cooperative and that they have better financial outcomes, for instance through searching longer for a good job, having higher credit scores, and being less likely to default on their loans (Curry, M. E. Price, and J. G. Price, 2008; Daly, Delaney, and Harmon, 2009; Della Vigna and Paserman, 2005; Meier and Sprenger, 2007). In the political realm, it seems like more patient individuals are more willing to make sacrifices today in order to enact policies that will bear benefits in the long run (Amdur et al., 2015; Fowler and Kam, 2006; Healy and Malhotra, 2009; Jacobs and Matthews, 2012).

Recent studies find that subjective 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 (2013) suggest that discount rates influence financial literacy, as they find that more future-oriented respondents are more likely to participate in free financial counseling programs (Meier and Sprenger, 2013). However, both Lahav, Rosenboim, and Shavit (2015) and Magistro (2020a) conduct classroom experiments among undergraduate students 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 (Lahav, Rosenboim, and Shavit, 2015; Magistro, 2020a). In particular, Magistro (2020a) addresses some endogeneity concerns that plagued some past studies and also finds that there is not a selection effect into economics and finance, as students enrolling in these fields do not have significantly lower SDRs than other students when they start college; and finally that more schooling in general does not change time preferences, only financial and economic education does. This may explain why certain citizens are more willing to make sacrifices today in order to enact policies that will only bring benefits in the long run.

3.2.4 Hypotheses

From these follow my hypotheses:

- H1: On average, FEL individuals are more likely to favor remaining in the Eurozone, EU immigration, non-EU immigration, free trade, and the Fornero pension reform than their FEI counterparts;

- H2: FEL winners and losers from economic openness and from pension reform are more likely to favor remaining in the Eurozone, EU immigration, non-EU immigration, free trade, and the Fornero pension reform than their FEI counterparts;

- H3: FEL individuals are more likely to have lower subjective discount rates.

3.3 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 survey research firm Cint[7]. I created the survey questions in Qualtrics and Cint recruited a representative sample of the Italian population, adding quotas to make the respondents representative in terms of age, gender, and region of residence, and distributed the survey. Participant recruitment occurred in July 2018, including a total of 1,128 individuals, all of whom were over 18[8].

3.3.1 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

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

[7]For more information on Cint see `www.cint.com`.

[8]I used multiple imputation with the R package Amelia to deal with 211 missing values, but the analysis was also run with listwise deletion and findings do not change. Multiple imputation has been shown to reduce bias and increase efficiency compared to listwise deletion (Honaker, King, and Blackwell, 2011). I run the analyses on 5 multiply imputed datasets, since Honaker, King, and Blackwell (2011) argue that unless the rate of missingness is very high 5 imputed datasets are enough.

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

3.3.2 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 numeracy, interest compounding, inflation, interest rates, and risk diversification (Lusardi and O. S. Mitchell, 2014b). 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?'[9]

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:'[10]

1) The cost of producing products will decrease,

2) Job opportunities in export industries will increase,

3) Consumers will pay higher prices for products,

4) Don't know.

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[9]Italy has a nonfinancial defined contribution (NDC) pension scheme, which features the lifelong contribution-benefit link of defined contribution systems, but is based on a pay-as-you-go format, where contributions paid by current workers finance current pensions, with additional funds possibly coming from the overall government budget (Fornero, Oggero, and Puglisi, 2020; Fornero, 2015). Like in many other EU countries, the national social security system (INPS) is the main pension provider, with the standard of living of the elderly depending largely or exclusively on it (Fornero, Lusardi, and Monticone, 2010). This suggests that respondents would be unlikely to address this question thinking of any voluntary supplementary private pension plans, since to this day the number of workers enrolled in a private pension fund is still low. Furthermore, this question has been validated and used in other papers analyzing the Italian context by Boeri, Boersch-Supan, and Tabellini (2002) and Boeri and Tabellini (2012). Their findings similarly show that most respondents are unaware of how the Italian pension system works, with about half the respondents not understanding how the pay-as-you-go system works.

[10] This question is one of the questions asked in the Test of Economic Literacy by Walstad, Rebeck, and Butters (2013), which has been revised and used throughout the US to assess knowledge of basic economic concepts to high school students for over 40 years. The economic content of the Test of Economic Literacy is based on the Voluntary National Content Standards in Economics by the Council of Economic Education, which focuses on the more fundamental economic ideas and concepts that are widely shared by professional economists.

The third question asks: 'Economic research agrees on the effects of immigration on advanced economies. More specifically'[11]:

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,

[11]This questions taps into what current research finds about the impacts of immigration on wages and employment. While there are widespread beliefs that immigration increases unemployment and reduces wages among native workers, falling prey to "the lump of labor fallacy" and to the idea that there is a fixed number of jobs to go around, this is problematic for at least two reasons (Leeson and Gochenour, 2015; Portes, 2019). Most models assume that workers are perfectly substitutable for one another. In this context, immigration would increase the supply of labor, which would in turn lead to a decline in the wages of native workers. However, immigrant labor may be in many cases complementary to some subpopulations of native labor. In this latter case, immigration would actually raise native wages. The second problem of using this model to predict immigration's economic effects is that it is a partial-equilibrium model, and it ignores important general-equilibrium effects of immigration. For instance, an influx of immigrants does not only increase the supply of labor, it also increases the demand for labor, since immigrants are also consumers and become employers themselves, putting upward pressure on native wages and employment (Leeson and Gochenour, 2015; Peri, 2012; Portes, 2019). Several studies show that increased immigration leads to net gains in GDP, it has no direct impact on unemployment in the host country, it increases innovation, and it actually increases total factor productivity (Coppel, Dumont, and Visco, 2001; Foged and Peri, 2016; Hamilton and Whalley, 1984; G. I. P. Ottaviano and Peri, 2012; G. I. Ottaviano, Peri, and Wright, 2013; Peri, 2012; Sequeira, Nunn, and Qian, 2020). The negative impacts of migration for native workers in developed countries are, if they exist at all, relatively small, short-lived and affect unskilled native labor (Portes, 2019).

2) 2 correct answers,

3) 3 correct answers,

4) 4 correct answers,

5) 5 correct answer, and

6) 6 correct answers.

In the sensitivity analyses, I consider financial literacy and economic literacy alone, to show that my results are not sensitive to either index. Furthermore, I also consider education, to show that financial and economic literacy has distinctive features from years of schooling in general.

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 individual annual income as a proxy of capital endowment and level of education to measure skill endowment (Hays, Ehrlich, and Peinhardt, 2005; Mansfield and Mutz, 2009). 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(Acemoglu and D. Autor, 2011; Halikiopoulou and Vlandas, 2018; Matias Cortes, 2016). *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 (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 individual's respondent gross income is[12]. 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, I also include political ideology as a control variable. The main concern is that the economic literacy questions may be confounded by political ideology. Political ideology may affect both how people answer factual economic questions and their economic

[12]The numbers are in line with those reported by the Ministry of Economy and Finance in 2018: https://www.repubblica.it/economia/miojob/lavoro/2019/03/28/news/mef_il_reddito_medio_italiano_e_sceso_a_20_670_euro-222716008/

policy preferences, confounding the relationship. The political ideology variable is a self-placement question where respondents self-identify from 0 - extreme left - to 10 - extreme right.

Finally, the usual demographic controls are also included (gender, region of residence, age). Table 3.1 shows descriptive statistics for the dependent variables, Table 3.2 shows descriptive statistics for the constructed measure of financial and economic literacy, and Table 3.3 shows descriptive statistics for the other independent and control variables, from one of the imputed datasets (N = 1,128).

3.3.3 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[13]. The question asks: 'You are supposed to receive 15,000 €in your bank account 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' [14]. The annual discount rate for delaying payment was calculated as follows:

$$SDR = \left(\frac{P}{X} - 1\right) \cdot \frac{12}{t} \tag{3.1}$$

[13]Two methods are mainly used to measure SDRs: the choice-based methods and the matching method. Choice-based methods present participants with a series of binary comparisons and use these to infer an indifference point, which is then converted into a discount rate. Conversely, with the matching method, which is used here, subjects reveal an indifference point, and hence an exact discount rate can be imputed for a single response. Most often these indifference points can then converted to discount rates, using two popular equations: exponential or hyperbolic. The hyperbolic model has been found to descriptively model discounting data better than the exponential model and hence it is used here (Hardisty et al., 2013). As to the choice between choice-based methods or the matching method, there is no theoretical basis for preferring one of these methods over any other, but there are trade-offs for each and they actually yield very different discount rates. The former is often associated with an anchoring problem, where the discount rates may simply be recovering the expectation of the experimenter (Frederick et al., 2008). The latter though, although much quicker to ask, appears harder for participants to understand (Hardisty et al., 2013).

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

Table 3.1: Descriptive statistics of the dependent variables for the imputed dataset (N = 1,128)

	Relative frequency, %	N
Vote intention on Italexit		
Stay in the Eurozone	59.2	666
Leave the Eurozone	26.8	303
Don't know	14	158
Views on immigration from EU		
Oppose	10.5	118
Favor	85	958
Don't know	4.5	51
Views on immigration from outside EU		
Oppose	47.7	538
Favor	42	473
Don't know	10.3	116
Views on free trade with the EU		
Oppose	12.5	141
Favor	80.9	912
Don't know	6.6	74
Views on Fornero pension reform		
Oppose	61.2	690
Favor	24.8	279
Don't know	14	158

Table 3.2: 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
N	29	163	282	275	223	110	45
Financial literacy questions							
	% Correct	N	% Incorrect	N	% Don't know	N	
Interest rate	71.4	805	22.8	256	5.8	66	
Inflation	68.3	769	20.8	235	10.9	123	
Risk diversification	54.5	615	13.6	359	31.9	153	
Economic literacy questions							
	% Correct	N	% Incorrect	N	% Don't know	N	
Pay as you go pensions	33	372	61.5	693	5.5	62	
Effects of protectionist measure	53.1	599	33.2	374	13.7	154	
Effects of immigration	30	338	51.6	582	18.4	207	

Table 3.3: Descriptive statistics of the other independent and control variables for the imputed dataset (N = 1,128)

		Rel. frequency, %	N
Education			
	Low education	66.9	754
	High education	33.1	373
Income			
	Low income	31	350
	Middle income	46.2	521
	High income	22.8	256
Occupation			
	Non-routine	45	275
	Routine	54.9	336
Female		50.6	570
Region			
	North	44	492
	Center	19.2	215
	South	36.8	411
		Mean	Sd
Age		45	14.4
Political ideology		6.3	2.8
Discount rate (with outliers)		121,838	2,139,975
Discount rate (without outliers)		29	32

where P is the amount the subject is willing to accept in t months for delaying the receiving of the amount X today.

3.4 Models

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

I use multinomial logit models to test the relationship between financial and economic literacy and policy preferences. Let Y_i be the unordered categorical dependent variable for individual i which takes an integer values $j = 1, ..., J$. I model respondent i's policy preference using multinomial logistic regression:

$$Y_i \sim Multinomial(Y_i \mid \pi_{i,j}) \tag{3.2}$$

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

$$\pi_{i,j} = \frac{exp(\mu_{i,j})}{\sum_{k=1}^{J} exp(\mu_{i,j})} \tag{3.3}$$

$$\mu_{i,j} = \beta_{j0} + \sum_{k=1}^{P} \beta_{j,k} x_{i,k}, \tag{3.4}$$

where 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. I estimate all models using this specification, with different outcome variables, interaction terms, and controls[15].

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

In this paper, since data on subjective discount rates is available, I investigate whether lower subjective discount rates among FEL individuals might be one mechanism behind the lack of a differential effect between FEL winners and losers from the policies under analysis. First, I run a multiple linear regression:

$$y_i = \beta_0 + \beta_k x_{i,k} + \epsilon_i \tag{3.5}$$

[15]All regression tables are available in Appendix B.

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, age, gender 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. Subjective discount rates calculated with this type of question are very high with high variance, in line with earlier findings (Lahav, Benzion, and Shavit, 2011; Lahav, Rosenboim, and Shavit, 2015; Thaler, 1981). Table 3 shows that the response variable includes very significant and extreme outliers, which may or may not be the result of misentered numbers or non-sensical answers. An OLS on this data would be extremely unreliable as it would essentially be a regression on noise. In these cases it is essential to use methods not overwhelmed by those outliers. Hence, I take three steps. First, I run a robust and resistant regression[16]. Whereas robust regression methods attempt to only dampen the influence of outlying cases, resistant regression methods use estimates that are not influenced by any outliers. This is best accomplished by trimming the data, which"trims" extreme values from either end (or both ends) of the range of data values. This is a conservative principled method for avoiding giving any weight to cases that are clearly extreme, while only giving weight to the central part of the data. Second, I run an OLS regression on a dataset where I have removed cases with high discrepancy and high leverage. In order to identify such cases I take two steps: I use a measure of leverage - "standardized" hat scores - that tell us how much weight an observation carries in least squares; furthermore, I use a measure of discrepancy - studentized residuals - that tell us how outlying each residual is. These, together, tell us how much influence an observation has. I consider outliers those observations with absolute hat scores and/or studentized residuals above 3. Finally, I run a quantile regression at the 50th quantile, hence a median regression, which is more robust to

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

outliers. In all models I control for potential confounders such as age, gender, income and education.

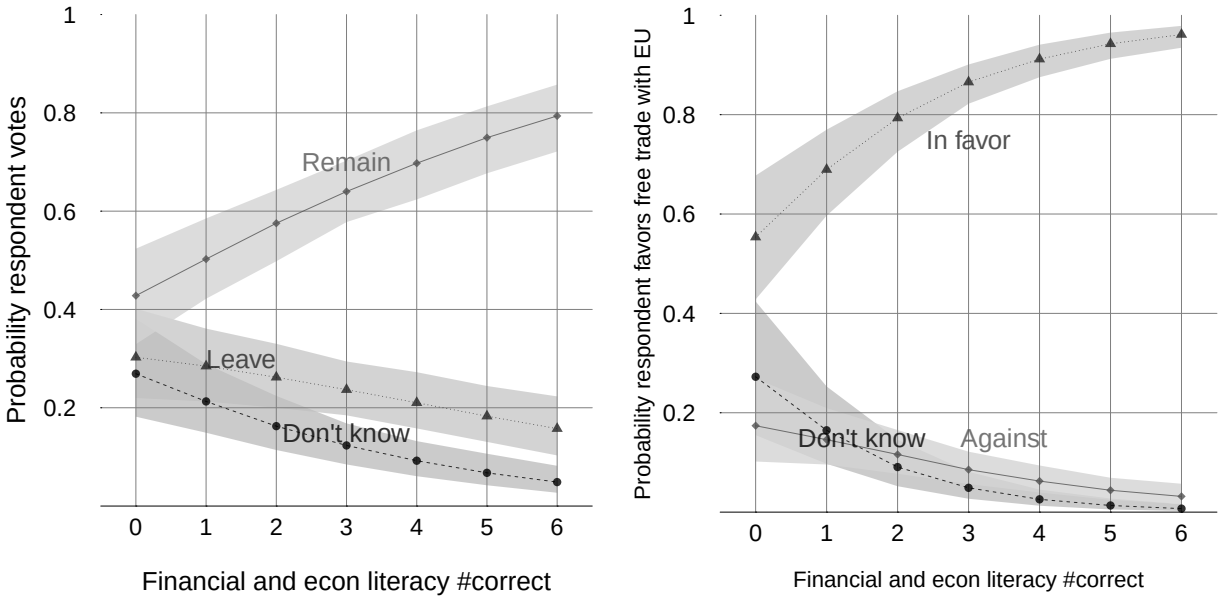
The second test I run consists in looking specifically at potential losers from the policies under analysis and comparing subjective discount rates between FEL and FEI individuals. Due to the unknown distribution of subjective discount rates I use the Mann-Whitney U test. In case that there are few observations and several outliers, the t-test may give unreliable results: Outliers can affect the sample mean and they can also make the standard errors larger than what they should be. If the observations come from a distribution which is skewed, and the sample size is small, then the central limit theorem may not hold, in which case the t-test is inappropriate. As explained in the paragraph above, I do not use a linear regression due to extreme outliers. However, I do not use robust and resistant regression in this case since on really small samples (I am only including the losers from these policies) resistant measures may not have enough observations to work with and may be very inefficient. Conversely, non-parametric tests, like the Mann-Whitney U test, are less sensitive to distributional assumptions. 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.

3.5 Results

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

The first hypothesis that I test (H1), using multinomial logit models, is whether on average FEL individuals are more likely to favor economic openness and pension reform than FEI individuals. The following figures show the expected probabilities with 95% confidence intervals of favoring or not favoring Eurozone membership, free trade, EU immigration, non-EU

immigration, and the Fornero pension reform[17].



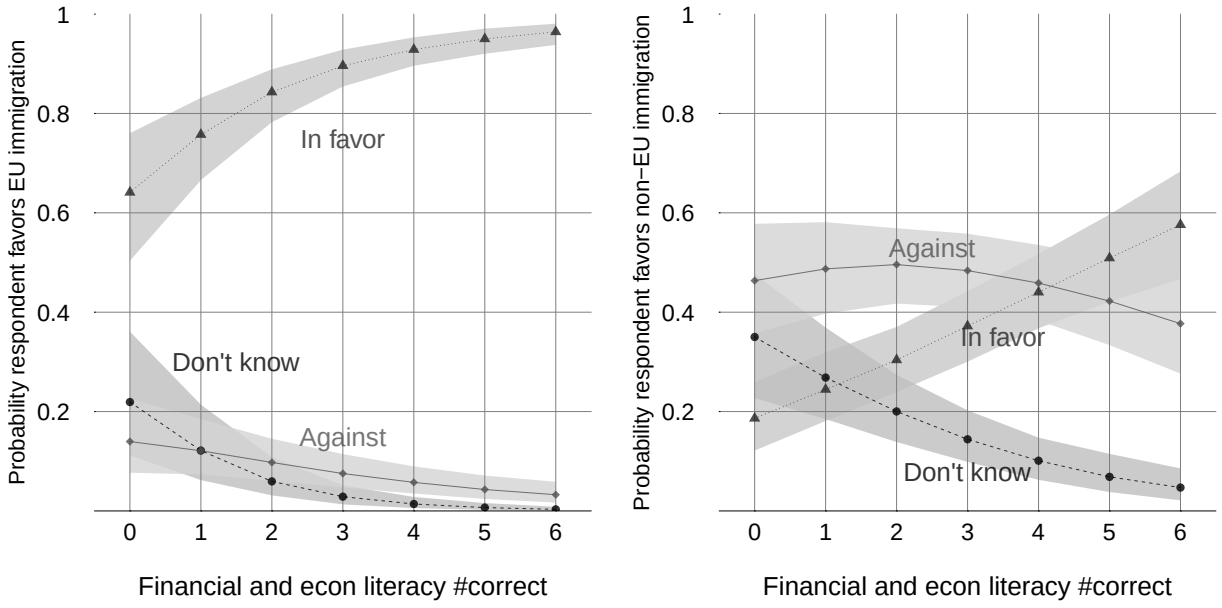
(a) Eurozone

(b) Free trade

Figure 3.1: Expected probabilities of voting Remain or Leave in Eurozone membership referendum, and of favoring free trade with the EU with 95% confidence intervals

Figures 3.1 to 3.3 show that as financial and economic literacy increases so does the probability that the respondent favors remaining in the Eurozone, free trade, EU immigration, non-EU immigration, and the Fornero pension reform. After estimating the models, we can interpret the results by simulating the probabilities of favoring each policy under different levels of financial and economic literacy, while holding all other covariates constant at their means. This process adds no new modeling assumptions. I define as FEL individuals those who got five out of six questions correctly (mean + 1sd of financial and economic literacy score or 85th percentile) and as FEI those who got one out of six questions correctly (mean -

[17]The figures are generated using the full models that include all the controls: education, income, political ideology, age, gender and region. Appendix B shows the regression tables (B1 through B5).



(a) EU Immigration

(b) Non-EU immigration

Figure 3.2: Expected probabilities of favoring EU immigration, and of favoring non-EU immigration with 95% confidence intervals

1 sd of financial and economic literacy score or 15th percentile). This helps to understand the substantive significance of these findings[18]. A FEL individual is respectively 25%, 26%, 19%, 27%, and 11% more likely than a FEI individual to favor remaining in the Eurozone, free trade, EU immigration, non-EU immigration, and the Fornero pension reform (see figures 3.8 to 3.10).

[18]I use Zelig in R to simulate the probability to favor each policy when financial and economic literacy is 1 vs 5, while keeping everything else constant in the model. Zelig takes the difference between these two values for us, called first difference. So the first difference in predicted probabilities for each category j, as defined in King, Tomz, and Wittenberg, 2000 is given by:

$$FD_j = Pr(Y = j \mid x_1) - Pr(Y = j \mid x) \text{ for } j = 1, \ldots, J.$$

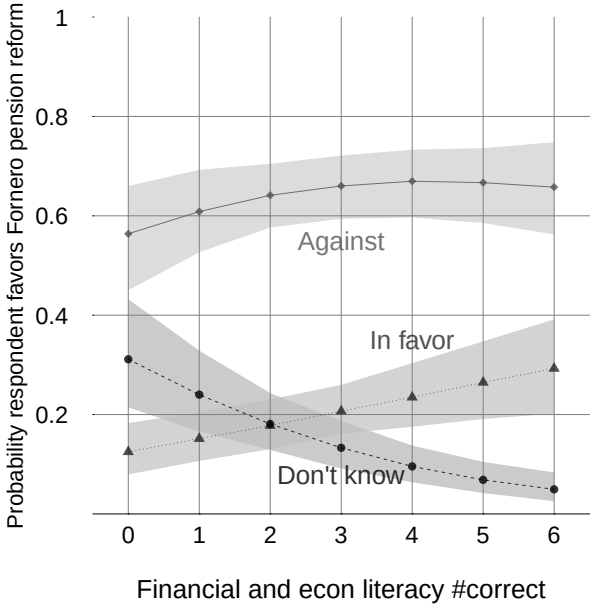


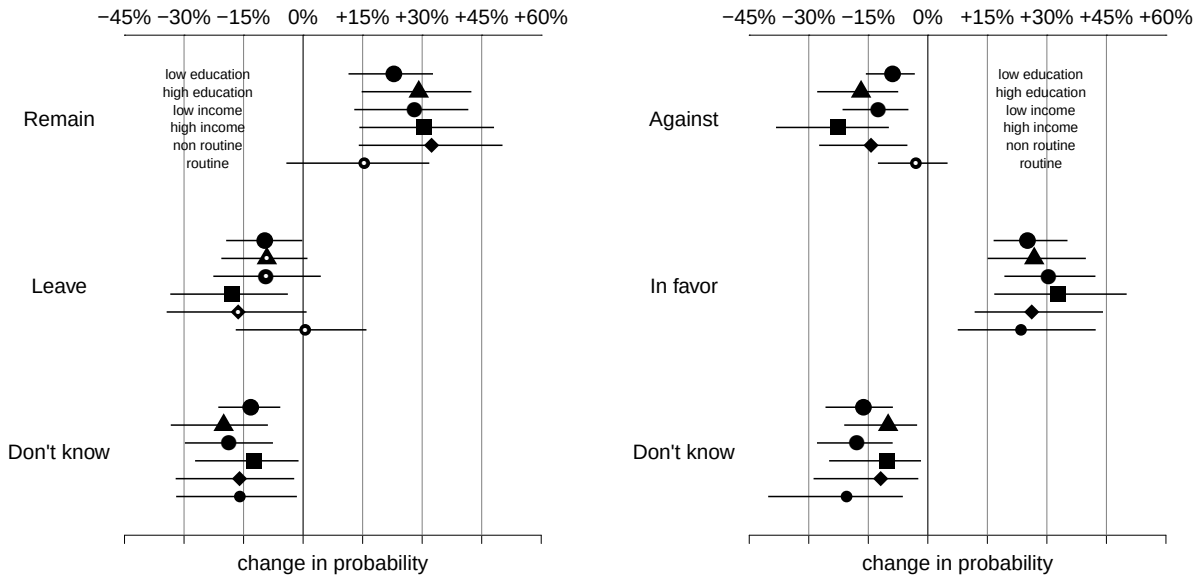
Figure 3.3: Expected probabilities of favoring Fornero pension reform with 95% confidence intervals

3.5.2 Heterogenous effects

I then test the second hypothesis (H2), specifically whether both FEL winners and losers from economic openness and pension reform are more likely to favor remaining in the Eurozone, free trade, EU immigration, non-EU immigration, and the Fornero pension reform than similar FEI individuals. Figures 3.4 to 3.6 show the change in probability of favoring the policies under analysis under different levels of financial and economic literacy with 95% confidence intervals[19].

Across all models FEL individuals, regardless of economic condition, are more likely to favor economic openness and pension reform. The results are statistically significant for all of the policies under analysis and for all sub-groups, except for routine workers, for which the

[19]The figures are generated using the full models that include all the controls: education, income, political ideology, age, gender and region. Appendix B shows the regression tables (B6 through B10).



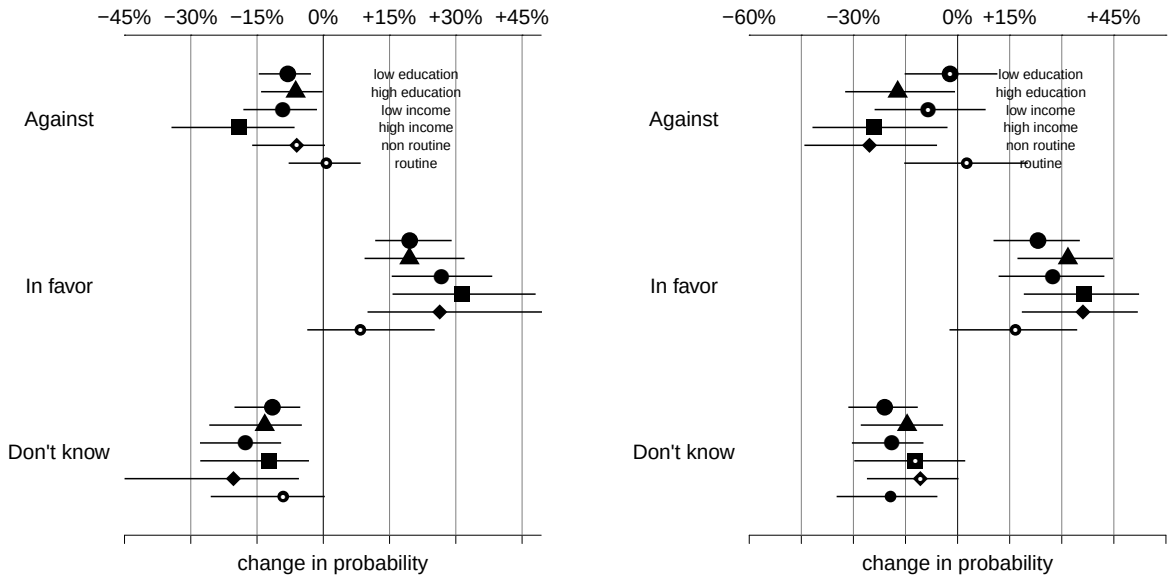
(a) Eurozone membership

(b) Free trade

Figure 3.4: Change in probability of voting Remain or Leave in Eurozone membership referendum, and of favoring free trade with the EU with 95% confidence intervals between FEI individuals (1 correct answers) and FEL individuals (5 correct answers), by education, income, and job routineness

effects are in the expected direction, but they fail to reach statistical significance. This might be due to the fact that 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 (609 out of 1128).

To understand the substantive significance of the results, it might help to look at the changes in probability of favoring each policy, where we are comparing individuals who got one questions correctly (FEI individuals) to individuals who got five questions correct (FEL individuals). With regard to the question on remaining or leaving the Eurozone, among individuals with low education, FEL individuals are 22% more likely to vote remain than



(a) EU Immigration

(b) Non-EU immigration

Figure 3.5: Change in probability of favoring EU immigration, and of favoring non-EU immigration with 95% confidence intervals between FEI individuals (1 correct answers) and FEL individuals (5 correct answers), by education, income, and job routineness

similar FEI individuals, while for those with high education, the FEL are 30% more likely to vote remain than the FEI.

The results for free trade tell a very similar story. Looking at individuals with low education, FEL individuals are 25% more likely to be in favor of free trade than similar FEI individuals, while for those with high education, the FEL are 27% more likely be in favor of free trade than the FEI.

Findings for immigration both from the EU and from outside the EU also support the hypotheses. To provide another example of the substantive significance of these results, low educated and highly educated FEL individuals are respectively 20%(23%) and 19%(32%) more likely to be in favor of EU immigration (non-EU immigration) than similar FEI indi-

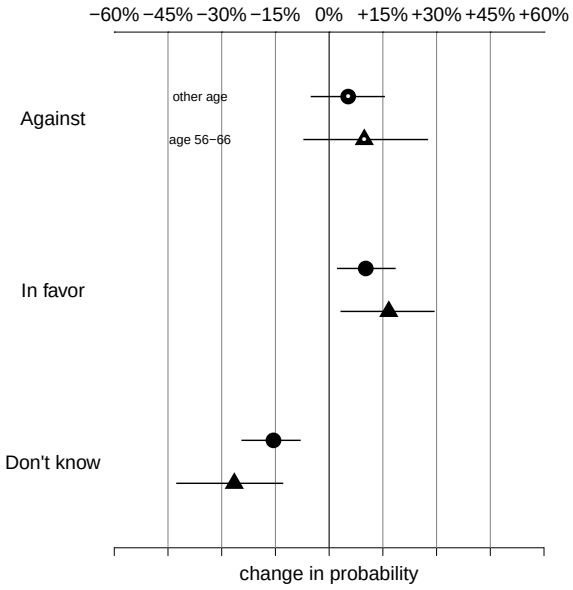


Figure 3.6: Change in probability of favoring Fornero pension reform with 95% confidence intervals between FEI individuals (1 correct answers) and FEL individuals (5 correct answers), by age group

viduals.

