

Financial and economic literacy and the conditional nature of information: A survey experiment on price controls in Italy

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Abstract

This paper uses a survey experiment on price controls in Italy to examine what information voters rely on to make policy choices, conditional on their financial and economic literacy. I manipulate whether citizens receive party cues, policy information, or neither type of information. Using different matching procedures, I show that financially and economically literate 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 financially and economically illiterate individuals, who instead are more receptive to party cues. These findings suggest that if citizens are not informed about the choices they make and blindly follow party cues, when such cues are misleading, they end up supporting policies that do not reflect their interests. Conversely, efforts to inform voters have the potential to successfully shift opinions, but only provided that citizens understand that information.

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1 Introduction

Recent events have reignited scholarly interest in the debate over the determinants of policy views. As support for political parties promoting protectionist, nationalist, and populist policies has increased across Western democracies, various scholars have investigated the effects of different types of information on public opinion (Arceneaux, 2008; Bolsen, Druckman, and Cook, 2014; Boudreau, 2009; Boudreau and MacKenzie, 2014; Bullock, 2011; Druckman, 2012; Druckman, Peterson, and Slothuus, 2013; Nicholson, 2012; Nyhan and Reifler, 2010; Nyhan, Porter, et al., 2019).

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? The effects of cues may depend not only upon the cue-provider's incentives, but also upon the type of citizen. Recent studies find that political sophistication affects which cues citizens 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). 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.

Financial and economic literacy affects the accuracy with which an individual evaluates the effects of an economic policy on their well-being. As such, it may influence the type of information that individuals are responsive to more directly. This is the first study to examine the role 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 (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), 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). I suggest that financial and economic literacy affects economic policy preferences. Specifically, I expect financial and economic literacy to affect the accuracy with which individuals evaluate the costs and benefits of a policy. Financially and economically literate (FEL) individuals are more likely to be accurate at predicting the effects of an economic policy on their economic well-being than their financially and economically illiterate (FEI) counterparts. As a result, FEI individuals are more likely to rely on other decision making factors, such as political ideology or cues from reference groups, rather than on cost-benefit analyses, 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. I investigate if: 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 controls¹ for domestic olive oil producers. 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). Although in this survey experiment information is randomly assigned to individuals, this is not the case for financial and economic literacy. Hence, in addition to controlling for

¹There 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.

confounding variables in the main analyses, I also employ different matching procedures in order to create pruned samples, aimed at achieving better balance on my covariates. The findings across both matched and non-matched samples show that, 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. Moreover, 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. Finally, as a robustness check, I also consider education alone as an alternative measure of financial and economic literacy and 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.

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.

The remainder of the paper is organized as follows. Section 2 lays out the theoretical argument, section 3 introduces the survey experiment, section 4 presents the models, section 5 contains the findings, and section 6 concludes.

2 Theoretical Argument

Most people lack knowledge or interest in politics, and hence 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 (Eagly and Chaiken, 1993). In politics, it would be too costly to gather all information and compare candidates across the entire policy space. Instead, voters rely on heuristics to make decisions as 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. However, heuristics may not always be rational and effective (Kuklinski and Hurley, 1994). Downs (1957) was the first to argue in favor of using cues 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. However, politicians often mislead their electorate and this may affect the effectiveness of using cues to make decisions (Kuklinski and Hurley, 1994). Although under idealized conditions we may expect that elected officials' incentives are aligned with those of their electorate, in reality very often politicians are not striving to maximize their electorate's welfare, but their own self-interest (i.e., reelection). In this scenario, smaller special interest groups exert disproportionate powers on elected officials as they can more easily organize and obtain favors that will hurt the majority of the population (e.g., tariffs, price controls, tax loopholes). The industry going after certain laws and regulations is able to pay with the things most important to a politician, votes and resources. One example of this is price floors, which benefit a small group of producers at the expense of consumers. 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 from price floors 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.

Most research on source cues suggests that they dominate other considerations and play a key role in shaping public opinion (Bowler and Donovan, 1998; Cohen, 2003; Goren, Federico, and Kittilson, 2009; Kuklinski and Hurley, 1994; Lupia, 1994; Rahn, 1993). If the public has little knowledge in politics, citizens may use these heuristics to compensate for information deficits. 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). One key reason for these differences may lie in the nature of the experiments, specifically in 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. However, none of these studies analyzes the possibility that the effects of partisan cues and policy information may vary based on financial and economic literacy. The latter may affect the type of information individuals are responsive to and impact their likelihood to update their prior beliefs.

2.1 Financial and Economic 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, 2014). Several studies find that financial literacy is a key determinant of individual retirement, savings, and investment

decisions (Behrman et al., 2012; Lusardi, 2015; Lusardi and O. S. Mitchell, 2007; Lusardi and O. S. Mitchell, 2011; Lusardi and O. S. Mitchell, 2017). Although the literature on the relevance of financial literacy and household decision making is expanding, not much work has been done to investigate the relationship between financial literacy and political and policy preferences, and the existing studies are for the most part observational (Fornero and Lo Prete, 2019; Montagnoli et al., 2016). Most of them use a common index to measure financial literacy, which is based on the number of correct answers to 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, 2015). This index provides a good measure of a person's basic financial knowledge, their ability to understand budgets, compound interest, and inflation. However, in a political context, this approach may have significant limitations. 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. When looking at policy preferences, it might be relevant to complement the financial literacy questions with a battery of questions measuring "economic literacy" too. Hence, besides the standard financial literacy questions, I include economic literacy questions that measure an individual's knowledge of the effects of certain public policies in the country in question². 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

²The specific questions that I use to construct the financial and economic literacy index are available in Appendix A.

economic policy.

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. 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 civics³ (Delli Carpini and Keeter, 1996). However, it is not always clear how these measures are related to the tasks that an individual performs when making a policy choice (Boudreau, 2009). 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 condition would easily allow to infer the option that would give the person the highest utility. Furthermore, although SAT math scores may be

³Delli 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.

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 capture⁴ (Fornero and Lo Prete, 2019).

2.2 Heuristic Model

In this section, I use a heuristic model to illustrate the theory. I assume that there are two types of voters: FEL and FEI voters. Each individual has their own priors over the utility of an economic policy proposal. I assume that the policy under analysis is novel and non-contentious, so that individuals, as a result of the fact that they do not yet have information about the costs and benefits of the policy in question, do not have strong priors on it⁵.

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. Non-partisan policy information may include policy evaluations from unbiased sources or evidence from peer-reviewed articles and books. Partisan cues may include information coming from political parties, business associations, or labor unions. In this model, I make the assumption that we are not in an idealized scenario, where the incentives of the party providing the cue are necessarily aligned with those of the voter, and hence where the partisan cue can act as a rational and effective

⁴As a robustness check I test whether indeed financial and economic literacy has different features not captured by general measures of education in Appendix D.

⁵I will return to this point in the survey experiment setting section.

heuristic. We are instead in a realistic scenario in which politicians may not be 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).

I hypothesize 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.

Consider a partisan signal such as a cue coming from one's party leader. I expect the signal to have different characteristics for 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 expensive, easier to interpret, and hence more definitive, 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 1 provides an example of the mechanisms at play.

