

The Cultural Origins of Institutional Trust: The Case of the ECB *

Siria Angino[†]

European Central Bank

Federico Maria Ferrara[‡]

London School of Economics

Stefania Secola[§]

European Central Bank

Abstract

Does culture have a causal effect on institutional trust? This issue is particularly relevant for the European Central Bank (ECB), as its policy effectiveness and legitimacy rest upon being trusted by euro area citizens. This paper uncovers the patterns of regional heterogeneity of trust in the ECB and assesses its non-economic determinants. To analyse central bank trust, we employ a novel dataset of citizen perceptions and knowledge of the ECB. Cultural traits are measured by indicators of social trust at the level of euro area sub-national regions. Results show that individuals living in regions with lower social trust systematically exhibit less trust in the ECB. An instrumental variable approach based on historical variables of regional literacy rates and political institutions supports a causal interpretation of our findings. These results are robust across different specifications and have significant implications in view of drops in social trust caused by the COVID-19 crisis.

JEL Classification: D83, E58, P48, Z10

Keywords: ECB, institutional trust, regional culture, instrumental variables

*We are grateful to Bernhard Winkler, Klaus Masuch, Jean-François Jamet, Marius Gardt and Michael Ehrmann for helpful comments. The views expressed in the article are those of the authors. They do not necessarily reflect those of the European Central Bank and should not be reported as such.

[†]E-mail: siria.angino@ecb.europa.eu

[‡]E-mail: f.m.ferrara@lse.ac.uk

[§]E-mail: stefania.secola@ecb.europa.eu

Introduction

Trust in policy-making institutions is an essential aspect of domestic and international governance. Institutional trust, namely individuals' belief that a given institution will not act in ways that will do them harm (Levi and Stoker 2000; Hakhverdian and Mayne 2012), is critical because the efficacy and legitimacy of policy-making institutions depend on it. This issue is particularly relevant for the European Central Bank (ECB), as its policy-making action is very consequential for the 340 million European citizens who reside in the euro area. Public trust in the central bank plays an important role in coordinating their inflation expectations (e.g., Baerg et al. 2018; Mellina and Schmidt 2018; Christelis et al. 2020). Also, in the face of intense pressures from political and economic actors, citizen support is even more needed for central banks to maintain their policy credibility and legitimacy (Kaltenthaler et al. 2010). This is even more important as the policy decisions and innovations of the ECB have been increasingly accompanied by legal challenges and mounting claims about its politicisation (Tortola 2020). Thus, understanding the sources of central bank trust bears significant implications for the policy effectiveness and independence of the ECB.

Many studies have analysed the determinants of trust in domestic and international institutions. A growing body of research in this area has focused on the sources of trust in central banks, and especially the ECB (e.g., Wälti 2012; Hayo and Neuenkirch 2014; Roth et al. 2014; Bursian and Fürth 2015; Roth et al. 2016; Roth and Jonung 2020; Bergbauer et al. 2020). Notably, most attention has been devoted to assessing the socio-economic determinants of trust in central banks at the individual- and country-level. Scholars have neither systematically considered the non-economic determinants of trust in the ECB, nor have they attempted to shed light on the patterns of sub-national regional heterogeneity in central bank trust in the euro area. This paper aims to fill this gap by addressing the following research question: do cultural differences at the regional level affect public trust in the ECB?

To answer this question, the paper makes use of novel data on public opinion and draws on contributions about culture and economics (e.g., Knack and Keefer 1997; La Porta et al. 1997; Guiso et al. 2004; Guiso

et al. 2006). To measure trust in the ECB, we rely on a new dataset of citizens' perception and knowledge about the ECB. Data were collected in all the 19 countries of the euro area in 2016, 2017 and 2018. To measure cultural traits across euro area sub-national regions, we follow previous studies (e.g., [Beugelsdijk and Schaik 2005](#); [Tabellini 2010](#)) and quantify cultural differences with indicators of regional social trust (i.e., the percentage of people who state that, generally speaking, most people can be trusted) from the European Social Survey.

The key difficulties in estimating the causal effect of culture on institutional trust are given by reverse causation and omitted-variables bias. To overcome this endogeneity issue, we resort to an instrumental variable approach. We follow the strategy advanced by [Tabellini \(2010\)](#) and rely on historical data to isolate the exogenous component of regional social trust. In particular, we use data on institutionalised constraints on the decision making powers of chief executives in the 1600-1850 period and literacy rates at the end of the 19th century to build a measure of social trust that does not suffer from reverse causation or omitted variable bias.

After controlling for country fixed effects and individual socio-economic determinants, the results show that individuals living in regions with lower social trust systematically exhibit less trust in the ECB. The use of historical variables as an exogenous source of variation in social trust supports a causal interpretation of our findings. These variables are a predictor of today's regional social trust and are positively and significantly associated with individual trust in the ECB.

Additionally, when considering proxies for individual economic culture, evidence suggests that individuals with greater financial sophistication and knowledge of the ECB exhibit greater trust in the institution. Interestingly, the relationship between knowledge and ECB trust appears to be non-linear: an increase in knowledge of the ECB is positively and significantly associated with greater trust in the institution only at a low level of knowledge.

Employing data from the World Values Survey and the Eurobarometer Survey, we show that our findings on the causal effect of culture on institutional trust are robust to different model specifications and across

different sources of data on social trust and ECB trust. Furthermore, we document that this effect extends to other European institutions (i.e., the European Commission and the European Parliament), while we find no evidence that culture affects trust in national institutions (i.e., national parliaments and governments).

