Financial literacy and preferences for economic openness in the U.K.

Beatrice Magistro*†‡

Abstract

Recent events in Europe and the United States suggest that the liberal order is increasingly under stress as nationalist, protectionist, and populist political entrepreneurs are gaining significant ground across the Western world. Many theories have been formulated as to which factors are more likely to explain such policy preferences. The hypothesis tested in this paper is that financial literacy affects economic policy preferences. I analyze data from the British Election Study and test my theory on three contentious issues: Brexit, immigration, and trade. Findings suggest that financial literacy does affect economic policy preferences. Financially literate individuals, regardless of economic self-interest, are more likely to vote remain in the Brexit referendum, and to think that free trade and immigration are good for the British economy.

1   Introduction

Western liberal democracies and open economies are under stress. Nationalist parties have achieved significant power in several European countries. The United Kingdom is leaving the European

Union. Donald Trump is president of the United States. This illiberal shift ultimately reflects preferences held by individuals, many of them economic.

Why, despite overall benefits to national economies, some people still oppose free trade and immigration? Why did some Brits vote in favor of Brexit, despite the negative consequences this entails for the British economy?[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, 2001a; Walstad, 1997), immigration (Daniels and Von der Ruhr, 2003; O'Rourke and Sinnott, 2006; Scheve and Slaughter, 2001a), or Brexit (Colantone and Stanig, 2018; Goodwin and Heath, 2016; Inglehart and Norris, 2016). 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 individual economic policy preferences. Apart from a few exceptions (Mansfield and Mutz, 2009; Walstad, 1997), none of these studies have 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 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

---

[1]On free trade see: http://www.igmchicago.org/surveys/free-trade and Frankel and Romer (1999) and Alcala and Ciccone (2004). On immigration see Leeson and Gochenour (2015), Coppel, Dumont, and Visco (2001), Foged and Peri (2013), Hamilton and Whalley (1984), Ottaviano and Peri (2006), Ottaviano, Peri, and Wright (2010), Peri (2009), and Sequeira, Nunn, and Qian (2017). On Brexit see Emmerson et al. (2016)

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 and Mitchell, 2014; Lusardi, 2008), however the literature investigating the relationship between financial literacy and policy and political preferences in still in its early stages (Montagnoli et al., 2016; Fornero and Lo Prete, 2019). 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 hypotheses that financial literacy affects policy preferences for three contentious issues: views on trade, Brexit, and immigration. 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 economic openness 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 economic openness than similar financially illiterate individuals.

The findings suggest that financial literacy does affect preferences for economic openness. 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, they are more likely to vote remain in the Brexit referendum, and they are also more likely to believe that immigration is good for the British economy, than similar financially illiterate individuals. The findings are unchanged when financial literacy is interacted with an objective measure of globalization, which is measured through the Chinese import shock.

---

[2]The Chinese import shock is an objective measure of globalization based on to the sudden increase in the Chinese share of total manufacturing imports in the United Kingdom from the end of the 1980s until 2007 Colantone and Stanig (2018).

As a robustness check, I address the concern 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 investigate 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 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 Prior approaches

2.1 Preferences for economic openness

Several scholars have investigated what shapes people's preferences for economic openness. With respect to free trade and immigration, economists agree that the free movement of labor and goods is beneficial at the aggregate level[3]. However, there are distributional consequences: although the

---

[3]See for example http://www.igmchicago.org/surveys/free-trade on free trade, and Coppel, Dumont, and Visco (2001), Foged and Peri (2013), Hamilton and Whalley (1984), Ottaviano and Peri (2006), Ottaviano, Peri, and Wright (2010), Peri (2009), and Sequeira, Nunn, and Qian (2017) on immigration. The findings 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

majority of people in a country benefits from free trade and immigration, some individuals do suffer economic harm (Acemoglu, Autor, et al., 2016; Fajgelbaum and Khandelwal, 2016; Feyrer, 2009; Irwin, 2015). One key question then regards what shapes people's attitudes towards trade and immigration. Most studies on support for trade 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 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 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 protectionist measures (Acemoglu and 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). Mansfield and Mutz (2009) also find that people form their trade preferences following sociotropic perceptions, not self-interest (Mansfield and Mutz, 2009). 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.

Multiple works have also examined the determinants of immigration policy preferences, testing two main explanations: self-interest (or egotropic economic explanations such as labor market competition or fiscal threat) and psychological mechanisms (which emphasize immigration's cultural impacts). Hainmueller and Hopkins (2012) review about a hundred studies of immigration attitudes from more than two dozen countries. The authors suggest that studies on immigration policy preferences consistently find that these attitudes are not strongly correlated with personal economic

circumstances (self-interest), instead they are shaped by sociotropic (or symbolic) concerns about its cultural effects on the country as a whole (Hainmueller and Hopkins, 2012).

With respect to 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). Although there is a consensus among most economists around central estimates of the costs of Brexit, there is also uncertainty, as these range from a cost of a few percentage points up to 10 percent of GDP (Miles, 2016). Furthermore, a poll commissioned by the Observer and carried out by IPSOS Mori also found that among 600 economists, 88 percent agreed that Brexit would damage the UK's growth prospects over the next five years (Sodha, Helm, and Inman, 2016). Similarly to preferences for free trade and immigration, most works on preferences for EU membership have tested whether economic insecurity, more specifically between the winners and losers of globalization, or cultural cleavages, reflected in opposition towards immigrants, best explain preferences for Brexit and EU membership in general, with mixed evidence (Colantone and Stanig, 2018; Goodwin and Heath, 2016; Halikiopoulou and Vlandas, 2018; Inglehart and Norris, 2016).