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

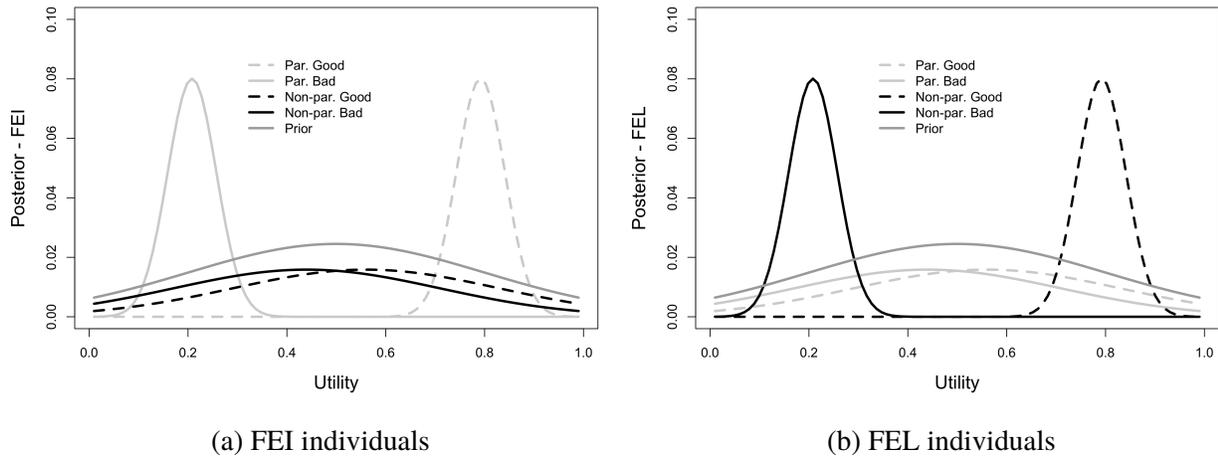


Figure 1: Posterior distributions for FEI and FEL individuals after receiving partisan (par.) or non-partisan (non par.) signals. In this example, priors, signals, and posteriors follow a truncated normal distribution (between a minimum utility (u) of 0 and a maximum of 1). The signal may suggest that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

will not update.

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 different types of individuals respond to variation in the type of information they receive about a specific policy. 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: price controls on olive oil⁶. The motivations for using a novel and non-contentious policy are two-fold. Firstly,

⁶This 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/). Furthermore, a similar policy that was recently discussed in Italy regarded the introduction of minimum prices on sheep's milk in Sardinia, however, this

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 to understand how individuals make policy decisions once their first hear about a policy. 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, 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). Following the theory, I expect that FEI individuals will be responsive to the party cue and update their views accordingly,

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-bandiere/4964684/>). However, to alleviate concerns that the policy may be contentious I control for political ideology in all of my models.

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.

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, only individuals with low or high literacy scores were retained⁷. The questions asked in the survey to determine financial and economic literacy are

⁷Based 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). The sample, retaining only low and high scorers, includes about 35 % of the population.

available in Appendix A. 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 group⁸.

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.”

The cost-benefit information treatment group saw this statement:

“Imagine the following scenario: Currently, the price of olive oil is €4 per liter.

⁸I used multiple imputation with the R package ‘Amelia’ to deal with about 200 missing values, but the analysis was also run with listwise deletion and findings do not change. ‘Amelia’ is compatible with the R package ‘Zelig’, which I used to run the regressions and compute the quantities of interest. ‘Zelig’ provides combined results across the imputed datasets calculated by Rubin’s Rules, 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.

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), this allows me to see not only if the respondents get the correct answer, but also if they understand the direction of the total effect, whether it is a net loss or gain for society⁹. 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.

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).

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 B, 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

⁹Appendix A explains how the exercise was derived.

literacy levels. More specifically the respondents are not balanced in terms of education, income, gender, region, political ideology, and age across literacy groups. 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 oil¹⁰. 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 several people might be employed in the industry, I control for this variable in the analysis¹¹.

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)¹². I match financial

¹⁰See 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

¹¹This 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.

¹²King 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) meth-

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 B. The results suggest that the two groups, before matching, are quite unbalanced. FEL individuals tend to have higher incomes, be more educated, males, 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. The following models are then run on both the full and matched samples.

4 Models

I test the hypotheses using logistic models¹³. Let Y_i be the binary dependent variable for observation i which takes the value of either zero or one. I model respondent i 's policy preference using logistic regression, where the stochastic component is given by:

$$\begin{aligned}
 Y_i &\sim \text{Bernoulli}(y_i \mid \pi_i) \\
 &= \pi_i^{y_i} (1 - \pi_i)^{(1-y_i)}
 \end{aligned}
 \tag{1}$$

ods, 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).

¹³I use the R package ‘Zelig’ to estimate the models (Imai, King, and O. Lau, 2007).

where $\pi_i = Pr(Y_i = 1)$. The systematic component is given by:

$$\pi_i = \frac{1}{1 + \exp(-x_i\beta)} \quad (2)$$

where x_i is the vector of k explanatory variables for observation i , and β is the vector of coefficients.

5 Findings

For each of the full and matched datasets I estimate logistic models and test hypotheses 1 to 3. Here I present figures summarizing the results for the full sample and the CEM matched sample¹⁴. In appendix C I show the full results, including regression tables, for the full sample and for all of the matching methods (PSM and CEM).

5.1 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 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. Figure 3 shows us the difference in the probability of answering the question correctly or in the correct direction between FEI and FEL

¹⁴As shown in Appendix C the estimated effects across the different datasets (Full, Nearest-Neighbor, and CEM) are not substantively different from one another, however, CEM achieves almost perfect balance and hence it is the one shown here.

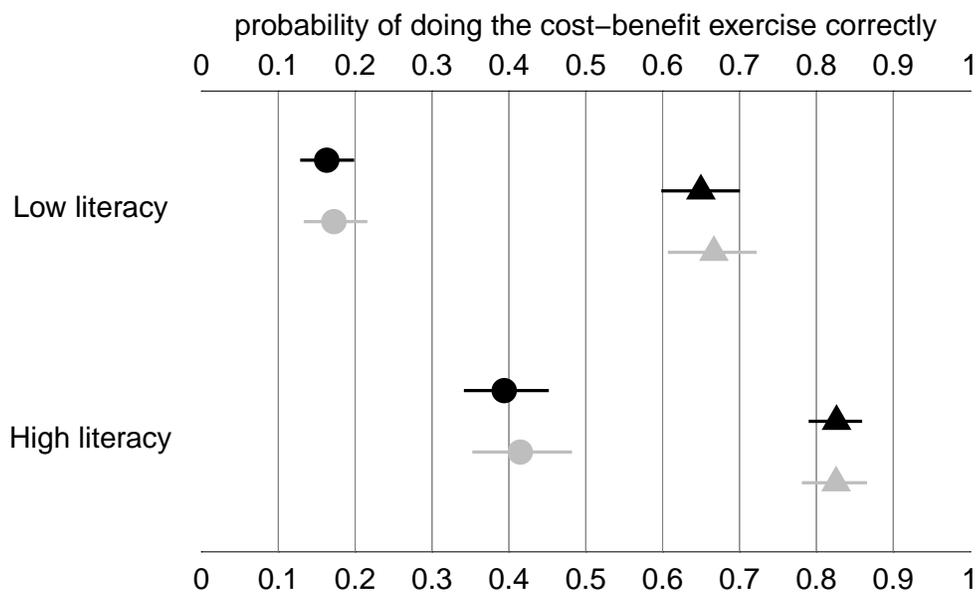


Figure 2: Expected probabilities of doing the cost-benefit exercise correctly (circle markers) and of identifying the correct direction of the policy effect (triangle markers) for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval.

individuals. The findings indicate that FEL individuals are more likely to answer the cost-benefit exercise correctly and they are also more likely to correctly 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 one. 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.