In view of severe drops in social trust that may be caused by the COVID-19 crisis ([Daniele et al. 2020](#); [Brück et al. 2020](#)) and, more generally, by pandemics ([Aksoy, Eichengreen and Saka 2020](#); [Aassve et al. 2020](#)), these findings have significant implications for interpreting the evolution of citizen trust in the ECB and other European institutions in the near future. Furthermore, the results may provide inputs for designing the communication policy of the ECB and the national central banks (NCBs) of the euro area. At the end of the article, we discuss the insights offered by the analysis.

In the next section, we review the literature on citizen trust in central banks and highlight how contributions about culture and economics may shed light on the determinants of institutional trust. The third section describes the data and method we employ in our analysis. The fourth section presents the main results and shows the relevance of cultural factors as drivers of public trust in the ECB. In the fifth section, we provide several robustness checks and extend our analysis of the cultural determinants of citizen trust in other European and national institutions. The sixth section discusses the implications of our analysis. The final section draws conclusions and points to further avenues of research.

Culture, Trust, and Central Banks

The notion of institutional trust occupies a prominent position in social science research. Many studies have attempted to assess the foundations of trust in domestic (e.g., [Mishler and Rose 2001](#); [Stevenson and Wolfers 2011](#); [Marien and Hooghe 2011](#); [Foster and Frieden 2017](#)) and international institutions (e.g., [Torgler 2008](#); [Roth 2009](#); [Muñoz et al. 2011](#); [Armingeon and Ceka 2013](#)). Within this literature, trust in central banks has increasingly captured the attention of scholars across disciplines. The motivation for the scholarly interest in the relationship between central banks and the public is ascribable to two main dimensions, which have to do with central banks' policy efficacy and legitimacy.

First, trust in central banks is essential for an effective transmission of monetary policy. In particular, it is the economic expectations of the general public (e.g., consumers and small-medium enterprise owners) that affect prices. As noticed by [Ehrmann et al. \(2013\)](#), low public trust in monetary authorities may contribute to leading inflation expectations astray from their inflation target, thereby undermining central banks' ability to deliver on their mandate. Consistent with this hypothesis, recent evidence shows that central bank trust significantly contributes to lowering individuals' expectations about future inflation and facilitates the anchoring of these expectations around the ECB's target (e.g., [Baerg et al. 2018](#); [Mellina and Schmidt 2018](#); [Christelis et al. 2020](#))¹. Hence, in order to control inflation expectations, a high level of public trust in central banks is essential.

Second, public trust is crucial for the legitimacy of central banks, and the ECB in particular. The ECB has an unusual status of being both a supranational institution and an independent central bank. Despite being committed to an increasingly higher degree of transparency and accountability ([Fraccaroli et al. 2018](#)), the ECB has been criticised for being free 'from democratic oversight and control' ([Berman and McNamara 1999](#)) and the legitimacy of its unconventional monetary policies has often been challenged (e.g., [Sinn and Wollmershaeuser 2011](#); [Högenauer and Howarth 2016](#)). Lacking direct electoral support, the ECB's legitimacy rests on the layer of public trust. If this trust plummets, citizens may pressure their politicians to restrict the ECB's independence, which may lead them to alter the ECB's mandate or even to regain control over the national monetary policy ([Kaltenthaler et al. 2010](#)).

For these reasons, a growing body of research in this area focuses on the sources of trust in central banks, and especially the ECB. Notably, the existent literature assesses the socio-economic determinants of central bank trust at the individual- and country-level. Also, most of these studies rely on data from the Eurobarometer survey.

In a pooled cross-section analysis of Eurobarometer data from 1999-2004, [Fischer and Hahn \(2008\)](#) show

¹A caveat that is worth highlighting is that these studies exploit only within country variation and do not test whether cross-country differences in central bank trust matter for inflation expectations. To our knowledge, there are no studies that analyse this relationship across households in different countries.

that trust in the ECB decreases with higher inflation rates and active labor market policies, while higher GDP and unemployment spending are positively associated with central bank trust. Extending the time frame to 2010, [Wälti \(2012\)](#) investigates the aggregate dynamics of declining trust in the ECB after the global financial crisis and shows that trust has decreased more in those euro area countries that have experienced increasing sovereign bond yields and financial market turbulence.

[Roth et al. \(2014\)](#) document a negative and significant relationship between unemployment and trust in times of crisis. This relationship has been confirmed by [Roth et al. \(2016\)](#): they show that the pronounced increase in unemployment in the euro area led to a marked decline in trust in the ECB during the crisis, while unemployment was more weakly related to support for the euro. Furthermore, [Roth and Jonung \(2020\)](#) provide evidence that ECB trust has been only partially restored by the improvement of employment conditions in the post-crisis period, suggesting that the loss of trust in the ECB will take time to recover.

Focusing on individual-level determinants, [Kaltenthaler et al. \(2010\)](#) show that economic perceptions and attitudes towards the European Union (EU) and democracy correlate with trust in the ECB. [Ehrmann et al. \(2013\)](#) find that individual demographic factors, euro area unemployment rates, and attitudes towards EU institutions are the best predictors of trust in the ECB. Also, [Farvaque et al. \(2017\)](#) provide evidence that expected inflation has a greater effect on trust than the actual inflation rate. Highlighting the disconnect between attitudes towards the ECB and support for the euro, [Bergbauer et al. \(2020\)](#) show that trust in the ECB is driven by citizens' evaluation of the EU's policy performance, while support for the single currency is largely based on underlying values relating to European integration.

Paying attention to central bank transparency as a determinant of trust, [van der Cruijssen and Eijffinger \(2010\)](#) use a Dutch household survey and argue that perceived (more than actual) transparency is positively associated with central bank trust. [Horvath and Katuscakova \(2010\)](#) document a non-linear relationship between the actual transparency of the ECB and euro area citizens' central bank trust, with transparency increasing trust only up to a certain point.