Finally, the results from pensions suggest that FEL individuals in the 56-66 age group and in all other age groups are respectively 17% and 10% more likely to be in favor of the Fornero pension reform than similar FEI individuals.

Overall, these results support the hypothesis that FEL individuals, regardless of their self-interest, are more likely to favor remaining in the Eurozone, free trade, EU immigration, non-EU immigration, and the Fornero pension reform than similar FEI individuals.

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

The third hypothesis (H3) that I test is whether FEL individuals do indeed have lower discount rates, explaining the lack of heterogeneous effects between FEL winners and losers. Figure 3.7 shows that this is the case for the robust and resistant regression, for the OLS regression that excludes extreme outliers, and for the quantile regression at the 50th quantile: as financial and economic literacy increases, subjective discount rates decrease[20].

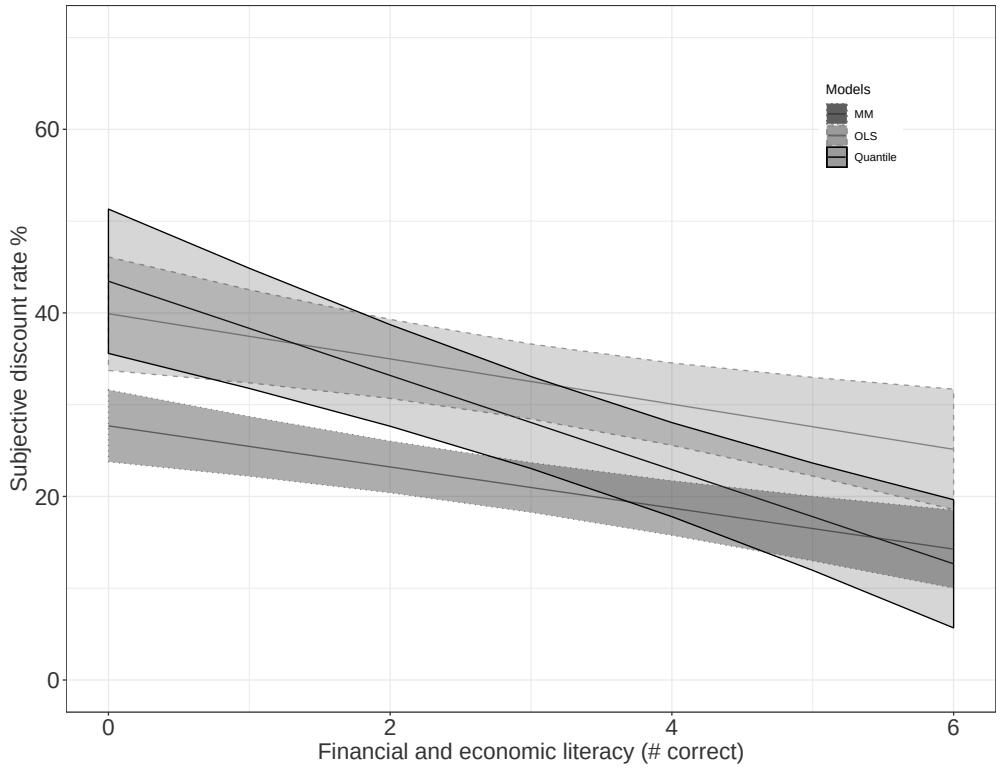


Figure 3.7: Expected values - Subjective discount rates by financial and economic literacy

The third hypothesis is 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 FEL (those

[20]Appendix B shows the regression table (B11).

Table 3.4: Summary statistics of subjective discount rates (SDR) and Mann-Whitney Test for imputed dataset (for dataset without outliers in parentheses) between FEL and FEI individuals.

Group	Count	Mean SDR	Median SDR	Standard Dev. SDR	Mann-Whitney test	
					W	p-value
Low income						
FEL	41 (37)	83.4 (32)	20 (20)	203.7 (38.9)	109,060	0.000
FEI	56 (36)	300,900 (40.6)	50 (33.3)	1,062,200 (34.1)	(56,950)	(0.000)
Low education						
FEL	97 (87)	113.6 (17.8)	6.7 (6.7)	676.4 (23.4)	206,050	0.000
FEI	84 (56)	231,518 (36.6)	33.3 (33.3)	844,089 (31.3)	(111,850)	(0.000)
Routine						
FEL	51 (46)	161.6 (13.2)	6.7 (6.7)	918.9 (18)	84,372	0.000
FEI	26 (14)	464,600 (36.7)	66.7 (33.3)	1,361,749 (28.5)	(47,120)	(0.000)
Age (56-66)						
FEL	52 (50)	12.4 (12.8)	6.7 (6.7)	15.2 (15.3)	80,586	0.000
FEI	22 (15)	546,237 (35.9)	33.3 (33.3)	1,243,905 (30.8)	(51,050)	(0.000)

scoring above mean + 1 sd of FEL index) and FEI (those scoring below mean - 1 sd of FEL index) potential losers from the policies under analysis. Table 3.4 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 indicates that the subjective discount rates of FEL losers are significantly lower from those of their FEI counterparts[21].This suggests that it is possible that FEL losers from certain policies may be weighting the long-term gains more than the short run losses.

While findings from both Magistro (2020a) and Lahav, Rosenboim, and Shavit (2015) suggest that there is a causal relationship between financial literacy and subjective discount

[21]Results are significant even when running the standard t-test.

rates, it is possible that these studies among college students are not generalizable to the broader population. Hence, the lack of heterogeneous effects between FEL winners and losers may be due to other unobservable factors. One plausible explanation could be that FEL individuals are more sociotropic – they care more about how a policy affects their country than themselves – rather than egotropic – driven by pocketbook evaluations. As a matter of fact, Mansfield and Mutz (2009) provide evidence from the US that sociotropic perceptions of how trade affects the country as a whole are more important than egotropic perceptions of one's self in predicting trade policy preferences. These perceptions may vary along different levels of financial and economic literacy. FEL individuals' higher accuracy at calculating the effects of a policy may make them more likely to be able to identify both individual and country-level effects correctly, while inaccuracy may bias the FEI individuals' calculations. This question should be further investigated in future studies.

3.6 Sensitivity analyses

3.6.1 Different indicators of financial and economic literacy

As I laid out in my theory, I argued that in a political context financial literacy alone may not capture the country and policy-specific knowledge required to make an accurate policy assessment. For this reason, I added a battery of economic literacy questions, which were aimed at constructing a better proxy for one's ability to estimate the effects of any economic policy on their economic well-being. Here, I check whether it is indeed the case that the financial and economic literacy index captures different, additive dimensions of this ability, or whether the results are driven by just one. Furthermore, I also assess whether financial and economic literacy is distinct from general education.

Hence, I run all the full models using the financial and economic literacy index, the financial literacy only index, the economic literacy only index, and education only.

Before I proceed, one concern is that the composite index may be plagued by collinearity. Collinearity is a problem when two variables in a regression model are highly correlated.

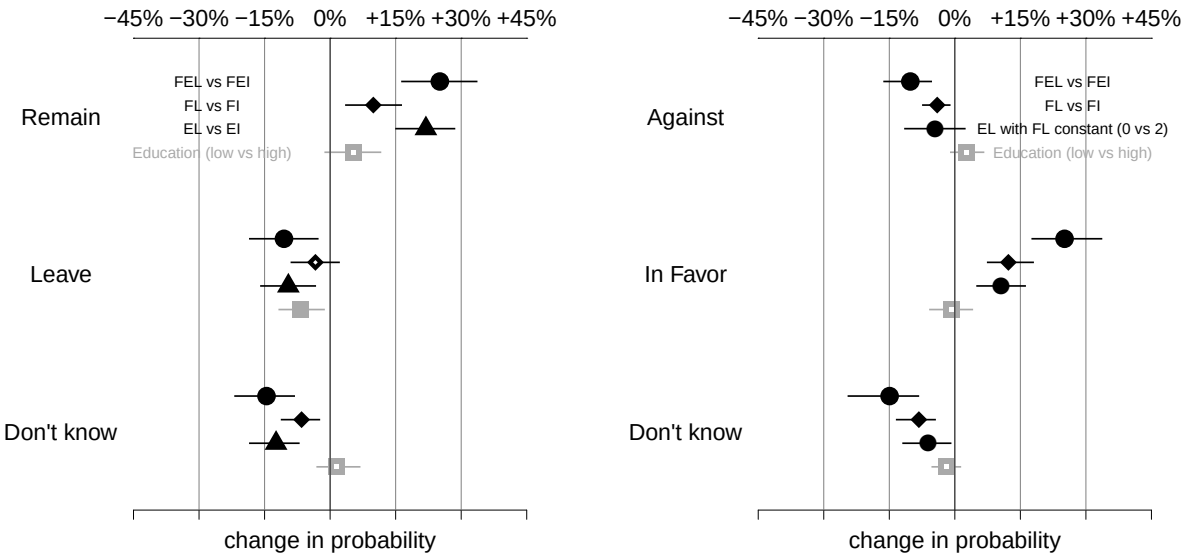
In this case, the coefficient estimates can swing substantially and become very sensitive to small changes in the model, reducing the precision of the coefficients. To alleviate concerns, in table 3.5 I show the correlation coefficient between the financial literacy index and the economic literacy index. The correlation between the two separate indices is relatively weak: 0.26. This means that the proportion of variation in one variable that can explained by the other is only about 6.8%.

Table 3.5: Table of correlations between Financial Literacy index and Economic Literacy index.

	Financial Literacy Index
Economic Literacy Index	0.26***

Figures 3.8 to 3.10 show the changes in probability of favoring or not favoring Eurozone membership, free trade, EU immigration, non-EU immigration, and the Fornero pension reform, between literate (highly educated) and illiterate (low educated) individuals. Literate individuals are those at the 85th percentile (or whose score was equal to the mean score plus one standard deviation), hence those that answered 5 questions correctly out of 6 for financial and economic literacy, 3 out of 3 for financial literacy and 2 out of 3 for economic literacy. Illiterate individuals are those at the 15th percentile (or whose score was to equal to the mean score minus one standard deviation), hence those that answered 1 question correctly out of 6 for financial and economic literacy, 1 out of 3 for financial literacy and 0 out of 3 for economic literacy. Highly educated individuals are individuals with a college degree or more, while low educated individuals are those with a high school diploma or less.

The results indicate that when using financial literacy alone or economic literacy alone, although most of the effects are smaller, their direction is unchanged: no matter what index of financial and economic literacy we use, literate people are always more likely to favor each of the policies under analysis than illiterate people, and this is especially the case



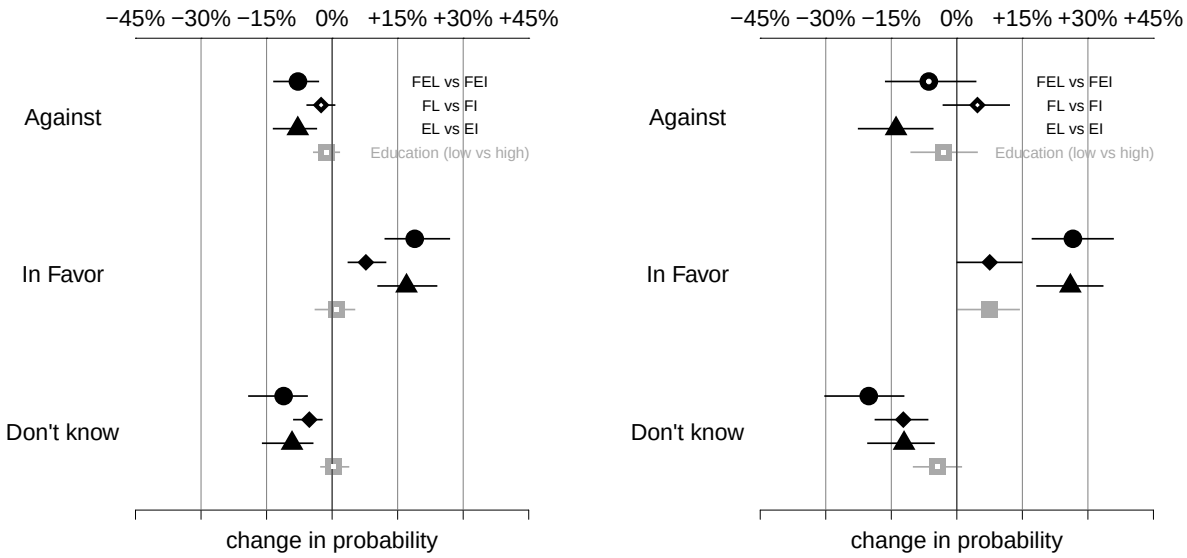
(a) Eurozone membership

(b) Free trade

Figure 3.8: Change in probability of voting Remain or Leave in Eurozone membership referendum, and of favoring free trade with the EU with 95% confidence intervals between highest and lowest scores of literacy, across different measures of literacy and education. FEL stands for financial and economic literacy, FL for financial literacy and EL for economic literacy.

for economic literacy [22]. These findings suggest that the financial and economic literacy index, by capturing different, additive dimensions of the ability to evaluate the effects of a policy, is a better proxy of such ability. Conversely, the effect of education is almost never significant across the five specifications, which suggests that financial and economic literate has distinctive features that are not captured by years of schooling only.

[22]Except for financially literate people and the Fornero pension reform, where the effect is not statistically significant at the 95 % level.



(a) EU Immigration

(b) Non-EU immigration

Figure 3.9: Change in probability of favoring EU immigration, and of favoring non-EU immigration with 95% confidence intervals between highest and lowest scores of literacy, across different measures of literacy and education. FEL stands for financial and economic literacy, FL for financial literacy and EL for economic literacy.

3.7 Conclusion

This paper investigates the influence 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, EU immigration and non-EU immigration, and the Fornero pension reform. Financial and economic is expected to affect the accuracy with which an individual calculates the effects of a policy on their expected utility. FEL 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 FEI individuals. Conversely, FEI individuals are less likely to be accurate at estimating the costs and benefits of a policy, and

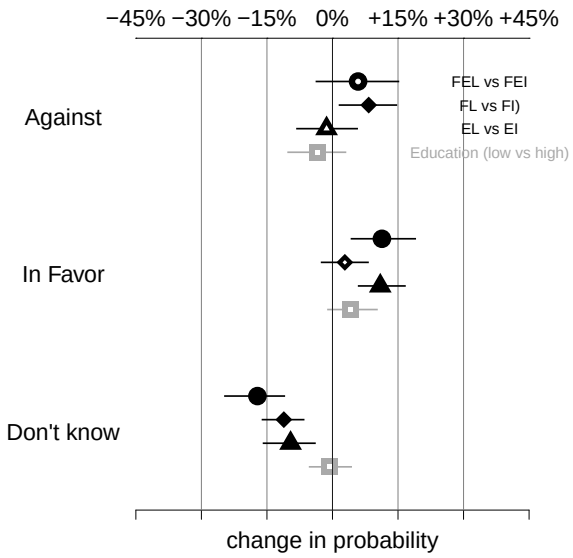


Figure 3.10: Change in probability of favoring Fornero pension reform with 95% confidence intervals between highest and lowest scores of literacy, across different measures of literacy and education. FEL stands for financial and economic literacy, FL for financial literacy and EL for economic literacy.

hence may be more likely to rely on other factors (such as political ideology, or party cues) in making their decision. Findings show that FEL individuals, regardless of their economic condition, are more likely to prefer remaining in the Eurozone, and to favor EU immigration, non-EU immigration, free trade, and the Fornero pension reform. To further investigate the potential mechanism behind the lack of differential effects between FEL winners and losers from the economic policies in question, I look into the relationship between financial and economic literacy and subjective discount rates. Recent studies suggest that financially 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. Indeed, findings show that FEL individuals have significantly lower discount rates.

Sensitivity analyses show that the findings are not driven by financial literacy or economic

literacy alone. When using financial literacy and economic literacy as predictors separately results are in the same directions, although the effect sizes are often smaller, suggesting that the composite index is a better proxy for one's ability to evaluate the effects of an economic policy on their well-being. Furthermore, all models are ran with general education as an alternative measure of financial and economic literacy and the results are not significant, implying that financial and economic literacy captures different features from more general measures of education, such as years of schooling.

These findings carry significant implications. 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 influencing 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 among the non-college population, to further disentangle the causal mechanisms at play.

Chapter 4

BECOMING PATIENT: THE EFFECTS OF FINANCIAL LITERACY ON TIME PREFERENCE

4.1 Introduction

Time preference refers to the phenomenon of an individual discounting the value of a reward to be received in the future relative to receiving the reward right now. The degree to which an individual discounts the future reward is referred to as the subjective discount rate or SDR: a higher SDR indicates that the individual is more focused on the present and less patient, a lower one indicates that the individual is more patient and future oriented. Patience is conceptualized as an individual-level disposition: some individuals are more patient than others, and these individuals are more likely to exhibit delayed gratification behaviors in several spheres. Patience plays a prominent role in both the economics and the psychology literatures. Findings suggest that more patient people are more cooperative and that they have better financial outcomes, for instance through searching longer for a good job, having higher credit scores, and being less likely to default on their loans (Curry, M. E. Price, and J. G. Price, 2008; Daly, Delaney, and Harmon, 2009; Della Vigna and Paserman, 2005; Meier and Sprenger, 2007). Recently, scholars have also analyzed how patience is relevant in the political realm, specifically with respect to policy issues with long-term implications (Amdur et al., 2015; Fowler and Kam, 2006; Healy and Malhotra, 2009; Jacobs and Matthews, 2012; Magistro, 2019). To what extent are citizens willing to make sacrifices today in order to enact policies that will bear benefits in the long run? Fowler and Kam (2006) find that patience significantly increases voter turnout. This is intuitive as the costs of voting must be borne before the benefits are realized, so people who are more patient should be more willing to vote. Similarly, Amdur et al. (2015) find that individuals with higher discount

rates are significantly less likely to support the imposition of a carbon tax in comparison with individuals that have lower discount rates. Jacobs and Matthews (2012) find clear evidence that the mass public discounts longer-term policy benefits. However, their data lends little support that this is due to varying time preference. In contrast, they find strong evidence across a diverse set of tests that uncertainty looms large in citizens' intertemporal policy assessments. Conversely, Magistro (2019) finds that financially literate short-term losers from policies with long-term benefits are more likely to favor them than similar financially illiterate individuals. She argues that financially literate individuals may be more patient and finds support for this claim, as these individuals indeed have significantly lower subjective discount rates, albeit without addressing possible endogeneity concerns.

These studies clearly show that discount rates affect economic and political behavior, however the literature has been relatively silent on factors that explain variation in the degree to which individuals discount future payoffs. This study investigates the role that one aspect of education, specifically financial education, has on affecting subjective discount rates. Does financial literacy make people more patient? If so, how does financial literacy affect SDRs? Financial literacy, through learning concepts like the time value of money, compound interest, inflation, capital budgeting, risk and return in financial markets, and risk diversification, is expected to decrease SDRs. When learning about the time value of money, people learn that money available at the present time is worth more than the identical sum in the future due to its earning capacity. One would also learn the basic process to calculate the future value (FV) and the present value (PV) of an amount of money. For example if one were to calculate the future value, one year from now, of \$100 one would do:

$$FV = PV \times (1 + i)^n \tag{4.1}$$

where i is the interest rate and n is the number of compounding periods. If one were to invest \$100 and the current interest rate i were 5%, in one year they would have 105\$. Assuming one does not need that money immediately, it is plausible that people who have learned about the time value of money, when asked about what sum of money would make them

indifferent between 100$ now and that sum one year from now, are more likely to indicate a number close to the FV of 100$, i.e., 105$.

To answer this question empirically, I use a classroom experiment among undergraduate students in economics and finance, and political science. In doing this I also attempt to address some endogeneity concerns that have undermined some past studies (Lahav, Rosenboim, and Shavit, 2015). The first question I tackle is whether learning financial concepts such as the time value of money and basic capitalization contributes to changing time preferences and making people more patient. Secondly, I test whether there is a selection effects of students choosing to study economics and finance, and hence whether they have lower SDRs to start with. Finally, I examine whether more education in general, not necessarily financial, decreases SDRs or not. Findings show that financial literacy decreases subjective discount rates significantly; there is not a selection effect into economics and finance, as students enrolling in these fields do not have significantly lower SDRs than other students when they start college; and finally more schooling in general does not change time preferences, only financial education does.

4.2 Theorizing the effect of financial literacy on discount rates

Although findings increasingly suggest that discount rates affect economic and political behavior, there is surprisingly little empirical evidence regarding the process through which discount rates are formed. A range of studies find a positive relationship between age and impatience, possibly explained by older people's expectations of a shorter stream of future utility (Becker and Mulligan, 1997; D. Read and N. L. Read, 2004). Furthermore, patience increases with financial resources (Becker and Mulligan, 1997; D. Read and N. L. Read, 2004) and with education, which can be seen as an investment in patience (Bauer and Chytilová, 2010; Perez-Arce, 2011).

A question that has not received much attention, and that is tested here, is that financial literacy may affect subjective discount rates. Financial literacy is the ability to understand basic economic concepts in relation to the functioning of modern economies and the achieve-

ment of individual financial well-being.

The relationship between financial literacy and personal financial decisions is well documented in the literature (Behrman et al., 2012; Lusardi, 2015; Lusardi and O. S. Mitchell, 2007; Lusardi and O. S. Mitchell, 2011; Lusardi and O. S. Mitchell, 2017; Monticone, 2010). Financially literate people are more likely to make savvier saving and investment decisions, manage debt better, plan more for retirement, and participate more in the stock market (Lusardi, 2015; Lusardi and O. S. Mitchell, 2007; Lusardi and O. S. Mitchell, 2011; Lusardi and O. S. Mitchell, 2017). Although the literature investigating the relationship between financial literacy and personal decision-making is well-established, recently scholars have also began looking into its association with public decision-making (Fornero and Lo Prete, 2019; Magistro, 2020b; Magistro, 2019; Montagnoli et al., 2016). Financial literacy does not only affect household financial decisions, but it also impacts how people make decisions about public policies, including pension reforms, trade and immigration policies, and EU membership. Regardless of the broad empirical evidence suggesting that financial literacy is a key determinant of economic behavior, financial illiteracy is still widespread and well-documented across countries (Caliendo and Findley, 2013; M. v. Rooij, Lusardi, and R. Alessie, 2011). A fundamental question then revolves around whether there are factors that determine who chooses or does not choose to become financially literate. If individuals self-select into learning financial and economic concepts based on some unobservable factor that is related to financial outcomes, then the relationship between financial literacy and economic behavior may be confounded. Time preference may be one such confounder. Determining the direction of the relationship between financial literacy and discount rates is thus important to understand the significance of current findings and to inform future policy prescriptions. The direction of this relationship has been a cause of debate. On one side, Meier and Sprenger (2013) show that people who decide to acquire personal financial information through a credit counseling program are more future oriented (have lower discount rates) than individuals who choose not to participate. On the other side, Lahav, Rosenboim, and Shavit (2015) find that financial education, through learning basic fundamentals of cash flow capitalization, significantly

decreases discount rates. This important finding, that learning concepts such as the time value of money contributes to changing time preferences, begets other fundamental questions, which this paper aims to address. One is whether students that select into learning economics and finance have fundamentally different SDRs to start with, in line with what Meier and Sprenger (2013) find on a group of people deciding to acquire personal financial information. The other is whether more education in general decreases SDRs, or whether it is something specific to financial and economic education. In Becker and Mulligan (1997)'s model of endogenous time preference, education can be seen as an investment in patience. For instance, Perez-Arce (2011) uses a natural experiment in a public college in Mexico to test whether education affects time preference and he finds that schooling does indeed reduce SDRs, although without accounting for potential heterogeneity effects across majors. Hence, to address these issues, I first investigate whether learning concepts such as the time value of money contributes to changing time preferences. Second, I test whether SDRs are different between freshmen choosing economics and freshmen choosing a political science class to start with. Third, I test whether SDRs are different for students before and after taking a political science class.

4.3 Classroom Experiment Design

The classroom experiment attempts to isolate the effect of obtaining financial literacy from the selection process. I want to test whether acquiring financial literacy lowers SDRs, making sure there is not a selection effect into finance and economics, and that it is not just more education in general that lowers discount rates. To do this I identify the treatment group as students who have acquired financial literacy, while the control groups include first-year students (freshmen) selecting into economics before taking any classes, freshmen selecting into a different field (here political science) before taking any classes, and political science students after taking a political science class.

The final number of eligible participants is 227 and they are all undergraduate students at the University of Washington. The survey consists of two pre- and post- parts: the

pre-part involved interviewing the groups of freshmen *before* they take any economics or political science class in the first week of the quarter, while the post-part involved interviewing students *after* they take the finance or political science class in the last two weeks of the quarter[1]. The first *before* group includes freshmen students who were enrolled in Introduction to Microeconomics (Fin/Econ *before*) in fall 2019. Introduction to Microeconomics is the pre-requisite to any subsequent economics or finance class. The second *before* group includes freshmen students who were enrolled in Introduction to Political Theory, Introduction to Comparative Politics, Introduction to American Politics, or Introduction to International Relations (Poli Sci *before*) in fall 2019, who confirmed that they were not also enrolled in any course from the economics department or the business school[2]. The freshmen in the these two groups were also asked if they had ever taken any economics classes before in high school, to further control for any selection effects and to make sure they were not already familiar with concepts like the time value of money, or basic capitalization. Although in classes like Introduction to Microeconomics concepts like the time value of money may be mentioned in passing, these are only explicitly taught in classes like Business Finance (FIN350) or Financial Economics (ECON422)[3]. This is where students learn concepts like the time value of money, inflation, capital budgeting, risk and return in financial markets, stocks, bonds and diversifiable risk. Hence, the first *after* group includes students who were enrolled in Business Finance in winter 2019 (Fin/Econ *after*). The second *after* group includes students who were enrolled in Introduction to Political Theory in winter 2019 (Poli Sci *after*), who confirmed that they were not at the time and had never been enrolled in any course from the economics department or the business school.

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[1]More specifically, I am not interviewing the same students. The *after* groups were interviewed in winter and spring of 2019, while the *before* groups were interviewed in fall 2019.The rationale for this is that I wanted to make sure that the same students would not be in both the before and after groups, potentially affecting their answers.

[2]The reason why I could not just use Intro to Political Theory students as in the Poli Sci *after* group is that there were too few freshmen in the class to achieve a large enough sample size.

[3]I did my survey in Business Economics since it is offered every quarter and has over 200 students enrolled each quarter. ECON422 is not offered every quarter and classes are much smaller, around 35 students. Introduction to Microeconomics is a prerequisite for both FIN350 and ECON422.

The survey was emailed to the students, it was completely anonymous, and students were incentivized to participate by a separate raffle of 20 $20 Amazon gift cards they could enter upon completing the survey.

4.3.1 Questionnaire

The participants were asked a series of questions including questions on time preferences, risk preferences, income, age, gender, and freshmen were further asked whether they had taken economics classes in high school. Students younger than 18 and students in political science who had taken or were taking at the time classes in economics or finance were excluded.

Similarly to Lahav, Rosenboim, and Shavit (2015), 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 10,000 $ in your bank account 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 10,000 $ today. Insert minimum amount' . The annual discount rate for delaying payment was calculated as follows:

$$SDR = \left(\frac{P}{X} - 1\right) \cdot \frac{12}{t} \tag{4.2}$$

where P is the amount the subject is willing to accept in t months for delaying the receiving of the amount X today.

Table 4.1 provides summary statistics on the participants. In line with previous studies (Lahav, Rosenboim, and Shavit, 2015; Magistro, 2019), SDRs have a very high mean and very high standard deviation, with some significant outliers, especially for groups not exposed to financial concepts. Just by looking at these descriptive statistics it appears that the students acquiring financial literacy have significantly lower SDRs, hence in the next section I turn to the regression models.

Table 4.1: Summary statistics for subjective discount rates across groups, excluding negative discount rates (n=196).

	Poli Sci *before*	Fin/Econ *before*	Poli Sci *after*	Fin/Econ *after*
Count	47	46	38	65
Min	4	0.01	1	1
Q25	65	11.87	13	2.2
Median	100	50	100	10
Mean	390	217759.6	14813	50.8
Q75	350	175	389	15
Max	2900	9999900	499900	1000
Standard Deviation	673.5	1474349.7	81055.5	178.4

4.4 Methods

The first hypothesis that I test is whether acquiring financial literacy decreases SDRs. To rule out a possible self-selection problem, I then test whether SDRs for freshmen enrolling in economics are significantly different from those of students enrolling in political science. To do this, I compare SDRs for freshmen choosing to take Introduction to Microeconomics (again, the prerequisite to any other economics or finance class) and freshmen not choosing any economics class, but a political science class instead. I further ask the freshmen in both groups whether they have taken any economics in high school. If the SDRs of freshmen choosing economics are already lower than those of students in political science, then there is a selection issue. Finally, to rule out the possibility that it is just more college education in general that decreases SDRs across the board, I also test whether students have significantly different SDRs after they have taken a political science class compared to freshmen who have just started the political science class. To do this, I compare SDRs for students who have finished a course in Introduction to Political Theory (making sure these students have not been enrolled in economics or finance), and for freshmen who have just started a political science class.

To test these hypotheses, the plan is to use linear regression, controlling for potential confounders. However, as Table 4.1 shows, there are some very significant outliers in the data, which may or may not be the result of misentered numbers. An OLS on this data would be extremely unreliable as it would essentially be a regression on noise. In these cases it is essential to use methods not overwhelmed by those outliers. Hence, I take four steps. First, I run a robust regression[4], which reduces, but does not eliminate, the influence of outliers at a moderate efficiency cost. Secondly, I run a robust and resistant regression[5]. Whereas robust regression methods attempt to only dampen the influence of outlying cases, resistant regression methods use estimates that are not influenced by any outliers. This

[4]I fit a linear model by robust regression using an M estimator in R.