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, 2008). 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, 2008; Lusardi and Mitchell, 2014). 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).

3   Theoretical argument

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 between them.

---

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

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.
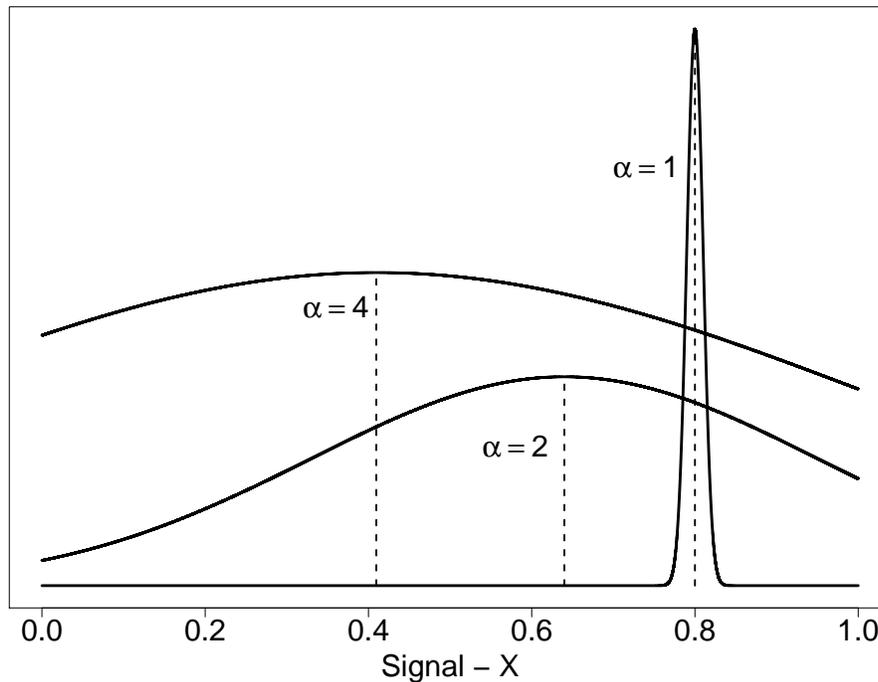

Figure 1: Truncated normal distributions of signal X when inaccuracy α=1, 2, 4 and true utility u=0.8. In this example, the true utility of the policy is set to u=0.8. For a financially literate individual ($\alpha = 1$), the utility inferred from the signal equals 0.8, and variance is set to 0.0001. 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

8

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 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.

3.2 Individual preferences for Brexit, immigration, and 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 all the three policies under investigation here, as discussed in depth in the sections on trade, immigration, and Brexit preferences. There is near consensus among experts that free trade and the free movement of labor lead to efficiency gains, however, they both come with distributional consequences, as at least in the short run, a minority

9

loses while the majority wins, hence explaining why we still see preferences for protectionism.

Hence, although I expect that on average financially literate individuals will be more likely to favor economic openness, 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. 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 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 vote Remain in the Brexit referendum, to think that immigration is good for the British economy, and 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 vote Remain in the Brexit referendum, to think that immigration is good for the British economy, and 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 vote Leave in the Brexit referendum, to think that immigration is bad for the British economy, and to think that free trade with the EU is bad for the British economy, than financially illiterate losers.

4 Methodology

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 [5]. The BES follows some of the individuals in the next waves, this allows me to use Wave 7 (2016) too, as some of the dependent variables are only available in later waves. However, not all respondents are followed through in subsequent waves. Depending on the dependent variable of interest, the total number of observations ranges between 3,000 to 5,555[6].

My first dependent variable comes from wave 2 and is: 'If there was a referendum on Britain's membership of the European Union, how do you think you would vote?'. My second dependent variable come from wave 2 and is: 'Do you think immigration is good or bad for Britain's economy?'[7]. My third dependent variable comes from wave 7 and is: 'Is this good or bad for Britain: Free trade with Europe'[8]. Table 1 shows descriptive statistics for the dependent variables.

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, 2008; Lusardi and Mitchell, 2014; Montagnoli et al., 2016). Table 2 shows descriptive statistics for my covariates of interest. The first question is: 'Suppose

---

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

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

[7]It's an ordinal variable that takes values from 1(bad) to 7 (good), and 'don't know'. I recoded it so to take values from 1 to 3 and 'don't know'.

[8]The question on the British referendum clearly measures a personal preference on the matter. However, due to data availability, the questions on free trade and immigration ask 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.

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 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: 0) 0 correct answers, 1) 1 correct answer, 2) 2 correct answers, and 3) 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 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 Autor, 2011; Matias

_____

[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)

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 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 (Colantone and Stanig, 2018; Autor, Dorn, and Hanson, 2013). 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 3 shows descriptive statistics for interaction terms and control variables, from one of the

---

[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.

[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.

imputed datasets (N = 5,555).

Table 1: Descriptive statistics of the dependent variables for the imputed dataset (N = 5,555)

	Relative frequency, %
Vote intention on Brexit	
Stay in the EU	43.9
Leave the EU	38.5
I would not vote	3.7
Don't know	13.9
Immigration good or bad for economy	
Bad	39.3
Neither good nor bad	16.9
Good	36
Don't know	7.8
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: 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

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:

$$Y_i \sim Multinomial(Y_i \mid \pi_{i,j}) \tag{1}$$

Table 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 $j = 1, ..., J$.

$$\pi_{i,j} = \frac{exp(\mu_{i,j})}{\sum_{k=1}^{J} exp(\mu_{i,j})} \tag{2}$$

$$\mu_{i,j} = \beta_{j0} + \sum_{k=1}^{P} \beta_{j,k} x_{i,k}, \tag{3}$$

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 variables for the main models are Brexit, immigration, and 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].