More closely related to this paper, some studies have departed from the traditional focus on individual-

and country-level socio-economic determinants of ECB trust, and have tried to expand the analysis of its dynamics in two different directions. First, [Bursian and Fürth \(2015\)](#) have shed light on sub-national regional variation of central bank trust in the euro area. Their study highlights that regional macroeconomic conditions are associated with public trust in the ECB, with this association becoming stronger after 2008. Second, [Hayo and Neuenkirch \(2014\)](#) have assessed some non-economic determinants of central bank trust. They document that specific knowledge about the ECB's mandate has a positive effect on central bank trust, while the intensity of media usage is negatively and significantly associated with trust in the ECB, at least in Germany.

However, very limited attention has been paid to the effect of cultural factors and sub-national regional heterogeneity on central bank trust in a joint perspective. Despite not being focused on central bank trust, an interesting exception is given by [Jost \(2018\)](#), who shows that linguistic differences in Switzerland are associated with different preferences with regard to inflation and unemployment, thereby suggesting that distinct monetary policy preferences may be driven by distinct cultural backgrounds. This paper aims to fill the gap by investigating how cultural differences at the regional level affect public trust in the ECB.

To do so, we draw on the literature that analyses the relationship between cultural factors and economic outcomes (for reviews, see [Fernández 2010](#) and [Castellani 2019](#)). Studies in this field show the impact of different cultural traits on economic, political and institutional variables. This literature is largely inspired by important contributions in political science (e.g., [Putnam 1993](#); [Fukuyama 1995](#)), which provide evidence that social trust and participation in social activities differ strikingly across regions and countries, and bear important consequences for economic and institutional development.

Economic research has corroborated these findings in a number of ways. [Knack and Keefer \(1997\)](#) provide one of the first pieces of cross-country evidence of the relationship between social trust and economic performance. [Zak and Knack \(2001\)](#) further investigate the link between trust and growth and underscore that this relationship persists even after controlling for the quality of law enforcement.

[La Porta et al. \(1997\)](#) show that countries in which people tend to trust each other more tend to have

better government performance, higher levels of participation in civic and professional associations, greater importance of large firms, and greater efficiency of social institutions. Also, [Aghion et al. \(2010\)](#) highlight that government regulation and individual demands for a stronger government role are negatively correlated with different measures of trust.

Guiso, Sapienza, and Zingales extend these findings by focusing on the effects of social trust on financial sophistication ([Guiso et al. 2004](#)) and financial market behavior ([Guiso et al. 2008](#)), as well as showing that lower between-country trust is associated with smaller bilateral economic exchanges ([Guiso et al. 2009](#)).

Focusing on sub-national regional cultural variations, [Beugelsdijk and Schaik \(2005\)](#) provide evidence that growth differentials in European regions correlate positively with regional levels of social capital. [Tabellini \(2010\)](#) explores the causal link between culture and economic development by instrumenting different measures of cultural traits with regional literacy rates and constraints on the executive government before the 20th century. He shows that the current economic regional growth rates correlate with the the exogenous component of regional culture.

Expanding on this literature, we investigate whether sub-national regional differences in cultural traits have a causal effect on central bank trust. The next section lays out the research design of our empirical analysis.

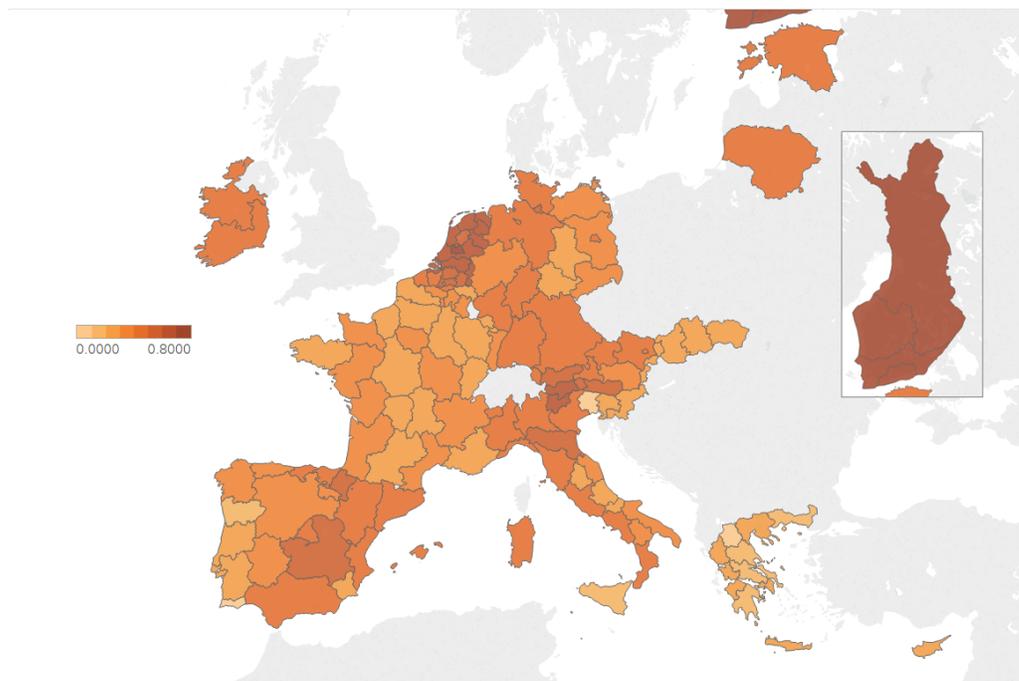
Data and Method

We adopt the definition provided by [Guiso et al. \(2006\)](#), who formalise culture “as those customary beliefs and values that ethnic, religious and social groups transmit fairly unchanged from generation to generation”. To measure differences across euro area regions, we consider social trust – defined as the degree of trust a person has towards another ([Guiso et al. 2008](#)) – as a proxy of cultural orientations. Social trust is the most studied and frequently considered one of the most important cultural traits ([Roland 2015](#)).