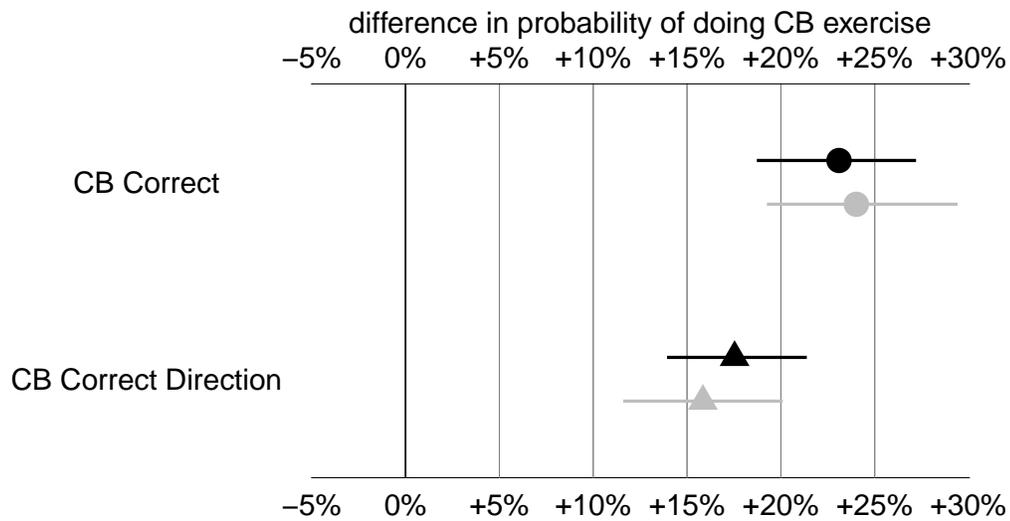


Figure 3: First differences between FEL and FEI individuals in the probability of doing the cost-benefit exercise correctly (circle markers) and of identifying the correct direction of the policy effect (triangle markers) for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval.

5.2 Information Treatments

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

and form their policy views accordingly, than FEI individuals.

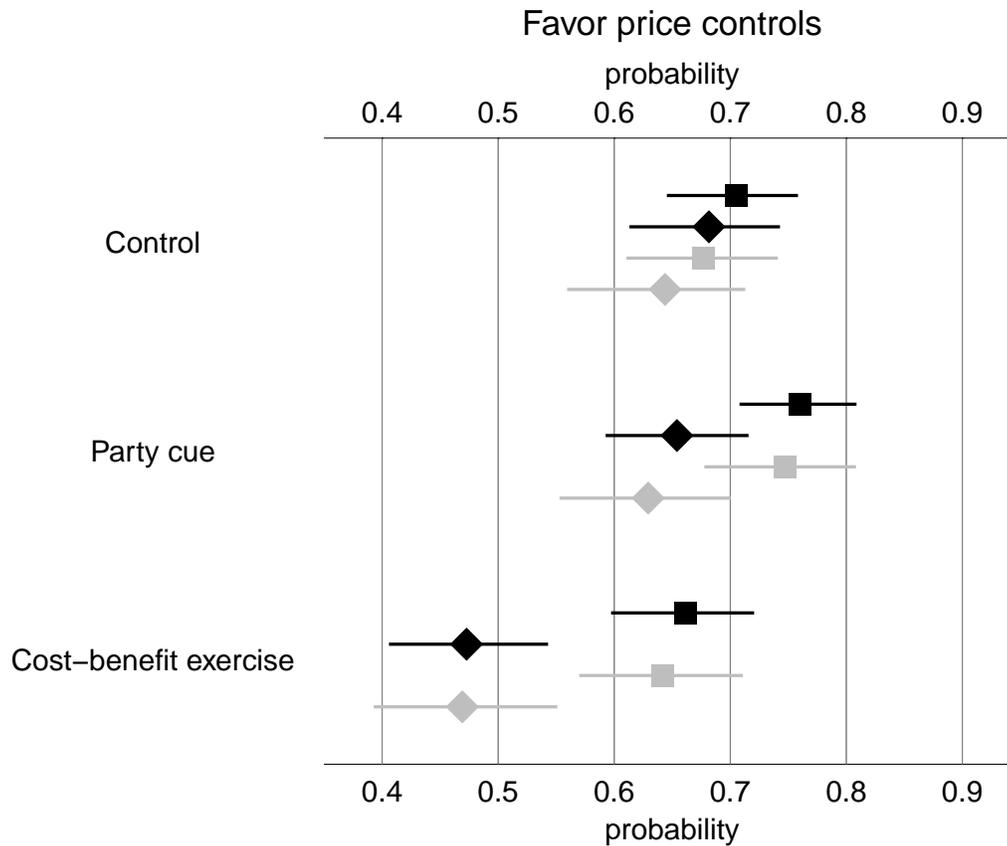


Figure 4: Expected probabilities of favoring price controls by treatment group for FEI individuals (square markers) and for FEL individuals (diamond markers) for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval.

Figure 4 and figure 5 show respectively the expected probabilities that the respondent favors price controls by treatment group and literacy group, and the first differences of the probabilities of favoring price controls by treatment group and literacy group. From the findings it emerges that FEI and FEL individuals in the control group do not have significantly different priors on price controls and, in the absence of information, the percentage of approval of price controls in both groups is quite high (70% for FEI and 67% for FEL). However, the first differences, across both

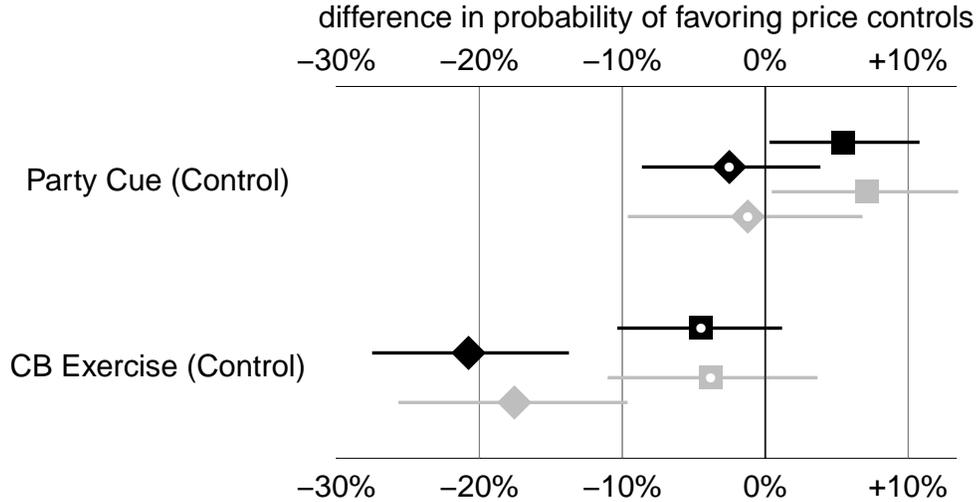


Figure 5: First differences of favoring price controls by treatment group for FEI individuals (square markers) and for FEL individuals (diamond markers) for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval. White markers indicate statistical non-significance, filled markers statistical significance.

matched and non-matched samples, show how the effects of the treatments are drastically different across the two groups. 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, but this is not significant at the 95% confidence level, and hence not distinguishable from zero. The effect of the cost-benefit information treatment is not statistically significant for FEI individuals, however, 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 4: 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, for whom, after doing the cost-benefit exercise, support for price controls is down to 47% .