5 Findings

5.1 Financial literacy and preferences for economic openness

I first estimate Equation 1 for the three different dependent variables and test H1, specifically whether on average financially literate individuals are more likely to vote Remain in the Brexit referendum, to think that immigration is good for the British economy, and to think that free trade with the EU is good for the British economy, than similar financially illiterate individuals.
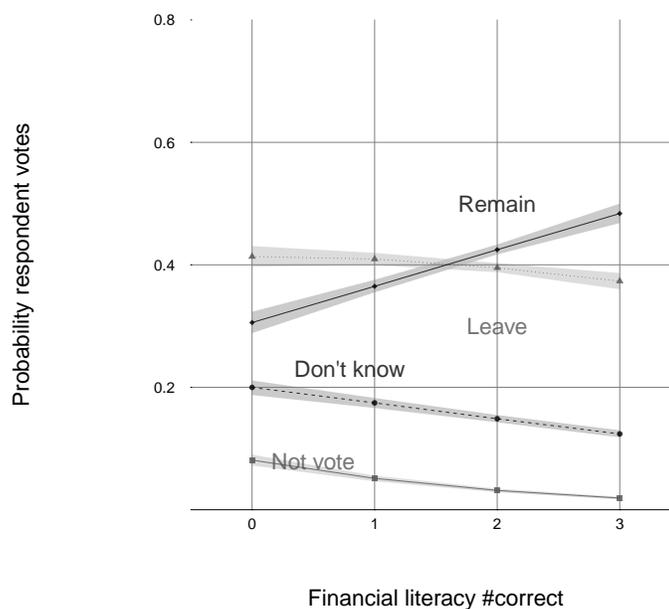
Figure 2: Expected probabilities of voting Remain or Leave in Brexit referendum with 95% confidence intervals

[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

Figures 2 to 4 show the expected probabilities of voting for or against Brexit, favoring or not favoring immigration and free trade with the EU, with 95 percent confidence intervals[14].
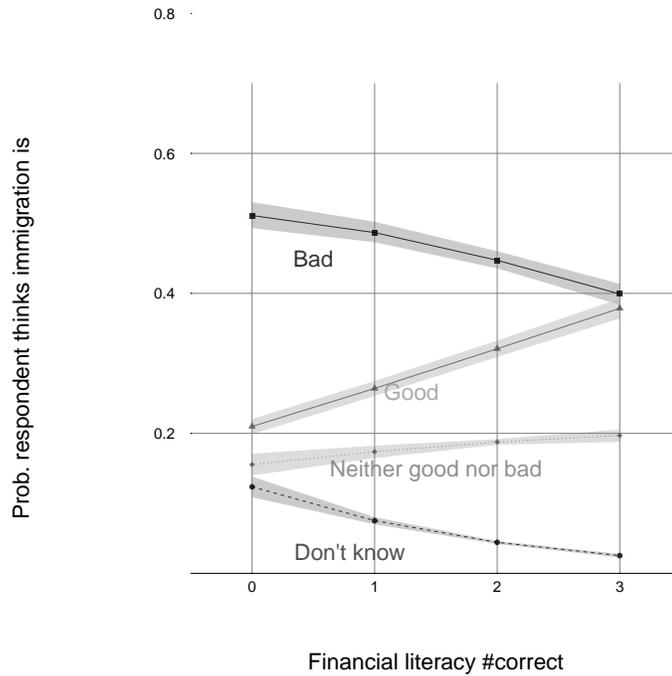

Figure 3: Expected probabilities of thinking immigration is good for the British economy with 95% confidence intervals

As figures 2 to 4 show, as financial literacy increases so does the probability that the respondent votes Remain in the Brexit referendum, that she thinks that immigration is good for the British economy, and that she 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 illiterate individual (who got no correct answers). A financially literate individual is respectively 18 percent, 17 percent, and 32 percent more likely than a financially illiterate individual to vote Remain in the Brexit referendum, to think that immigration is good for the British economy, and to think that free trade is good for the British economy.

---

[14]Online appendix B shows log-odds with standard errors in parentheses, and cluster bootstrapped p-values.
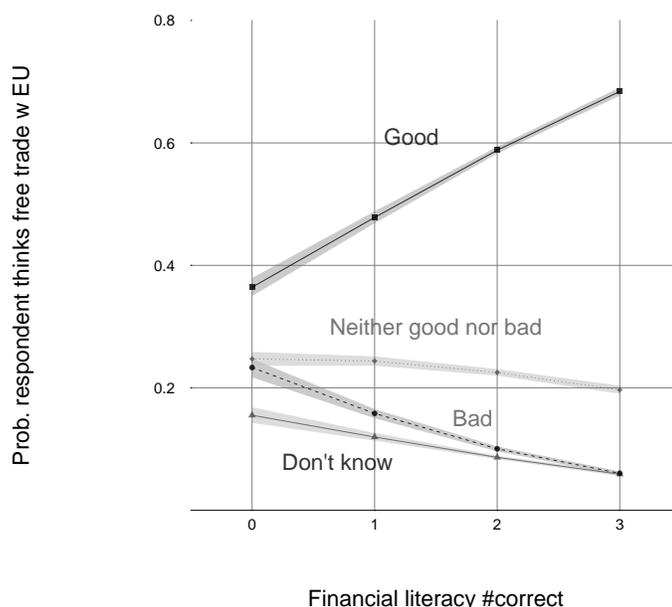
Figure 4: Expected probabilities of thinking free trade is good for the British economy with 95% confidence intervals

5.1.1 Heterogeneous Effects

I then estimate Equation 1 for the three different dependent variables and test H2 and H3, specifically whether: 1) financially literate winners from economic openness are more likely to vote Remain in the Brexit referendum, to think that immigration is good for the British economy, and to think that free trade with the EU is good for the British economy than similar financially illiterate individuals; and 2) financially literate losers from economic openness are more likely to vote Leave in the Brexit referendum, to think that immigration is bad for the British economy, and to think that free trade with the EU is bad for the British economy than similar financially illiterate individuals.