Following the approach employed by several authors (e.g., [Beugelsdijk and Schaik 2005](#); [Tabellini 2010](#)), we aggregate at the regional level – either NUTS1 and NUTS2 based on data availability – individual

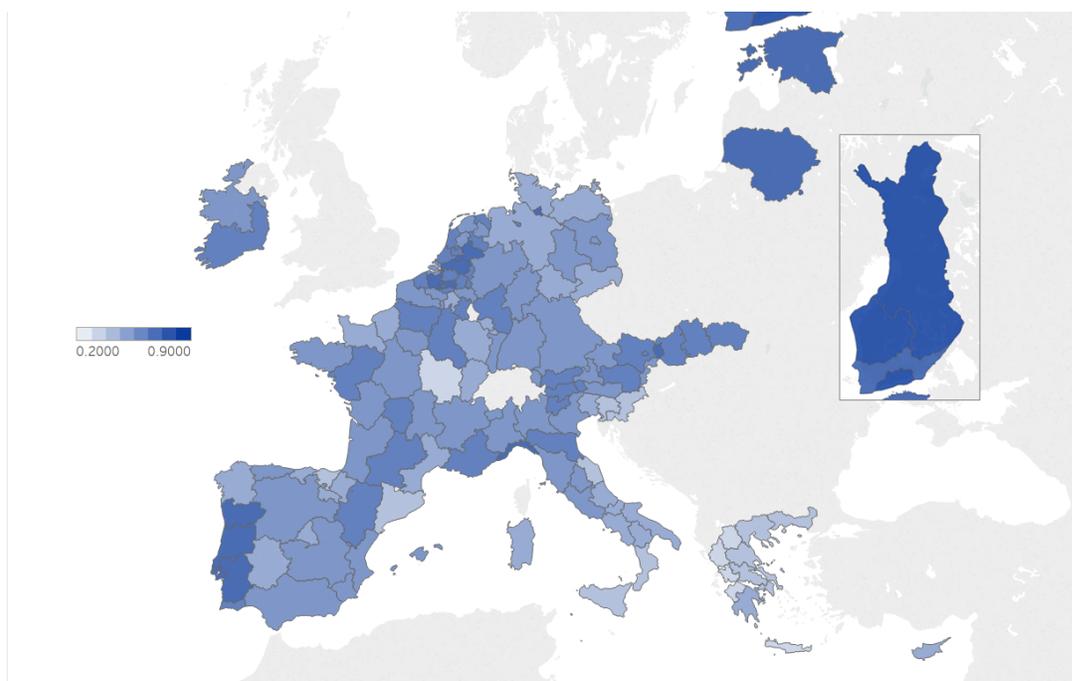
responses collected in opinion polls. In particular, for the measure of social trust we rely on the European Social Survey (ESS) data between 2002 and 2016. Consistent with previous studies using responses to the World Values Survey, we employ the following survey item from the ESS: “Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?”. Respondents are provided with a scale from 0 to 10. For our main independent variable, we compute the regional share of respondents who state that most people can be trusted, namely individuals who choose a value higher than 5. Figure 1 displays the variation in strength of social trust across regions.

Figure 1: Social Trust across Euro Area Regions



To measure trust in the ECB, we rely on data collected in the 19 euro area countries in 2016, 2017 and 2018 for the ECB Knowledge & Attitudes Survey (K&A). Interviewees belong to the general public and were asked about their opinion and knowledge regarding the ECB. The sample is representative of the euro area population over the age of 15 and contains in total 39,246 observations.

Figure 2: Trust in the ECB across Euro Area Regions



As an advantage compared to previous studies, using novel survey data from the K&A allows us to address some issues related to the survey design of the Eurobarometer. In particular, as noticed by [Ehrmann et al. \(2013\)](#), a key characteristic of the Eurobarometer survey is the fact that the question on trust in the ECB is lumped together with questions on trust in other European institutions. It may therefore become automatic to give a collective answer to the trust questions, unless a respondent really has a strong view of any particular institution². This suggests that the survey design of the Eurobarometer is a potentially serious matter, and explains why we resort to K&A data for our main analyses. Nonetheless, as a robustness check, we will show that the results of our analysis remain qualitatively unchanged when using the data from the Eurobarometer.

The main dependent variable of our analysis is measured by the question “Do you tend to trust or not the ECB?” which results in a dummy equal to 1 if the person does and 0 otherwise. Non-responses are

²In their analysis of the determinants of individual trust in the ECB, [Ehrmann et al. \(2013\)](#) observe that two thirds of all respondents have given exactly the same answer (group answer) for all European institutions that are covered in the Eurobarometer survey.

not taken into account. Figure 2 displays the share of respondents who trust the ECB across euro area sub-national regions.

To better assess the non-economic determinants of central bank trust at the individual-level, data on factual and self-assessed knowledge about the ECB are also collected. For factual knowledge, people are asked to pick what they deem to be the ECB's main objectives from a list. The knowledge score built using these answers ranges from 0 to 6, based on the number of correct answers³. The score for respondents who answered "Don't Know" is set to 0. Finally, we create a new variable dividing individuals according to their factual knowledge score in three categories, "Low" (0-2), "Average" (3-4) and "High" (5-6).

Respondents provide their subjective evaluation of their knowledge about the ECB and the Eurosystem on a scale from 0 to 9. In this case as well, we recode "Don't Know" answers as 0 and build a new variable with three levels, "Low" (0-3), "Average" (4-5) and "High" (6-9).