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

is best accomplished by trimming the data, which"trims" extreme values from either end (or both ends) of the range of data values. This is a conservative principled method for avoiding giving any weight to cases that are clearly extreme, while only giving weight to the central part of the data. Third, I run an OLS regression on a dataset where I have removed cases with high discrepancy and high leverage. In order to identify such cases I take two steps: I use a measure of leverage - "standardized" hat scores - that tell us how much weight an observation carries in least squares; furthermore, I use a measure of discrepancy - studentized residuals - that tell us how outlying each residual is. These, together, tell us how much influence an observation has. I consider outliers those observations with absolute hat scores and/or studentized residuals above 3. Finally, I run a quantile regression at the 50th quantile, hence a median regression, which is more robust to outliers. In all models I control for potential confounders such as age, gender, family income, and risk aversion. Furthermore, when comparing the two groups of freshmen I also control for whether they have taken economics in high school.

4.5 Results

Tables C2 to C5 in Appendix C show the regression tables for all of the models, while figure 4.1 shows the coefficients of different groups. Findings show that learning basic capitalization concepts dramatically decreases discount rates, regardless of the models I use. No significant differences in SDRs exist between freshmen who choose economics and those who choose political science, and no significant differences in SDRs exist between students *before* and *after* they take a political science class, suggesting that it is not just more schooling in general that decreases SDRs. Conversely, students in the Fin/Econ *after* group have discount rates between 11 and 59 percentage points lower than those in the Fin/Econ *before* group and between 11 and 83 percentage points lower than those in the Poli Sci *after* group, depending on the model I use. Although these results vary, due to each method's different way of dealing with outliers, they are all in the same direction and statistically significant. Learning how to compute PVs and FVs, the time value of money, how compound interest works, significantly

contributes to decreasing SDRs, making people more patient. Furthermore, the size of the effect for the Fin/Econ *before* and *after* groups are very similar to those found in Lahav, Rosenboim, and Shavit (2015).

One key concern is that these results may not be generalizable to the non-college population. However, one preliminary indication that these may have external validity comes from Magistro (2019). More specifically, she measures SDRs in the same way as they are measured here and looks at the relationship between SDR and financial and economic literacy in the general population[6], expecting financially and economically literate individuals to have lower discount rates and hence to be more patient. Indeed, she finds that financially literate people among the general population have significantly lower SDRs and the mean and standard deviations found in the sample are very similar to the ones found here for college students.

4.6 Conclusion

Although multiple works in economics, political science, and psychology show that discount rates affect individual behavior, the literature has been relatively silent on factors that form and potentially change subjective discount rates. Can people become more patient? The answer to this question is of utmost importance for understanding many individual choices involving intertemporal trade-offs: from financial decisions to public policy decisions on pensions, free trade, immigration, debts and deficits. In this paper I investigate the effects of financial literacy on time preferences and I attempt to address some potential endogeneity issues. Findings show that financial literacy decreases subjective discount rates significantly; there is not a selection effect into economics and finance, as students enrolling in these fields do not have significantly lower SDRs than other students when they start college; and finally more schooling in general does not change time preferences, only financial education does.

[6]Financial and economic literacy is measured through a series of 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, and questions on country-specific knowledge on certain policies and on their inherent trade-offs.

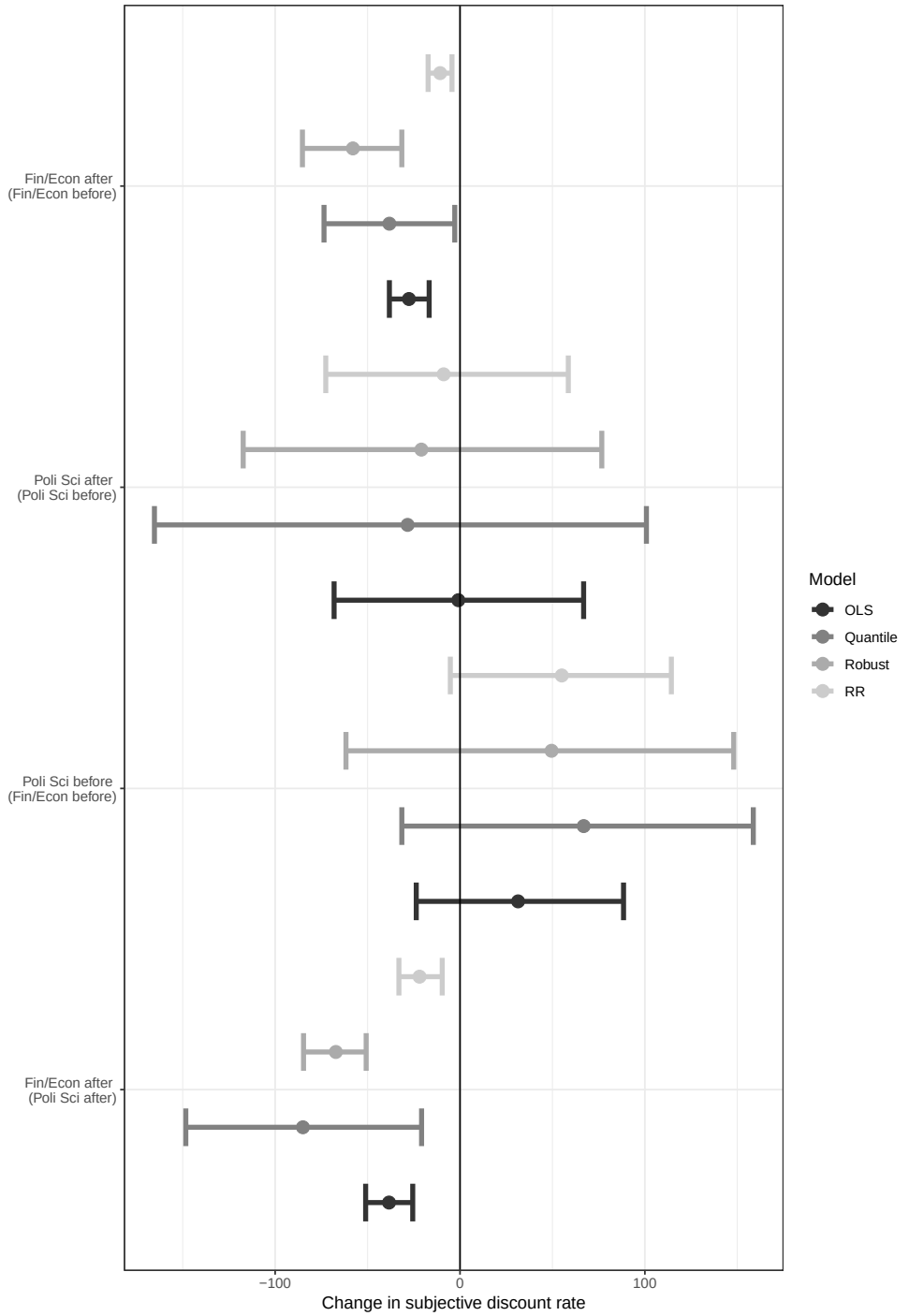

Figure 4.1: Coefficients estimates of different groups on subjective discount rates. Bars indicate the 95% confidence interval.

These findings have implications for the economics, psychology, and political science literatures studying the relationship between patience and individual behavior, and for financial education programs and campaigns. Previous studies show that people with lower SDRs and financially literate people have better financial outcomes and make savvier savings and investment decisions. If indeed learning concepts like the time value of money, compound interest, and basic capitalization dramatically decreases SDRs, then financial education programs have the potential to bring substantial benefits to their recipients, and possibly to society as well, since in situations where policies with intertemporal trade-offs are under consideration, financially literate individuals with lower SDRs may be more patient and willing to favor policies with net long run benefits and net short run costs.

Further research is needed to investigate whether these effects are indeed generalizable to the non-college population and most importantly, it should be tested whether these effects are long-lasting or whether they disappear quickly after having learned the concepts in question.

Chapter 5

PARTY CUES OR POLICY INFORMATION? THE DIFFERENTIAL INFLUENCE OF FINANCIAL AND ECONOMIC LITERACY

5.1 Introduction

It is widely argued in public opinion research that, when exposed to party cues and policy information, citizens will choose to rely on cheaper party cues rather than policy information (Arceneaux, 2008; Arceneaux and Kolodny, 2009; Boudreau, 2009; Cohen, 2003; Lupia, 1994; Popkin, 1991; Rahn, 1993; Zaller, 1992). More specifically, when evaluating policies, citizens often use partisan cues to make policy decisions, without engaging in costly information searches. Scholars have praised this decision making strategy as rational and effective: if candidates adopt policy positions that are consistent with those of voters and with partisan stereotypes, partisan cues can aid citizens in making accurate voting decisions even with low information (Arceneaux, 2008; Downs, 1957; Mondak, 1993; Popkin, 1991; Rahn, 1993; Zaller, 1992). If this is true, partisan cues can enhance democratic representation. However, politicians often mislead their electorate, and when this is the case democratic representation may be weakened by citizens' reliance on party cues in decision making. Under idealized conditions, the elected officials' incentives are aligned with those of the electorate. However, in reality, politicians are often not pursuing the electorate's welfare, but rather their own self-interest (i.e., re-election). In order to be re-elected, votes and contributions are key, and small interest groups can provide those in exchange for political favors. The outcomes of this are welfare-reducing policies such as tax loopholes, tariffs, price controls, and legalized monopolies. The latter are designed in such a way as to redistribute rents from unorganized groups, like consumers and taxpayers, to organized interests (W. C. Mitchell and Munger,

1991; Olson, 1971; Stigler, 1971). This is a clear example in which, for the majority of voters, relying on cues would not be a rational and effective tool for decision making and in which information, although costly, may be important.

Under what conditions are voters more or less likely to rely on cues rather than policy information? One hypothesis is that the content of the cue determines the degree to which it influences the voter. Alternatively, different features of voters may shape their likelihood to rely on cues. Recent studies find that citizens' political sophistication affects which cues they decide to use and under what conditions (Boudreau, 2009; Kam, 2005; Kuklinski, Quirk, et al., 2001; R. R. Lau and Redlawsk, 2001; Sniderman, Brody, and Tetlock, 1991). Sophistication, however, is a complex concept and the mechanism by which it affects the use of cues likely varies across policy domains. For example, the most commonly used measures of political sophistication are a battery of factual questions on politics (often asking to identify key political figures and to place political parties on the spectrum) and questions on political interest (Delli Carpini and Keeter, 1996). However, this measure may not be strongly related to the task being studied in an experiment, such as stating a policy preference.

In this paper, I focus on a distinct aspect of voter sophistication: financial and economic literacy. Financial and economic literacy affects the accuracy with which an individual evaluates the costs and benefits of an economic policy on their well-being. As such, it may influence the type of information that individuals are responsive to more directly. I assume that the cost of processing information is different for financially and economically literate (FEL) and financially and economically illiterate (FEI) individuals. Hence, I expect FEL individuals to be more likely to rely on non-partisan policy information, since this is relatively cheaper for them, due to their higher ability to evaluate the effects of the policy under analysis. On the other hand, FEI people, who are less likely to be able to evaluate the effects of a policy on their economic well-being on their own, are more likely to rely disproportionately on political ideology or cues from reference groups, rather than on non-partisan factual information, to make their policy decisions.

This study tests whether FEL and FEI individuals respond differently when exposed to

new information about a policy and its effects. With a survey experiment conducted in Italy involving a policy proposal for price controls[1] for domestic olive oil producers, I investigate if: FEL individuals are more likely to form their policy views using factual information on the costs and benefits of a policy; FEI individuals, due to their lower ability to conduct accurate cost-benefit analyses, are more likely to rely on cues from their party leaders. In this experiment, respondents are randomly exposed to two possible treatments: either a political statement coming from the respondent's party leader (a party cue), or a cost-benefit exercise on the short-term effects of price controls (policy information). The findings show that FEL individuals are more likely to understand factual information concerning the costs and benefits of the policy under analysis, and to be responsive to it. This is not the case for FEI individuals, who instead are more receptive to party cues. Specifically, when given factual information on the societal costs and benefits of a policy, FEL individuals are 18% more likely to understand that the total economic effect of that policy on society is negative, and 23% more likely to correctly estimate the size of this effect, than FEI individuals. Furthermore, FEL individuals treated with the cost-benefit exercise are 21% less likely to support price controls than FEL individuals in the control group, while this effect is not significant for FEI individuals. And again, FEI individuals treated with the party cue are 5% more likely to support price controls than similar FEI individuals in the control group, while this effect is not significant for FEL individuals.

Critically, one might assume that this result is merely driven by differences in education between the FEL and FEI samples. To examine whether literacy has the distinct effect proposed in this theory, I take severally steps. Findings show that education is only weakly correlated to FEL. Furthermore, I find no differential effects of the treatments between educated and uneducated voters, suggesting that financial and economic literacy has distinctive features that general education does not capture.

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[1]There are two main types of price controls, a price ceiling, which is the maximum price that can be charged, and a price floor, the minimum price that can be charged. In this paper, when I refer to price controls I refer to a price floor, and more specifically to the case in which a price floor is introduced and the government purchases the surplus, also known as a price support.

This is among the first studies to highlight the consequences of financial and economic literacy in a political context. Although the relationship between financial literacy and household decision making is an expanding area of research[2], the literature on the relationship between financial literacy and political and policy preferences is still in its infancy, and relies for the most part on observational studies (Fornero and Lo Prete, 2019; Montagnoli et al., 2016).

These findings have significant implications. When politicians have policy preferences counter to the interests of the mass public, voters that rely on party cues are more likely to express support for policies that directly hurt them. One proposed solution to this failure of representation of interests might be to increase the information available to voters. Here, I show that this can successfully shift opinions, but only provided that citizens have sufficient financial and economic literacy to understand this information and translate it into policy preferences. This suggests that financial and economic education may have the potential to increase support for welfare-enhancing reforms and to aid voter's detection of welfare-reducing ones.

5.2 Conceptual framework

Voters' lack of knowledge and interest in politics is well-documented in the extant literature. As such, party cues may act as a cheaper and as effective option to make policy decisions. Cues are pieces of information that allow people to formulate their judgments and decisions without in-depth knowledge of policy issues (Eagly and Chaiken, 1993). For example, in political elections, it would be too costly to gather all information and compare candidates across the entire policy space. Instead, voters are said to rely on heuristics to make decisions consistent with those they would make if they were fully informed (Lupia and McCubbins, 1998). Scholars have for the most part praised this type of decision making, called heuristic processing, as rational and effective. Downs (1957) was the first to argue in favor of using cues

[2]See for example Behrman et al., 2012; Lusardi, 2015; Lusardi and O. S. Mitchell, 2007; Lusardi and O. S. Mitchell, 2011; Lusardi and O. S. Mitchell, 2017; Monticone, 2010

as heuristics, after demonstrating the irrationality of investing time, attention, and resources to become politically informed. He argued that it would be rational for citizens to turn for guidance to experts who can be trusted and who share their political goals[3]. However, politicians often mislead their electorate and this may affect the effectiveness of using cues to make decisions (Kuklinski and Hurley, 1994). When the incentives of elected officials are aligned with those of their electorate, a Downsian argument may hold in which using cues would be rational and effective. This is, however, an idealized condition that need not exist. In reality, politicians are often not striving to maximize their electorate's welfare, but rather serving their own self-interests of maintaining power and winning reelection. This opens the door for smaller special interest groups to exert disproportionate power and influence on elected officials as they can more easily organize and obtain favors that will hurt the majority of the population. While the examples of this are numerable, this occurs notably with tariffs, price controls, and tax loopholes. Industries with vested interests in certain policies and regulations are able to compensate the politician with resources that advance their primary objective of reelection. Furthermore, this is exacerbated in contexts where regulators are appointed and not elected, since for most voters regulatory issues will not be salient, and hence there are electoral incentives to respond to stakeholder interests (Besley and Coate, 2003). When the costs for the majority of citizens are diffuse, they will not try to capture politicians, since the intensity of their preferences is low compared to special interest groups, whose benefits are more concentrated and visible (Olson, 1971; Stigler, 1971). When this is the case, foregoing policy information and relying on cues may not be an effective decision making strategy.

If voters have little knowledge on such policy issues, they may use cues from politicians to compensate for information deficits and form preferences over policies. Most research on source cues suggests that they dominate other considerations and play a key role in shaping

[3]Regarding guidance from like-minded experts, analyzing decision-makers' behavior rather than voters', Calvert (1985) builds a model of how a rational decision maker makes use of imperfect advice. He shows that, under certain circumstances, the rational decision-maker should engage in 'bolstering', i.e., attending to sources that share their predisposition and defensively avoiding discrepant information.

public opinion (Bowler and Donovan, 1998; Cohen, 2003; Goren, Federico, and Kittilson, 2009; Kuklinski and Hurley, 1994; Lupia, 1994; Rahn, 1993). However, others find that policy information can influence citizens even when party cues are present, and that its effects can be as large (Arceneaux, 2008; Boudreau and MacKenzie, 2014; Bullock, 2011; Nicholson, 2012). Aside from the large literature studying the effects of party cues and policy information on political opinions, there is also a considerable body of work that investigates the effects of information on voting behavior. Although the theoretical literature agrees that better information should influence electoral accountability (Besley and Prat, 2006), empirically this relationship has not been established consistently. The empirical literature has examined the effects on voter behavior of information on politicians' performance, attributes and campaign activities, and campaign promises. As emphasized by DellaVigna and Gentzkow (2010), who provide a review of the literature on the effects as well as drivers of persuasive communication on behavior, the evidence on the effectiveness of such information on electoral outcomes is mixed at best. While some field experiments find that interventions significantly affect voter behaviors, others do not. Furthermore, even less is clear about the mechanisms through which information works. On one side, certain studies, such as Banerjee et al. (2011), Cruz et al. (2018), Ferraz and Finan (2008), and Kendall, Nannicini, and Trebbi (2015), find in different political contexts that information has a positive effect on voting behavior: either through increasing turnout, reducing vote buying, increasing the vote share for more qualified incumbents, voting for candidates closer to one's own preferences, or punishing corrupt incumbents. However, on the other side, a recent large study consisting of seven randomized control trials in six countries finds no evidence that typical nonpartisan voter information campaigns shape voter behavior (Dunning et al., 2019). Similarly, Kalla and Broockman (2018) analyze results from 49 field experiments and find that the effect of campaign contact and advertising on Americans' candidates choices in general elections is zero.

How do we make sense of these contradictory results to understand the consequences of cues and information? One key reason for these differences may lie in the nature of the

experiments. Specifically, the extant research relies on the use of fictitious policy information or candidates, which may make subjects believe that their choices have no real consequences, in the policy information being counter-stereotypical or too detailed, and often in the lack of adequate control groups. Another reason may have to do with heterogeneous effects. Recent research finds that the effects of cues vary under different circumstances and for different types of citizens (Boudreau, 2009; Kam, 2005; Kuklinski, Quirk, et al., 2001; R. R. Lau and Redlawsk, 2001; Sniderman, Brody, and Tetlock, 1991). Most of these studies focus on the question of whether sophisticated and unsophisticated citizens use different cues, under what conditions, and whether such cues are effective. Findings on the effects of cues across different levels of sophistication are mixed, and although a majority suggests that cues can close the gap between sophisticated and unsophisticated voters, often this is only the case under idealized conditions where incentives between principals and agents are aligned. Further, none of these studies analyzes the possibility that the effects of partisan cues and policy information may vary based on financial and economic literacy. In the theoretical and empirical evidence that follows, I seek to explicitly incorporate the role that financial and economic literacy plays in individuals' acquisition of and responsiveness to information. This missing piece may both explain the disparate results in the extant literature and generate novel empirical implications for the effects of partisan cues on voters' preferences over policy outcomes.

5.2.1 Financial and Economic Literacy

A key task for citizens in modern democracies is to vote for candidates and policies that represent their interests. This raises the fundamental question of whether citizens are indeed informed and understand the policies they decide upon. In this context, there have been significant issues regarding how to measure citizens' knowledge and understanding of policies (Boudreau, 2009; Gilens, 2001; Pietryka and MacIntosh, 2013). My proposed measure of financial and economic literacy, aimed at capturing one individual's ability to evaluate the costs and benefits of an economic policy on their well-being, attempts to alleviate some

limitations of two separate literatures: the one on political knowledge/sophistication and the one on financial literacy.

Financial literacy is defined as the ability to understand basic economic concepts in relation to the functioning of modern economies and the achievement of individual financial well-being (Atkinson and Messy, 2012; Fornero and Lo Prete, 2019; Lusardi and O. S. Mitchell, 2014a). Most studies on financial literacy examine the relationship between financial literacy and individual-level outcomes like savings, investment, or default behavior (see Lusardi and O. S. Mitchell (2014a) for a review). Financially literate people are more likely to make savvier saving and investment decisions, manage debt better, plan more for retirement, and participate more in the stock market (Delavande, Rohwedder, and Willis, 2008; Jappelli and Padula, 2013; Lusardi and O. S. Mitchell, 2014a; Lusardi and O. S. Mitchell, 2017; M. C. v. Rooij, Lusardi, and R. J. Alessie, 2012). However, financial education has a large impact at the macro level too. At the macroeconomic level, Jappelli (2010) shows that countries with more generous social security systems show lower levels of financial literacy, suggesting that the incentives to acquire financial information are related to the size of financial markets. Grohmann, Klühs, and Menkhoff (2018), analyzing cross-country data, find that financial literacy has clear beneficial effects on financial inclusion. Lo Prete (2013) finds that across countries inequality growth is lower in countries where economic literacy is higher among the population. Jappelli and Padula (2013) show, both with micro and macro data, that there is a strong link between financial literacy and wealth accumulation. In order to tackle endogeneity issues, several recent studies use randomized control trials (RCTs) to test the relationship between financial literacy and financial behavior. A review of the literature suggests that financial education has significant effects on financial literacy and financial behavior, but that there is great heterogeneity across interventions, with effects being somewhat lower in low and lower middle-income countries (for a review see Kaiser and Menkhoff (2017) and Lusardi and O. S. Mitchell (2014a)). Although the literature on the relevance of financial literacy and household decision making is expanding, we understand comparatively little about the relationship between financial literacy and political and policy

preferences, aside from a few exceptions investigating pension reform preferences. Fornero and Lo Prete (2019) find that pension reforms take less of a toll on the politicians that passed them in countries where financial literacy is higher. Gouveia (2017) conducts two RCTs among Portuguese voters and finds that more literacy on the pension system increases individual willingness to support reform. Furthermore, recently Fornero, Oggero, and Puglisi (2020) investigate the importance of both information and financial literacy for socially sustainable nonfinancial defined contribution (NDC) pension schemes and they find that the media plays a key role in providing context-specific information on pension reform.

Much of the existing literature on financial literacy relies on a common index to measure financial literacy, which is based on the number of correct answers to questions on basic financial concepts, including the working of interest compounding, the difference between nominal and real values, and risk diversification (Lusardi, 2015). This index provides a valid measure of a person's basic financial knowledge, their ability to understand budgets, compound interest, and inflation, and this is appropriate for the research concentrated on studying financial behaviors. However, in a political context, this conceptualization and measure may have significant limitations. For example, it may not necessarily capture policy and country specific knowledge, and the individual's understanding of a policy's effects on one's economic well-being (Atkinson and Messy, 2012). A person may very well know what compound interest is, but if they do not know how the pension system in their country works, that may not be very informative to their pension policy preference. In a similar way, an individual may well know the concept of inflation, but if they do not understand that tariffs can be inflationary, knowing what inflation is may not directly influence their policy preference over tariffs. Ultimately, while necessary, it is unclear how knowledge about compound interest or inflation alone would be sufficient, and whether it would necessarily translate into understanding how economic policies, such as immigration or trade policy, work and the trade-offs that they involve. When looking at the relationship between literacy and policy preferences – which to my knowledge, aside from pension reform, no other study has investigated – I argue it is necessary to complement the aforementioned financial literacy

questions with a battery of questions measuring "economic literacy". Economic literacy refers to an individual's knowledge of the economic effects of certain public policies in the country in question[4]. For example, one question may ask the individual about the consequences that restricting imports from another nation that is a major trading partner would have on domestic prices. The constructed financial and economic literacy index encompasses both one's understanding of basic economic concepts and policy-specific knowledge, and is therefore expected to be a more general proxy for the respondent's ability to estimate the effects of any economic policy. Although economic and financial literacy, as a proxy for one's understanding of basic economic concepts and the working of policies, is expected to influence economic policy preferences, different domain-specific literacies could matter in affecting one's ability to use information in different fields.

Conceptually, financial and economic literacy is distinct from the extensive literature on political sophistication. Political sophistication is usually proxied by an index measuring an individual's ability to answer factual questions about politics, covering three main categories: people, party, and civics[5] (Delli Carpini and Keeter, 1996). However, Boudreau (2009) argues, it is not always clear how these measures are related to the tasks that an individual performs when making a policy choice. Specifically, conventional metrics do not capture policy-specific information (Gilens, 2001) Departing from this, Boudreau (2009) uses SAT math scores as a measure of sophistication, arguing that this measure overcomes previous limitations by its direct relation to the task that subjects are asked to perform in her experiment (i.e. solving math problems). The argument is that, although it is often difficult when dealing with voting to identify whether a person has chosen the correct candidate or policy, in a math problem there is only one correct answer. However, there are policies for which winners and losers can be clearly identified, and knowing the individual's economic

[4]Appendix D provides more information on how the specific questions in this study were derived.

[5]Delli Carpini and Keeter (1996) recommend constructing a five-question political index with questions asking respondents to identify key political figures like the vice-president, the party that holds the majority in the House, the relative ideological position of the two parties, the veto override percentage, and judicial review.

condition would easily allow to infer the option that would give the person the highest utility. Furthermore, although SAT math scores may be correlated with financial and economic literacy, they are not a substitute for it. Although numeracy may be a necessary condition for a person to be financially and economically literate, it is unlikely to be sufficient. Having high math skills does not necessarily mean thinking in terms of costs and benefits, trade-offs, supply and demand. As a matter of fact, previous studies find that financial and economic literacy has distinctive features that more general dimensions of education, including math literacy and years of schooling, do not capture (Fornero and Lo Prete, 2019). To examine whether literacy has distinctive features from education, I also re-analyze the data according to respondent's education level.

Finally, one concern may be that this index of financial and economic literacy does not capture different, complementary dimensions of one's ability to evaluate economic policies, but rather results are driven by financial literacy alone or economic literacy alone. To alleviate this concern, Magistro (2019) analyzes a sample of 1,100 Italian individuals and investigates the relationship between FEL and different policy preferences, while also running alternative specifications of the models with financial literacy only and economic literacy only, to confirm whether indeed the composite index has distinctive features that more closely capture an individual's ability to evaluate policies. Her findings show that financial and economic literacy does influence economic policy preferences: FEL individuals are more likely to prefer remaining in the Eurozone, to favor free trade, EU immigration, non-EU immigration, and the Fornero pension reform. Furthermore, the alternative specifications of the models suggest that the findings are not driven by financial literacy alone or economic literacy alone. The results indicate that when using financial literacy alone or economic literacy alone, although most of the effect sizes are smaller, their direction is unchanged: no matter which index of financial and economic literacy is used, literate people are always more likely to favor each of the policies under analysis than illiterate people. This suggests that the FEL index, by capturing different, additive dimensions of the ability to evaluate the costs and benefits of a policy, is a more encompassing proxy of such ability.

5.2.2 A theory of financial and economic literacy and information

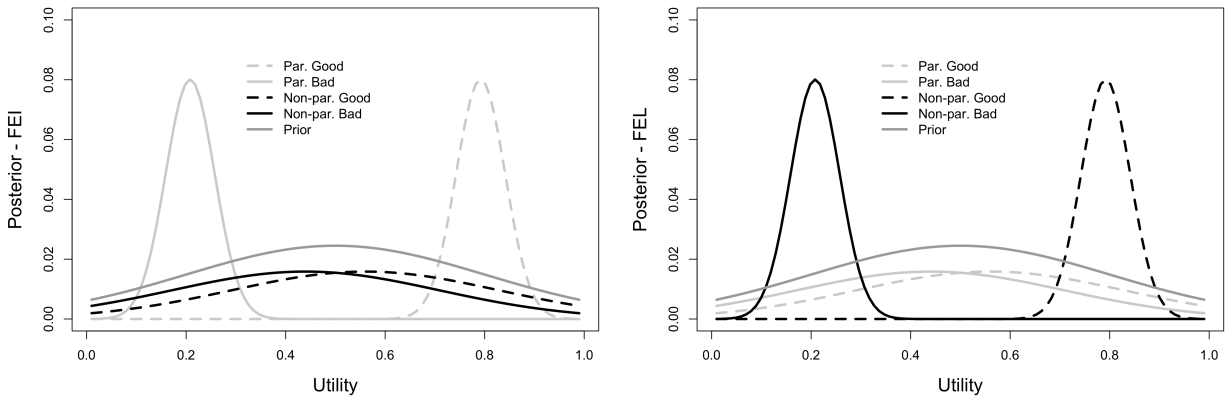
In this section, I use an illustrative model to demonstrate how financial and economic literacy, party cues, and information interact to generate policy preferences. I consider two types of voters: FEL and FEI voters, where FEL individuals are more accurate at evaluating the costs and benefits of different economic policies. While each individual has a prior over the utility of an economic policy proposal, I assume that their priors are weak/uninformed. Substantively, this reflects a novel and non-contentious policy in which individual voters do not yet have information about the costs and benefits of the policy in question.