Figures 5 to 7 show the first differences of voting for or against Brexit, favoring or not favoring immigration and 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 and objective

---

[15]Online appendix B shows log-odds with standard errors in parentheses, and cluster bootstrapped p-values.
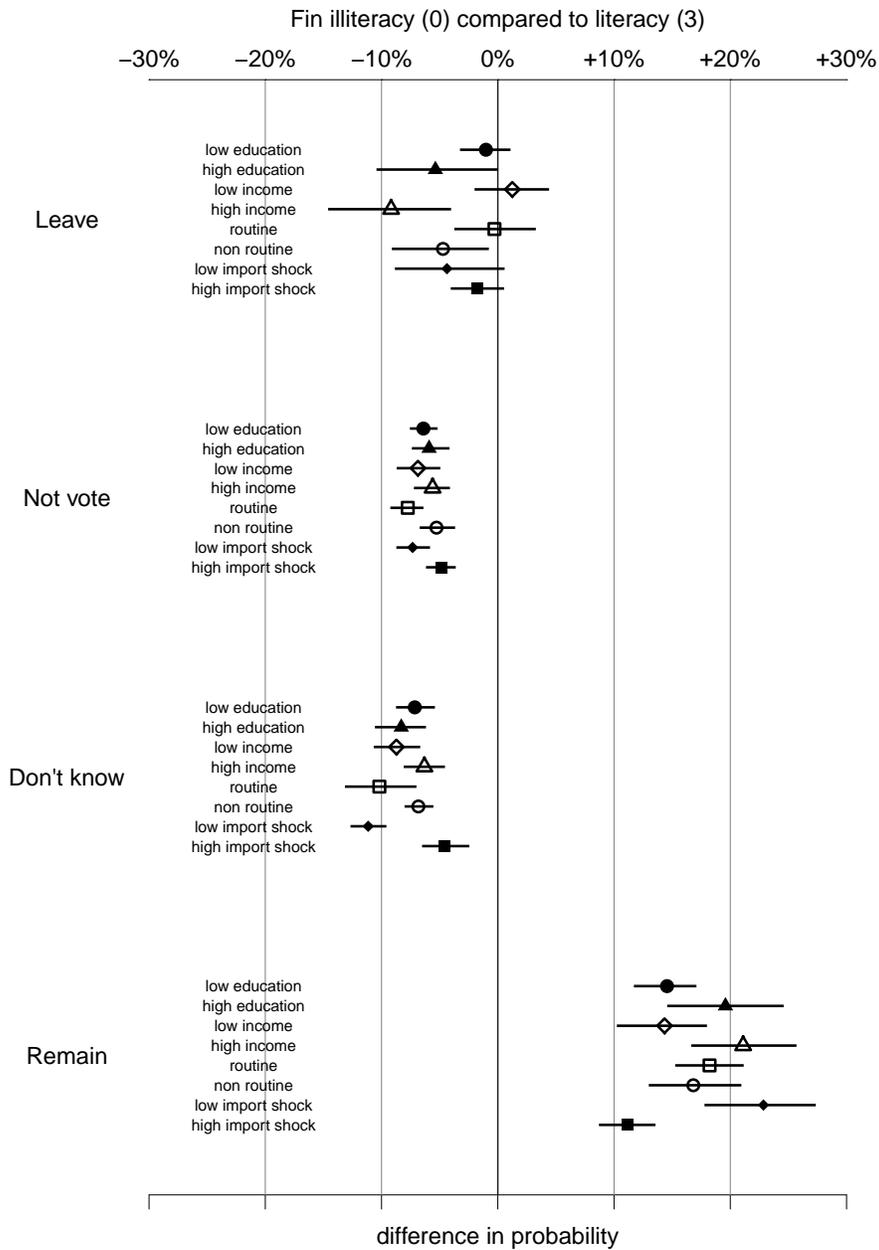
Figure 5: First differences in probability of voting Remain or Leave in Brexit referendum with 95% confidence intervals between financially illiterate individuals (0 correct answers) and financially literate individuals (3 correct answers), by education, income, job routineness, and import shock
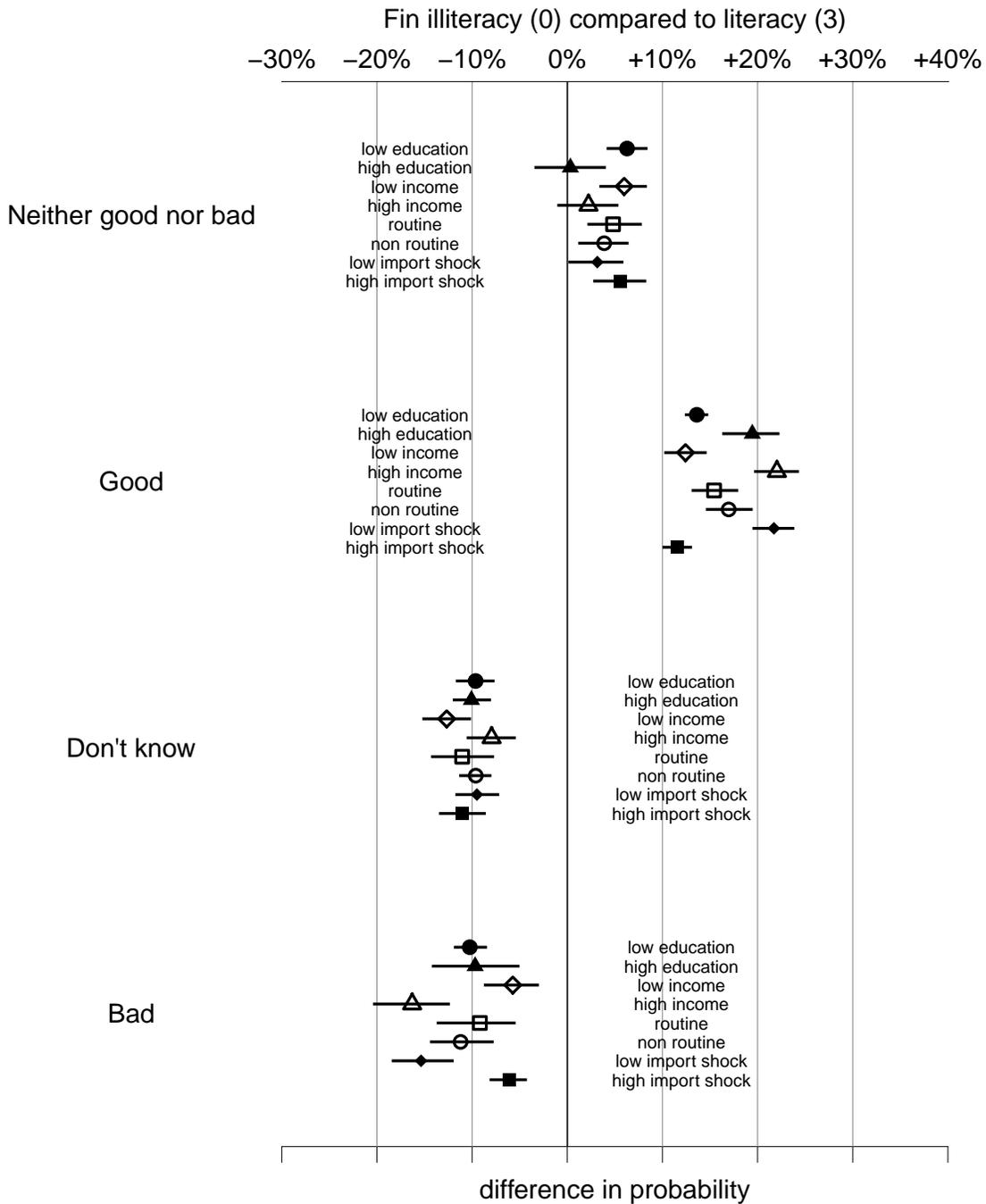
Figure 6: First differences in probability of thinking immigration is good for the British economy with 95% confidence intervals between financially illiterate individuals (0 correct answers) and financially literate individuals (3 correct answers), by education, income, job routineness, and import shock