Furthermore, as a measure of individual financial culture, we create a proxy for respondents' financial sophistication based on the type of financial products that they use. Again, this variable has three ordered categories⁴.

Finally, a set of socio-demographic characteristics is also collected. The set includes usual variables such as a dummy equal to 1 if the person is female and the person's age. Education is collected as the age at which one has stopped full-time education, which we recode as a categorical variable, with each level being a proxy for middle-school or lower education (less than 15 years old), high school (16-20) and college education (more than 20).

The key difficulty in estimating a causal effect of culture is that it is endogenous to institutional trust. Indeed, trust in national and international institutions may affect cultural orientations and social norms at the regional level, which raises issues of reverse causation. For instance, using individual-level survey

³As the correctness of some of these items is hard to assess for the general public, we only use a subset of six tasks and objectives: "to ensure financial stability" (Correct), "to supervise euro area banks" (C), "to help countries in financial difficulties" (Wrong), "to keep inflation at bay" (C), "to give loans to banks" (W), "to finance governments" (W).

⁴We assign individuals using only current accounts, debit cards, mortgages or consumer loans to the "Low" category; individuals who make use of credit cards, saving accounts, bonds or pension funds to the "Average" category; individuals using money market funds and stocks to the "High" category

data from Denmark, [Sønderskov and Dinesen \(2016\)](#) show that trust in state institutions is a prominent explanation of social trust. Furthermore, the relationship between social trust and institutional trust is potentially confounded by unobservable factors, thereby engendering omitted-variable bias.

To overcome endogeneity issues, we need to find some exogenous source of variation in culture in order to identify a causal effect of culture on trust in the ECB. We resort to an instrumental variable approach. We focus on within-country variation among euro area regions, and use historical data to isolate the exogenous component of regional social trust. In particular, we rely on data from [Tabellini \(2010\)](#) on regional levels of institutionalised constraints on the decision making powers of chief executives in the period from 1600 to 1850 and literacy rates at the end of the 19th century. After controlling for country fixed effects, [Tabellini \(2010\)](#) shows that regions with historically looser constraints on the executive power and lower literacy rates tend to have specific cultural traits today, most notably lower levels of social trust. In order to be valid, our estimation strategy rests on two premises:

1. Past education and early political institutions explain social trust at the regional level (*relevance condition*).
2. Past education and early political institutions affect trust in the ECB only through their effect on regional culture (*exclusion restriction*).

Data on past political institutions and early literacy rates are available only for a subset of 56 regions in 7 euro area countries: France, Germany (except East Germany and Berlin), Italy, the Netherlands, Belgium, Spain and Portugal. These data are illustrated in Figures 3 and 4.

Figure 3: Levels of Institutionalised Constraints on the Executive Power across Euro Area Regions, 1600-1850

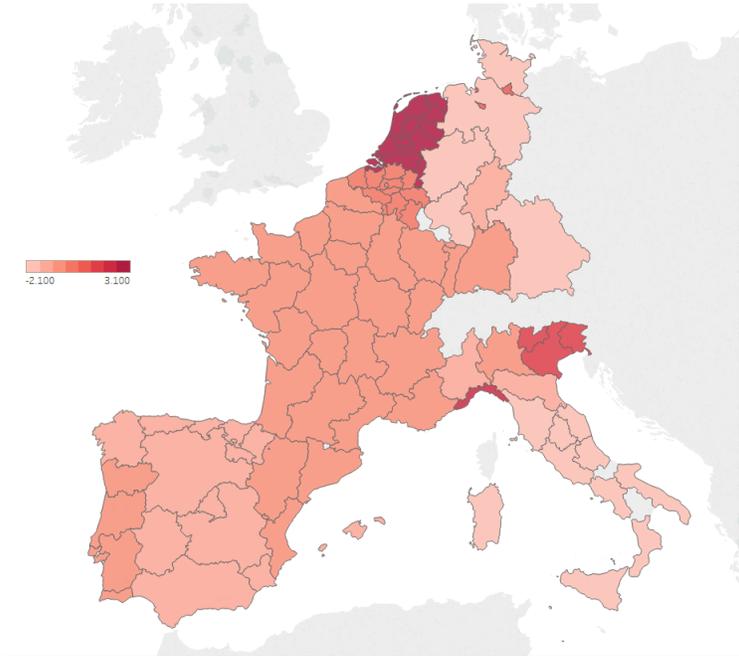
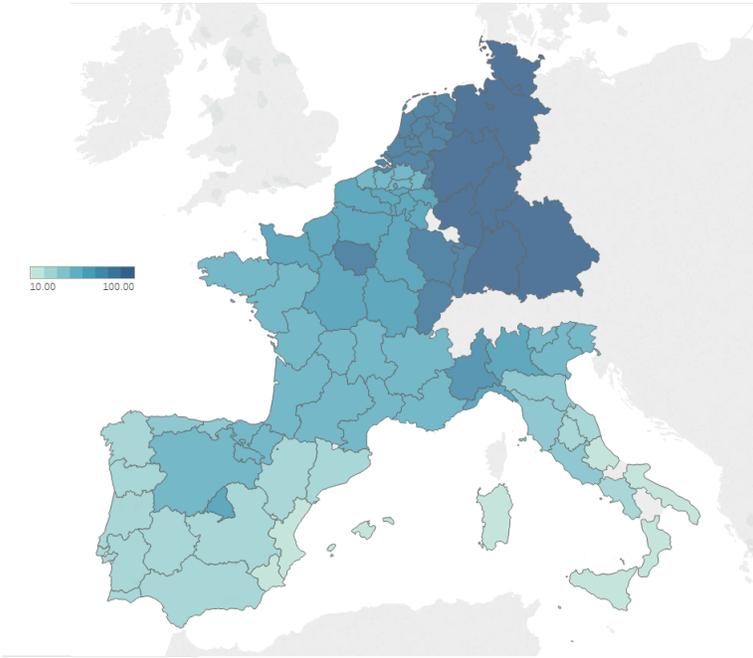