Next, I assume that the cost of processing information is different for the two types of voters. I assume that FEL individuals are more likely to rely on non-partisan policy information, since this is relatively cheaper for them, due to their higher ability to evaluate the effects of the policy under analysis. On the other hand, FEI people, who are less likely to be able to evaluate the effects of a policy on their economic well-being on their own, are more likely to rely on cues coming from partisan sources of information, which are less expensive to them.

In this model, I focus on the scenario in which politicians are not maximizing their electorate's welfare, but their own self-interest, and this may imply promoting welfare-reducing policies in order to gain the electoral support of small interest groups (W. C. Mitchell and Munger, 1991).

Next, I assume both types of voters receive a signal containing information about the policy. This information may come in the form of a partisan cue or non-partisan factual policy information. Consider a partisan signal such as a cue coming from one's party leader. I expect the signal to be weighted differently by FEI and FEL individuals. For FEI individuals, this information is probably definitive and clearer, due to their lower ability to do cost-benefit analysis. Conversely, people with high FEL will find this piece of news only slightly informative, and will not be placing much confidence in it. Alternatively, consider non-partisan information coming from unbiased sources, such as national institutes of statistics,

peer-reviewed studies, or policy evaluations. People with high FEL will find it less costly to interpret, and will be more likely to rely on it when making their choices. Conversely, individuals with low literacy, due to their lower ability to evaluate this type of information and to its higher cost, will find it less informative. Figure 5.1 provides an example of the mechanisms at play.



(a) FEI individuals

(b) FEL individuals

Figure 5.1: Posterior distributions for FEI and FEL individuals after receiving partisan (par.) or non-partisan (non par.) signals. In this example, priors, signals, and posteriors follow a truncated normal distribution (between a minimum utility (u) of 0 and a maximum of 1). The signal may suggest that the policy is either good ($u = 0.8$) or bad ($u = 0.2$).

As a result, each type of voter, when updating their beliefs, will put more weight on the most informative signal. Hence, the predictions are that for partisan cues, FEI individuals will update in the direction of the signal, while FEL individuals will not update. Conversely, for non-partisan policy information, FEL individuals will update in the direction of the signal, while FEI individuals will not update.

5.3 Survey Experiment Setting: Price Controls in Italy

I test these predictions empirically using an original survey experiment in Italy. More specifically, I examine how individuals with different levels of financial and economic literacy respond to variation in the type of information they receive about a specific policy: price controls on olive oil. While there are two main types of price controls, where a price ceiling is the maximum price that can be charged and a price floor is the minimum price that can be charged for a good or service, I here decide to concentrate on the latter, also called a price support. Overall, price supports are intended to help producers, but at a cost to the rest of society. Regardless of which type of price support is implemented, these measures result in losses to society, although their corresponding distribution of benefits varies (Barkley, 2016). Here I decide to focus on the scenario where after the introduction of a minimum price on olive oil, the government buys the excess supply of oil (I expand on the different possible types of price supports in Appendix D). When the government decides to institute a minimum price for olive oil higher than the market price, producers increase the quantity supplied, but at the higher price this increased quantity does not have a buyer, so a surplus exists. The most common solution is for the government to purchase this surplus at the price support level. Consumers are unambiguously worse off as the price is now higher and quantity is lower than in the scenario with no intervention. Furthermore, the high costs of purchasing the surplus by the government are shifted to taxpayers, while producers are better off since they sell more olive oil at a higher price, resulting in net losses to society. In essence, the government is paying to make producers better off and consumers worse off, and the losses to consumers and the government outweigh the gains to producers.

I use a policy that, although realistic, has not been discussed in the public arena, and whose effects on utility most people would not be informed about[6]. The motivations for using

[6]This specific policy does not exist in Italy. However, olive oil has been historically salient in Italy, as recently there were protests when tariffs were removed on oil from Tunisia, so it would be realistic (see: `https://www.repubblica.it/economia/2016/03/10/news/olio_la_coldiretti_contro_la_legge_ue_che_toglie_i_dazi_alle_importazioni_dalla_tunisia-135158425/`).

a novel and non-contentious policy are two-fold. First, if I analyzed a very salient policy (something that citizens hear about constantly on the news and social media), the two groups would be more likely to have strong priors already and probably in opposite directions. With such strong priors, it is unlikely that any of the treatments would have much of an effect. Consider for example factual information for FEL voters: if they believe that a policy is good because they have already received plenty of signals supporting such position, seeing factual information confirming this would not move their views and I would not be able to capture how they make their policy decisions in the first place. Considering a policy that is realistic enough, but that has not been debated in the public arena, provides a better test to see whether party cues and/or policy information affect public opinion because it allows us to understand how individuals make policy decisions once their first hear about a policy. Second, in this context non-contentious refers to a policy with unanimous support from both sides of the political spectrum[7]. The choice to avoid using a very politically contentious issue stems from the fact that choosing a partisan issue would imply an additional interaction term (and an even larger sample size) , as heterogeneous effects would be expected not only across literacy, but also across partisanship. Choosing a fictitious but realistic policy that is supported across the political spectrum obviates this problem.

The two types of information that individuals are treated with are:

1) a political statement (party cue), coming from the individual's party leader, and

2) a cost-benefit exercise that asks the respondent to calculate what the total effect of the introduction of price controls would be on society (non-partisan policy information).

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[7]The expectation that this policy would have unanimous support from the left and right stems from a recent policy proposal in Italy involving the introduction of minimum prices on sheep's milk in Sardinia. This issue was not contentious as politicians from all of the main parties (the Democratic Party, the League, and the Five Star Movement) expressed support for the policy (see: https://www.ilfattoquotidiano.it/2019/02/12/sardegna-il-movimento-dei-pastori-pd-e-centrodestra-hanno-colpe-corteggiati-dal-m5s-ma-non-vogliamo-4964684/). However, to alleviate concerns that the policy may be contentious I control for political ideology in all of my models.

Following the theory, I expect that FEI individuals will be responsive to the party cue and update their views accordingly, while they will not be responsive to the cost-benefit exercise. Conversely, FEL individuals, who are more likely to do the cost-benefit analysis correctly, will be responsive to the cost-benefit exercise and update their views accordingly, while they will not be responsive to the political statement.

From these follow my hypotheses:

- H1: FEL individuals are more likely to understand the net welfare effect of the policy on society, and to quantify it, than FEI individuals;

- H2: FEI individuals are more likely to be responsive to the party cue and form their policy views accordingly, than FEL individuals;

- H3: FEL individuals are more likely to be responsive to the cost-benefit information treatment and form their policy views accordingly, than FEI individuals.

5.3.1 Varying information on Price Controls

The survey experiment was conducted on a online sample of the Italian population in April 2019. The survey was administered by Cint and the sample is representative of the population in terms of age, gender, and region of residence. An initial financial and economic literacy test determined who was eligible for the survey experiment, where only individuals with low or high literacy scores were retained[8]. The questions asked in the survey to determine financial and economic literacy are available in Appendix D. The total sample includes 2,881 individuals, 1,004 in the control group, 1,017 in the political statement treatment group, and 860 in the cost-benefit treatment group.

[8]Based on a previous survey conducted in July 2018 of 1,100 Italian individuals in Magistro (2019), I determined that individuals with low literacy would be those answering zero or one correct questions out of six (anyone below mean minus one standard deviation) and individuals with high literacy would be those answering five or six correct questions out of six (anyone above mean plus one standard deviation). The sample, retaining only low and high scorers, includes about 35 % of the population.

Respondents in the survey were randomly assigned to one of the three groups (control, political statement treatment, and cost-benefit treatment). The control group saw this statement:

> "Imagine the following scenario: Currently, the price of olive oil is €4 per liter. Producers are asking the government to introduce a minimum price on oil, around €6, in order to cover at least the costs of production. The government accepts to introduce a minimum price for oil."

The party cue treatment group saw this statement:

> "Imagine the following scenario: Currently, the price of olive oil is €4 per liter. Producers are asking the government to introduce a minimum price on oil, around €6, in order to cover at least the costs of production. The government accepts to introduce a minimum price for oil. The leader of the party you identify the most with argues that domestic producers need a protective shield or competition from abroad will be a gigantic risk to the future national production of oil."[9]

The cost-benefit information treatment group saw this statement:

> "Imagine the following scenario: Currently, the price of olive oil is €4 per liter. Producers are asking the government to introduce a minimum price for oil, around €6, in order to cover at least the costs of production. The government accepts to introduce a minimum price for oil. This creates an excess of oil on the market: more oil is produced than it is demanded by consumers. The government decides to buy the excess oil. After this measure is introduced, producers gain €100 million. The government pays €240 million. Finally, consumers lose €60 million. How much does society as a whole gain (+) or lose (-)? "

The latter is a multiple choice question with five options $(+100, -200, -240, +160, -60)$, allowing me to see not only if the respondents get the correct answer, but also if they

[9]This piece of information is not in itself incorrect, it is telling one side of the story only – disclosing concentrated benefits while concealing diffuse costs, unlike the exercise, which tries to communicate the broader effects on society of such a policy.

understand the direction of the total effect, whether it is a net loss or gain for society[10]. In the party cue treatment the name of the political leader from the party the individual feels closest to is not mentioned in order to avoid cueing source affinity.

Finally, after reading the statement to which the individual was randomly assigned, each respondent is asked whether they favor a minimum price on olive oil (Yes or No).

5.3.2 Covariate Balance and Matching

Following these questions, all respondents are asked to report their education level, income, age, gender, region in which they live, political ideology, work status, and type of occupation they perform. As shown in Appendix D, although the respondents' characteristics are quite balanced across treatment groups since people were randomly assigned into each group, financial and economic literacy is not randomly assigned, and as a result respondents are not balanced across literacy levels. More specifically the respondents are not balanced in terms of education, income, gender, region, political ideology, and age across literacy groups. In order to address concerns about confounding in the main models, I control for these variables. Moreover, olive oil is not produced homogenously across Italian regions: the majority of its production is concentrated in Southern Italy (mostly Puglia), then followed by Central regions, and finally by Northern regions, which produce the least oil[11]. As a result of this, I create a variable, *Region group*, that distinguishes three groups: North, Center, and South. Since I expect that support for price controls on oil might be significantly higher in regions where it is produced the most and where some respondents may even be employed in the industry, I control for this variable in the analysis[12].

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[10]Appendix D explains how the exercise was derived.

[11]See data for production of olive oil by year and region at `http://agri.istat.it/sag_is_pdwout/jsp/dawinci.jsp?q=plC270000010000011000&an=2018&ig=1&ct=311&id=15A|21A|30A|32A`

[12]This policy does have distributional consequences, however, in a sample of 2,881 individuals I do not expect there to be a significantly high number of producers of olive oil, so I expect the great majority of respondents to approach the question as consumers, and hence as losers. One way to still account for the possibility that certain regions (such as Puglia), who would greatly benefit from such a measure, might favor price controls, is controlling for region group.

However, there are limitations to only controlling for these confounders, since although this adjusts for average differences in the outcome responses, if the treatment (financial and economic literacy in this case) is rare, many of the control observations may not be comparable. Hence, in addition to controlling for these confounding variables in the main analyses, I also conduct different matching procedures in order to create pruned samples, aimed at achieving better balance on my covariates. The goal of matching is to create a dataset that looks closer to one that would result from a perfectly blocked (and possibly randomized) experiment. To create matched samples, I use both propensity score matching (PSM) and Coarsened Exact Matching (CEM). King and Nielsen (2019) show that PSM methods should not be used for matching, as they can often increase imbalance, model dependence, researcher discretion, and bias. Instead Monotonic Imbalance Bounding (MIB) methods, including CEM, should be favored, as they have been shown to dominate other matching methods in reducing imbalance, model dependence, estimation error, bias, variance, mean square error, and other criteria (Iacus, King, and Porro, 2011; Iacus, King, and Porro, 2012). I match financial and economic literacy and all of the potential confounders: education, income, age, gender, region, and political ideology. The balances between treatment and control groups pre and post matching are shown in Appendix D. The results suggest that the two groups, before matching, are quite unbalanced. FEL individuals tend to have higher incomes, be more educated, male, older, slightly less right-wing, and live in the North, compared to FEI individuals. The results also suggest that the CEM method outperforms the PSM methods (especially the nearest neighbor), and achieves almost perfect balance on all variables. Following King and Nielsen (2019), the models are then run on the full and the CEM matched samples.

It should be emphasized that matching can only adjust for observed covariates, and thus it cannot eliminate omitted variable bias. Hence, although the information treatments are randomly assigned, since FEL is not randomly assigned, we cannot be certain that there is not some unobserved variable affecting FEL, information processing, and the policy preference.

5.4 Findings

For each of the full and matched datasets I estimate logistic models and test hypotheses 1 to 3. I use multiple imputation with the R package 'Amelia' to deal with about 200 missing values, since multiple imputation has been shown to reduce bias and increase efficiency compared to listwise deletion[13] (Honaker, King, and Blackwell, 2011). I then run the analyses on 20 multiply imputed datasets[14]. Both'Amelia' and 'MatchIt', the package used for matching, are compatible with the R package 'Zelig', which I used to run the regressions and compute the quantities of interest (Imai, King, and O. Lau, 2007; Ho et al., 2011). 'Zelig' provides combined results across the imputed datasets calculated by Rubin's Rules (Rubin, 2009), to correct the standard errors by combining the within imputation variance and the between imputation variance. Similarly, when quantities of interest are plotted, these are correctly pooled across those from each of the imputed datasets.

In the next subsections I present regression tables for all models and figures summarizing the results for the full sample and the CEM matched sample.

5.4.1 Cost-benefit exercise

In the first set of models I test hypothesis 1, more specifically whether FEL individuals are more likely to understand the net welfare effect of the policy on society, and to quantify it, than FEI individuals.

Figure 5.2 shows the probability that a respondent answered the cost-benefit exercise correctly and the probability that they were at least able to identify the direction of the effect, whether society as a whole loses or gains from the policy in question, while tables 5.1 and 5.2 show the regression tables. The findings indicate that FEL individuals are more likely to answer the cost-benefit exercise correctly and they are also more likely to correctly

[13]I also run the analysis with listwise deletion and findings do not change.

[14]Honaker, King, and Blackwell (2011) argue that unless the rate of missingness is very high 5 imputed datasets are enough.

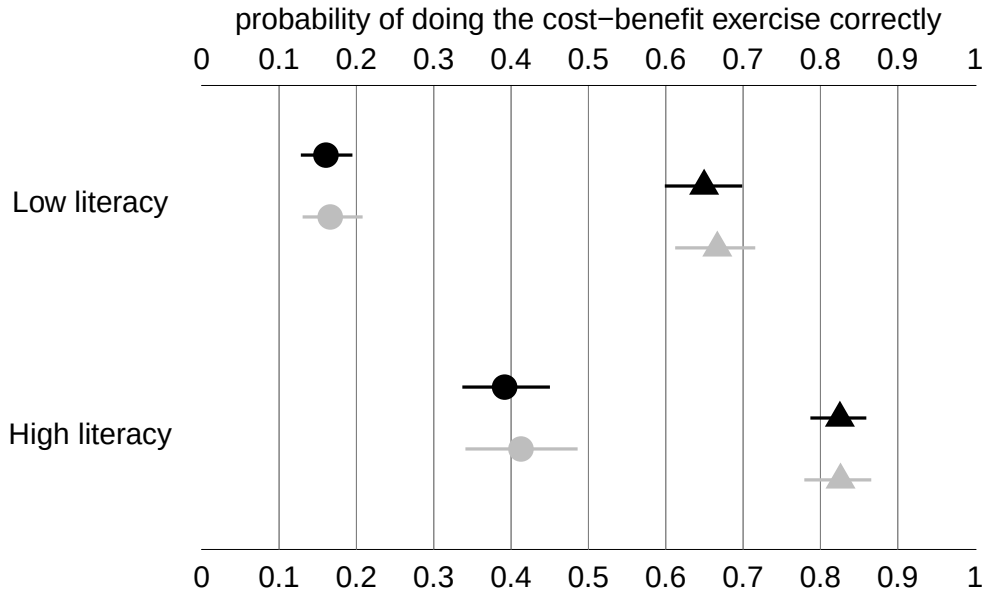

Figure 5.2: Expected probabilities of doing the cost-benefit exercise correctly (circle markers) and of identifying the correct direction of the policy effect (triangle markers) for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval.

identify the direction of the effect of the policy, which in this case is negative for society. The findings are very similar for both the full sample and the CEM sample. Individuals with high literacy are 23% (24% in the CEM model) more likely to answer the question correctly than FEI individuals, and they are 18% (16% in the CEM model) more likely to understand the direction of the effect of the policy in question.

5.4.2 Information Treatments

In the second set of models I test hypotheses 2 and 3, whether FEI individuals are more likely than FEL individuals to be responsive to the party cue and form their policy views accord-

Table 5.1: Logistic models for full models (no matching): log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Correct CB	Correct Direction CB	Information
Intercept	-1.42^{***}	0.40^{*}	0.27
	(0.18)	(0.17)	(0.18)
FEL	1.22^{***}	0.93^{***}	-0.12
	(0.10)	(0.10)	(0.14)
Female	-0.12	0.15	0.17
	(0.09)	(0.09)	(0.09)
High Education	0.25^{**}	0.07	0.11
	(0.10)	(0.09)	(0.09)
Middle Income	0.07	-0.04	0.09
	(0.11)	(0.10)	(0.10)
High Income	0.19	0.03	0.18
	(0.13)	(0.12)	(0.12)
Region Center	-0.14	-0.21	0.09
	(0.12)	(0.12)	(0.11)
Region South	-0.19	-0.21^{*}	0.06
	(0.10)	(0.10)	(0.09)
Age 32-51	-0.12	0.34^{***}	0.15
	(0.11)	(0.10)	(0.10)
Age over 51	-0.15	0.51^{***}	0.21
	(0.13)	(0.13)	(0.12)
Political Ideology	-0.01	-0.04^{*}	0.03^{*}
	(0.02)	(0.02)	(0.02)
Party Cue			0.27^{*}
			(0.13)
Cost-benefit exercise			-0.20
			(0.14)
Party Cue: FEL			-0.39^{*}
			(0.20)
Cost-benefit exercise: FEL			-0.66^{***}
			(0.20)
Num. obs.	57620	57620	57620
Num. imp.	20	20	20

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 5.2: Logistic models with CEM matching: log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Correct CB	Correct Direction CB	Information
Intercept	-1.21^{***}	0.28	0.16
	(0.23)	(0.21)	(0.22)
FEL	1.27^{***}	0.87^{***}	-0.16
	(0.12)	(0.11)	(0.17)
Female	-0.21	0.13	0.13
	(0.12)	(0.11)	(0.10)
High Education	0.21	0.08	0.17
	(0.13)	(0.12)	(0.12)
Middle Income	0.18	0.09	0.10
	(0.14)	(0.12)	(0.12)
High Income	0.24	-0.07	0.26
	(0.18)	(0.17)	(0.16)
Region Center	-0.17	-0.31^{*}	0.07
	(0.16)	(0.15)	(0.15)
Region South	-0.38^{**}	-0.23^{*}	0.07
	(0.13)	(0.11)	(0.11)
Age 32-51	-0.25	0.26^{*}	0.19
	(0.14)	(0.13)	(0.13)
Age over 51	-0.46^{**}	0.34^{*}	0.47^{**}
	(0.17)	(0.16)	(0.16)
Political Ideology	-0.02	-0.01	0.03
	(0.02)	(0.02)	(0.02)
Party Cue			0.32^{*}
			(0.16)
Cost-benefit exercise			-0.19
			(0.17)
Party Cue: FEL			-0.40
			(0.24)
Cost-benefit exercise: FEL			-0.53^{*}
			(0.24)
Num. obs.	39560	39560	39560
Num. imp.	20	20	20

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

ingly, and whether FEL individuals are more likely than FEI individuals to be responsive to the cost-benefit information treatment and form their policy views accordingly.

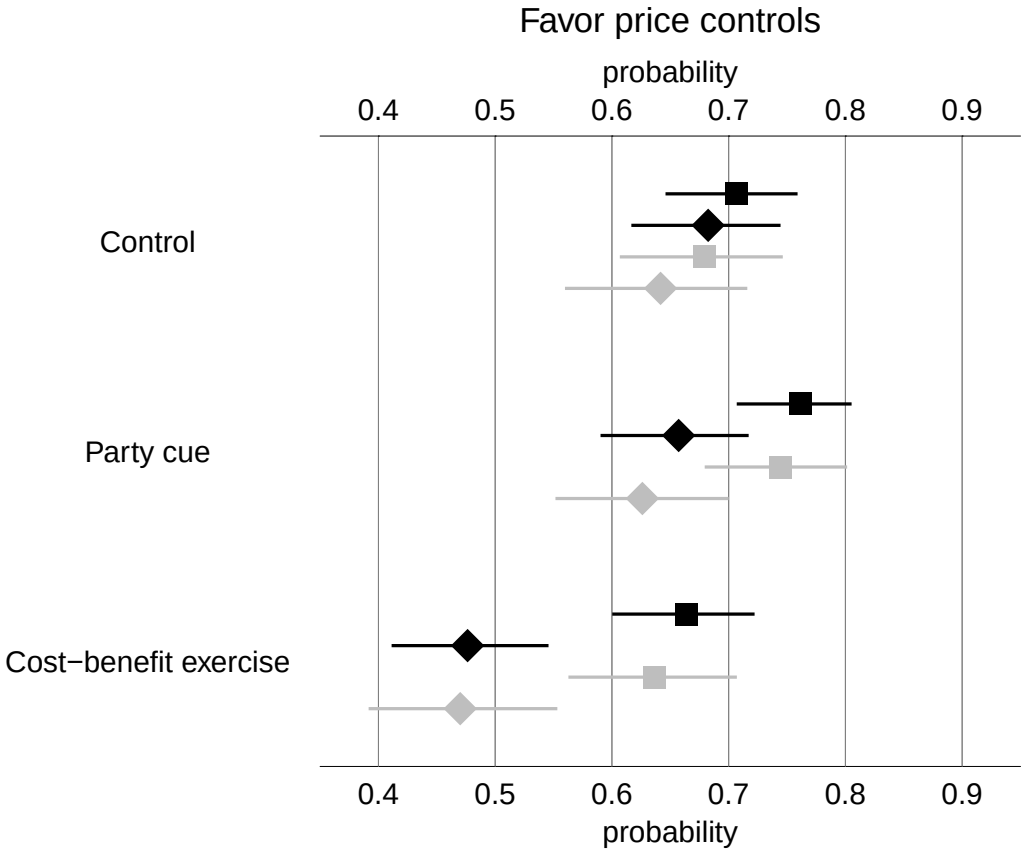

Figure 5.3: Expected probabilities of favoring price controls by treatment group for FEI individuals (square markers) and for FEL individuals (diamond markers) for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval.

Tables 5.1 and 5.2 show regression results. Figure 5.3 and figure 5.4 show respectively the expected probabilities that the respondent favors price controls by treatment group and

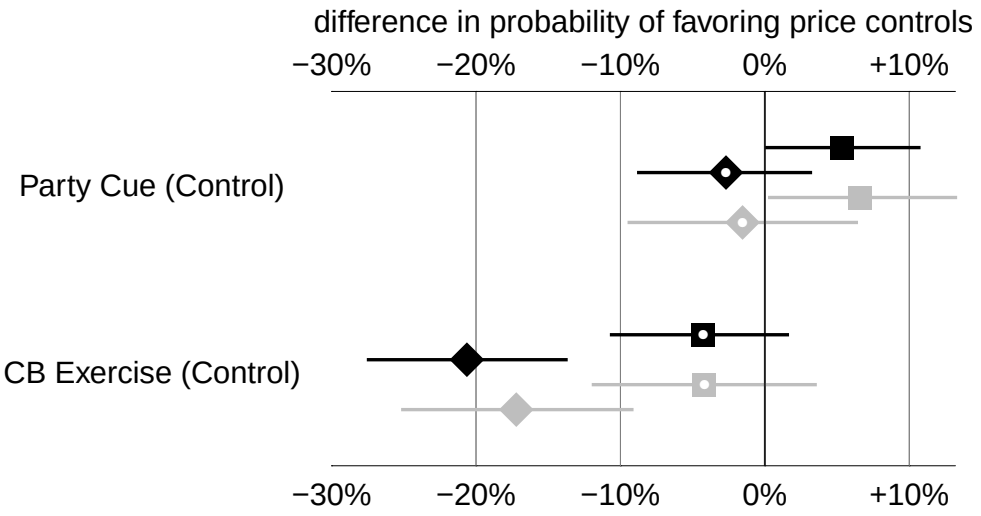

Figure 5.4: First differences of favoring price controls by treatment group for FEI individuals (square markers) and for FEL individuals (diamond markers) for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval. White markers indicate statistical non-significance, filled markers statistical significance.

literacy group, and the first differences of the probabilities of favoring price controls by treatment group and literacy group. When looking at the results for the control group in figure 5.3, it is clear that FEI and FEL individuals do not have significantly different priors on price controls. In the absence of additional information of either type, the percentage of approval of price controls in both groups is quite high (70% for FEI and 67% for FEL). However, consistent with the theoretical expectations, the effects of the information treatments are drastically different across the two groups. Turning to figure 5.4, the effect of the party cue treatment is significant for FEI individuals, as those in the treatment group are 5% (7% in the CEM model) more likely to approve of price controls than those in the control group. However, the effect of the party cue treatment is not significant for FEL individuals, who

are 2% less likely to approve of price controls than FEL individuals in the control group. Conversely, while the effect of the cost-benefit information treatment is not statistically significant for FEI individuals, it is statistically and substantively significant for FEL individuals: FEL individuals in the cost-benefit treatment group are 21% less likely to approve of price controls than FEL individuals in the control group (17% using CEM). To understand the substantive significance of this effect it is helpful to look at the expected probabilities of supporting price controls by group in figure 5.3: it is evident that the majority is in favor of price controls in all groups *except for FEL people in the cost-benefit treatment group.* After doing the cost-benefit exercise, support for price controls among the FEL is down to 47% .

Figure 5.5 shows us the first differences of the probabilities of favoring price controls by literacy group. What emerges is that in the control group, as mentioned above, FEI and FEL individuals do not have significantly different priors on price controls. However, the distance grows significantly in the two treatment groups, as after the party cue treatment, FEL individuals are 11% (12% using CEM) less likely to approve of price controls than FEI individuals, while in the cost-benefit treatment FEL individuals are 18% (17% using CEM) less likely to approve of price controls.

Overall, the findings across both matched and non-matched datasets, support all three hypotheses under study and emphasize the conditional nature of information. FEL individuals are more likely to understand the net welfare effect of the policy on society, and to quantify it, than FEI individuals. FEI individuals are more likely to be responsive to the party cue and form their policy views accordingly, than FEL individuals; and finally, FEL individuals are more likely to be responsive to the cost-benefit treatment and form their policy views accordingly, than FEI individuals.

I acknowledge that since, as discussed above, matching adjusts for observed covariates but not for unobserved ones, omitted variable bias may still be an issue. In particular, in the analysis under study the party cue is in favor of the policy while the policy information underlines how the costs of the policy exceed the benefits for society. If there was some omitted factor perfectly correlated with FEL, which in turn affected how people respond to

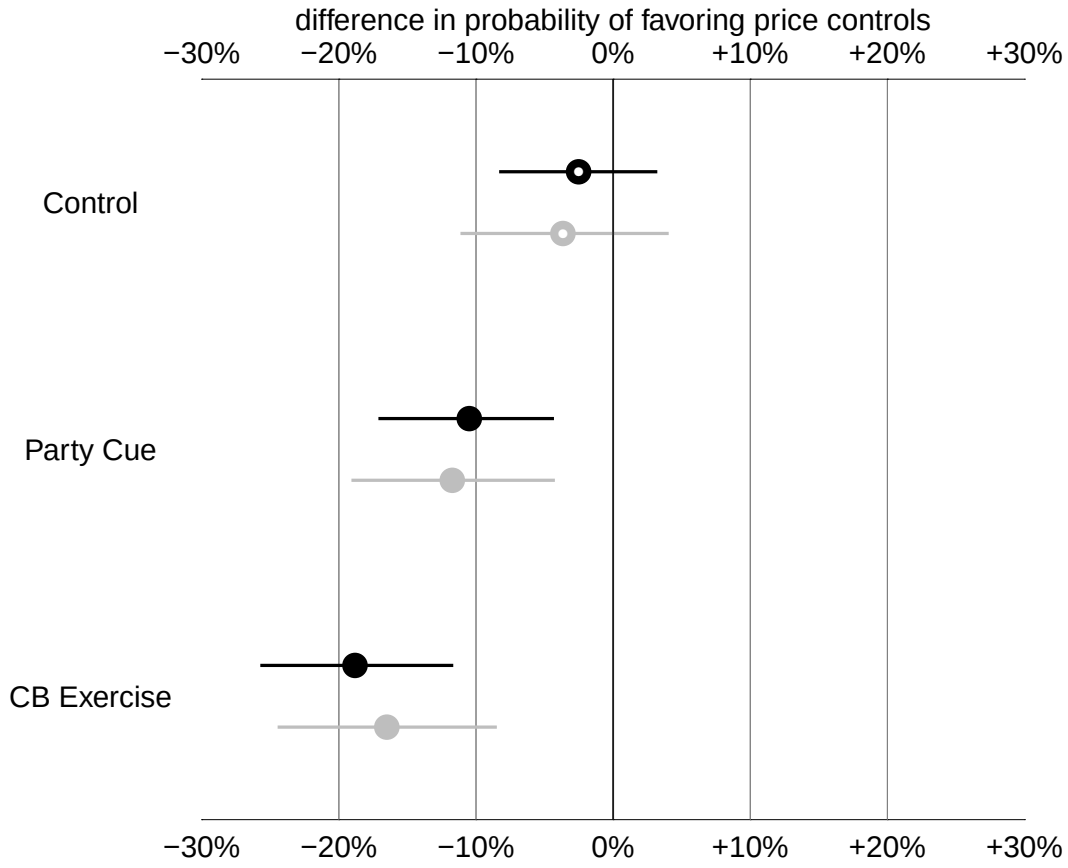

Figure 5.5: First differences between FEL and FEI individuals of probabilities of favoring price controls for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval. White markers indicate statistical non-significance, filled markers statistical significance.

the different information treatments in the same way as FEL would, the results would be biased. This would occur if for instance FEL individuals had an intellectual bias of appearing smart by being more likely to be responsive to information that is "against" a policy, while FEI individuals had a bias towards being "gregarious", and hence more likely to be responsive

to information that is pro-policy. This would only have to apply to reception of information though, otherwise we would see a pre-existing difference in the control group among FEI and FEL individuals, where the latter would be more likely to be against a policy they know little about, to confirm their "against" bias.