economic self-interest, are more likely to support immigration, free trade, and remaining in the EU than financially illiterate individuals. To understand the substantive importance of these findings, looking at figures 5 to 7, we can see that an individual with high education who answered all three financial literacy questions correctly is 20 percent more likely to vote Remain in the Brexit referendum than a similar individual who answered no questions correctly. Conversely, financially literate individuals with low education are not more likely to vote Leave than similar illiterate individuals, they are actually 15 percent more likely to vote Remain than their illiterate counterpart.

In a similar way, a financially literate individual with high education is 19 percent more likely to think that immigration is good for the British economy and 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 immigration and free trade, they are actually respectively 14 and 32 percent more likely to support economic openness than their illiterate counterpart.

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 economic openness than their illiterate counterparts. However, financially literate losers from globalization are not more likely to oppose economic openness than their illiterate counterparts, they are actually more likely to favor it.

6   Robustness checks

6.1   Financial literacy and social policy preferences

An issue with this empirical approach is endogeneity. In the absence of a randomized controlled trial (RCT), which randomly assigns financial literacy, we are not able to avoid selection bias, confounds, and omitted variable bias completely. Analyzing existing data on financial literacy and policy preferences does not allow me to rule out all alternative explanations as an experiment would, but, so much as the data available permits me, I attempt to partially address this problem by laying out all of the assumptions I make and controlling for the relevant confounders.