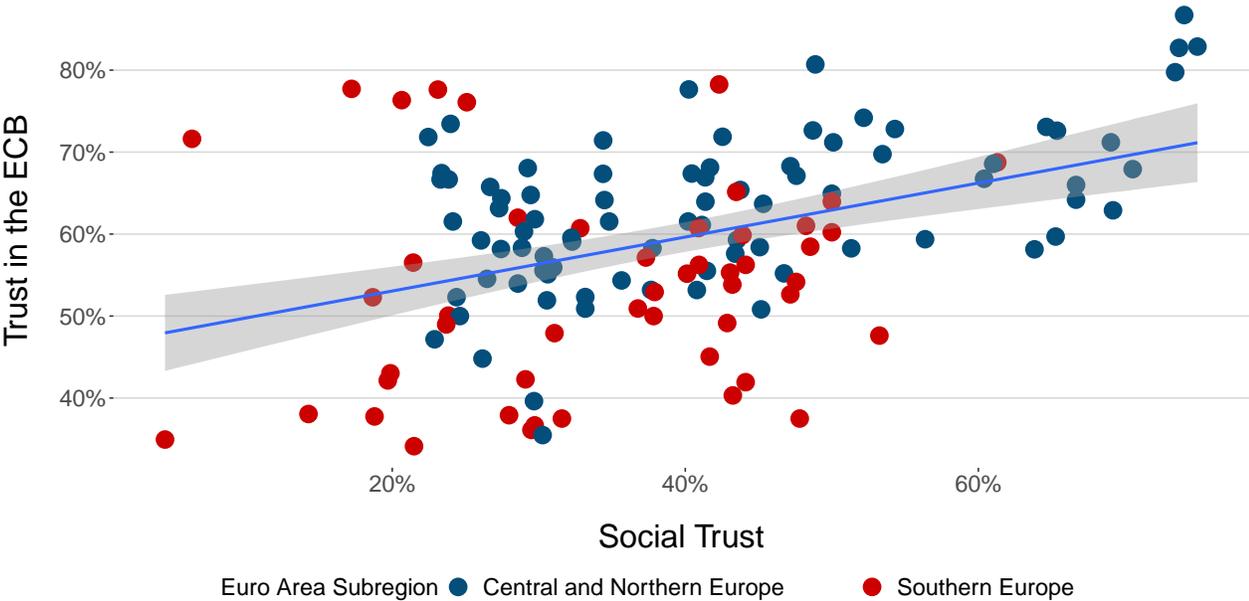
Figure 4: Literacy Rates across Euro Area Regions at the End of the 19th Century



Results

We start by considering the presence of correlational evidence between social trust and trust in the ECB at the aggregate level by euro area sub-national regions. Figure 5 displays the share of ESS respondents who state that most people can be trusted (on the horizontal axis) and the share of K&A respondents who state they trust the ECB (on the vertical axis). The positive correlation between social trust and ECB trust is not due to specific outliers. Interestingly, Southern European countries (i.e., Cyprus, Greece, Italy, Portugal, Spain) exhibit a higher variance in ECB trust than Central and Northern European countries. As within-country regional differences are more pronounced in Southern Europe, most notably in Italy and Spain, this ensures that the relationship is not driven by few specific countries.

Figure 5: Social Trust and ECB Trust across Euro Area Regions



Next, we estimate the effect of regional culture on institutional trust at the individual level. Table 1 presents results from different model specifications. We show marginal effects from probit models, as well as estimates from linear probability models (LPM). In all models we cluster standard errors at the region-year level⁵. The dependent variable is a dummy equal to 1 if the K&A respondent states she trusts the ECB and 0 otherwise. The main independent variable is the degree of social trust in the region of each K&A respondent (i.e., the regional share of ESS respondents who state most people can be trusted).

Column (1) presents results from a probit model without any controls. In column (2) we introduce country fixed effects, which capture the effect of national-level factors. In column (3) we also control for age (both linear and quadratic terms), gender, education, employment status, self-reported family income level, area of residence (i.e., rural or urban area), and number of family members of each respondent. In column (4) we estimate a LPM with the same covariates included in the specification in column (3). In columns (5), (6) and (7) we introduce, respectively, the variables for financial sophistication, factual knowledge and self-assessed knowledge in the probit specification. In column (8) we include all three variables. Column (9) presents the results for the specification with all variables for the LPM specification.

⁵Results do not change when clustering at the regional level only.

Table 1: Cultural Determinants of Trust in the ECB: Probit Marginal Effects and LPM Regressions