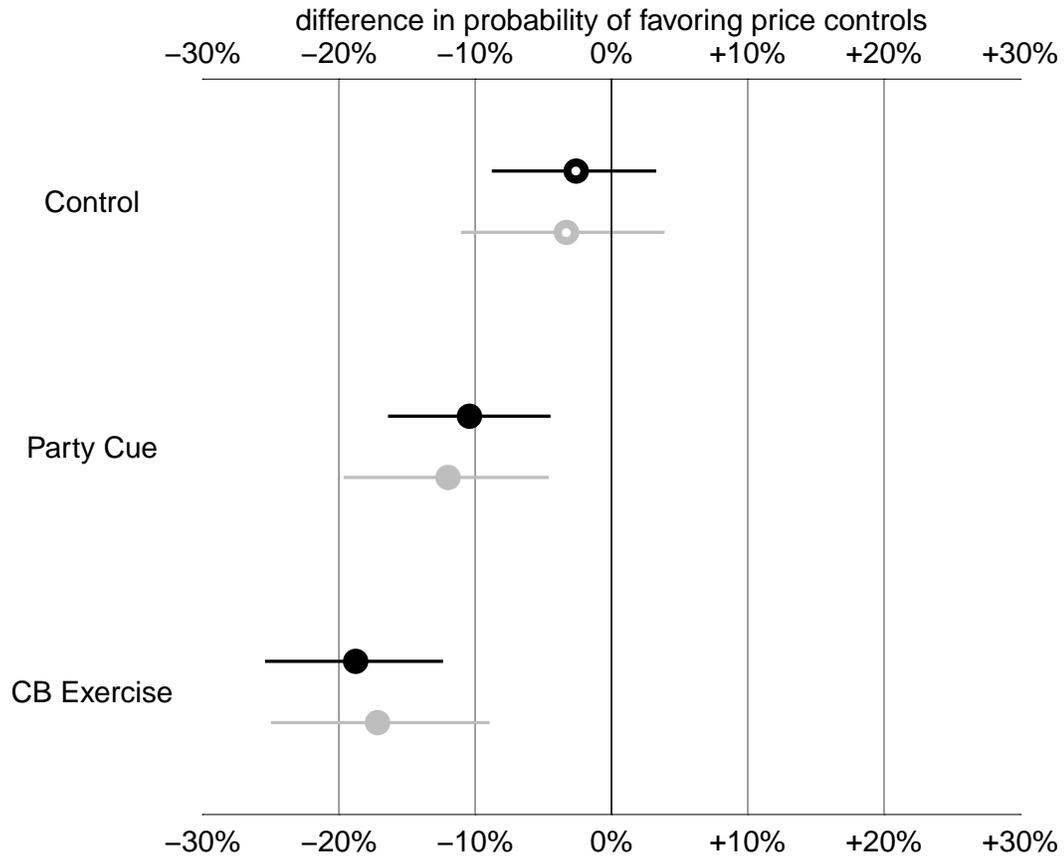


Figure 6: First differences between FEL and FEI individuals of probabilities of favoring price controls for the full non-matched sample (black) and the matched sample from CEM (grey). Bars indicate the 95% confidence interval. White markers indicate statistical non-significance, filled markers statistical significance.

Figure 6 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.

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 different types of information on an hypothetical policy proposal involving price controls on olive oil. The control group is asked to express their preference on price controls without being exposed to any information, the first treatment is a political statement in favor of price controls from the individual's party leader, and the second treatment is a short cost-benefit exercise, in which the

individual has to indicate the total gain or loss to society after the introduction of the measure. 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 total effect on society is a gain or a loss, than FEI individuals. Second, FEI individuals are more likely to be responsive to the party cue, resulting in increased support for price controls compared to FEI respondents in the control group. Third, FEL individuals are more likely to respond to the cost-benefit policy information treatment, resulting in much lower support for price controls than FEL respondents in the control group. 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 party cues and policy information they form their policy views differently, relying on different types of information. While FEL 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.

References

- Arceneaux, Kevin (2008). “Can Partisan Cues Diminish Democratic Accountability?” In: *Political Behavior* 30.2, pp. 139–160. ISSN: 0190-9320. DOI: 10.1007/s11109-007-9044-7.
- Arceneaux, Kevin and Robin Kolodny (2009). “Educating the Least Informed: Group Endorsements in a Grassroots Campaign”. In: *American Journal of Political Science* 53.4, pp. 755–770. ISSN: 00925853. DOI: 10.1111/j.1540-5907.2009.00399.x.
- Atkinson, Adele and Flore-Anne Messy (2012). “Measuring Financial Literacy: Results of the OECD / International Network on Financial Education (INFE) Pilot Study”. In: *OECD Working Papers on Finance, Insurance and Private Pensions* 15. DOI: 10.1787/5k9csfs90fr4-en.
- Barkley, Andrew P. (2016). *The economics of food and agricultural markets*. New Prairie Press. ISBN: 9781944548056.
- Behrman, Jere R. et al. (2012). “How Financial Literacy Affects Household Wealth Accumulation”. In: *American Economic Review* 102.3, pp. 300–304. DOI: 10.1257/aer.102.3.300.
- Bolsen, Toby, James N. Druckman, and Fay Lomax Cook (2014). “The Influence of Partisan Motivated Reasoning on Public Opinion”. In: *Political Behavior* 36.2, pp. 235–262. ISSN: 01909320. DOI: 10.1007/s11109-013-9238-0.
- Boudreau, Cheryl (2009). “Closing the Gap: When Do Cues Eliminate Differences between Sophisticated and Unsophisticated Citizens?” In: *The Journal of Politics* 71.3, pp. 964–976. ISSN: 0022-3816. DOI: 10.1017/S0022381609090823.
- Boudreau, Cheryl and Scott A. MacKenzie (2014). “Informing the Electorate? How Party Cues and Policy Information Affect Public Opinion about Initiatives”. In: *American Journal of Political Science* 58.1, pp. 48–62. ISSN: 00925853. DOI: 10.1111/ajps.12054.