One further possibility is that financial literacy may have little to do with self-interest, but rather
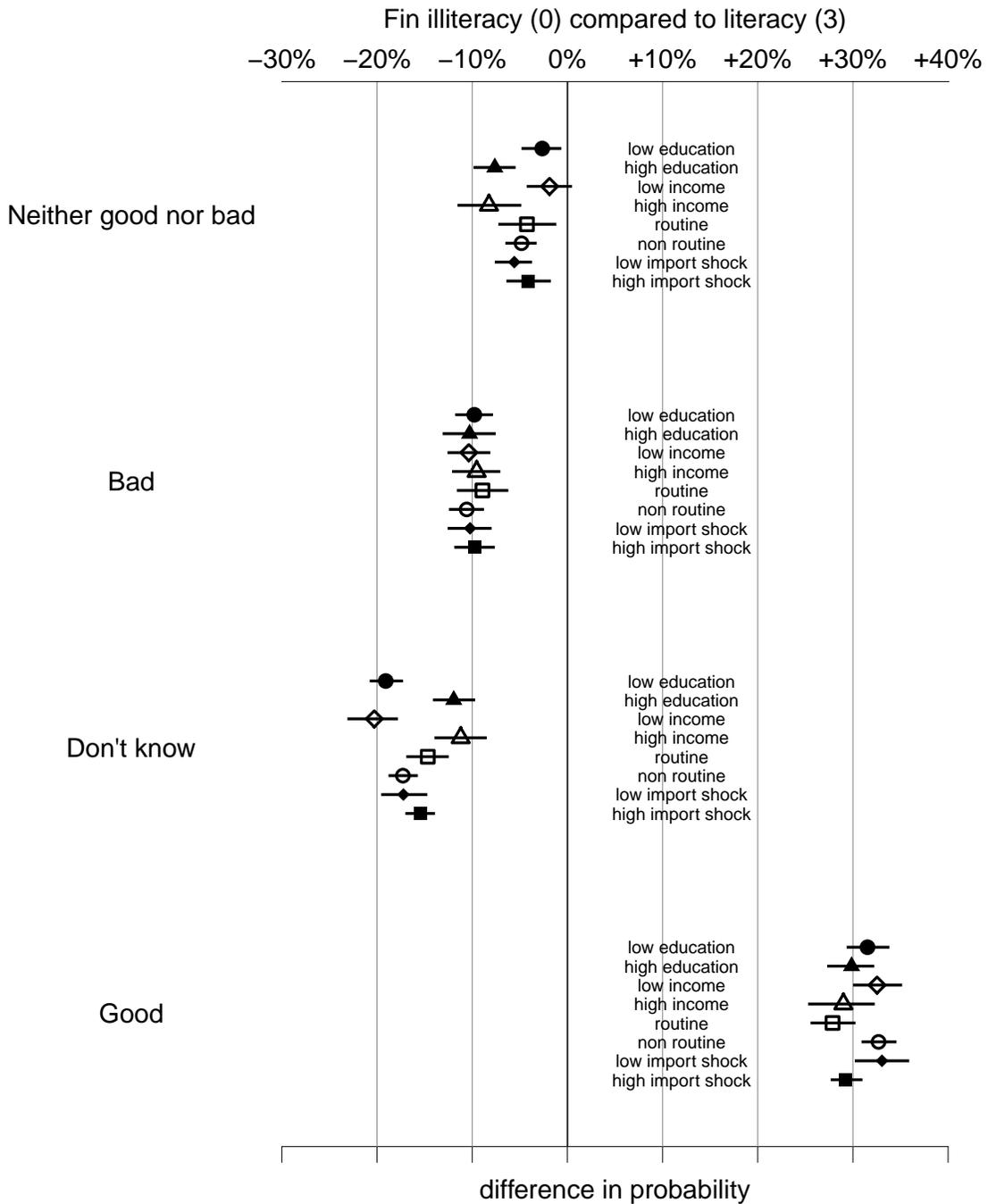
Figure 7: First differences in probability of thinking free trade is good for the British economy with 95% confidence intervals between financially illiterate individuals (0 correct answers) and financially literate individuals (3 correct answers), by education, income, job routineness, and import shock

it may be a proxy for liberal views in general, including tolerance for out-groups, which are 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 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.

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, immigration, and remaining in the EU than similar financially illiterate individuals, supports hypothesis 2 and suggests that financially literate winners from more economic openness are more likely to recognize its economic benefits
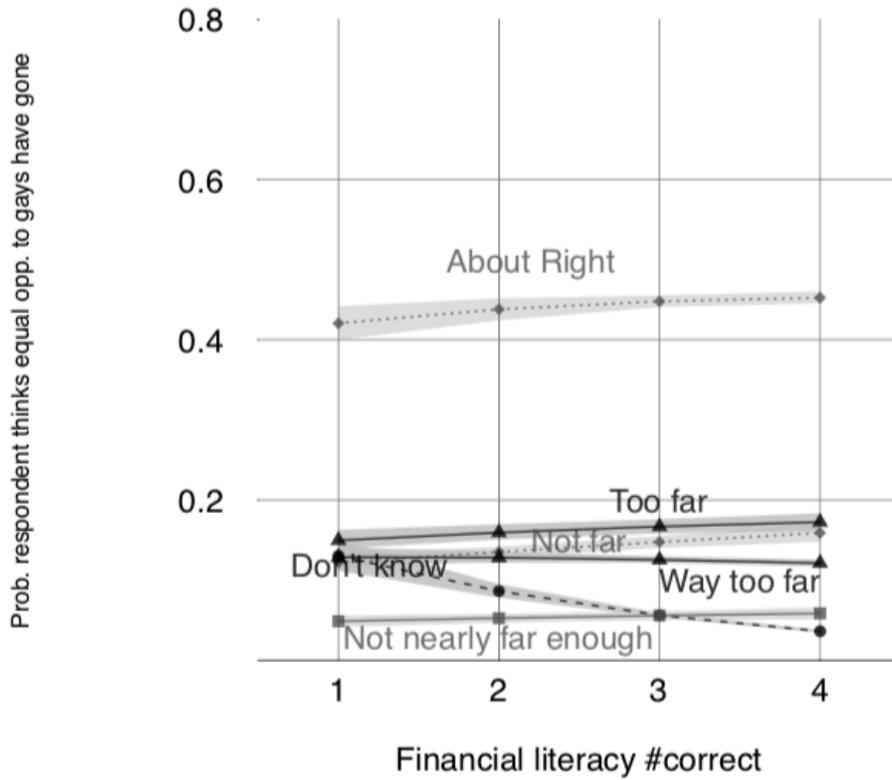
Figure 8: Expected probabilities of thinking attempts to give equal opp. to gays have gone with 95% confidence intervals
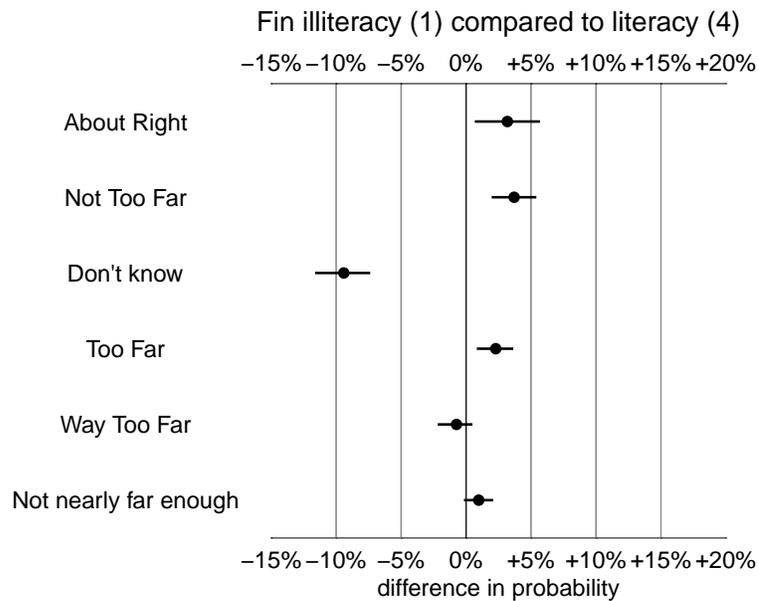