5.5 Education and financial and economic literacy

In this section, I also take several steps to investigate the relationship between education and FEL. First, I run bivariate correlations between education and FEL to examine the strength of their relationship. Second, I run all the main regressions without controlling for education, in order to avoid potential collinearity issues. Third, to investigate whether higher education might be a complement of FEL I run a model with an interaction between education and FEL. Finally, to see if education is just an alternative measure for FEL I run the same models with education as the main covariate of interest rather than FEL.

First, I analyze bivariate correlations between education and FEL. I use both the original education variable with 6 categories and the binary education variable, with higher education and less than higher education only. Table 5.3 shows these bivariate correlations: regardless of the measurement we use for education, the correlation between education and FEL is rather weak, suggesting that they do not capture the same underlying features.

Second, if FEL were just a proxy for education, including a control for education in the main models would likely result in collinearity. Table D7 in Appendix D shows the results of all of the regressions without including a control variable for education: the substantive and statistical significance of the coefficients does not change, bringing further support to the claim that education and FEL capture different features.

Next, I investigate whether higher education might be a complement of FEL. Table D8 in the appendix shows that this is not the case. The effects of party cues and policy information for literate and illiterate individuals do not vary by education level. Finally, I run the main models with education instead of financial and economic literacy as the main covariate of interest. If financial and economic literacy were just a proxy for education, then

we should find differential treatment effects between educated and uneducated voters in a similar way as we do for FEI and FEL respondents. The regression table is available in table D9 of the appendix. As far as conducting the cost-benefit exercise, figure 5.6 shows that educated people are more likely to do the exercise correctly or guess the correct direction by respectively 8% and 4% than uneducated ones, however, these effects are significantly smaller than when using financial and economic literacy, potentially suggesting that there is a partial effect of numeracy.

Table 5.3: Table of correlations between FEL and education variables.

	Education (1-6)	Education Binary
FEL	0.21***	0.15***

For the information treatments, what emerges from figure 5.7 is that the effects of the treatments are not differential between educated and uneducated people (the first differences between educated and uneducated individuals are never significantly different from zero), suggesting that financial and economic literacy has distinctive features that general education does not capture.

5.6 Conclusion

This paper analyzes the effects of party cues and policy information on public opinion, conditional on financial and economic literacy. I hypothesize that FEL individuals are more likely to rely on non-partisan policy information when judging a policy proposal, since this is relatively cheaper for them, due to their higher ability to evaluate the effects of the policy under analysis. Conversely, FEI people, who are less likely to be accurate at estimating the effects of a policy on their economic well-being on their own, are more likely to rely on cues coming from partisan sources of information, which are less expensive to them.

Using a survey experiment in Italy, I investigate how FEI and FEL individuals respond to

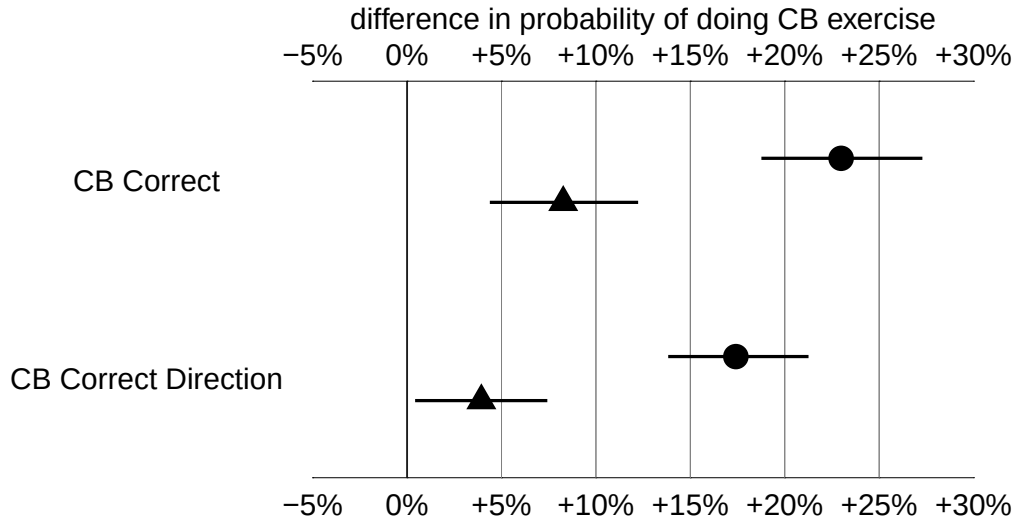

Figure 5.6: First differences in probability of doing the cost-benefit exercise correctly and of identifying the correct direction of the policy effect between FEL and FEI respondents (circle markers) and educated and uneducated ones (triangle markers). Bars indicate the 95% confidence interval.

different types of information, i.e., a party cue and a cost-benefit exercise, on an hypothetical policy proposal involving price controls on olive oil. Since financial and economic literacy, unlike information, is not randomly assigned, this article employs matching procedures. Findings across both matched and non-matched samples suggest that first, FEL individuals are significantly more likely to answer the cost-benefit exercise correctly and also more likely to answer in the right direction, identifying whether the change in society's welfare is positive or negative, than FEI individuals. What also emerges from the findings is that these two groups of individuals do not have drastically different priors on such a policy, which is novel and non-contentious, however, once exposed to the party cue or the cost-benefit exercise they form their policy views differently, relying on different types of information. While FEL

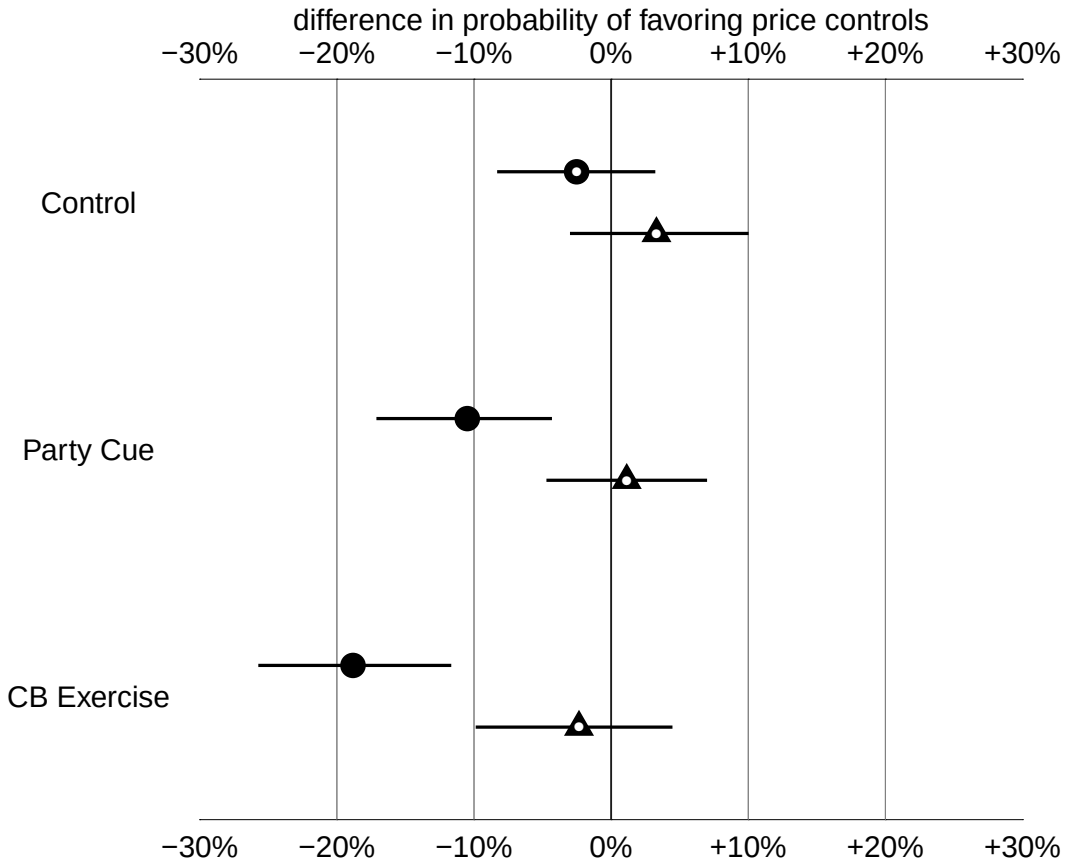

Figure 5.7: First differences of probabilities of favoring price controls between FEL and FEI respondents (circle markers) and between educated and uneducated ones (triangle markers) by treatment group. Bars indicate the 95% confidence interval. White markers indicate statistical non-significance, filled markers statistical significance.

individuals are more responsive to factual information concerning the costs and benefits of the policy under analysis, FEI individuals are not responsive to this type of information, instead they are more receptive to cues coming from politicians that they support. Finally, robustness checks demonstrate that financial and economic literacy is distinct from general

education and captures different features that years of schooling do not measure.

These findings have significant implications for both representative and direct democracy. Although scholars have celebrated party cues as one low-cost, rational, and effective decision making instrument, this is not the case in scenarios in which politicians' interests are not aligned with those of the majority of the electorate. In this scenario, cues are not a rational and effective substitute for policy information. If citizens are not informed about the choices that they are making and if they blindly follow party cues, when such cues are misleading, they will end up supporting policies that do not reflect their interests. Conversely, efforts to inform the voters may successfully shift opinions, but only provided that citizens can understand and evaluate the information. In the long-term, providing financial and economic courses from early education may help citizens better understand the effects of policies on their economic well-being and ultimately make democracy more responsive to their preferences.

Future research should investigate further under which conditions FEI and FEL individuals update their beliefs. Following the recent research on the effects of information, future experiments should analyze how and if findings change when using a more salient issue and a more contentious issue. In this case, priors would be likely to differ in the first place among FEI and FEL individuals. Finally, when analyzing a contentious issue, it would be interesting to manipulate the political information that different individuals are exposed to, since preference formation and updating may differ not only based on financial and economic literacy, but also based on partisanship.

Appendix A

APPENDIX TO CHAPTER 2

A.1 Supplementary Material

A.1.1 Heuristic Model

The model assumes that individuals are guided by self-interest. Financial literacy is expected to have an impact on an individual's accuracy at calculating the effects of a specific policy on their expected utility. For simplicity, I consider two types of individuals: financially literate and financially illiterate. Each individual has his or her own prior probability distribution over U, a random variable describing the unknown levels of utility that a policy will bring. The individuals' prior beliefs about U can be represented by a uniform distribution on bounded intervals (Calvert, 1985), so no utility level is any more likely than another. This will be the unit interval, so that all utility values lie between zero and one. Both types of individuals' prior subjective probability density functions for the policy's utility are:

$$\begin{aligned} f(u) &= 1, \text{if } 0 \leq u \leq 1 \\ &= 0, \text{otherwise} \end{aligned} \tag{A.1}$$

Each individual then observes X, a signal with information about U. The utility inferred from the signal may vary across different individuals: its content depends on the true, but hidden, utility of the policy, and on the individual's accuracy in interpreting it. The latter is represented by α, an inaccuracy parameter which will be described below.

The signal X will be more informative for financially literate people, as they can conduct more accurate cost-benefit analyses. Conversely, it will be less clear and less informative for financially illiterate people, who are less likely to be accurate at estimating the effects of a

policy on their individual economic well-being and who may be more likely to rely on other decision-making factors such as core personal values (for example culture, political ideology, identity, etc.), or cues from reference groups, and on less correct cost-benefit analyses to make their decisions. The signal X is a continuous variable. Its mean value, μ, represents the utility inferred from the signal, and the distance between the policy's actual utility and the utility inferred from the signal is the bias. Its variance, σ^2, represents the precision over the signaled utility, and it increases as inaccuracy increases.

$$X \sim TN(\mu, \sigma^2, 0, 1)$$
$$\mu = u^{\alpha}$$
$$\sigma^2 = (log\alpha + \hat{\sigma^2})^2$$

The signal X has a truncated normal distribution and lies within the interval $X \in [0, 1]$. The closer the signal is to 1 the higher the expected utility of the policy is argued to be, the closer the signal is to 0 the lower the expected utility of the policy is argued to be. The constant $\alpha \in [1, 10]$, which I will call the inaccuracy parameter[1], has two effects on the signal X itself, one on bias and the other on precision. I argue that α is low for financially literate individuals as their ability to do more sophisticated cost-benefit analyses will give them a more precise and unbiased estimate of the expected utility of the policy, hence the verdict from the signal will most likely be very close to the true utility of the policy (see Figure A.1). Moreover, the variance around the signal will be smaller (it will be assumed fixed at $\hat{\sigma^2}$ for financially literate individuals and in these examples it is set at 0.0001 for simplicity) as they can be more confident of their estimate. Conversely, for financially illiterate individuals α will be any number greater than 1, suggesting that as there are varying degrees of inaccuracy,

[1]If I allowed $0 < \alpha < 1$, it would be possible to also overestimate the benefits of a policy, whereas in the current setting a financially illiterate person would always be more likely to underestimate the benefits of a policy; for this model this complication is unnecessary. Since each policy under discussion can go in both directions (e.g. Brexit or Remain, free trade or protectionism, immigration or protectionism. If you are a financially illiterate loser from globalization, overestimating the benefits of free trade is equivalent to saying you are underestimating the benefits of protectionism), the accuracy can be in either direction even with $\alpha > 1$

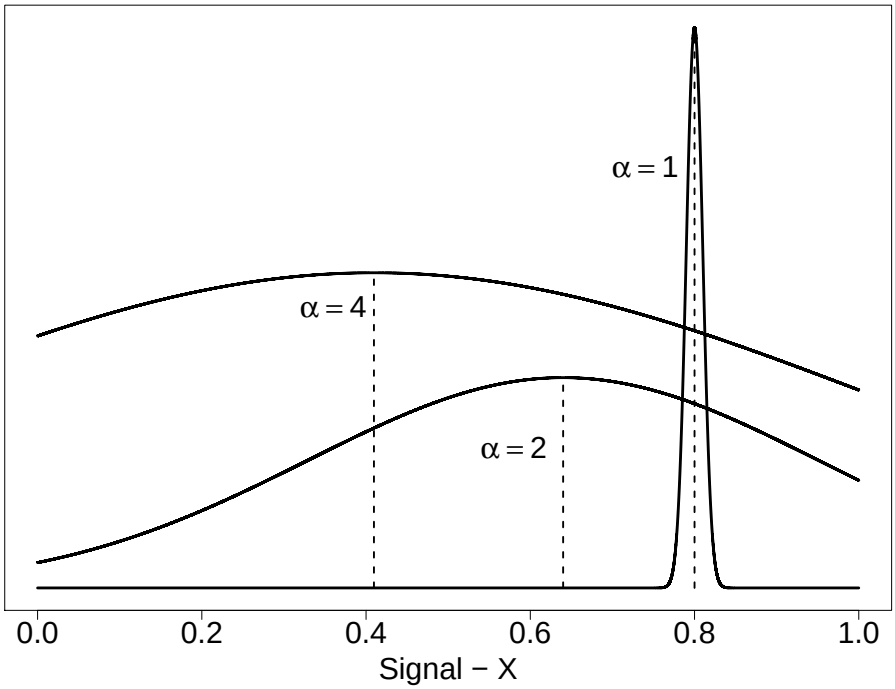

Figure A.1: Truncated normal distributions of signal X when inaccuracy α=1, 2, 4 and true utility u=0.8. In this example, the true utility of the policy is set to u=0.8. For a financially literate individual ($\alpha = 1$), the utility inferred from the signal μ equals 0.8, and $\hat{\sigma^2}$ is set to 0.0001. For a financially illiterate person, when $\alpha = 2$, their inferred utility from the signal is about 0.6 and the variance increases with α. Finally, when $\alpha = 4$ the signal wrongly indicates that u is equal to 0.4, with larger uncertainty.

there is more uncertainty over the expected utility of the policy. As a result of this, when the signal is more inaccurate (so α is greater than one) the verdict is unlikely to be close to the true utility of the policy (see Figure A.1 for examples). Furthermore, X will also have larger variance, as the signal might not be as clear and informative.

After observing the signal, the individual updates their prior, using Bayes rule, which gives $f(u|x)$, the posterior distribution of U.

$$f(u|x) = \frac{f(u) \cdot P(X = x|U = u)}{\int_0^1 f(u) \cdot P(X = x|U = u)du}$$

.

As inaccuracy α approaches 1, the updated belief about the expected utility of the policy is more likely to be closer to the true utility of the policy. Conversely, as inaccuracy α increases, the distance between the expected utility and the true utility of the policy increases.

In order to show what type of individual is more likely to more accurately assess the effect on her economic well-being of a specific economic policy, we have to first calculate the expected utility of the policy given the signal:

$$E(U|X) = \int_0^1 u \cdot f(u|x)du$$

and then calculate the difference between $E(U|X)$ and the true utility of the policy u:

$$| \, (E(U|X) - u) \, |$$

For all levels of utility (Figure A.2 shows that this is the case for u=0.8), indeed the difference between the expected utility of a policy after receiving the signal x and the true utility of the policy u is smallest when α is equal to 1, hence implying that financially literate individuals are more likely to more accurately assess the effect of a specific economic policy on their expected utility than financially illiterate individuals.

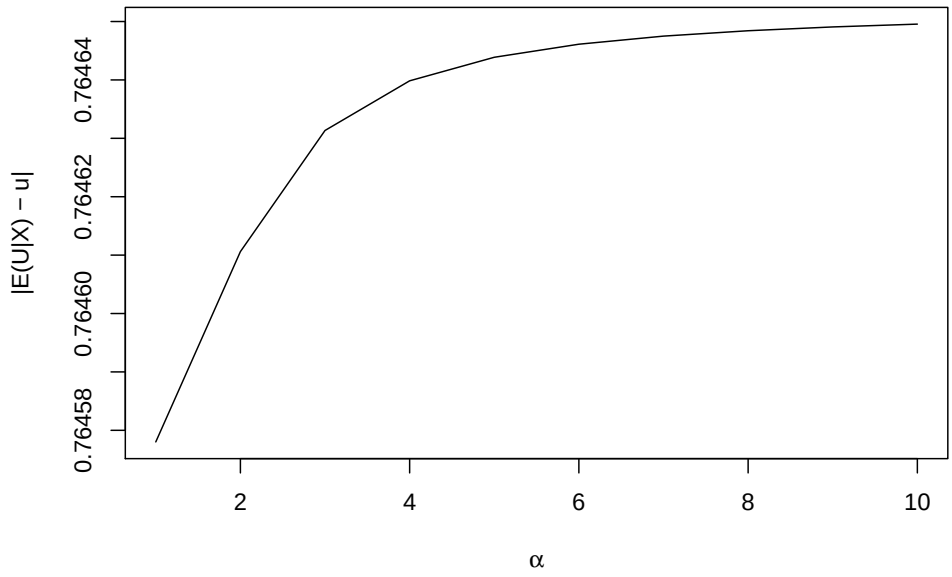

Figure A.2: Difference between $E(U|X)$ and true utility with u=0.8 for all values of α

A.1.2 Regression Results

Table A.1: Multinomial logit models for Brexit: Log-odds and standards errors in parentheses

	DV: Brexit (ref. category: Remain)		
	Leave	Not vote	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	-0.212^{***}	-0.609^{***}	-0.319^{***}
	(0.037)	(0.074)	(0.046)
High education	-0.929^{***}	-0.680^{***}	-0.498^{***}
	(0.068)	(0.163)	(0.091)
Income	-0.166^{***}	-0.404^{***}	-0.267^{***}
	(0.046)	(0.110)	(0.062)
Age	0.024^{***}	-0.008	-0.002
	(0.002)	(0.005)	(0.003)
Male	0.164^{**}	-0.158	-0.361^{***}
	(0.066)	(0.154)	(0.090)
Import shock	0.854^{***}	0.731	1.093^{***}
	(0.254)	(0.578)	(0.335)
Constant	-0.306	0.689^{*}	0.568^{**}
	(0.193)	(0.383)	(0.239)
Akaike Inf. Crit.	11,263.800	11,263.800	11,263.800

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.2: Clustered bootstrap p-values for Brexit

	Leave	Not vote	Don't know
Constant	0.209	0.143	0.124
Financial Literacy (# correct)	0.165	0	0.001
High Education	0	0.004	0.005
Income	0	0.052	0.017
Age	0.054	0.783	0.014
Male	0	0.033	0.642
Import shock	0.133	0.483	0.078

Table A.3: Multinomial logit models for immigration: Log-odds and standards errors in parentheses

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	0.174***	0.268***	−0.425***
	(0.044)	(0.039)	(0.065)
High education	0.612***	1.177***	0.602***
	(0.084)	(0.071)	(0.143)
Income	0.020	0.113**	−0.377***
	(0.057)	(0.048)	(0.099)
Age	−0.012***	−0.020***	−0.031***
	(0.003)	(0.002)	(0.004)
Male	−0.232***	0.093	−0.166
	(0.081)	(0.069)	(0.137)
Import shock	−0.382	−1.438***	−1.256**
	(0.307)	(0.267)	(0.527)
Constant	−0.839***	−0.412**	1.539***
	(0.233)	(0.199)	(0.339)
Akaike Inf. Crit.	11,755.290	11,755.290	11,755.290
Note:			*p<0.1; **p<0.05; ***p<0.01

Table A.4: Clustered bootstrap p-values for immigration

	Neither good nor bad	Good	Don't know
Constant	0.010	0.219	0.024
Financial Literacy (# correct)	0.097	0.002	0.001
High Education	0	0	0.001
Income	0.074	0.046	0.054
Age	0.004	0.067	0.234
Male	0.122	0.001	0
Import shock	0.103	0.091	0.032

Table A.5: Multinomial logit models for free trade: Log-odds and standards errors in parentheses

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	-0.276^{***}	-0.525^{***}	-0.722^{***}
	(0.040)	(0.054)	(0.048)
High education	-0.558^{***}	-0.477^{***}	-0.421^{***}
	(0.077)	(0.114)	(0.102)
Income	-0.194^{***}	-0.286^{***}	-0.175^{**}
	(0.051)	(0.075)	(0.068)
Age	0.011^{***}	-0.003	-0.017^{***}
	(0.003)	(0.004)	(0.003)
Male	-0.352^{***}	-0.207^{*}	-0.691^{***}
	(0.073)	(0.106)	(0.099)
Import shock	0.661^{**}	0.570	0.424
	(0.278)	(0.403)	(0.368)
Constant	-0.096	0.511^{*}	2.037^{***}
	(0.215)	(0.289)	(0.254)
Akaike Inf. Crit.	10,937.890	10,937.890	10,937.890

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.6: Clustered bootstrap p-values for free trade

	Neither good nor bad	Bad	Don't know
Constant	0.936	0.423	0.004
Financial Literacy (# correct)	0.003	0.001	0
High Education	0	0.025	0.001
Income	0.004	0.005	0.165
Age	0.004	0.403	0.001
Male	0.040	0.877	0.010
Import shock	0.047	0.461	0.834

Table A.7: Multinomial logit models for Brexit with education and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Brexit (ref. category: Remain)		
	Leave	Not vote	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	-0.169^{***}	-0.607^{***}	-0.293^{***}
	(0.045)	(0.091)	(0.059)
High education	-0.786^{***}	-0.428	-0.436
	(0.244)	(0.427)	(0.287)
Income	-0.155^{***}	-0.455^{***}	-0.223^{***}
	(0.046)	(0.114)	(0.062)
Male	0.144^{**}	-0.126	-0.337^{***}
	(0.066)	(0.158)	(0.089)
Age	0.024^{***}	-0.014^{***}	0.001
	(0.002)	(0.005)	(0.003)
Import shock	0.768^{***}	1.338^{**}	0.925^{***}
	(0.254)	(0.580)	(0.335)
Financial literacy: high education	-0.047	-0.141	-0.002
	(0.072)	(0.151)	(0.088)
Constant	-0.445^{**}	0.832^{**}	0.262
	(0.208)	(0.407)	(0.262)
Akaike Inf. Crit.	11,198.360	11,198.360	11,198.360

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.8: Clustered bootstrap p-values for Brexit (interaction education and financial literacy)

	DV: Brexit (ref. category: Remain)		
	Leave	Not Vote	Don't know
Constant	0.092	0.084	0.110
Financial Literacy (# correct)	0.019	0.003	0.003
High education	0.055	0.270	0.088
Income	0.010	0.002	0
Male	0.119	0.044	0.028
Age	0	0.061	0.901
Import shock	0.051	0.243	0.004
Financial literacy: high education	0.925	0.058	0.878

Table A.9: Multinomial logit models for Brexit with routineness and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Brexit (ref. category: Remain)		
	Leave	Not vote	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	−0.187***	−0.538***	−0.290***
	(0.042)	(0.092)	(0.053)
Routine occupation	−0.066	0.811*	0.100
	(0.245)	(0.414)	(0.293)
High education	−0.870***	−0.965***	−0.584***
	(0.069)	(0.182)	(0.093)
Income	−0.185***	−0.375***	−0.174***
	(0.046)	(0.115)	(0.062)
Male	0.120*	−0.032	−0.314***
	(0.066)	(0.160)	(0.089)
Age	0.024***	−0.011**	0.003
	(0.002)	(0.005)	(0.003)
Import shock	0.961***	0.895	1.217***
	(0.253)	(0.597)	(0.332)
Financial literacy: routine occupation	0.022	−0.312*	−0.045
	(0.076)	(0.160)	(0.095)
Constant	−0.416**	0.459	0.048
	(0.207)	(0.423)	(0.258)
Akaike Inf. Crit.	11,245.400	11,245.400	11,245.400

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.10: Clustered bootstrap p-values for Brexit (interaction routineness and financial literacy)

	DV: Brexit (ref. category: Remain)		
	Leave	Not Vote	Don't know
Constant	0.164	0.054	0.238
Financial Literacy (# correct)	0.150	0.006	0.001
Routine occupation	0.836	0.190	0.079
High education	0.003	0.001	0.022
Income	0.001	0.003	0.009
Male	0.030	0.994	0.027
Age	0	0.020	0.990
Import shock	0.103	0.642	0
Financial literacy: routine occupation	0.666	0.415	0.048

Table A.11: Multinomial logit models for Brexit with income and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Brexit (ref. category: Remain)		
	Leave	Not vote	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	−0.068	−0.470**	−0.291**
	(0.093)	(0.190)	(0.116)
Income	−0.012	−0.060	−0.197
	(0.156)	(0.273)	(0.186)
High education	−0.860***	−0.898***	−0.527***
	(0.068)	(0.171)	(0.091)
Male	0.131**	−0.175	−0.405***
	(0.066)	(0.157)	(0.089)
Age	0.023***	−0.014***	0.001
	(0.002)	(0.005)	(0.003)
Import shock	0.798***	0.311	0.854**
	(0.253)	(0.597)	(0.335)
Financial literacy: Income	−0.061	−0.087	−0.016
	(0.046)	(0.096)	(0.058)
Constant	−0.658**	0.624	0.411
	(0.334)	(0.596)	(0.399)
Akaike Inf. Crit.	11,274.520	11,274.520	11,274.520

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.12: Clustered bootstrap p-values for Brexit (interaction income and financial literacy)

	DV: Brexit (ref. category: Remain)		
	Leave	Not Vote	Don't know
Constant	0.022	0.520	0.372
Financial Literacy (# correct)	0.408	0.047	0.034
Income	0.810	0.513	0.402
High education	0	0	0.090
Male	0.112	0.043	0.042
Age	0	0.067	0.890
Import shock	0.045	0.262	0.002
Financial literacy: Income	0.231	0.459	0.756

Table A.13: Multinomial logit models for immigration with education and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	0.185***	0.273***	−0.450***
	(0.054)	(0.050)	(0.081)
High education	0.872***	1.224***	0.577
	(0.293)	(0.253)	(0.364)
Income	−0.013	0.100**	−0.351***
	(0.057)	(0.048)	(0.099)
Male	−0.222***	0.105	−0.162
	(0.081)	(0.069)	(0.137)
Age	−0.009***	−0.019***	−0.026***
	(0.003)	(0.002)	(0.004)
Import shock	−0.343	−1.364***	−1.240**
	(0.308)	(0.267)	(0.529)
Financial literacy: high education	−0.053	−0.012	0.014
	(0.087)	(0.074)	(0.127)
Constant	−1.011***	−0.467**	1.296***
	(0.252)	(0.221)	(0.359)
Akaike Inf. Crit.	11,768.940	11,768.940	11,768.940

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.14: Clustered bootstrap p-values for immigration (interaction education and financial literacy)

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
Constant	0.009	0.396	0.033
Financial Literacy (# correct)	0.007	0	0.022
High education	0.156	0.025	0.154
Income	0.116	0.138	0.015
Male	0.010	0.071	0.276
Age	0.092	0	0
Import shock	0.113	0.060	0.032
Financial literacy: high education	0.647	0.723	0.444