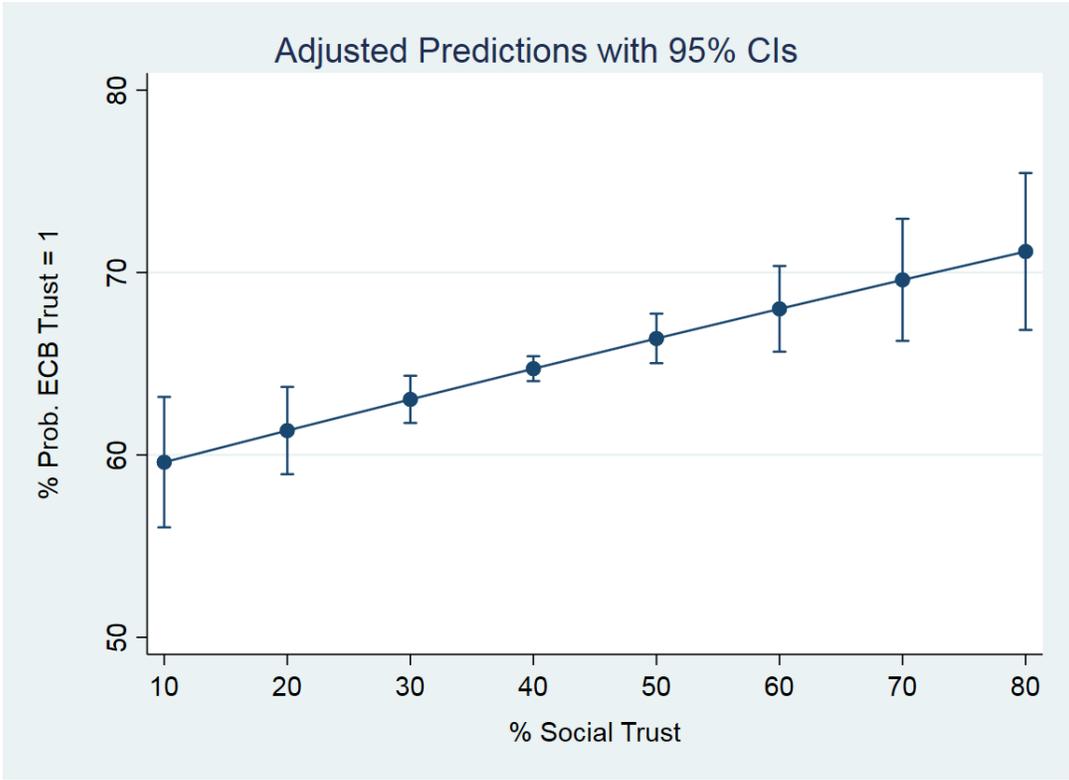
Model	(1) Probit	(2) Probit	(3) Probit	(4) LPM	(5) Probit	(6) Probit	(7) Probit	(8) Probit	(9) LPM
Social Trust	0.396*** (6.56)	0.265*** (4.71)	0.195*** (3.49)	0.210*** (3.52)	0.165*** (2.99)	0.179*** (3.24)	0.195*** (3.55)	0.154*** (2.87)	0.169*** (2.94)
Financial Sophistication					0.085*** (12.34)			0.075*** (11.03)	0.074*** (10.88)
					0.156*** (17.00)			0.135*** (15.07)	0.135*** (14.69)
Factual Knowledge						0.112*** (15.06)		0.099*** (13.45)	0.101*** (13.60)
						0.082*** (8.83)		0.068*** (7.29)	0.069*** (7.59)
Self-Assessed Knowledge							0.074*** (13.61)	0.062*** (11.44)	0.062*** (11.55)
							0.104*** (14.15)	0.087*** (11.74)	0.085*** (11.89)
Constant				0.531*** (13.48)					0.546*** (14.74)
Observations	39246	39246	38658	38658	38658	38658	38658	38658	38658
Country Fixed Effects		✓	✓	✓	✓	✓	✓	✓	✓
Individual-Level Controls			✓	✓	✓	✓	✓	✓	✓

t statistics in parentheses. Errors clustered at region-year level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

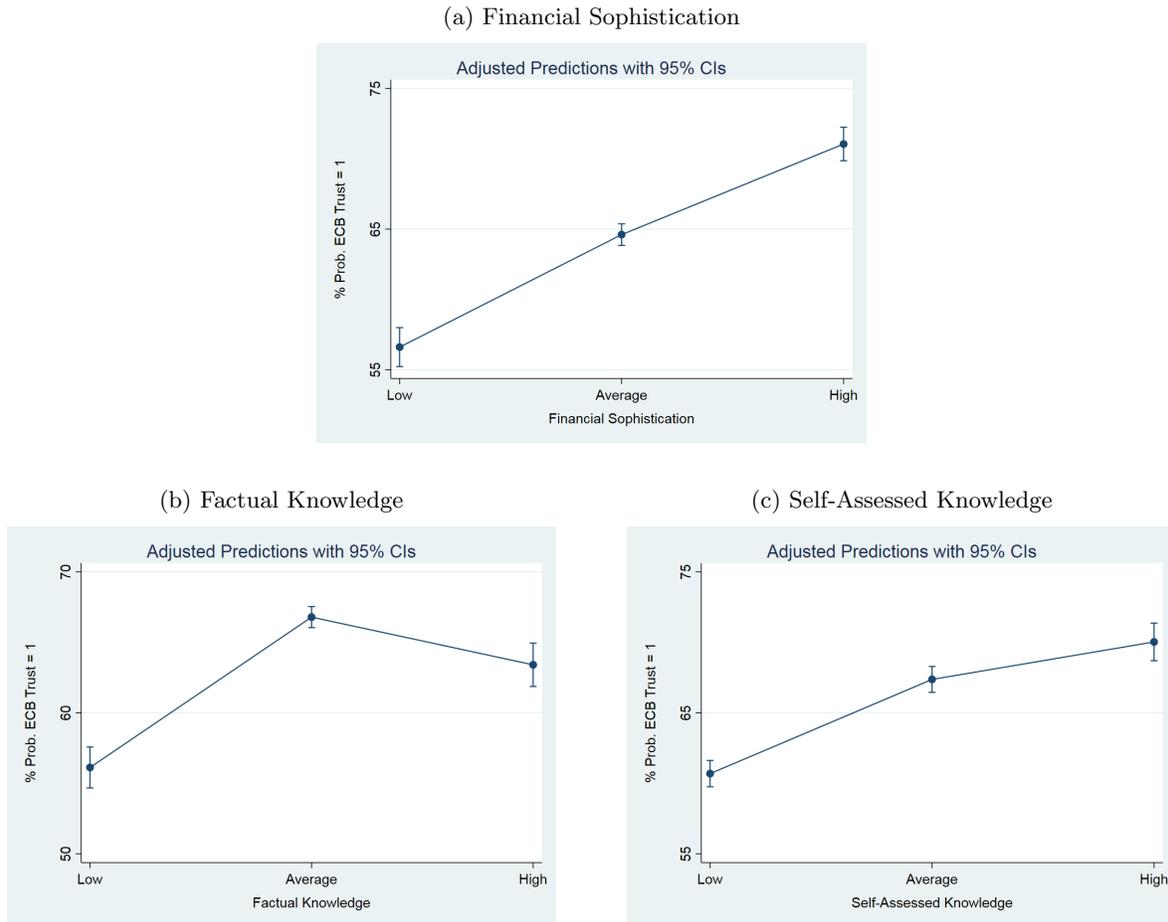
Results from column (1) of Table 1 show the presence of a positive and strong correlation between individual trust in the ECB and the degree of social trust in their region of residence. The introduction of country fixed effects in column (2) and individual controls in column (3) only slightly reduces the magnitude and precision of the estimated coefficient. To better quantify the importance of this correlation, Figure 6 presents the predicted probability of trusting the ECB conditional on the level of regional social trust for an average individual. The strength of the association is sizable: an individual residing in a region in the bottom 5% of the distribution of regional social trust (lower than 20%) is estimated to be 11% less likely to trust the ECB than an individual living in a region in the top 5% (higher than 70%), everything else being equal.