- Bowler, Shaun and Todd Donovan (1998). *Demanding choices : opinion, voting, and direct democracy*. University of Michigan Press. ISBN: 9780472023349.
- Bullock, John G. (2011). “Elite Influence on Public Opinion in an Informed Electorate”. In: *American Political Science Review* 105.3, pp. 496–515. ISSN: 0003-0554. DOI: 10.1017/s0003055411000165.
- Cohen, Geoffrey L. (2003). *Party Over Policy: The Dominating Impact of Group Influence on Political Beliefs*. DOI: 10.1037/0022-3514.85.5.808.
- Delli Carpini, Michael X. and Scott Keeter (1996). *What Americans know about politics and why it matters*. Yale University Press. ISBN: 9780300072754.
- Downs, Anthony. (1957). *An economic theory of democracy*. New York: Harper. ISBN: 9780060417505.
- Druckman, James N. (2012). “The politics of motivation”. In: *Critical Review* 24.2, pp. 199–216. ISSN: 08913811. DOI: 10.1080/08913811.2012.711022.
- Druckman, James N., Erik Peterson, and Rune Slothuus (2013). “How Elite Partisan Polarization Affects Public Opinion Formation”. In: *American Political Science Review* 107.1, pp. 57–79. ISSN: 0003-0554. DOI: 10.1017/s0003055412000500.
- Eagly, Alice Hendrickson and Shelly Chaiken (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich College Publishers. ISBN: 9780155000971.
- Fornero, Elsa and Anna Lo Prete (2019). “Voting in the aftermath of a pension reform: the role of financial literacy”. In: *Journal of Pension Economics and Finance* 18.1, pp. 1–30. ISSN: 1474-7472. DOI: 10.1017/s1474747218000185.

- Goren, Paul, Christopher M. Federico, and Miki Caul Kittilson (2009). “Source Cues, Partisan Identities, and Political Value Expression”. In: *American Journal of Political Science* 53.4, pp. 805–820. ISSN: 00925853. DOI: 10.1111/j.1540-5907.2009.00402.x.
- Iacus, Stefano M., Gary King, and Giuseppe Porro (2011). “Multivariate Matching Methods That Are Monotonic Imbalance Bounding”. In: *Journal of the American Statistical Association* 106.493, pp. 345–361. ISSN: 0162-1459. DOI: 10.1198/jasa.2011.tm09599.
- (2012). “Causal Inference without Balance Checking: Coarsened Exact Matching”. In: *Political Analysis* 20.1, pp. 1–24. ISSN: 1047-1987. DOI: 10.1093/pan/mpr013.
- Imai, Kosuke, Gary King, and Olivia Lau (2007). *Zelig: Everyone’s Statistical Software*.
- Kam, Cindy D. (2005). “Who Toes the Party Line? Cues, Values, and Individual Differences”. In: *Political Behavior* 27.2, pp. 163–182. ISSN: 0190-9320. DOI: 10.1007/s11109-005-1764-y.
- King, Gary and Richard Nielsen (2019). “Why Propensity Scores Should Not Be Used for Matching”. In: *Political Analysis*, pp. 1–20. ISSN: 1047-1987. DOI: 10.1017/pan.2019.11.
- Kuklinski, James H. and Norman L. Hurley (1994). “On Hearing and Interpreting Political Messages: A Cautionary Tale of Citizen Cue-Taking”. In: *The Journal of Politics* 56.3, pp. 729–751. ISSN: 0022-3816. DOI: 10.2307/2132190.
- Kuklinski, James H., Paul J. Quirk, et al. (2001). “The Political Environment and Citizen Competence”. In: *American Journal of Political Science* 45.2, p. 410. ISSN: 00925853. DOI: 10.2307/2669349.
- Lau, Richard R and David P Redlawsk (2001). “Advantages and Disadvantages of Cognitive Heuristics in Political Decision Making”. In: *American Journal of Political Science* 45.4, pp. 951–971.

- Lupia, Arthur (1994). “Shortcuts Versus Encyclopedias: Information and Voting Behavior in California Insurance Reform Elections”. In: *American Political Science Review* 88.1, pp. 63–76. ISSN: 0003-0554. DOI: 10.2307/2944882.
- Lupia, Arthur and Mathew D. McCubbins (1998). *The democratic dilemma : can citizens learn what they need to know?* Cambridge University Press, p. 282. ISBN: 9780521585934.
- Lusardi, Annamaria (2015). “Financial literacy: Do people know the ABCs of finance?” In: *Public Understanding of Science* 24.3, pp. 260–271. ISSN: 13616609. DOI: 10.1177/0963662514564516.
- Lusardi, Annamaria and Olivia S. Mitchell (2007). “Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth”. In: *Journal of Monetary Economics* 54.1, pp. 205–224. ISSN: 03043932. DOI: 10.1016/j.jmoneco.2006.12.001.
- (2011). “Financial literacy around the world: an overview”. In: *Journal of Pension Economics and Finance* 10.4, pp. 497–508. DOI: 10.1017/S1474747211000448.
- (2014). “The Economic Importance of Financial Literacy: Theory and Evidence”. In: *Journal of economic literature* 52.1, p. 5. DOI: 10.1257/JEL.52.1.5.
- (2017). “How Ordinary Consumers Make Complex Economic Decisions: Financial Literacy and Retirement Readiness”. In: *Quarterly Journal of Finance* 07.03, p. 1750008. ISSN: 2010-1392. DOI: 10.1142/s2010139217500082.
- Mitchell, William C. and Michael C. Munger (1991). “Economic Models of Interest Groups: An Introductory Survey”. In: *American Journal of Political Science* 35.2, p. 512. ISSN: 00925853. DOI: 10.2307/2111373.

- Mondak, Jeffery J. (1993). "Source Cues and Policy Approval: The Cognitive Dynamics of Public Support for the Reagan Agenda". In: *American Journal of Political Science* 37.1, p. 186. ISSN: 00925853. DOI: 10.2307/2111529.
- Montagnoli, Alberto et al. (2016). "Financial Literacy and Political Orientation in Great Britain". In: *IZA Discussion Papers 10285, Institute for the Study of Labor (IZA)*. URL: http://www.gla.ac.uk/media/media%7B%5C_%7D501639%7B%5C_%7Den.pdf.
- Monticone, Chiara (2010). "How much does wealth matter in the acquisition of financial literacy?" In: *Journal of Consumer Affairs* 44.2, pp. 403–422. ISSN: 00220078. DOI: 10.1111/j.1745-6606.2010.01175.x.
- Nicholson, Stephen P. (2012). "Polarizing Cues". In: *American Journal of Political Science* 56.1, pp. 52–66. ISSN: 00925853. DOI: 10.1111/j.1540-5907.2011.00541.x.
- Nyhan, Brendan, Ethan Porter, et al. (2019). "Taking Fact-Checks Literally But Not Seriously? The Effects of Journalistic Fact-Checking on Factual Beliefs and Candidate Favorability". In: *Political Behavior*. ISSN: 01909320. DOI: 10.1007/s11109-019-09528-x.
- Nyhan, Brendan and Jason Reifler (2010). "When corrections fail: The persistence of political misperceptions". In: *Political Behavior* 32.2, pp. 303–330. ISSN: 01909320. DOI: 10.1007/s11109-010-9112-2.
- Olson, Mancur. (1971). *The logic of collective action; public goods and the theory of groups*. Harvard University Press. ISBN: 9780674537514.
- Popkin, Samuel L. (1991). *The reasoning voter : communication and persuasion in presidential campaigns*. University of Chicago Press. ISBN: 9780226675459.
- Rahn, Wendy M (1993). "The Role of Partisan Stereotypes in Information Processing about Political Candidates". In: *American Journal of Political Science* 37.2, pp. 472–496.