Table A.15: Multinomial logit models for immigration with routineness and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	0.148***	0.268***	−0.420***
	(0.051)	(0.045)	(0.076)
Routine occupation	−0.319	−0.200	−0.007
	(0.296)	(0.267)	(0.361)
Income	−0.021	0.087*	−0.366***
	(0.057)	(0.049)	(0.099)
High education	0.674***	1.148***	0.562***
	(0.087)	(0.073)	(0.147)
Male	−0.231***	0.091	−0.177
	(0.082)	(0.069)	(0.137)
Age	−0.009***	−0.020***	−0.026***
	(0.003)	(0.002)	(0.004)
Import shock	−0.341	−1.363***	−1.237**
	(0.308)	(0.267)	(0.530)
Financial literacy: routine occupation	0.056	−0.003	−0.085
	(0.092)	(0.082)	(0.138)
Constant	−0.811***	−0.328	1.356***
	(0.248)	(0.213)	(0.355)
Akaike Inf. Crit.	11,766.300	11,766.300	11,766.300

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.16: Clustered bootstrap p-values for immigration (interaction routine and financial literacy)

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
Constant	0	0.415	0.010
Financial Literacy (# correct)	0.105	0.001	0
Routine occupation	0.953	0.967	0.529
Income	0.147	0.149	0.013
High education	0	0	0.001
Male	0.006	0.062	0.269
Age	0.096	0	0
Import shock	0.115	0.069	0.031
Financial literacy: routine occupation	0.663	0.738	0.358

Table A.17: Multinomial logit models for immigration with income and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	0.217*	0.157	−0.418***
	(0.112)	(0.098)	(0.161)
Income	0.198	−0.071	−0.151
	(0.189)	(0.166)	(0.242)
High education	0.620***	1.128***	0.508***
	(0.085)	(0.071)	(0.145)
Male	−0.233***	0.106	−0.167
	(0.081)	(0.069)	(0.137)
Age	−0.006**	−0.018***	−0.020***
	(0.003)	(0.002)	(0.004)
Import shock	−0.389	−1.438***	−1.281**
	(0.307)	(0.266)	(0.528)
Financial literacy: Income	−0.035	0.059	−0.030
	(0.057)	(0.049)	(0.085)
Constant	−1.393***	−0.150	0.792
	(0.400)	(0.349)	(0.509)
Akaike Inf. Crit.	11,811.830	11,811.830	11,811.830

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.18: Clustered bootstrap p-values for immigration (interaction income and financial literacy)

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
Constant	0.024	0.638	0.046
Financial Literacy (# correct)	0.014	0.127	0.012
Income	0.225	0.534	0.518
High education	0	0.001	0.009
Male	0.002	0.060	0.169
Age	0.274	0.005	0.001
Import shock	0.065	0.062	0.023
Financial literacy: Income	0.374	0.138	0.668

Table A.19: Multinomial logit models for free trade with education and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	-0.233^{***}	-0.464^{***}	-0.616^{***}
	(0.048)	(0.064)	(0.059)
High education	-0.527^{**}	-0.363	-0.779^{***}
	(0.267)	(0.335)	(0.287)
Income	-0.115^{**}	-0.173^{**}	-0.194^{***}
	(0.051)	(0.075)	(0.068)
Male	-0.389^{***}	-0.133	-0.725^{***}
	(0.072)	(0.106)	(0.098)
Age	0.010^{***}	-0.004	-0.016^{***}
	(0.003)	(0.004)	(0.003)
Import shock	0.549^{**}	0.942^{**}	0.324
	(0.277)	(0.397)	(0.365)
Financial literacy: high education	-0.024	-0.093	0.102
	(0.079)	(0.106)	(0.093)
Constant	-0.237	0.094	1.801^{***}
	(0.227)	(0.304)	(0.267)
Akaike Inf. Crit.	11,094.600	11,094.600	11,094.600

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.20: Clustered bootstrap p-values for free trade with EU (interaction education and financial literacy)

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
Constant	0.268	0.798	0
Financial Literacy (# correct)	0.004	0.002	0
High education	0.062	0.414	0.032
Income	0.076	0.127	0.126
Male	0.006	0.201	0.005
Age	0.001	0.064	0.007
Import shock	0.034	0.082	0.331
Financial literacy: high education	0.776	0.537	0.194

Table A.21: Multinomial logit models for free trade with routineness and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	−0.239***	−0.484***	−0.640***
	(0.047)	(0.063)	(0.056)
Routine occupation	0.095	0.123	−0.572**
	(0.256)	(0.319)	(0.285)
High education	−0.583***	−0.615***	−0.504***
	(0.078)	(0.118)	(0.104)
Income	−0.108**	−0.168**	−0.197***
	(0.051)	(0.076)	(0.068)
Male	−0.379***	−0.124	−0.731***
	(0.073)	(0.106)	(0.099)
Age	0.010***	−0.004	−0.015***
	(0.003)	(0.004)	(0.003)
Import shock	0.548**	0.930**	0.359
	(0.277)	(0.398)	(0.365)
Financial literacy: routine occupation	0.005	−0.017	0.199**
	(0.080)	(0.107)	(0.097)
Constant	−0.294	0.099	1.882***
	(0.231)	(0.310)	(0.268)
Akaike Inf. Crit.	11,095.090	11,095.090	11,095.090
Note:			*p<0.1; **p<0.05; ***p<0.01

Table A.22: Clustered bootstrap p-values for free trade with EU (interaction routine and financial literacy)

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
Constant	0.081	0.731	0.002
Financial Literacy (# correct)	0	0	0.001
Routine occupation	0.545	0.637	0.015
High education	0.007	0	0.007
Income	0.059	0.159	0.106
Male	0.003	0.272	0.006
Age	0.003	0.089	0.008
Import shock	0.041	0.101	0.305
Financial literacy: routine occupation	0.915	0.857	0.013

Table A.23: Multinomial logit models for free trade with income and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	−0.266***	−0.385***	−0.781***
	(0.101)	(0.136)	(0.122)
Income	−0.160	−0.010	−0.501***
	(0.171)	(0.214)	(0.189)
High education	−0.604***	−0.628***	−0.502***
	(0.077)	(0.116)	(0.102)
Male	−0.390***	−0.131	−0.731***
	(0.072)	(0.106)	(0.098)
Age	0.010***	−0.004	−0.016***
	(0.003)	(0.004)	(0.003)
Import shock	0.547**	0.941**	0.324
	(0.277)	(0.397)	(0.365)
Financial literacy: Income	0.014	−0.061	0.111*
	(0.051)	(0.069)	(0.062)
Constant	−0.130	−0.109	2.249***
	(0.360)	(0.462)	(0.401)
Akaike Inf. Crit.	11,092.230	11,092.230	11,092.230

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.24: Clustered bootstrap p-values for free trade with EU (interaction income and financial literacy)

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
Constant	0.682	0.763	0.006
Financial Literacy (# correct)	0.016	0.031	0
Income	0.371	0.931	0.016
High education	0.008	0	0.019
Male	0.005	0.195	0
Age	0.001	0.064	0.009
Import shock	0.043	0.088	0.321
Financial literacy: Income	0.782	0.328	0.045

Table A.25: Multinomial logit models for Brexit with import shock and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Brexit (ref. category: Remain)		
	Leave	Not vote	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	-0.351^{***}	-1.137^{***}	-0.611^{***}
	(0.093)	(0.193)	(0.116)
Import shock	-0.923	-2.610^{*}	-2.113^{**}
	(0.877)	(1.482)	(1.068)
Income	-0.156^{***}	-0.462^{***}	-0.226^{***}
	(0.046)	(0.115)	(0.062)
Male	0.144^{**}	-0.122	-0.337^{***}
	(0.066)	(0.158)	(0.089)
Age	0.024^{***}	-0.014^{***}	0.001
	(0.002)	(0.005)	(0.003)
High education	-0.942^{***}	-0.809^{***}	-0.453^{***}
	(0.068)	(0.173)	(0.092)
Financial literacy: import shock	0.523^{**}	1.468^{***}	0.989^{***}
	(0.266)	(0.532)	(0.334)
Constant	0.148	2.260^{***}	1.250^{***}
	(0.333)	(0.590)	(0.403)
Akaike Inf. Crit.	11,185.960	11,185.960	11,185.960

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.26: Clustered bootstrap p-values for Brexit (interaction import shock and financial literacy)

	DV: Brexit (ref. category: Remain)		
	Leave	Not Vote	Don't know
Constant	0.472	0.001	0.008
Financial Literacy (# correct)	0.132	0.001	0.013
Import shock	0.336	0.004	0.064
Income	0.002	0.020	0
Male	0.026	0.357	0.004
Age	0	0.001	0.712
High education	0.001	0.027	0.014
Financial literacy: import shock	0.263	0.018	0.054

Table A.27: Multinomial logit models for immigration with import shock and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	0.216*	0.493***	−0.179
	(0.113)	(0.097)	(0.164)
Import shock	0.093	0.882	0.935
	(1.056)	(0.934)	(1.297)
Income	−0.012	0.102**	−0.349***
	(0.057)	(0.048)	(0.099)
Male	−0.221***	0.105	−0.165
	(0.081)	(0.069)	(0.137)
Age	−0.009***	−0.019***	−0.026***
	(0.003)	(0.002)	(0.004)
High education	0.701***	1.189***	0.606***
	(0.085)	(0.072)	(0.145)
Financial literacy: import shock	−0.152	−0.705**	−0.840*
	(0.322)	(0.282)	(0.486)
Constant	−1.097***	−1.175***	0.579
	(0.399)	(0.348)	(0.508)
Akaike Inf. Crit.	11,761.340	11,761.340	11,761.340

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.28: Clustered bootstrap p-values for immigration (interaction import shock and financial literacy)

	DV: Immigration (ref. category: Bad)		
	Neither good nor bad	Good	Don't know
Constant	0.002	0.001	0.121
Financial Literacy (# correct)	0.051	0	0.339
Import shock	0.961	0.057	0.464
Income	0.087	0.114	0.012
Male	0.007	0.054	0.256
Age	0.081	0	0
High education	0	0	0
Financial literacy: import shock	0.416	0.005	0.238

Table A.29: Multinomial logit models for free trade with import shock and financial literacy interaction: Log-odds and standards errors in parentheses

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
	(1)	(2)	(3)
Financial Literacy (# correct)	−0.363***	−0.614***	−0.645***
	(0.101)	(0.136)	(0.121)
Import shock	−0.668	−0.197	−0.326
	(0.952)	(1.166)	(1.028)
Income	−0.115**	−0.174**	−0.195***
	(0.051)	(0.076)	(0.068)
Male	−0.389***	−0.132	−0.727***
	(0.072)	(0.106)	(0.098)
Age	0.010***	−0.004	−0.015***
	(0.003)	(0.004)	(0.003)
High education	−0.605***	−0.631***	−0.502***
	(0.077)	(0.116)	(0.102)
Financial literacy: import shock	0.385	0.378	0.207
	(0.291)	(0.383)	(0.349)
Constant	0.178	0.545	1.916***
	(0.362)	(0.460)	(0.398)
Akaike Inf. Crit.	11,095.070	11,095.070	11,095.070

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.30: Clustered bootstrap p-values for free trade with EU (interaction import shock and financial literacy)

	DV: Free Trade with EU (ref. category: Good)		
	Neither good nor bad	Bad	Don't know
Constant	0.520	0.143	0.001
Financial Literacy (# correct)	0.004	0	0
Import shock	0.443	0.714	0.635
Income	0.079	0.134	0.110
Male	0.002	0.173	0.006
Age	0.002	0.061	0.011
High education	0.005	0	0.015
Financial literacy: import shock	0.172	0.177	0.299

Table A.31: Multinomial logit models for attitude towards gay rights: Log-odds and standards errors in parentheses

	DV: Attempts to give gays equal rights gone (ref. category: Not nearly far enough)				
	Not far	About right	Too far	Way too far	Don't know
	(1)	(2)	(3)	(4)	(5)
Financial Literacy (# correct)	0.002	−0.057	−0.023	−0.091	−0.530***
	(0.069)	(0.064)	(0.071)	(0.074)	(0.079)
High education	−0.105	−0.537***	−0.732***	−0.962***	−0.826***
	(0.135)	(0.123)	(0.136)	(0.143)	(0.165)
Income	−0.019	0.140*	−0.007	−0.022	−0.107
	(0.089)	(0.082)	(0.091)	(0.094)	(0.109)
Age	0.015***	0.040***	0.058***	0.073***	0.016***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Male	−0.290**	−0.078	0.324**	0.728***	−0.280*
	(0.130)	(0.118)	(0.132)	(0.138)	(0.158)
Constant	0.402	0.264	−1.714***	−2.706***	1.366***
	(0.271)	(0.250)	(0.293)	(0.316)	(0.303)
Akaike Inf. Crit.	16,655.290	16,655.290	16,655.290	16,655.290	16,655.290

Note: *p<0.1; **p<0.05; ***p<0.01

Table A.32: Clustered bootstrap p-values for attitude towards gay rights

	DV: Attempts to give equal opp. to gays gone (ref. category: Not nearly far)				
	Not far	About right	Too far	Way too far	Don't know
Constant	0.380	0.500	0.003	0	0.113
Financial Literacy (# correct)	0.984	0.554	0.835	0.324	0.020
High education	0.203	0	0.002	0	0.002
Income	0.850	0.379	0.954	0.859	0.451
Age	0.092	0	0	0	0.080
Male	0.033	0.472	0.051	0.022	0.040

Appendix B

APPENDIX TO CHAPTER 3

B.1 Supplementary Material

Table B.1: Multinomial logit models for Italexit with different literacy measures: Log-odds and standards errors in parentheses

	DV: Italexit (ref. category: Don't Know)			
	Model 1	Model 2	Model 3	Model 4
Constant [Outcome=Remain]	0.95*	1.48**	1.31**	2.07***
	(0.48)	(0.46)	(0.46)	(0.43)
Constant [Outcome=Leave]	−0.17	−0.03	0.02	0.28
	(0.53)	(0.52)	(0.51)	(0.48)
FEL [Outcome=Remain]	0.39***			
	(0.07)			
FEL [Outcome=Leave]	0.18*			
	(0.08)			
High Education [Outcome=Remain]	−0.13	−0.06	−0.12	−0.01
	(0.21)	(0.20)	(0.21)	(0.20)
High Education [Outcome=Leave]	−0.48*	−0.46	−0.47*	−0.43
	(0.24)	(0.24)	(0.24)	(0.23)
Middle Income [Outcome=Remain]	0.50*	0.54*	0.51*	0.56**
	(0.21)	(0.21)	(0.21)	(0.21)
Middle Income [Outcome=Leave]	0.12	0.14	0.14	0.16
	(0.23)	(0.23)	(0.23)	(0.23)
High Income [Outcome=Remain]	0.82**	0.88**	0.83**	0.91**
	(0.28)	(0.28)	(0.28)	(0.28)
High Income [Outcome=Leave]	−0.05	−0.02	−0.03	0.00
	(0.32)	(0.32)	(0.32)	(0.32)
Female [Outcome=Remain]	0.11	0.03	0.01	−0.09
	(0.20)	(0.20)	(0.19)	(0.19)
Female [Outcome=Leave]	−0.23	−0.25	−0.28	−0.31
	(0.22)	(0.22)	(0.21)	(0.21)
Age [Outcome=Remain]	−0.01	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Age [Outcome=Leave]	−0.01	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Region Center [Outcome=Remain]	−0.54*	−0.52*	−0.57*	−0.53*
	(0.24)	(0.24)	(0.24)	(0.23)
Region Center [Outcome=Leave]	−0.19	−0.18	−0.21	−0.18
	(0.26)	(0.26)	(0.26)	(0.26)
Region South [Outcome=Remain]	0.25	0.19	0.20	0.12
	(0.22)	(0.21)	(0.21)	(0.21)
Region South [Outcome=Leave]	0.33	0.31	0.30	0.27

	(0.23)	(0.23)	(0.23)	(0.23)
Political Ideology [Outcome=Remain]	-0.08^{*}	-0.10^{**}	-0.08^{*}	-0.10^{**}
	(0.03)	(0.03)	(0.03)	(0.03)
Political Ideology [Outcome=Leave]	0.12^{**}	0.12^{**}	0.12^{**}	0.11^{**}
	(0.04)	(0.04)	(0.04)	(0.04)
Financial literacy [Outcome=Remain]		0.35^{***}		
		(0.10)		
Financial literacy [Outcome=Leave]		0.19		
		(0.11)		
Economic Literacy [Outcome=Remain]			0.65^{***}	
			(0.12)	
Economic literacy [Outcome=Leave]			0.26^{*}	
			(0.13)	
Num. obs.	5640	5640	5640	5640
Num. imp.	5	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.2: Multinomial logit models for free trade with different literacy measures: Log-odds and standards errors in parentheses

	DV: Free Trade (ref. category: Don't Know)			
	Model 1	Model 2	Model 3	Model 4
Constant [Outcome=Against]	−0.67	−0.65	−0.18	0.07
	(0.74)	(0.72)	(0.73)	(0.69)
Constant [Outcome=In Favor]	0.86	1.41^{*}	1.68^{**}	2.67^{***}
	(0.64)	(0.61)	(0.62)	(0.58)
FEL [Outcome=Against]	0.33^{**}			
	(0.12)			
FEL [Outcome=In Favor]	0.72^{***}			
	(0.10)			
High Education [Outcome=Against]	0.52	0.53	0.55	0.61
	(0.35)	(0.35)	(0.35)	(0.34)
High Education [Outcome=In Favor]	0.15	0.24	0.19	0.36
	(0.31)	(0.31)	(0.31)	(0.30)
Middle Income [Outcome=Against]	0.14	0.19	0.23	0.25
	(0.33)	(0.33)	(0.33)	(0.33)
Middle Income [Outcome=In Favor]	0.38	0.48	0.46	0.55^{*}
	(0.28)	(0.28)	(0.28)	(0.27)
High Income [Outcome=Against]	0.99	1.05^{*}	1.07^{*}	1.10^{*}
	(0.53)	(0.53)	(0.52)	(0.52)
High Income [Outcome=In Favor]	1.00^{*}	1.12^{*}	1.07^{*}	1.18^{*}
	(0.48)	(0.48)	(0.48)	(0.48)
Female [Outcome=Against]	−0.54	−0.52	−0.62	-0.65^{*}
	(0.33)	(0.33)	(0.32)	(0.32)
Female [Outcome=In Favor]	−0.34	−0.41	−0.51	-0.64^{*}
	(0.29)	(0.29)	(0.28)	(0.28)
Age [Outcome=Against]	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Age [Outcome=In Favor]	0.01	0.01	0.02	0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Region Center [Outcome=Against]	−0.67	−0.63	−0.61	−0.57
	(0.38)	(0.38)	(0.38)	(0.37)
Region Center [Outcome=In Favor]	-0.99^{**}	-0.93^{**}	-0.96^{**}	-0.88^{**}

	(0.33)	(0.32)	(0.32)	(0.31)
Region South [Outcome=Against]	0.22	0.21	0.15	0.13
	(0.35)	(0.35)	(0.35)	(0.35)
Region South [Outcome=In Favor]	0.24	0.18	0.11	0.02
	(0.31)	(0.31)	(0.30)	(0.30)
Political Ideology [Outcome=Against]	0.03	0.02	0.03	0.02
	(0.06)	(0.06)	(0.06)	(0.06)
Political Ideology [Outcome=In Favor]	-0.10^{*}	-0.11^{*}	-0.10^{*}	-0.12^{**}
	(0.05)	(0.05)	(0.05)	(0.05)
Financial literacy [Outcome=Against]		0.51^{**}		
		(0.16)		
Financial literacy [Outcome=In Favor]		0.83^{***}		
		(0.14)		
Economic Literacy [Outcome=Against]			0.24	
			(0.21)	
Economic literacy [Outcome=In Favor]			0.90^{***}	
			(0.18)	
Num. obs.	5640	5640	5640	5640
Num. imp.	5	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.3: Multinomial logit models for EU immigration with different literacy measures: Log-odds and standards errors in parentheses

	DV: EU Immigration (ref. category: Don't Know)			
	Model 1	Model 2	Model 3	Model 4
Constant [Outcome=Against]	-1.49	-1.37	-1.05	-0.52
	(0.86)	(0.84)	(0.86)	(0.80)
Constant [Outcome=In Favor]	0.90	1.55^{*}	1.57^{*}	2.77^{***}
	(0.73)	(0.70)	(0.73)	(0.67)
FEL [Outcome=Against]	0.48^{***}			
	(0.14)			
FEL [Outcome=In Favor]	0.80^{***}			
	(0.12)			
High Education [Outcome=Against]	-0.36	-0.34	-0.32	-0.23
	(0.41)	(0.40)	(0.40)	(0.40)
High Education [Outcome=In Favor]	-0.25	-0.17	-0.20	-0.02
	(0.36)	(0.35)	(0.35)	(0.34)
Middle Income [Outcome=Against]	0.37	0.45	0.47	0.50
	(0.39)	(0.39)	(0.39)	(0.39)
Middle Income [Outcome=In Favor]	0.63	0.76^{*}	0.72^{*}	0.83^{*}
	(0.34)	(0.33)	(0.33)	(0.33)
High Income [Outcome=Against]	0.99	1.10^{*}	1.06	1.15^{*}
	(0.56)	(0.56)	(0.56)	(0.55)
High Income [Outcome=In Favor]	0.84	1.00^{*}	0.89	1.07^{*}
	(0.51)	(0.50)	(0.50)	(0.49)
Female [Outcome=Against]	-0.21	-0.19	-0.34	-0.39
	(0.37)	(0.37)	(0.37)	(0.36)
Female [Outcome=In Favor]	0.02	-0.05	-0.16	-0.33
	(0.33)	(0.33)	(0.32)	(0.32)
Age [Outcome=Against]	0.00	0.00	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Age [Outcome=In Favor]	-0.00	-0.00	0.01	0.01

	(0.01)	(0.01)	(0.01)	(0.01)
Region Center [Outcome=Against]	−0.27	−0.22	−0.29	−0.22
	(0.46)	(0.45)	(0.45)	(0.45)
Region Center [Outcome=In Favor]	−0.29	−0.23	−0.33	−0.24
	(0.39)	(0.38)	(0.38)	(0.37)
Region South [Outcome=Against]	0.81*	0.77	0.71	0.64
	(0.41)	(0.41)	(0.41)	(0.40)
Region South [Outcome=In Favor]	0.77*	0.66	0.62	0.48
	(0.37)	(0.36)	(0.36)	(0.35)
Political Ideology [Outcome=Against]	0.14*	0.13	0.14*	0.12
	(0.07)	(0.07)	(0.07)	(0.07)
Political Ideology [Outcome=In Favor]	−0.06	−0.07	−0.05	−0.08
	(0.06)	(0.06)	(0.06)	(0.06)
Financial literacy [Outcome=Against]		0.62**		
		(0.19)		
Financial literacy [Outcome=In Favor]		0.83***		
		(0.16)		
Economic Literacy [Outcome=Against]			0.61*	
			(0.26)	
Economic literacy [Outcome=In Favor]			1.22***	
			(0.23)	
Num. obs.	5640	5640	5640	5640
Num. imp.	5	5	5	5

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Table B.4: Multinomial logit models for non-EU immigration with different literacy measures: Log-odds and standards errors in parentheses

	DV: non-EU Immigration (ref. category: Don't Know)			
	Model 1	Model 2	Model 3	Model 4
Constant [Outcome=Against]	−1.14*	−1.14*	−0.63	−0.38
	(0.56)	(0.56)	(0.54)	(0.52)
Constant [Outcome=In Favor]	1.34*	1.92***	1.90***	2.77***
	(0.56)	(0.54)	(0.54)	(0.51)
FEL [Outcome=Against]	0.31***			
	(0.08)			
FEL [Outcome=In Favor]	0.53***			
	(0.08)			
High Education [Outcome=Against]	0.22	0.23	0.26	0.29
	(0.25)	(0.25)	(0.25)	(0.25)
High Education [Outcome=In Favor]	0.41	0.47	0.42	0.55*
	(0.25)	(0.25)	(0.25)	(0.25)
Middle Income [Outcome=Against]	−0.28	−0.25	−0.21	−0.19
	(0.25)	(0.25)	(0.25)	(0.24)
Middle Income [Outcome=In Favor]	−0.23	−0.17	−0.17	−0.10
	(0.25)	(0.25)	(0.25)	(0.25)
High Income [Outcome=Against]	0.07	0.12	0.14	0.18
	(0.35)	(0.35)	(0.35)	(0.34)
High Income [Outcome=In Favor]	0.19	0.29	0.22	0.35
	(0.35)	(0.35)	(0.35)	(0.34)
Female [Outcome=Against]	−0.36	−0.35	−0.47*	−0.50*
	(0.23)	(0.23)	(0.23)	(0.23)
Female [Outcome=In Favor]	−0.35	−0.42	−0.48*	−0.59**

	(0.23)	(0.23)	(0.23)	(0.22)
Age [Outcome=Against]	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Age [Outcome=In Favor]	−0.01	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Region Center [Outcome=Against]	−0.40	−0.37	−0.38	−0.36
	(0.28)	(0.28)	(0.28)	(0.28)
Region Center [Outcome=In Favor]	−0.55	−0.53	−0.56	−0.52
	(0.29)	(0.29)	(0.29)	(0.28)
Region South [Outcome=Against]	0.00	0.00	−0.07	−0.10
	(0.25)	(0.25)	(0.24)	(0.24)
Region South [Outcome=In Favor]	0.12	0.04	0.04	−0.07
	(0.25)	(0.25)	(0.25)	(0.24)
Political Ideology [Outcome=Against]	0.25***	0.25***	0.25***	0.24***
	(0.04)	(0.04)	(0.04)	(0.04)
Political Ideology [Outcome=In Favor]	−0.14**	−0.15***	−0.14**	−0.16***
	(0.04)	(0.04)	(0.04)	(0.04)
Financial literacy [Outcome=Against]		0.48***		
		(0.12)		
Financial literacy [Outcome=In Favor]		0.53***		
		(0.12)		
Economic Literacy [Outcome=Against]			0.24	
			(0.14)	
Economic literacy [Outcome=In Favor]			0.77***	
			(0.14)	
Num. obs.	5640	5640	5640	5640
Num. imp.	5	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.5: Multinomial logit models for Fornero pension reform with different literacy measures: Log-odds and standards errors in parentheses

	DV: Fornero pension reform (ref. category: Don't Know)			
	Model 1	Model 2	Model 3	Model 4
Constant [Outcome=Against]	−0.82	−0.68	−0.23	0.18
	(0.47)	(0.45)	(0.44)	(0.41)
Constant [Outcome=In Favor]	−1.01	−0.48	−0.45	0.38
	(0.53)	(0.51)	(0.50)	(0.46)
FEL [Outcome=Against]	0.34***			
	(0.07)			
FEL [Outcome=In Favor]	0.46***			
	(0.08)			
High Education [Outcome=Against]	−0.11	−0.09	−0.06	−0.01
	(0.21)	(0.21)	(0.21)	(0.20)
High Education [Outcome=In Favor]	0.09	0.14	0.12	0.22
	(0.23)	(0.23)	(0.23)	(0.23)
Middle Income [Outcome=Against]	0.30	0.33	0.34	0.38
	(0.20)	(0.20)	(0.20)	(0.20)
Middle Income [Outcome=In Favor]	0.14	0.18	0.17	0.22
	(0.24)	(0.24)	(0.24)	(0.24)
High Income [Outcome=Against]	0.44	0.48	0.47	0.50
	(0.30)	(0.30)	(0.29)	(0.29)
High Income [Outcome=In Favor]	0.98**	1.04**	0.99**	1.06***

	(0.32)	(0.32)	(0.32)	(0.32)
Female [Outcome=Against]	−0.22	−0.22	−0.33	−0.38*
	(0.20)	(0.20)	(0.19)	(0.19)
Female [Outcome=In Favor]	−0.46*	−0.50*	−0.58**	−0.67**
	(0.22)	(0.22)	(0.22)	(0.22)
Age [Outcome=Against]	0.02*	0.01*	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Age [Outcome=In Favor]	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Region Center [Outcome=Against]	−0.15	−0.12	−0.14	−0.12
	(0.26)	(0.26)	(0.25)	(0.25)
Region Center [Outcome=In Favor]	−0.61*	−0.59*	−0.62*	−0.58*
	(0.30)	(0.29)	(0.29)	(0.29)
Region South [Outcome=Against]	0.04	0.04	−0.03	−0.06
	(0.21)	(0.21)	(0.20)	(0.20)
Region South [Outcome=In Favor]	−0.34	−0.39	−0.41	−0.49*
	(0.24)	(0.24)	(0.24)	(0.23)
Political Ideology [Outcome=Against]	0.10**	0.09**	0.09**	0.08*
	(0.03)	(0.03)	(0.03)	(0.03)
Political Ideology [Outcome=In Favor]	−0.01	−0.03	−0.01	−0.04
	(0.04)	(0.04)	(0.04)	(0.04)
Financial literacy [Outcome=Against]		0.50***		
		(0.10)		
Financial literacy [Outcome=In Favor]		0.51***		
		(0.12)		
Economic Literacy [Outcome=Against]			0.32**	
			(0.11)	
Economic literacy [Outcome=In Favor]			0.61***	
			(0.13)	
Num. obs.	5640	5640	5640	5640
Num. imp.	5	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.6: Multinomial logit models for Italexit with FEL index and heterogeneous effects: Log-odds and standards errors in parentheses