Figure 9: First differences in probability of thinking attempts to give equal opp. to gays have gone with 95% confidence intervals

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, immigration, and remaining in 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 and freer movement of labor improve productive efficiency and offer consumers better choices, and in the long run these gains are much larger than any effects on employment[16]. 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 or immigration, 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.

---

[16]On free trade see: http://www.igmchicago.org/surveys/free-trade and Frankel and Romer (1999) and Alcala and Ciccone (2004). On immigration see Leeson and Gochenour (2015), Coppel, Dumont, and Visco (2001), Foged and Peri (2013), Hamilton and Whalley (1984), Ottaviano and Peri (2006), Ottaviano, Peri, and Wright (2010), Peri (2009), and Sequeira, Nunn, and Qian (2017)

8   Conclusion

This paper investigates the relationship between financial literacy and preferences for economic openness 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 cases under analysis, I expect that on average financially literate individuals are more likely to be in favor of economic openness. 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 economic openness. 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, they are more likely to vote remain in the Brexit referendum, and they are also more likely to believe that immigration is good for the British economy than similar financially illiterate individuals. However, financially literate losers from globalization are not more likely to oppose economic openness 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 omitted variable bias concerns. More specifically, I investigate 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.

References

Acemoglu, D. and D. Autor (2011). "Handbook of Labor Economics". In: Elsevier. Chap. Skills, Tasks and Technologies: Implications for employment and earnings.

Acemoglu, D., D. Autor, et al. (2016). "Import competition and the great U.S. employment sag of the 2000s". In: *Journal of Labor Economics* 34.1, pp. 141–194.

Alcala, F. and A. Ciccone (2004). "Trade and Productivity". In: *The Quarterly Journal of Economics* 119.2, pp. 613–646.

Angrist, J.D. and J. Pischke (2009). *Mostly harmless econometrics*. Princeton University Press.

Autor, D., D. Dorn, and G.H. Hanson (2013). "The China Syndrome: Local Labor Market Effects of Import Competition in the United States". In: *American Economic Review* 103.6, pp. 2121–68.

Burgoon, B.A. and M.J. Hiscox (2008). "The gender divide over international trade: Why do men and women have different views about openness to the world economy?" In: *Unpublished paper*.

Colantone, I. and P. Stanig (2018). "Global competition and Brexit". In: *American Political Science Review* 112.2, pp. 201–218.

Coppel, J., J. Dumont, and I. Visco (2001). "Trends in immigration and economic consequences". In: *OECD Economics Working Paper* 242001.

Daniels, J.P. and M. Von der Ruhr (2003). "The determinants of immigration policy preferences in advanced economies: A cross-country study". In: *Atlantic Economic Journal* 31.2, pp. 146–158.

Ebenstein, A. et al. (2014). "Estimating the impact of trade and offshoring on American workers using the current population surveys". In: *The Review of Economics and Statistics* 96.4, pp. 581–595.

Elwert, F. (2013). "Graphical causal models". In: *Handbook of Causal Analysis for Social Research*. Ed. by S.L. Morgan (ed.) Springer Science. Chap. 13.

Emmerson, C. et al. (2016). "Brexit and the U.K.'s public finances". In: *Institute for Fiscal Studies*.

Esarey, J. and A. Menger (2016). "Practical and Effective Approaches to Dealing with Clustered Data". In: *Conditionally accepted at Political Science Research and Methods*.

Fajgelbaum, P.D. and A.K. Khandelwal (2016). "Measuring the unequal gains from trade". In: *The Quarterly Journal of Economics*, pp. 1113–1180.

Feyrer, J. (2009). "Trade and income - exploiting time series in geography". In: *NBER Working Paper* 14190.

Fieldhouse, E. et al. (2018). "British Election Study Internet Panel Waves 1-14". In:

Foged, M. and G. Peri (2013). "Immigrants' and native workers: new analysis on longitudinal data". In: *NBER Working Paper* 19315.

Fornero, E. (2015). "Economic-financial literacy and (sustainable) pension reforms: Why the former is a key ingredient for the latter". In: *Bankers, Markets and Investors* 134.

Fornero, E. and A. 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.

Frankel, J.A. and D.H. Romer (1999). "Does Trade cause Growth?" In: *American Economic Review* 89.3, pp. 379–399.