Sniderman, Paul M., Richard A. Brody, and Phillip E. Tetlock (1991). *Reasoning and Choice*. Cambridge: Cambridge University Press. ISBN: 9780511720468. DOI: 10.1017/CBO9780511720468.

Stigler, George J. (1971). "The Theory of Economic Regulation". In: *Bell Journal of Economics* 2.1, pp. 3–21.

Zaller, John (1992). *The nature and origins of mass opinion*. Cambridge University Press. ISBN: 9780511818691.

Appendix A Survey experiment setting

Figure A1 shows a summary of how the experiment was conducted, how individuals were recruited, and which were retained and randomized to three statements.

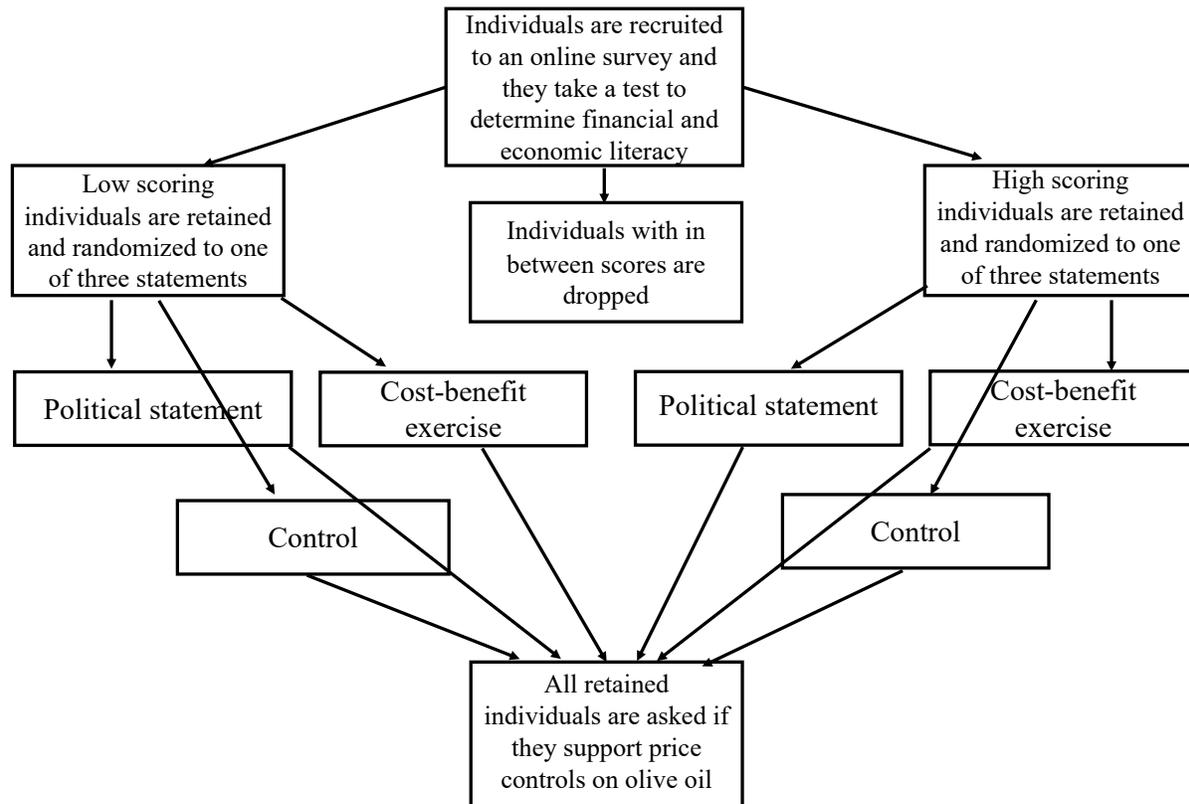


Figure A1: Survey experiment summary

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 respondents 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 18¹⁵.

¹⁵For more information on Cint see www.cint.com.

A.1 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 control¹⁶.

Imagine an hypothetical market for olive oil, where supply and demand are such that equilibrium price and quantity are €4 and 400 units¹⁷. The government then decides to institute a minimum price for oil at €6 per unit.

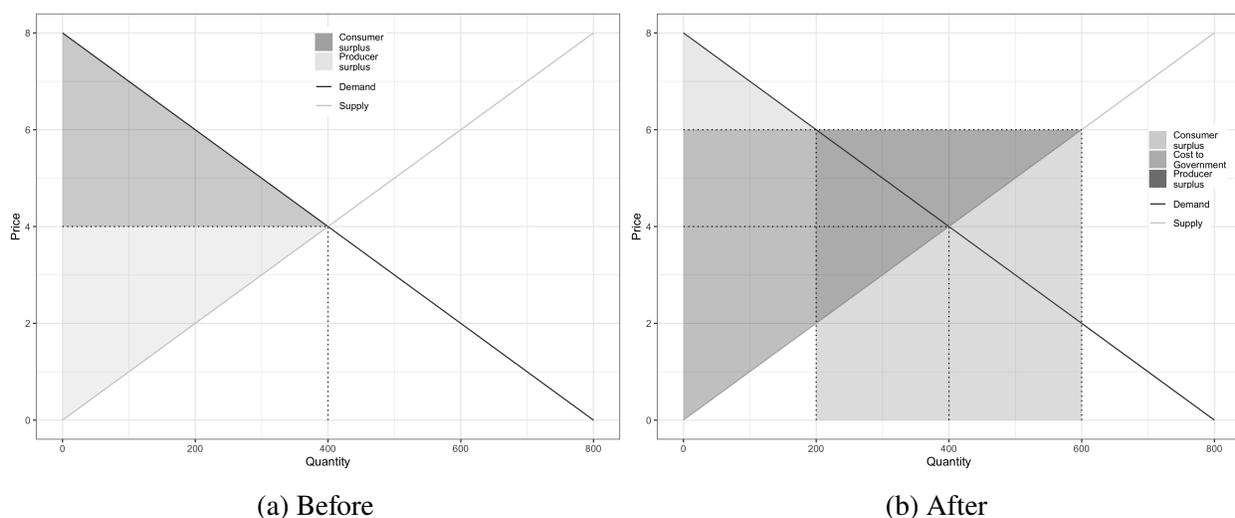


Figure A2: Consumer and producer surplus before and after the introduction of price controls

As shown in figure A2, before the minimum price is introduced, $P^* = 4$ and $Q^* = 400$, and consumer surplus is equal to €800, while producer surplus is equal to €800. After the government

¹⁶For more details on this and different forms of price support see Chapter 2.2 in Barkley (2016).

¹⁷In 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.

sets the new price to €6 and buys the surplus of 400 units (for a total of €2,400), consumer surplus decreases to €200, and producer surplus increases to €1,800.

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: $800 - 200 = €600$. The cost to the government is equal to the cost of the surplus in the market $6 * 400 = €2,400$. Maintaining this price floor involves losses for society and is a cost to consumers, since government spending is financed out of taxes with opportunity costs. Hence, the total cost to consumers (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 $600 + 2,400 = €3,000$. The benefit to producers is €1,000. The net welfare loss to society is equal to €2,000¹⁸.