	DV: Italexit (ref. category: Don't Know)		
	Model 1	Model 2	Model 3
Constant [Outcome=Remain]	1.07*	0.88	0.68
	(0.50)	(0.52)	(0.86)
Constant [Outcome=Leave]	−0.12	−0.24	−0.47
	(0.55)	(0.56)	(0.93)
FEL [Outcome=Remain]	0.35***	0.42***	0.47**
	(0.09)	(0.11)	(0.15)
FEL [Outcome=Leave]	0.16	0.20	0.16
	(0.09)	(0.11)	(0.16)
High Education [Outcome=Remain]	−0.42	−0.13	0.22
	(0.44)	(0.21)	(0.29)
High Education [Outcome=Leave]	−0.59	−0.49*	−0.02
	(0.49)	(0.24)	(0.33)
Middle Income [Outcome=Remain]	0.50*	0.70	0.61
	(0.21)	(0.45)	(0.34)

Middle Income [Outcome=Leave]	0.13	0.07	−0.11
	(0.23)	(0.48)	(0.36)
High Income [Outcome=Remain]	0.82**	0.84	0.91*
	(0.28)	(0.61)	(0.41)
High Income [Outcome=Leave]	−0.04	0.49	−0.30
	(0.32)	(0.66)	(0.45)
Female [Outcome=Remain]	0.10	0.10	0.20
	(0.20)	(0.20)	(0.28)
Female [Outcome=Leave]	−0.23	−0.23	−0.22
	(0.22)	(0.22)	(0.31)
Age [Outcome=Remain]	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)
Age [Outcome=Leave]	−0.01	−0.01	0.00
	(0.01)	(0.01)	(0.01)
Region Center [Outcome=Remain]	−0.55*	−0.54*	−0.63*
	(0.24)	(0.24)	(0.32)
Region Center [Outcome=Leave]	−0.20	−0.20	0.10
	(0.26)	(0.26)	(0.34)
Region South [Outcome=Remain]	0.25	0.26	0.24
	(0.22)	(0.22)	(0.31)
Region South [Outcome=Leave]	0.33	0.32	0.47
	(0.23)	(0.23)	(0.35)
Political Ideology [Outcome=Remain]	−0.09*	−0.08*	−0.09
	(0.03)	(0.03)	(0.05)
Political Ideology [Outcome=Leave]	0.12**	0.12**	0.13*
	(0.04)	(0.04)	(0.05)
FEL x High Education [Outcome=Remain]	0.10		
	(0.14)		
FEL x High Education [Outcome=Leave]	0.04		
	(0.15)		
FEL x Middle Income [Outcome=Remain]		−0.07	
		(0.15)	
FEL x Middle Income [Outcome=Leave]		0.01	
		(0.16)	
FEL x High Income [Outcome=Remain]		−0.02	
		(0.18)	
FEL x High Income [Outcome=Leave]		−0.18	
		(0.21)	
Routine [Outcome=Remain]			0.20
			(0.64)
Routine [Outcome=Leave]			−0.68
			(0.69)
FEL x Routine [Outcome=Remain]			−0.16
			(0.20)
FEL x Routine [Outcome=Leave]			0.08
			(0.21)
Num. obs.	5640	5640	5640
Num. imp.	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.7: Multinomial logit models for Free Trade with FEL index and heterogeneous effects: Log-odds and standards errors in parentheses

	DV: Free Trade (ref. category: Don't Know)		
	Model 1	Model 2	Model 3
Constant [Outcome=Against]	−0.89	−0.49	−1.31
	(0.77)	(0.78)	(1.41)
Constant [Outcome=In Favor]	0.74	0.97	0.45
	(0.65)	(0.67)	(1.27)
FEL [Outcome=Against]	0.43**	0.24	0.29
	(0.14)	(0.17)	(0.30)
FEL [Outcome=In Favor]	0.77***	0.66***	0.80**
	(0.13)	(0.14)	(0.28)
High Education [Outcome=Against]	1.18	0.53	−0.02
	(0.65)	(0.35)	(0.50)
High Education [Outcome=In Favor]	0.57	0.17	−0.45
	(0.58)	(0.31)	(0.45)
Middle Income [Outcome=Against]	0.10	−0.61	0.30
	(0.33)	(0.63)	(0.53)
Middle Income [Outcome=In Favor]	0.35	0.23	0.73
	(0.29)	(0.53)	(0.47)
High Income [Outcome=Against]	0.98	1.06	1.50
	(0.53)	(0.94)	(0.78)
High Income [Outcome=In Favor]	0.99*	0.49	1.63*
	(0.48)	(0.89)	(0.72)
Female [Outcome=Against]	−0.52	−0.52	0.21
	(0.33)	(0.33)	(0.48)
Female [Outcome=In Favor]	−0.33	−0.34	0.06
	(0.29)	(0.29)	(0.43)
Age [Outcome=Against]	0.01	0.01	0.00
	(0.01)	(0.01)	(0.02)
Age [Outcome=In Favor]	0.01	0.01	−0.00
	(0.01)	(0.01)	(0.02)
Region Center [Outcome=Against]	−0.66	−0.68	−0.15
	(0.38)	(0.38)	(0.53)
Region Center [Outcome=In Favor]	−0.99**	−1.00**	−0.30
	(0.33)	(0.33)	(0.46)
Region South [Outcome=Against]	0.22	0.20	1.45*
	(0.35)	(0.35)	(0.64)
Region South [Outcome=In Favor]	0.24	0.24	1.41*
	(0.31)	(0.31)	(0.59)
Political Ideology [Outcome=Against]	0.03	0.03	0.15
	(0.06)	(0.06)	(0.08)
Political Ideology [Outcome=In Favor]	−0.10*	−0.10*	−0.01
	(0.05)	(0.05)	(0.07)
FEL x High Education [Outcome=Against]	−0.30		
	(0.24)		
FEL x High Education [Outcome=In Favor]	−0.20		
	(0.22)		
FEL x Middle Income [Outcome=Against]		0.31	
		(0.25)	
FEL x Middle Income [Outcome=In Favor]		0.09	
		(0.22)	
FEL x High Income [Outcome=Against]		0.02	
		(0.38)	
FEL x High Income [Outcome=In Favor]		0.21	
		(0.36)	
Routine [Outcome=Against]			−1.43

			(0.99)
Routine [Outcome=In Favor]			−0.52
			(0.88)
FEL x Routine [Outcome=Against]			0.21
			(0.37)
FEL x Routine [Outcome=In Favor]			−0.12
			(0.34)
Num. obs.	5640	5640	5640
Num. imp.	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.8: Multinomial logit models for EU immigration with FEL index and heterogeneous effects: Log-odds and standards errors in parentheses

	DV: EU Immigration (ref. category: Don't Know)		
	Model 1	Model 2	Model 3
Constant [Outcome=Against]	−1.53	−1.42	−2.71
	(0.88)	(0.90)	(1.68)
Constant [Outcome=In Favor]	0.82	0.95	0.46
	(0.75)	(0.76)	(1.45)
FEL [Outcome=Against]	0.51**	0.44*	1.04*
	(0.17)	(0.20)	(0.42)
FEL [Outcome=In Favor]	0.84***	0.78***	1.43***
	(0.16)	(0.17)	(0.40)
High Education [Outcome=Against]	−0.25	−0.38	−0.35
	(0.73)	(0.41)	(0.61)
High Education [Outcome=In Favor]	−0.03	−0.26	−0.44
	(0.60)	(0.36)	(0.55)
Middle Income [Outcome=Against]	0.36	0.04	0.24
	(0.39)	(0.75)	(0.70)
Middle Income [Outcome=In Favor]	0.62	0.83	0.49
	(0.34)	(0.60)	(0.60)
High Income [Outcome=Against]	0.99	0.85	1.08
	(0.56)	(0.94)	(0.84)
High Income [Outcome=In Favor]	0.84	0.14	0.73
	(0.51)	(0.85)	(0.74)
Female [Outcome=Against]	−0.20	−0.19	0.13
	(0.37)	(0.37)	(0.57)
Female [Outcome=In Favor]	0.03	0.03	0.28
	(0.33)	(0.33)	(0.50)
Age [Outcome=Against]	0.00	0.00	−0.03
	(0.01)	(0.01)	(0.03)
Age [Outcome=In Favor]	−0.00	−0.00	−0.02
	(0.01)	(0.01)	(0.02)
Region Center [Outcome=Against]	−0.27	−0.29	0.01
	(0.46)	(0.46)	(0.64)
Region Center [Outcome=In Favor]	−0.28	−0.30	−0.10
	(0.39)	(0.39)	(0.55)
Region South [Outcome=Against]	0.82*	0.80	2.02*
	(0.41)	(0.41)	(0.86)
Region South [Outcome=In Favor]	0.77*	0.77*	1.80*
	(0.37)	(0.37)	(0.80)
Political Ideology [Outcome=Against]	0.14*	0.14*	0.32**

	(0.07)	(0.07)	(0.11)
Political Ideology [Outcome=In Favor]	−0.06	−0.06	−0.03
	(0.06)	(0.06)	(0.09)
FEL x High Education [Outcome=Against]	−0.07		
	(0.29)		
FEL x High Education [Outcome=In Favor]	−0.11		
	(0.26)		
FEL x Middle Income [Outcome=Against]		0.11	
		(0.30)	
FEL x Middle Income [Outcome=In Favor]		−0.08	
		(0.26)	
FEL x High Income [Outcome=Against]		0.15	
		(0.41)	
FEL x High Income [Outcome=In Favor]		0.33	
		(0.39)	
Routine [Outcome=Against]			0.89
			(1.17)
Routine [Outcome=In Favor]			1.70
			(0.99)
FEL x Routine [Outcome=Against]			−0.62
			(0.49)
FEL x Routine [Outcome=In Favor]			−1.02*
			(0.45)
Num. obs.	5640	5640	5640
Num. imp.	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.9: Multinomial logit models for non-EU immigration with FEL index and heterogeneous effects: Log-odds and standards errors in parentheses

	DV: non-EU Immigration (ref. category: Don't Know)		
	Model 1	Model 2	Model 3
Constant [Outcome=Against]	−1.29*	−1.32*	−1.38
	(0.59)	(0.61)	(1.01)
Constant [Outcome=In Favor]	1.37*	1.15	1.02
	(0.58)	(0.62)	(1.00)
FEL [Outcome=Against]	0.36***	0.38**	0.16
	(0.10)	(0.13)	(0.18)
FEL [Outcome=In Favor]	0.53***	0.62***	0.52**
	(0.10)	(0.14)	(0.18)
High Education [Outcome=Against]	0.61	0.22	0.22
	(0.50)	(0.25)	(0.35)
High Education [Outcome=In Favor]	0.38	0.40	0.34
	(0.53)	(0.25)	(0.35)
Middle Income [Outcome=Against]	−0.29	−0.19	0.02
	(0.25)	(0.48)	(0.41)
Middle Income [Outcome=In Favor]	−0.24	0.23	−0.17
	(0.25)	(0.51)	(0.41)
High Income [Outcome=Against]	0.06	0.66	0.24
	(0.35)	(0.69)	(0.49)
High Income [Outcome=In Favor]	0.18	0.27	−0.03
	(0.35)	(0.73)	(0.49)
Female [Outcome=Against]	−0.35	−0.36	−0.10

	(0.23)	(0.23)	(0.32)
Female [Outcome=In Favor]	−0.35	−0.36	−0.18
	(0.23)	(0.23)	(0.32)
Age [Outcome=Against]	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)
Age [Outcome=In Favor]	−0.01	−0.01	0.00
	(0.01)	(0.01)	(0.01)
Region Center [Outcome=Against]	−0.39	−0.40	−0.36
	(0.28)	(0.28)	(0.38)
Region Center [Outcome=In Favor]	−0.55	−0.55	−0.67
	(0.29)	(0.29)	(0.39)
Region South [Outcome=Against]	0.00	−0.00	−0.03
	(0.25)	(0.25)	(0.36)
Region South [Outcome=In Favor]	0.12	0.13	−0.22
	(0.25)	(0.25)	(0.36)
Political Ideology [Outcome=Against]	0.26^{***}	0.26^{***}	0.31^{***}
	(0.04)	(0.04)	(0.06)
Political Ideology [Outcome=In Favor]	-0.14^{**}	-0.14^{**}	-0.13^{*}
	(0.04)	(0.04)	(0.06)
FEL x High Education [Outcome=Against]	−0.14		
	(0.17)		
FEL x High Education [Outcome=In Favor]	−0.01		
	(0.17)		
FEL x Middle Income [Outcome=Against]		−0.06	
		(0.18)	
FEL x Middle Income [Outcome=In Favor]		−0.18	
		(0.18)	
FEL x High Income [Outcome=Against]		−0.22	
		(0.23)	
FEL x High Income [Outcome=In Favor]		−0.07	
		(0.23)	
Routine [Outcome=Against]			−1.07
			(0.71)
Routine [Outcome=In Favor]			−0.17
			(0.73)
FEL x Routine [Outcome=Against]			0.26
			(0.23)
FEL x Routine [Outcome=In Favor]			−0.02
			(0.23)
Num. obs.	5640	5640	5640
Num. imp.	5	5	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.10: Multinomial logit models for Fornero pension reform with FEL index and heterogeneous effects: Log-odds and standards errors in parentheses

	DV: Fornero pension reform (ref. category: Don't Know)
	Model 1
Constant [Outcome=Against]	−0.16
	(0.39)
Constant [Outcome=In Favor]	−0.43
	(0.45)
FEL [Outcome=Against]	0.29^{***}

	(0.07)
FEL [Outcome=In Favor]	0.39***
	(0.09)
Age 56-66 [Outcome=Against]	−0.51
	(0.51)
Age 56-66 [Outcome=In Favor]	−1.16
	(0.71)
High Education [Outcome=Against]	−0.16
	(0.20)
High Education [Outcome=In Favor]	0.03
	(0.23)
Middle Income [Outcome=Against]	0.35
	(0.20)
Middle Income [Outcome=In Favor]	0.19
	(0.24)
High Income [Outcome=Against]	0.50
	(0.29)
High Income [Outcome=In Favor]	1.02**
	(0.32)
Female [Outcome=Against]	−0.23
	(0.20)
Female [Outcome=In Favor]	−0.47*
	(0.23)
Region Center [Outcome=Against]	−0.05
	(0.25)
Region Center [Outcome=In Favor]	−0.53
	(0.29)
Region South [Outcome=Against]	0.07
	(0.21)
Region South [Outcome=In Favor]	−0.32
	(0.24)
Political Ideology [Outcome=Against]	0.11**
	(0.03)
Political Ideology [Outcome=In Favor]	−0.01
	(0.04)
FEL x Age 56-66 [Outcome=Against]	0.35
	(0.18)
FEL x Age 56-66 [Outcome=In Favor]	0.46*
	(0.22)
Num. obs.	5640
Num. imp.	5

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table B.11: Regression table with robust and resistant estimates, OLS estimates without outliers, and quantile estimates, and standard errors in parentheses for the relationship between financial and economic literacy and discount rates

	DV: Subjective Discount Rate		
	Robust and resistant	*OLS*	*Quantile*
	(1)	(2)	(3)
Financial and Economic Literacy (# correct)	-2.236^{***}	-2.462^{**}	-5.258^{***}
	(0.558)	(0.832)	(0.888)
Middle Income	-0.360	-4.958	-6.439
	(1.790)	(2.572)	(4.462)
High Income	-4.510^{*}	-10.130^{**}	-11.036^{*}
	(2.243)	(3.210)	(4.527)
High Education	-2.071	-2.614	1.210
	(1.671)	(2.401)	(2.279)
Age	-1.098^{***}	-1.763^{***}	-3.672^{***}
	(0.333)	(0.498)	(0.925)
Age Squared	0.008^{*}	0.013^{*}	0.030^{***}
	(0.004)	(0.005)	(0.009)
Female	3.547^{*}	9.256^{***}	6.669^{*}
	(1.576)	(2.230)	(2.926)
Constant	60.327^{***}	92.029^{***}	146.069^{***}
	(7.738)	(11.678)	(24.591)
Observations	999	808	999
Residual Std. Error	21.868 (df = 991)	29.838 (df = 800)	
F Statistic		20.331^{***} (df = 7; 800)	

Note: *p<0.05; **p<0.01; ***p<0.001

Appendix C

APPENDIX TO CHAPTER 4

C.1 Supplementary Material

Table C.1: Summary statistics for control variables across groups: relative frequencies and mean and standard deviation for age (n=227).

	Poli Sci *before*	Fin/Econ *before*	Poli Sci *after*	Fin/Econ *after*
Gender				
Female	62%	45%	69%	52%
Male	38%	55%	31%	48%
Income				
$0 - $24,999	7%	2%	15%	14%
$25,000 - $49,999	12%	9%	13%	10%
$50,000 - $74,999	12%	7%	6%	10%
$75,000 - $99,999	14%	9%	11%	16%
$100,000 - $124,999	16%	19%	15%	17 %
$125,000 - $149,999	9%	19%	4%	9%
$150,000 - $174,999	2%	13%	15%	5%
$175,000 - $199,999	5%	4%	11%	3%
$200,000 and up	21%	19%	11%	16%
Taken Econ Before				
Yes	45%	39%	N/A	N/A
No	55%	61%	N/A	N/A
Risk				
Winning $1,000 in cash right away	84%	82%	83%	90%
Winning $2,000 with prob. of 50%	16%	18%	17%	10%
Age	18.1 (0.23)	18.2 (0.41)	19.3 (1.2)	21.2 (4.1)

Table C.2: Regression table for Fin/Econ *after* and Poli Sci *after* groups

	DV: Subjective Discount Rate			
	Robust	Robust and Resistant	OLS (excluding outliers)	Quantile
	(1)	(2)	(3)	(4)
Fin/Econ after (Poli Sci after ref. category)	−66.861***	−10.881**	−43.684***	−84.542*
	(8.645)	(3.433)	(8.500)	(32.593)
Age	−1.349	0.111	0.785	−0.708
	(1.218)	(0.484)	(1.156)	(3.529)
Male (Female ref. category)	−10.165	−1.111	−15.458	−3.333
	(8.027)	(3.187)	(7.775)	(5.641)
Income $25,000 - $49,999 ($0 - $24,999 ref. category)	14.218	−1.378	−16.214	3.042
	(14.965)	(5.942)	(16.352)	(116.635)
Income $50,000 - $74,999	1.318	9.332	18.663	−5.458
	(16.745)	(6.649)	(16.300)	(20.392)
Income $75,000 - $99,999	−0.083	3.510	7.742	−3.333
	(14.860)	(5.900)	(14.181)	(12.548)
Income $100,000 - $124,999	−5.654	3.805	7.980	−4.750
	(14.107)	(5.601)	(13.592)	(12.938)
Income $125,000 - $149,999	−7.745	1.329	−5.000	−4.750
	(16.014)	(6.359)	(15.511)	(12.919)
Income $150,000 - $174,999	−13.150	−2.417	−16.185	−6.417
	(16.073)	(6.382)	(16.329)	(18.753)
Income $175,000 - $199,999	−30.438	4.755	−25.628	−49.292**
	(18.274)	(7.256)	(18.214)	(16.142)
Income $200,000 and up	−6.699	8.297	3.006	−4.042
	(13.461)	(5.345)	(12.751)	(12.110)
Risk-taker (Risk-averse ref. category)	14.561	−2.607	4.491	4.750
	(11.592)	(4.603)	(13.033)	(157.101)
Constant	115.833***	14.950	47.995	112.750
	(26.504)	(10.524)	(26.289)	(79.564)
Observations	102	102	89	102
Residual Std. Error	23.294 (df = 89)	15.896 (df = 89)	34.051 (df = 76)	
F Statistic			3.556*** (df = 12; 76)	

Note: *p<0.05; **p<0.01; ***p<0.001

Table C.3: Regression table for Fin/Econ *before* and Poli Sci *before* groups

	DV: Subjective Discount Rate			
	Robust	Robust and Resistant	OLS (excluding outliers)	Quantile
	(1)	(2)	(3)	(4)
Fin/Econ before (Poli Sci before ref. category)	−52.320	−41.879	−31.338	−66.667
	(53.254)	(22.950)	(28.345)	(50.702)
Age	−29.022	−4.756	1.344	−3.333
	(84.274)	(36.318)	(42.667)	(36.343)
Male (Female ref. category)	−12.888	−1.797	−25.606	33.333
	(50.520)	(21.772)	(27.008)	(44.884)
Income $25,000 - $49,999 ($0 - $24,999 ref. category)	43.618	−7.384	−17.542	30.000
	(153.185)	(66.016)	(76.546)	(103.871)
Income $50,000 - $74,999	530.556***	−13.111	−12.050	83.333
	(153.745)	(66.257)	(80.737)	(1,047.338)
Income $75,000 - $99,999	96.191	41.992	81.178	50.000
	(131.041)	(56.472)	(62.902)	(78.050)
Income $100,000 - $124,999	67.988	−9.944	1.266	33.333
	(129.616)	(55.858)	(63.256)	(101.401)
Income $125,000 - $149,999	79.686	−16.684	−16.393	33.333
	(134.113)	(57.797)	(66.734)	(265.178)
Income $150,000 - $174,999	−24.359	−45.241	−67.699	−3.333
	(148.225)	(63.878)	(72.464)	(79.022)
Income $175,000 - $199,999	7.933	−16.278	23.977	−0.000
	(156.453)	(67.424)	(74.846)	(88.151)
Income $200,000 and up	69.080	5.690	23.172	53.333
	(125.665)	(54.156)	(60.983)	(87.322)
Taken Econ before Yes (No ref. category)	−65.648	−24.607	−44.063	−33.333
	(50.970)	(21.966)	(26.144)	(37.056)
Risk-taker (Risk-averse ref. category)	−6.833	−6.590	−13.049	−3.333
	(68.906)	(29.695)	(35.910)	(51.615)
Constant	676.416	198.967	109.943	143.333
	(1,510.397)	(650.911)	(764.746)	(672.848)
Observations	93	93	77	93
Residual Std. Error	185.515 (df = 79)	96.894 (df = 79)	106.761 (df = 63)	
F Statistic			1.273 (df = 13; 63)	

Note: *p<0.05; **p<0.01; ***p<0.001

Table C.4: Regression table for Poli Sci *before* and Poli Sci *after* groups

	DV: Subjective Discount Rate			
	Robust	Robust and Resistant	OLS (excluding outliers)	Quantile
	(1)	(2)	(3)	(4)
Poli Sci before (Poli Sci after ref. category)	17.076	22.239	1.311	27.500
	(47.667)	(39.339)	(36.005)	(64.488)
Age	−18.645	−8.405	−15.921	−10.000
	(21.423)	(17.680)	(16.189)	(29.509)
Male (Female ref. category)	7.782	−11.686	−23.489	−5.000
	(41.374)	(34.145)	(32.965)	(52.811)
Income $25,000 - $49,999 ($0 - $24,999 ref. category)	317.568***	−2,227.086***	97.865	335.000
	(82.331)	(67.947)	(66.384)	(293.494)
Income $50,000 - $74,999	19.390	−2,299.711***	8.748	77.500
	(91.189)	(75.257)	(67.308)	(125.837)
Income $75,000 - $99,999	17.557	−2,283.911***	27.111	20.000
	(78.807)	(65.038)	(57.216)	(85.584)
Income $100,000 - $124,999	12.605	−2,309.326***	1.221	27.500
	(74.297)	(61.317)	(55.060)	(144.162)
Income $125,000 - $149,999	−65.795	−2,367.718***	−58.776	−77.500
	(88.439)	(72.988)	(66.120)	(95.791)
Income $150,000 - $174,999	−8.345	−2,365.319***	−62.873	−60.000
	(85.585)	(70.632)	(66.535)	(4,188.657)
Income $175,000 - $199,999	−8.526	−2,279.521***	39.094	−22.500
	(85.489)	(70.553)	(60.434)	(135.959)
Income $200,000 and up	19.379	−2,289.919***	5.246	−0.000
	(73.193)	(60.406)	(54.027)	(138.934)
Risk-taker (Risk-averse ref. category)	17.886	−13.215	1.908	−27.500
	(54.514)	(44.990)	(42.293)	(70.827)
Constant	454.087	2,559.696***	406.812	280.000
	(417.457)	(344.523)	(315.573)	(639.548)
Observations	84	84	69	84
Residual Std. Error	110.469 (df = 71)	148.656 (df = 71)	115.988 (df = 56)	
F Statistic			0.838 (df = 12; 56)	

Note: *p<0.05; **p<0.01; ***p<0.001

Table C.5: Regression table for Fin/Econ *before* and Fin/Econ *after* groups

	DV: Subjective Discount Rate			
	Robust	Robust and Resistant	OLS (excluding outliers)	Quantile
	(1)	(2)	(3)	(4)
Fin/Econ after (Econ before ref. category)	−58.050***	−10.804***	−27.295***	−39.417*
	(14.146)	(3.258)	(5.447)	(18.653)
Age	0.032	−0.132	−0.612	−0.194
	(2.169)	(0.500)	(0.756)	(0.461)
Male (Female ref. category)	1.199	2.167	4.041	4.889
	(12.430)	(2.863)	(4.756)	(3.901)
Income $25,000 - $49,999 ($0 - $24,999 ref. category)	−17.767	−2.752	−2.089	−0.389
	(30.460)	(7.016)	(10.785)	(7.743)
Income $50,000 - $74,999	66.000*	0.582	−11.827	4.306
	(31.094)	(7.162)	(11.855)	(15.650)
Income $75,000 - $99,999	13.997	0.423	−10.795	4.889
	(26.892)	(6.194)	(10.197)	(14.278)
Income $100,000 - $124,999	−10.641	−0.514	−7.793	0.000
	(26.251)	(6.046)	(9.630)	(7.333)
Income $125,000 - $149,999	34.786	5.175	−9.092	4.889
	(26.831)	(6.180)	(10.348)	(41.959)
Income $150,000 - $174,999	−33.997	−2.472	−21.417	−20.000**
	(30.734)	(7.079)	(11.089)	(6.548)
Income $100,000 - $124,999	−27.513	3.062	−13.281	−0.389
	(38.785)	(8.933)	(13.553)	(94.313)
Income $175,000 - $199,999	−12.892	1.981	−0.159	4.694
	(24.966)	(5.750)	(8.935)	(6.630)
Income $200,000 and up	8.505	−4.835	−17.346*	−4.500
	(18.605)	(4.285)	(7.572)	(8.842)
Risk-taker (Risk-averse ref. category)	75.528	21.134	56.023**	48.611*
	(49.084)	(11.305)	(17.136)	(21.772)
Observations	111	111	93	111
Residual Std. Error	52.742 (df = 98)	15.240 (df = 98)	22.006 (df = 80)	
F Statistic			3.660*** (df = 12; 80)	

Note: *p<0.05; **p<0.01; ***p<0.001

C.2 Questionnaire

- **Age**: How old are you? (Students below 18 are excluded).
- **Gender**: What is your gender? (*Male, Female*)
- **Income**: What is your family's income? (*$0 - $24,999, $25,000 - $49,999, $50,000 - $74,999, $75,000 - $99,999, $100,000 - $124,999, $125,000 - $149,999, $150,000 - $174,999, $175,000 - $199,999, $200,000 and up)*
- **Economics before**: Have you ever taken an economics class in high school? (This is only asked to freshmen in Poli Sci and Econ/Fin *before* groups.)
- **Economics in college**: Have you taken in the past or are you taking a class from the Economics department and/or the Foster Business School? (This is only asked to Poli Sci *before* and *after* groups and those answering yes are excluded.)
- **Subjective discount rate**: 'You are supposed to receive 10,000 $ in your bank account 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 10,000 $ today. Insert minimum amount' [1]. The annual discount rate for delaying payment was calculated as follows:

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

where P is the amount the subject is willing to accept in t months for delaying the receiving of the amount X today[2].

[1] I excluded individuals that reported numbers below 10,000 $, implying negative discount rates, as they likely resulted from misentering numbers or misunderstanding the question. Most of these observations were in the three control groups. Furthermore, 7 students in the Fin/Econ *after* group, rather than writing a number, wrote that the amount they would be willing to take one year from now depended upon the current market interest rate. I hence put in $10,200, which corresponds to the future value of $10,000 with a market interest rate of 2%, which is currently the highest rate paid on savings accounts.

[2] Two methods are mainly used to measure SDRs: the choice-based methods and the matching method.

- **Risk aversion**: 'Suppose you participate in a TV show. The host offers two options. Which one would you choose?'

  0) Winning $1,000 in cash right away,

  1) Win $2,000 with a probability of 50%

Choice-based methods present participants with a series of binary comparisons and use these to infer an indifference point, which is then converted into a discount rate. Conversely, with the matching method, which is used here, subjects reveal an indifference point, and hence an exact discount rate can be imputed for a single response. Most often these indifference points can then converted to discount rates, using two popular equations: exponential or hyperbolic. The hyperbolic model has been found to descriptively model discounting data better than the exponential model and hence it is used here (Hardisty et al., 2013). As to the choice between choice-based methods or the matching method, there is no theoretical basis for preferring one of these methods over any other, but there are trade-offs for each and they actually yield very different discount rates. The former is often associated with an anchoring problem, where the discount rates may simply be recovering the expectation of the experimenter(Frederick et al., 2008). The latter though, although much quicker to ask, appears harder for participants to understand (Hardisty et al., 2013).

Appendix D

APPENDIX TO CHAPTER 5

D.1 Supplementary Materials

D.1.1 Survey experiment setting

Figure D.1 shows a summary of how the experiment was conducted, how individuals were recruited, and which were retained and randomized to three statements.