Goodwin, M.J. and O. Heath (2016). "The 2016 Referendum, Brexit and the left behind: An aggregate-level analysis of the result". In: *The Political Quarterly* 87.3, pp. 323–332.

Green, D.P. and L. Vavreck (2008). "Analysis of Cluster-Randomized Experiments: A Comparison of Alternative Estimation Approaches". In: *Political Analysis* 16.2, pp. 138–152.

Hainmueller, J. and M.J. Hiscox (2006). "Learning to love globalization: Education and individual attitudes toward international trade". In: *International Organization* 60.2, pp. 469–498.

Hainmueller, J. and D.J. Hopkins (2012). "Public attitudes toward immigration". In: *Annual Review of Political Science* 17, pp. 225–249.

Halikiopoulou, D. and T. Vlandas (2018). "Voting to leave: Economic insecurity and the Brexit vote". In: *The Routledge Handbook of Euroscepticism*. Ed. by B. Leruth, N. Startin, and S. Usherwood. Routledge. Chap. 34.

Hamilton, B. and J. Whalley (1984). "Efficiency and distributional implications of global restrictions on labour mobility: Calculations and policy implications". In: *Journal of Development Economics* 14.1-2, pp. 61–75.

Hays, J.C., S.D. Ehrlich, and C. Peinhardt (2005). "Government spending and public support for trade in the OECD: An empirical test of the embedded liberalism thesis". In: *International Organization* 59, pp. 473–494.

Hicks, M.J. and S. Devaraj (2015). "The myth and the reality of manufacturing in America". In: *Center for Business and Economic Research, Ball State University*.

Inglehart, R. and P. Norris (2016). "Trump, Brexit, and the rise of populism: Economic have-nots and cultural backlash". In: *HKS Working Paper* RWP16-026.

Irwin, D.A. (2015). *Free trade under fire*. 4th ed. Princeton University Press.

Lahav, E., M. Rosenboim, and T. Shavit (2015). "Financial literacy's effect on elicited subjective discount rate". In: *Economics Bulletin* 35.2, pp. 1360–1368.

Leeson, P.T. and Z. Gochenour (2015). "The economic effects of international labor mobility". In: *The economics of immigration: Market-based approaches, social science, and public policy*. Ed. by B. Powell. Oxford University Press, pp. 11–25.

Lusardi, A. (2008). "Household saving behavior: The role of financial literacy, information, and financial education programs". In: *NBER Working Paper* 13824.

— (2015). "Financial literacy: Do people know the ABCs of finance?" In: *Public understanding of science* 24.3, pp. 260–271.

Lusardi, A. and O.S. Mitchell (2014). "The economic importance of financial literacy: Theory and evidence". In: *Journal of Economic Literature* 52.1, pp. 5–44.

Mansfield, E.D. and D.C. Mutz (2009). "Support for free trade: Self-interest, sociotropic politics, and out-group anxiety". In: *International Organization* 63, pp. 425–457.

Matias Cortes, G. (2016). "Where have the middle-wage workers gone? A study of polarization using panel data". In: *Journal of Labor Economics* 34.1.

Miles, D. (2016). "Brexit realism: What economists know about costs and voter motives." In: *VoxEU*. URL: http://voxeu.org/article/brexit-realism-what-economists-know-aboutcosts-%20and-voter-motives.

Montagnoli, A. et al. (2016). "Financial literacy and political orientation in Great Britain". In: *IZA Discussion Paper* 10285.

O'Rourke, K.H. and R. Sinnott (2001). "What determines attitudes towards protection? Some cross-country evidence". In: *Brookings Trade Forum*. Ed. by S.M. Collins and D. Rodrik. Washington, D.C.: Brookings Institute Press, pp. 157–206.

— (2006). "The determinants of individual attitudes towards immigration". In: *European Journal of Political Economy* 22, pp. 838–861.

Ottaviano, G.I.P. and G. Peri (2006). "Rethinking the effects of immigration on wages". In: *NBER Working Paper* 12497.

Ottaviano, G.I.P., G. Peri, and G.C. Wright (2010). "Immigration, offshoring and American jobs". In: *NBER Working Paper* 16439.

Owen, E. and N.P. Johnston (2017). "Occupation and the political economy of trade: Job routineness, offshorability, and protectionist sentiment". In: *International Organization* 71.4, pp. 665–699.

Pearl, J. and D. Mackenzie (2018). *The book of why: The new science of cause and effect*. Basic Books.

Peri, G. (2009). "The effect of immigration on productivity: Evidence from U.S. states". In: *NBER Working Paper* 15507.

Scheve, K.F. and M.J. Slaughter (2001a). "Labor market competition and individual preferences over immigration policy". In: *The Review of Economics and Statistics* 83.1, pp. 133–145.

— (2001b). "What determines individual trade policy preferences?" In: *Journal of International Economics* 54, pp. 267–292.

Sequeira, S., N. Nunn, and N. Qian (2017). "Migrants and the making of America: The short and long-run effects of immigration during the age of mass migration". In: *NBER Working Paper* 23289.

Sodha, S., T. Helm, and P. Inman (2016). "Economists overwhelmingly reject Brexit in boost for Cameron." In: *The Guardian*. URL: https://www.theguardian.com/politics/2016/may/28/economists-reject-brexit-boost-cameron.

Stigler, G. (1970). "The case, if any, for economic literacy". In: *Journal of Economic Education* 1.2, pp. 77–84.

Walstad, W.B. (1997). "Economic knowledge and public opinion on economic issues". In: *Journal of Economic Education* 28.3, pp. 195–205.