A.2 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

¹⁸In the cost-benefit exercise for respondents I divided all numbers by 10 for simplicity so the correct answer is -200.

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 necessitano 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?”

A.3 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). The financial literacy questions reflect knowledge about interest compounding, inflation, interest rates,

and risk diversification¹⁹. 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:

- 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.

¹⁹Studies 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 (2014).

The third question asks: ‘The following statement: ‘An individual share in a company is usually a less risky asset to invest in than a portfolio of different company shares’ is’:.

- 1) True,
- 2) False,
- 3) Don’t know.

The first economic literacy question asks: ‘According to you, for which purpose are pension contributions paid for?’

- 1) Only to pay for future pensions,
- 2) Only to pay for current pensions,
- 3) To pay for both current and future pensions,
- 4) Don’t know.

The second question asks: ‘If Italy adopts public policies that restrict imports from another nation that is a major trading partner, then in Italy’:

- 1) The cost of producing products will decrease,
- 2) Job opportunities in export industries will increase,
- 3) Consumers will pay higher prices for products,
- 4) Don’t know.

The third question asks: ‘Economic research agrees on the effects of immigration on advanced economies. More specifically’:

- 1) In the short run there may be a decline in wages and employment of unskilled natives, but these would be offset by rising wages and employment in the long run,
- 2) In the short run there may be an increase in wages and employment of unskilled natives, but these would be offset by declining wages and employment in the long run,
- 3) Native workers lose, in terms of wages and employment, in both the short run and the long run in all sectors,
- 4) Don't know.

The financial and economic literacy index variable combines these six questions and measures the number of correct answers to the questions: 0) 0 correct answers, 1) 1 correct answer, 2) 2 correct answers, 3) 3 correct answers, 4) 4 correct answers, 5) 5 correct answer, and 6) 6 correct answers.

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) 52 and above. 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).

Appendix B Matching and Balance

Tables B1 and B2 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'²⁰.

In tables B3, B4, and B5 I provide summaries, such as the means of each covariate before and

²⁰Unfortunately, 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 B1: 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 %
52+	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 B2: 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 %
52+	17 %	34 %
Gender		
Female	62 %	37 %
Male	38 %	63 %
Political ideology (0 - 10)	6.4 (2.7)	5.7 (2.5)

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 B3: 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		% Improvement
	Treated	Control	Treated	Control	
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 (31-50)	0.49	0.50	0.49	0.52	-194
Age (50+)	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 B4: 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		% Improvement
	Treated	Control	Treated	Control	
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 (31-50)	0.49	0.50	0.49	0.48	95
Age (50+)	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 B5: 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		% Improvement
	Treated	Control	Treated	Control	
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 (31-50)	0.49	0.50	0.55	0.55	100
Age (50+)	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	

Appendix C Supplementary Regression Results

Table C1: Logistic models for doing correct cost-benefit exercise: log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Full Sample	CEM	Nearest-Neighbor	Full Matching
Intercept	-1.43*** (0.19)	-1.29*** (0.23)	-1.53*** (0.19)	-1.50*** (0.18)
FEL	1.21*** (0.10)	1.22*** (0.12)	1.21*** (0.10)	1.21*** (0.10)
Female	-0.13 (0.10)	-0.17 (0.11)	-0.10 (0.09)	-0.11 (0.09)
High Education	0.24* (0.09)	0.23 (0.12)	0.22* (0.10)	0.24* (0.09)
Middle Income	0.08 (0.11)	0.17 (0.14)	0.11 (0.12)	0.09 (0.11)
High Income	0.19 (0.13)	0.23 (0.17)	0.20 (0.13)	0.19 (0.13)
Region Center	-0.15 (0.12)	-0.13 (0.16)	-0.17 (0.12)	-0.14 (0.12)
Region South	-0.19 (0.10)	-0.35** (0.12)	-0.19 (0.10)	-0.16 (0.10)
Age 18-31	-0.10 (0.11)	-0.19 (0.13)	-0.01 (0.12)	-0.07 (0.11)
Age 32-51	-0.13 (0.14)	-0.36* (0.17)	-0.06 (0.14)	-0.08 (0.13)
Political Ideology	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
Num. obs.	14405	9960	13100	14405
Num. imp.	5	5	5	5

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

Table C2: Logistic models for identifying the correct direction of the policy effect: log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Full Sample	CEM	Nearest-Neighbor	Full Matching
Intercept	0.37* (0.17)	0.25 (0.21)	0.24 (0.18)	0.37* (0.16)
FEL	0.94*** (0.10)	0.87*** (0.11)	0.95*** (0.10)	0.94*** (0.10)
Female	0.15 (0.09)	0.16 (0.11)	0.15 (0.09)	0.14 (0.09)
High Education	0.08 (0.10)	0.10 (0.12)	0.07 (0.10)	0.06 (0.09)
Middle Income	-0.05 (0.10)	0.04 (0.13)	0.04 (0.11)	-0.04 (0.10)
High Income	0.01 (0.13)	-0.13 (0.18)	0.06 (0.13)	0.00 (0.12)
Region Center	-0.20 (0.12)	-0.22 (0.15)	-0.16 (0.12)	-0.19 (0.11)
Region South	-0.21* (0.10)	-0.24* (0.11)	-0.24* (0.10)	-0.19* (0.10)
Age 18-31	0.36*** (0.10)	0.28* (0.12)	0.42*** (0.11)	0.37*** (0.10)
Age 32-51	0.53*** (0.13)	0.40* (0.16)	0.58*** (0.13)	0.53*** (0.12)
Political Ideology	-0.04* (0.02)	-0.00 (0.02)	-0.03 (0.02)	-0.03* (0.02)
Num. obs.	14405	9960	13100	14405
Num. imp.	5	5	5	5

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

Table C3: Logistic models for favoring price controls: log odds and standard errors in parentheses. The results are for the combined imputations and they are calculated by Rubin's Rules.

	Full Sample	CEM	Nearest-Neighbor	Full Matching
Intercept	0.29 (0.18)	0.20 (0.22)	0.36 (0.19)	0.31 (0.18)
Party Cue	0.27* (0.13)	0.35* (0.16)	0.30* (0.15)	0.27* (0.13)
Cost-benefit exercise	-0.21 (0.14)	-0.16 (0.17)	-0.33* (0.16)	-0.19 (0.14)
FEL	-0.12 (0.14)	-0.15 (0.17)	-0.19 (0.15)	-0.13 (0.14)
Female	0.16 (0.09)	0.13 (0.11)	0.22* (0.09)	0.17* (0.08)
High Education	0.12 (0.09)	0.21 (0.12)	0.13 (0.09)	0.13 (0.09)
Middle Income	0.09 (0.10)	0.09 (0.12)	0.01 (0.11)	0.09 (0.10)
High Income	0.17 (0.12)	0.25 (0.16)	0.11 (0.12)	0.18 (0.12)
Region Center	0.10 (0.11)	0.09 (0.16)	0.10 (0.12)	0.10 (0.11)
Region South	0.05 (0.10)	0.05 (0.11)	0.08 (0.10)	0.03 (0.09)
Age 18-31	0.15 (0.10)	0.21 (0.13)	0.16 (0.11)	0.14 (0.10)
Age 32-51	0.21 (0.12)	0.50** (0.15)	0.23 (0.13)	0.23 (0.12)
Political Ideology	0.03* (0.02)	0.02 (0.02)	0.03* (0.02)	0.03 (0.02)
Party Cue: FEL	-0.39* (0.20)	-0.41 (0.25)	-0.42* (0.21)	-0.39* (0.20)
Cost-benefit exercise: FEL	-0.66*** (0.20)	-0.55* (0.24)	-0.52* (0.21)	-0.66*** (0.20)
Num. obs.	14405	9960	13100	14405
Num. imp.	5	5	5	5

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

Appendix D Robustness Checks

In this section, as a robustness check I also test whether financial and economic literacy is just an alternative measure of education. Hence, 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. As far as conducting the cost-benefit exercise, figure D1 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.