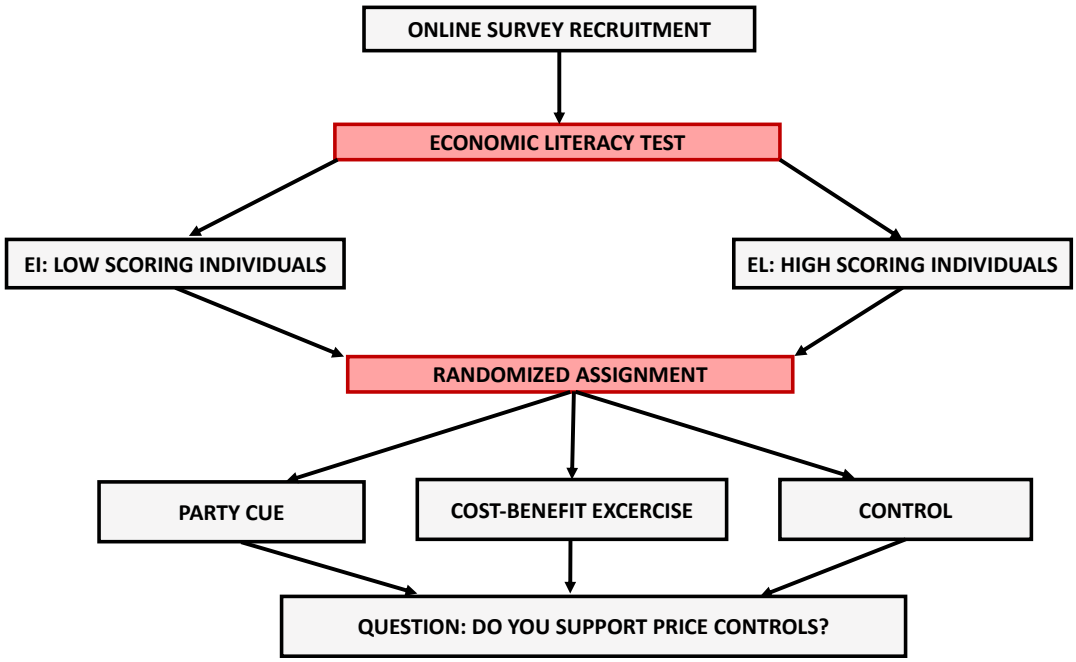

Figure D.1: Survey experiment summary

The company that administered the survey is Cint, a survey research firm. I contacted them to recruit a representative sample of Italians. They added quotas to make the respon-

dents representative in terms of age, gender, and region of residence, while I inserted logic conditions to ensure that only respondents with high and low literacy would be selected, discarding those in the middle, and to make sure that retained respondents would randomly see one of the three statements. Participant recruitment occurred in April 2019 and all individuals were over 18[1].

D.1.2 Cost-benefit exercise

The numbers provided in the cost-benefit exercise question come from this simple hypothetical exercise on the short run effects of introducing a minimum price, also called a price support, which is a specific type of price control[2]. There are different types of price supports: the easiest case is the one in which no surplus exists, illustrated in figure D.2; in the second case, shown in figure D.3, the surplus exists and has no buyer; finally in the third case the government purchases this extra surplus, illustrated in figure D.4. The latter case is the case analyzed in this paper. Overall, price supports are intended to help producers, but at a cost to the rest of society. Regardless of which type of price support is implemented, these measures result in losses to society, although the distribution of benefits varies across these (Barkley, 2016). In the case where no surplus exists, the loss to society after the introduction of the price support is equal to the purple triangle in figure D.2, representing the deadweight loss (DWL): while producers are slightly better off, consumers are unambiguously worse off, so that the total change in society's welfare is negative. In the second case, where a surplus does exist, illustrated by figure D.3, the effect on consumers is the same as in case one: they are significantly worse off than before the price support. Producers, however, are much worse off than before. The surplus is costly to produce and it does not have a buyer, this is represented by the gold rectangle in figure D.3. Ultimately, the total change in society's welfare is once again negative. I now turn to the third case, the exercise used in this study and illustrated by figure D.4.

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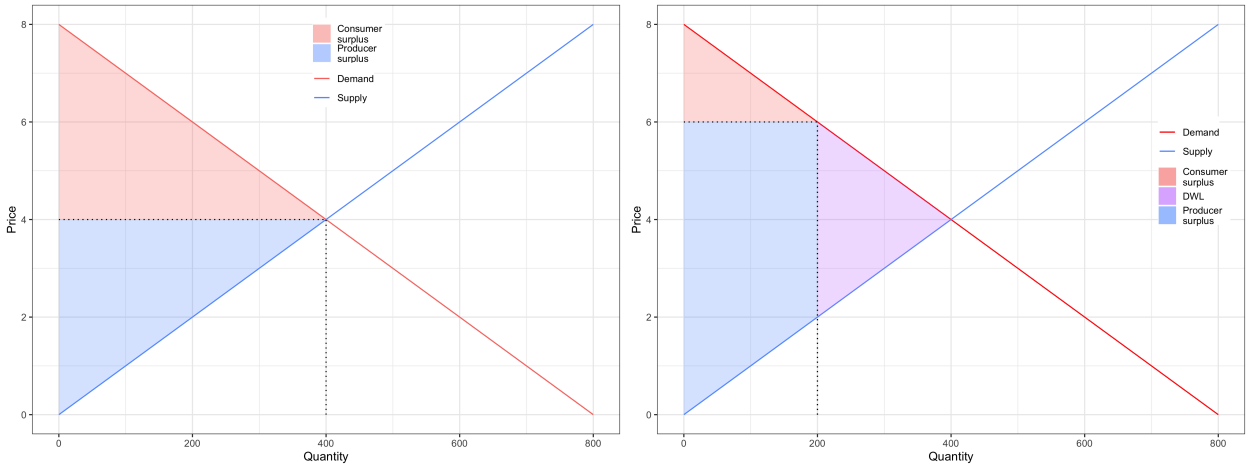
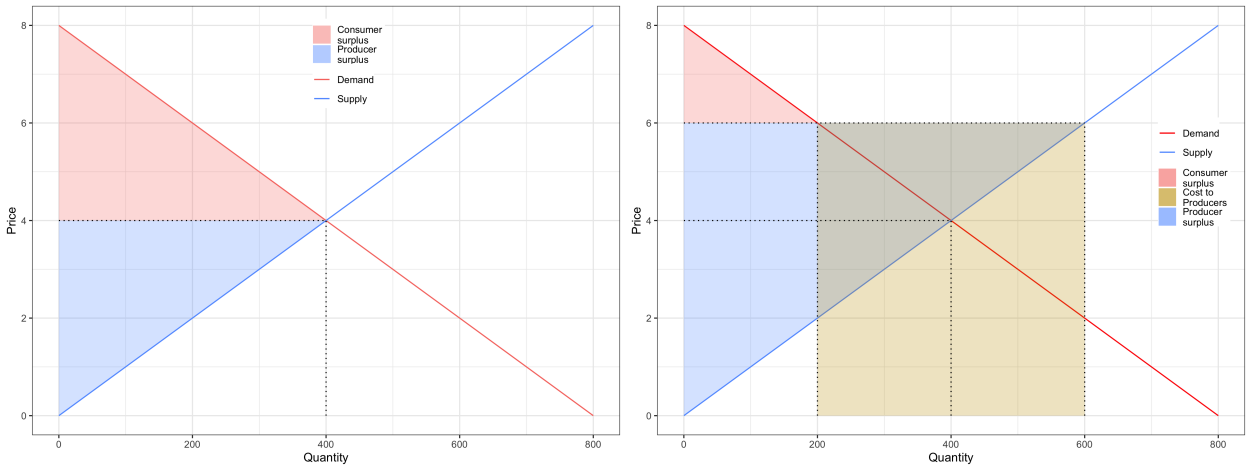
[1]For more information on Cint see `www.cint.com`.

[2]For more details on this and different forms of price support see Chapter 2.2 in Barkley (2016).



(a) Before price support (b) After price is set to 6

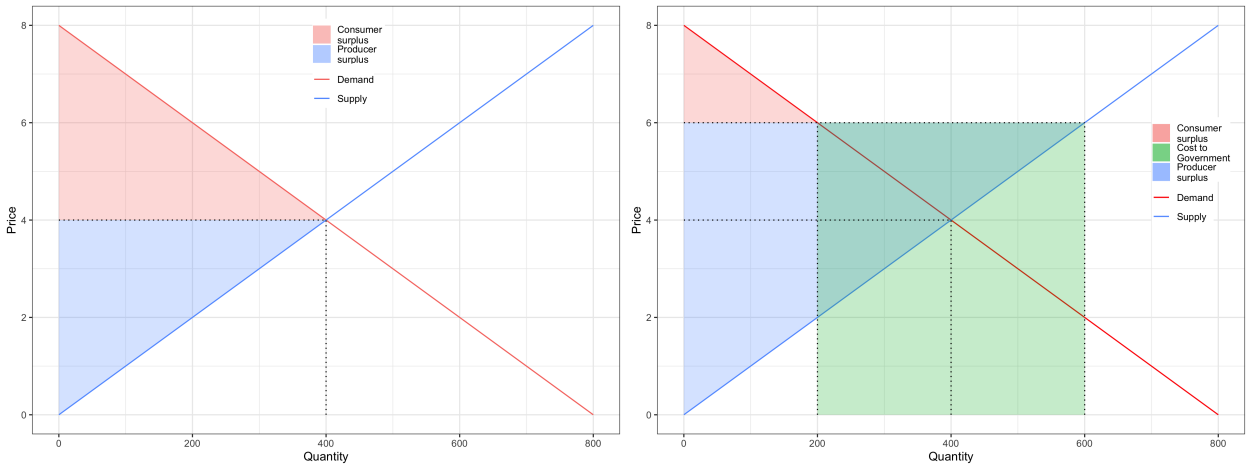
Figure D.2: Consumer and producer surplus before and after the introduction of price support with no surplus



(a) Before price support (b) After price is set to 6

Figure D.3: Consumer and producer surplus before and after the introduction of price support without government buying the surplus

Imagine an hypothetical market for olive oil, where supply and demand are such that equilibrium price and quantity are €4 and 400 units[3]. The government then decides to institute a minimum price for oil at €6 per unit.



(a) Before price support

(b) After price is set to 6

Figure D.4: Consumer and producer surplus before and after the introduction of price support with government buying the surplus

As shown in figure D.4, before the minimum price is introduced, $P^* = 4$ and $Q^* = 400$. The initial values of surplus are:

- Consumer surplus $(CS_0) =$ €800
- Producer surplus $(PS_0) =$ €800
- Government spending $(G_0) =$ €0, and

[3]In order to keep this exercise as simple and as generalizable as possible, demand and supply are represented as being unit elastic. However, how much a price support costs the government does not only depend upon how high the price support is, but also on how much surplus output it generates, which is a function of the elasticities of supply and demand. Price supports are more costly and inefficient when consumers and producers are more price sensitive, and viceversa when they are less price sensitive.

- Social Welfare (SW_0) = €1600.

After the government sets the new price to €6 and buys the surplus of 400 units (for a total of €2,400):

- Consumer surplus (CS_1) = €200
- Producer surplus (PS_1) = €1800
- Government spending (G_1) = -€2400, and
- Social Welfare (SW_1) = -€400.

The changes in surplus are equal to:

- $\Delta CS = -$€600
- $\Delta PS =$ €1000
- $\Delta G = -$€2400, and
- $\Delta SW = -$€2000
- $DWL = -\Delta SW =$ €2000

The benefit to producers is equal to the gain in producer surplus: $1,800 - 800 =$€$1,000$. The cost to consumers is equal to the loss in consumer surplus: $200 - 800 =$ $-$€600. The cost to the government is equal to the cost of buying the surplus in the market $6 * 400 =$ $-$€$2,400$. Maintaining this price floor involves losses for society and is a cost to taxpayers, since government spending is financed out of taxes with opportunity costs. Hence, the total cost to society (in the short run) is the sum of the loss in consumer surplus and the cost of the government purchasing the surplus off the market, totaling €$3,000$. The benefit to producers

is €1,000. The net welfare loss to society is equal to €2,000[4]. Since respondents are not expected to be familiar with concepts such as consumer surplus or producer surplus, I have simplified the question for the cost-benefit exercise. Hence, respondents are not asked to quantify ΔCS, ΔPS or ΔSW, but rather they are given those numbers and are just asked how much society gains or loses if producers gain €1000, consumers lose €600 and the government buys excess surplus for €2400 as a result of the measure. The exercise is aimed at testing whether FEL individuals are more likely to understand what constitutes a cost and what constitutes a benefit in this example. The CB exercise is not only shown to the policy information treatment group, but also to the control group and the party cue group *after* seeing their respective treatments and *after* being asked whether they favor price controls or not, so not to bias the treatment but to increase the sample on which to calculate whether respondents can solve the exercise.

D.1.3 Original treatment questions

Respondents in the survey were randomly assigned to one of the three groups (control, political statement treatment, and cost-benefit treatment). These are the original questions. The control group saw this statement:

> "Immagini il seguente scenario: Il prezzo attuale dell'olio di oliva è intorno ai 4 euro al litro. I produttori chiedono che venga stabilito un prezzo minimo per l'olio, intorno ai 6 euro al litro, per coprire almeno i costi di produzione. Lei è favorevole a fissare un prezzo minimo per l'olio di oliva?"

The political statement treatment group saw this statement:

> "Immagini il seguente scenario: Il prezzo attuale dell'olio di oliva è intorno ai 4 euro al litro. I produttori chiedono che venga stabilito un prezzo minimo per l'olio, intorno ai 6 euro al litro, per coprire almeno i costi di produzione. Il leader del partito che più La rappresenta sostiene che i produttori nazionali necessitino

[4]In the cost-benefit exercise for respondents I divided all numbers by 10 for simplicity so the correct answer is -200.

di uno scudo protettivo contro la concorrenza estera, che altrimenti porrebbe un rischio enorme al futuro della produzione nazionale. Lei è favorevole a fissare un prezzo minimo per l'olio di oliva?"

The cost-benefit treatment group saw this statement:

"Immagini il seguente scenario: Il prezzo attuale dell'olio di oliva è intorno ai 4 euro al litro. I produttori chiedono che venga stabilito un prezzo minimo per l'olio, intorno ai 6 euro al litro, per coprire almeno i costi di produzione. Il governo accetta di imporre un prezzo minimo sull'olio. Questo crea un eccesso di olio sul mercato: viene prodotto più olio di quanto ne sia richiesto dai consumatori. Il governo decide di comprare l'eccesso di olio. Dopo che questa misura viene introdotta, i produttori guadagnano 100 milioni di euro. Il governo paga 240 milioni di euro per comprare l'eccesso di olio. I consumatori perdono 60 milioni di euro. Quanto guadagna (+) o perde (-) la società nel suo complesso?" "Lei è favorevole a fissare un prezzo minimo per l'olio di oliva?"

D.1.4 Financial and economic literacy and other covariates

Based on a survey conducted in July 2018 of 1,100 Italian individuals I determined that individuals with low literacy would be those answering zero or one correct questions out of six (anyone below mean minus one standard deviation) and individuals with high literacy would be those answering five or six correct questions out of six (anyone above mean plus one standard deviation) (Magistro, 2019). The financial literacy questions reflect knowledge about interest compounding, inflation, interest rates, and risk diversification[5]. 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 five years?' The answers are:

[5]Studies on financial literacy have been measuring the concept in a consistent manner, using this set of questions. See Lusardi and O. S. Mitchell (2007) and Lusardi and O. S. Mitchell (2014b).

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?'[6]

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'[7]:

1) The cost of producing products will decrease,

2) Job opportunities in export industries will increase,

3) Consumers will pay higher prices for products,

4) Don't know.

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[6]Italy has a nonfinancial defined contribution (NDC) pension scheme, which features the lifelong contribution-benefit link of defined contribution systems, but is based on a pay-as-you-go format, where contributions paid by current workers finance current pensions, with additional funds possibly coming from the overall government budget (Fornero, Oggero, and Puglisi, 2020; Fornero, 2015). As is the case in most other EU countries, the social security system (INPS in the Italian case) is still by far the most important pension provider; indeed, the standard of living of the elderly still depends largely or exclusively on it (Fornero, Lusardi, and Monticone, 2010). Furthermore, this question has been validated and used in other papers analyzing the Italian context by Boeri et al (2002) and Boeri and Tabellini (2012). Their findings similarly reveal large unawareness of how the Italian pension system works with about half the respondents not understanding the function of the pay-as-you-go system.

[7] This question is one of the questions asked in the Test of Economic Literacy by Walstad, Rebeck, and Butters (2013), which has been revised and used throughout the US to assess knowledge of basic economic concepts to high school students for over 40 years. The economic content of the Test of Economic Literacy is based on the Voluntary National Content Standards in Economics by the Council of Economic Education, which focuses on the more fundamental economic ideas and concepts that are widely shared by professional economists.

The third question asks: 'Economic research agrees on the effects of immigration on advanced economies. More specifically'[8]:

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 financial and economic literacy index variable combines these six questions and measures the number of correct answers to the questions:

0) 0 correct answers,

[8]What does current research find about the impacts of immigration on wages and employment? Many people commonly believe that immigration increases unemployment and reduces wages among native workers, falling prey to "the lump of labor fallacy", the idea that there is a fixed number of jobs to go around. Most models assume that workers are perfectly substitutable for one another. In this context, immigration would increase the supply of labor, which would in turn lead to a decline in the wages of native workers. However, using these models is problematic for at least two reasons (Leeson and Gochenour, 2015; Portes, 2019). One is the assumption of perfect immigrant-native substitutability. Immigrant labor may be in many cases complementary to some subpopulations of native labor. In this latter case, immigration would actually raise native wages. The second problem of using this model to predict immigration's economic effects is that it is a partial-equilibrium model, and it ignores important general-equilibrium effects of immigration. For instance, an influx of immigrants does not only increase the supply of labor, it also increases the demand for labor, since immigrants are also consumers and become employers themselves, putting upward pressure on native wages and employment (Leeson and Gochenour, 2015; Peri, 2012; Portes, 2019). Several studies show that increased immigration leads to net gains in GDP, it has no direct impact on unemployment in the host country, it increases innovation, and it actually increases total factor productivity (Coppel, Dumont, and Visco, 2001; Foged and Peri, 2016; Hamilton and Whalley, 1984; G. I. P. Ottaviano and Peri, 2012; G. I. Ottaviano, Peri, and Wright, 2013; Peri, 2012; Sequeira, Nunn, and Qian, 2020). The negative impacts of migration for native workers in developed countries are, if they exist at all, relatively small, short-lived and affect unskilled native labor (Portes, 2019).

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.

Table D.1: Descriptive statistics for the Financial and Economic Literacy index (n=2,881).

Financial and economic literacy index	FEL		FEI	
# Correct Answers	6/6	5/6	1/6	0/6
N	252	1058	1040	536
Total	1310		1576	
Financial literacy questions	Correct N (%)			
Interest rate	1287 (98%)		350 (22%)	
Inflation	1291 (99%)		177 (11%)	
Risk diversification	1232 (94%)		153 (10%)	
Economic literacy questions	Correct N (%)			
Pay as you go pensions	891 (68%)		106 (7%)	
Effects of protectionist measure	1120 (93%)		138 (9%)	
Effects of immigration	881 (67%)		116 (7%)	

Table D.1 shows descriptive statistics on the retained individuals with respect to the financial and economic literacy index, specifically on the exact questions that FEI and FEL individuals got correctly, respectively.

Education is a variable with 6 categories: no education, elementary school diploma, middle school diploma, high school diploma, undergraduate degree, and postgraduate degree. The variable is recoded so that it takes two values 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 (undergraduate or postgraduate):

1) low education,

2) high education.

Income is an ordinal variable that indicates in which bracket the individual's gross income is. The variable has 10 categories, going from less than 3,000 €to more than 75,000 €. 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 €).

Age is also 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) 18-31,

1) 32-51, and

2) over 51.

The political ideology variable is a self-placement question where respondents self-identify from 0 - extreme left - to 10 - extreme right. *Female* takes values:

0) male,

1) female.

And *region* takes values:

0) North,

1) Center, and

2) South.

All of the models are run also with the original variables for income, education, and age, and the results do not change substantively. However, when using the CEM method on the original non-transformed variables, the effects are larger and more uncertain as a result of the fact that very few individuals are matched (respectively 162 and 156).

D.2 Matching and Balance

Tables D.2 and D.3 show relative frequencies for the main covariates across treatment groups and across literacy levels. It emerges that although the respondents' characteristics are quite balanced across information treatment groups, since people were randomly assigned into each group, they are not balanced across literacy levels. Hence, in addition to controlling for these covariates in the main analyses, I also conduct different matching procedures in order to create pruned samples, aimed at achieving better balance on my covariates. To create matched samples, I use both propensity score matching (PSM) methods, including nearest-neighbor matching and full matching, and Coarsened Exact Matching (CEM), which are all available in the R function 'MatchIt'[9].

[9]Unfortunately, there is not an automated procedure for using 'MatchIt' with multiply imputed datasets through 'Amelia'. I hence multiply imputed the data, did matching on each imputed data set, and then combined them in 'Zelig' using the 'mi' function.

Table D.2: Demographics/balance across treatment groups for one imputed dataset: relative frequencies and mean and standard deviation for political ideology (n=2,881).

	Control	Political Treatment	Cost-benefit Treatment
Education			
Low education	69 %	66 %	61 %
High education	31 %	34 %	39 %
Income			
Low income	32 %	30 %	31 %
Middle income	42 %	44 %	41 %
High income	26 %	26 %	28 %
Region			
North	46 %	44 %	42 %
Center	19 %	20 %	20 %
South	35 %	36 %	38 %
Age Group			
18-31	26 %	28 %	24 %
32-51	43 %	44 %	63 %
51+	31 %	28 %	13 %
Gender			
Female	52 %	52 %	49 %
Male	48 %	48%	51 %
Political ideology (0 - 10)	6.1 (2.6)	6 (2.7)	6.1 (2.7)

Table D.3: Demographics/balance across literacy groups for one imputed dataset: relative frequencies and mean and standard deviation for political ideology (n=2,881).

	FEI	FEL
Education		
Low education	72%	58 %
High education	28 %	42 %
Income		
Low income	41 %	19 %
Middle income	40 %	45 %
High income	19 %	36 %
Region		
North	38 %	52 %
Center	20 %	19 %
South	42 %	29 %
Age Group		
18-31	34 %	17 %
32-51	49 %	49 %
51+	17 %	34 %
Gender		
Female	62 %	37 %
Male	38 %	63 %
Political ideology (0 - 10)	6.4 (2.7)	5.7 (2.5)

In tables D.4, D.5, and D.6 I provide summaries, such as the means of each covariate before and after matching and a % improvement statistics, that allow to assess the balance of covariates after matching for each method employed. The summaries I provide are for one imputed dataset for each method. The results suggest that the CEM method outperforms the PSM methods (especially the nearest neighbor), and achieves almost perfect balance on all variables.

Table D.4: Summary of balance for the non-matched dataset and the matched one using nearest-neighbor matching. The treated individuals refer to FEL individuals, while the control ones are FEI.

	No Matching		**Matching**		
	Treated	Control	Treated	Control	% Improvement
High Education	0.42	0.28	0.42	0.32	26
Middle Income	0.45	0.40	0.45	0.45	98
High Income	0.36	0.19	0.36	0.22	18
Center Region	0.19	0.20	0.19	0.21	-100
South Region	0.29	0.42	0.29	0.37	37
Age (32-51)	0.49	0.50	0.49	0.52	-194
Age (51+)	0.34	0.17	0.34	0.20	17
Female	0.38	0.62	0.38	0.56	25
Political Ideology	5.7	6.4	5.7	6.2	28
Sample Size	1310	1571	1310	1310	

Table D.5: Summary of balance for the non-matched dataset and the matched one using full matching. The treated individuals refer to FEL individuals, while the control ones are FEI.

	No Matching		**Matching**		
	Treated	Control	Treated	Control	% Improvement
High Education	0.42	0.28	0.42	0.44	85
Middle Income	0.45	0.40	0.45	0.43	55
High Income	0.36	0.19	0.36	0.37	92
Center Region	0.19	0.20	0.19	0.20	30
South Region	0.29	0.42	0.29	0.28	90
Age (32-51)	0.49	0.50	0.49	0.48	95
Age (51+)	0.34	0.17	0.34	0.34	97
Female	0.38	0.62	0.38	0.38	100
Political Ideology	5.7	6.4	5.7	5.8	87
Sample Size	1310	1570	1310	1570	

Table D.6: Summary of balance for the non-matched dataset and the matched one using CEM. The treated individuals refer to FEL individuals, while the control ones are FEI.

	No Matching		**Matching**		
	Treated	Control	Treated	Control	% Improvement
High Education	0.42	0.28	0.25	0.25	100
Middle Income	0.45	0.40	0.44	0.44	100
High Income	0.36	0.19	0.17	0.17	100
Center Region	0.19	0.20	0.14	0.14	100
South Region	0.29	0.42	0.42	0.42	100
Age (32-51)	0.49	0.50	0.55	0.55	100
Age (51+)	0.34	0.17	0.18	0.18	100
Female	0.38	0.62	0.58	0.58	100
Political Ideology	5.7	6.4	6.2	6.2	100
Sample Size	1310	1571	891	1101	

D.3 Supplementary Regression Results

Table D.7: Logistic models using financial and economic literacy as main covariate without controlling for education: log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Correct CB	Correct Direction CB	Information
Intercept	-1.35^{***}	0.42^{*}	0.29
	(0.18)	(0.16)	(0.18)
Female	-0.10	0.16	0.17^{*}
	(0.09)	(0.09)	(0.09)
FEL	1.25^{***}	0.94^{***}	-0.11
	(0.10)	(0.09)	(0.14)
Middle Income	0.10	-0.03	0.11
	(0.11)	(0.10)	(0.10)
High Income	0.27^{*}	0.05	0.21
	(0.13)	(0.12)	(0.12)
Region Center	-0.13	-0.21	0.10
	(0.12)	(0.12)	(0.11)
Region South	-0.18	-0.20^{*}	0.06
	(0.10)	(0.10)	(0.09)
Age 32-51	-0.14	0.34^{***}	0.14
	(0.11)	(0.10)	(0.10)
Age over 51	-0.22	0.49^{***}	0.18
	(0.13)	(0.13)	(0.12)
Political Ideology	-0.01	-0.04^{*}	0.03^{*}
	(0.02)	(0.02)	(0.02)
Party Cue			0.28^{*}
			(0.13)
Cost-benefit exercise			-0.20
			(0.14)
Party Cue: FEL			-0.39^{*}
			(0.20)
Cost-benefit exercise: FEL			-0.66^{***}
			(0.20)
Num. obs.	57620	57620	57620
Num. imp.	20	20	20

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table D.8: Logistic models with interaction between financial and economic literacy and education: log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Correct CB	Correct Direction CB	Information
Intercept	-1.45^{***}	0.40^{*}	0.25
	(0.19)	(0.17)	(0.18)
FEL	1.31^{***}	0.92^{***}	-0.07
	(0.12)	(0.12)	(0.17)
High Education	0.40^{**}	0.05	0.27
	(0.15)	(0.12)	(0.23)
Female	-0.12	0.15	0.16
	(0.09)	(0.09)	(0.09)
Middle Income	0.07	-0.04	0.08
	(0.11)	(0.10)	(0.10)
High Income	0.18	0.03	0.16
	(0.13)	(0.12)	(0.12)
Region Center	-0.14	-0.21	0.09
	(0.12)	(0.12)	(0.11)
Region South	-0.19	-0.21^{*}	0.07
	(0.10)	(0.10)	(0.09)
Age 32-51	-0.11	0.34^{***}	0.16
	(0.11)	(0.10)	(0.10)
Age over 51	-0.15	0.51^{***}	0.21
	(0.13)	(0.13)	(0.12)
Political Ideology	-0.01	-0.04^{*}	0.03^{*}
	(0.02)	(0.02)	(0.02)
FEL: High ed.	-0.24	0.04	-0.19
	(0.19)	(0.19)	(0.31)
Party Cue			0.20
			(0.15)
Cost-benefit exercise			-0.17
			(0.16)
Party Cue: FEL			-0.18
			(0.24)
Cost-benefit exercise: FEL			-0.63^{*}
			(0.25)
Party Cue: High ed.			0.29
			(0.33)
Cost-benefit exercise: High ed.			-0.14
			(0.32)
Party Cue: FEL: High ed.			-0.61
			(0.44)
Cost-benefit exercise: FEL: High ed.			0.02
			(0.43)
Num. obs.	57620	57620	57620
Num. imp.	20	20	20

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table D.9: Logistic models using education as main covariate: log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Correct CB	Correct Direction CB	Information
Intercept	-0.76^{***}	0.83^{***}	0.17
	(0.17)	(0.16)	(0.17)
Female	-0.34^{***}	-0.03	0.25^{**}
	(0.09)	(0.09)	(0.08)
High Education	0.40^{***}	0.20^{*}	0.17
	(0.09)	(0.09)	(0.16)
Middle Income	0.25^{*}	0.08	0.02
	(0.11)	(0.10)	(0.10)
High Income	0.41^{**}	0.19	0.06
	(0.12)	(0.12)	(0.12)
Region Center	-0.27^{*}	-0.31^{**}	0.14
	(0.12)	(0.11)	(0.11)
Region South	-0.33^{***}	-0.31^{**}	0.12
	(0.10)	(0.10)	(0.09)
Age 31-51	0.03	0.43^{***}	0.10
	(0.11)	(0.10)	(0.10)
Age over 51	0.20	0.75^{***}	0.10
	(0.13)	(0.12)	(0.12)
Political Ideology	-0.04^{**}	-0.06^{***}	0.05^{**}
	(0.02)	(0.02)	(0.02)
Party Cue			0.13
			(0.12)
Cost-benefit exercise			-0.46^{***}
			(0.12)
Party Cue: High ed.			-0.12
			(0.21)
Cost-benefit exercise: High ed.			-0.26
			(0.21)
Num. obs.	57620	57620	57620
Num. imp.	20	20	20

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

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