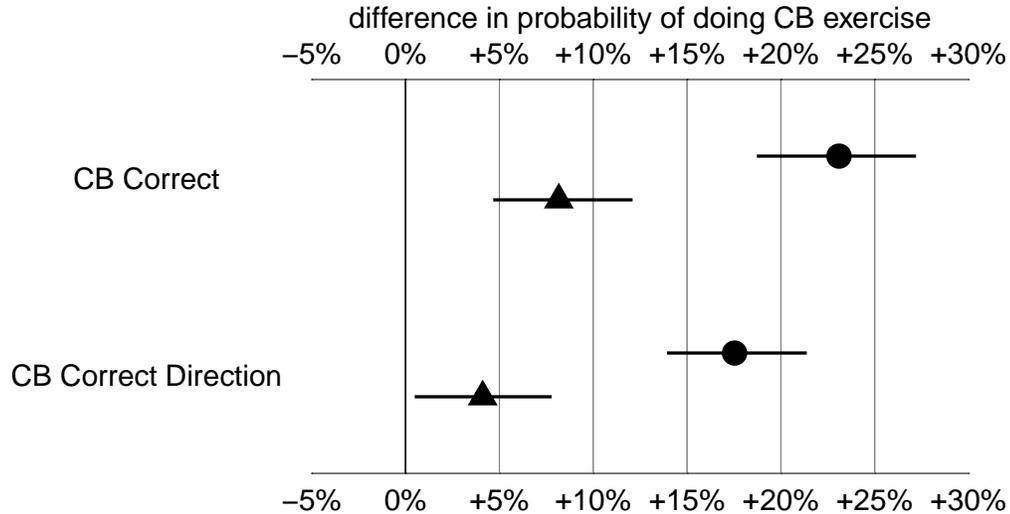


Figure D1: First differences in probability of doing the cost-benefit exercise correctly and of identifying the correct direction of the policy effect between FEL and FEI respondents (circle markers) and educated and uneducated ones (triangle markers). Bars indicate the 95% confidence interval.

For the information treatments, what emerges from figure D2 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.

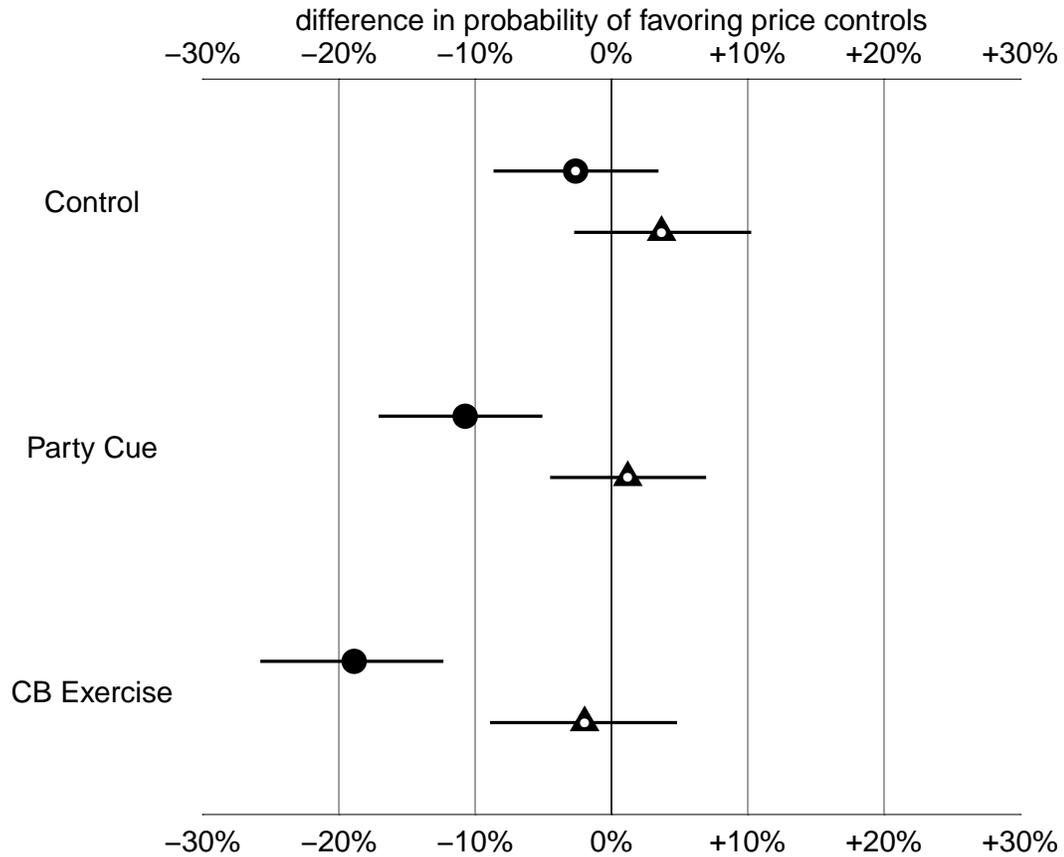


Figure D2: First differences of probabilities of favoring price controls between FEL and FEI respondents (circle markers) and between educated and uneducated ones (triangle markers) by treatment group. Bars indicate the 95% confidence interval. White markers indicate statistical non-significance, filled markers statistical significance.

Table D1: 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.

	Information	Correct CB	Correct Direction CB
Intercept	-0.78*** (0.17)	0.81*** (0.16)	0.19 (0.17)
Female	-0.35*** (0.09)	-0.03 (0.09)	0.25** (0.08)
High Education	0.40*** (0.09)	0.21* (0.09)	0.18 (0.16)
Middle Income	0.25* (0.11)	0.07 (0.10)	0.01 (0.10)
High Income	0.40*** (0.12)	0.17 (0.12)	0.06 (0.12)
Region Center	-0.28* (0.12)	-0.31** (0.11)	0.15 (0.11)
Region South	-0.33*** (0.10)	-0.31*** (0.09)	0.12 (0.09)
Age 18-31	0.05 (0.11)	0.44*** (0.10)	0.10 (0.10)
Age 32-51	0.21 (0.13)	0.77*** (0.12)	0.10 (0.12)
Political Ideology	-0.04* (0.02)	-0.06*** (0.02)	0.04** (0.02)
Party Cue			0.13 (0.12)
Cost-benefit exercise			-0.46*** (0.12)
Party Cue: FEL			-0.12 (0.21)
Cost-benefit exercise: FEL			-0.27 (0.21)
Num. obs.	14405	14405	14405
Num. imp.	5	5	5

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