Figure 6: Predicted Probability of Trusting the ECB Conditional on Social Trust



Results from column (5) show that individuals with medium or high financial sophistication tend to trust the institution more than respondents with low levels of sophistication. The same conclusion holds for factual and self-assessed knowledge, as showed in column (6) and (7). However, different from financial

Figure 7: Predicted Probability of Trusting the ECB Based on Financial Sophistication, Factual Knowledge and Self-Assessed Knowledge



sophistication, the relationship between trust and knowledge appears to be non-linear: individuals with high levels of objective knowledge of the institution are not significantly more likely to trust the institution than respondents with medium levels. This result is displayed in Figure 7, which presents the predicted probability of trusting the ECB conditional on the levels of, respectively, financial sophistication, factual knowledge and self-assessed knowledge for an average individual. The predicted probabilities in Figure 7 are based on the results from column (8).

An average individual with a low degree of financial sophistication is predicted to be 8% less likely to trust the institution than an individual with a medium degree, and 14% less likely than one with a high degree of sophistication. The estimated difference in trust between an individual with low factual knowledge about

the ECB and one with medium knowledge is 10%, while it is lower between low and high knowledge (7%). Taking into account self-assessed knowledge, the estimated difference is around 7% probability between low and medium knowledge, and 11% between low and high knowledge. Thus, the difference between medium and high knowledge is estimated to be positive, but small, for self-assessed knowledge (3%) and negative for objective knowledge (-3%). These differences are statistically significant at the 1% level.

The following step in the analysis is to employ an instrumental variable approach to verify whether the exogenous component of regional social trust correlates with individual trust in the ECB. Table 2 presents the estimates from a two-stage least squares (2SLS) regression, in which regional social trust is instrumented with data on regional literacy rates and constraints on the executive power from [Tabellini \(2010\)](#). In line with the indication of [Angrist and Pischke \(2008\)](#), we estimate a linear model.

In column (1), we control for country fixed-effects and individual socio-demographic factors⁶. In column (2), following [Tabellini \(2010\)](#), we introduce controls for the rate of regional school enrollment in 1960 and urbanization in 1850: these variables are aimed at ensuring that culture is not just used as a proxy for human capital in the region, thereby guaranteeing that the exclusion restriction is not violated. Additionally, we control for the average regional GDP from 1977-2000, to remove additional concerns about the effects of the economic channels via which past education and early political institutions might affect trust in the ECB. Finally, in column (3), we add the variables on financial sophistication and knowledge of the ECB.

It is worth highlighting the conditioning on financial sophistication and ECB knowledge might distort the treatment effect estimates, as the two variables are significantly affected by the exogenous variation in sub-national regional culture. In other words, this might generate post-treatment bias ([Montgomery et al. 2018](#)). This is why we prefer the model specification used in column (2) for the robustness checks and the additional analyses in the following section. Also for this reason we decide to employ historical, rather than contemporaneous, measures of regional economic performance as control variables. The validity of our identification strategy should ensure that the effect culture on institutional trust is accurately estimated

⁶Even in this case, clustering at the regional level does not yield significantly different results.

Table 2: Cultural Determinants of Trust in the ECB: 2SLS Regressions

	(1)	(2)	(3)
Social Trust	0.681*** (3.13)	0.695*** (3.08)	0.586*** (2.72)
GDP 1977-2000		0.007 (0.65)	0.003 (0.24)
Urbanization Rate (x100)		-0.073 (-1.58)	-0.069 (-1.56)
School Enrollment (x100)		0.091 (0.57)	0.048 (0.32)
Financial Sophistication	<i>Average</i>		0.067*** (5.80)
	<i>High</i>		0.130*** (8.88)
Factual Knowledge	<i>Average</i>		0.104*** (10.27)
	<i>High</i>		0.065*** (4.96)
Self-Assessed Knowledge	<i>Average</i>		0.074*** (8.85)
	<i>High</i>		0.089*** (7.82)
Constant	0.434*** (4.25)	0.351* (1.74)	0.336* (1.75)
Observations	18129	18129	18129
Country Fixed-Effects	✓	✓	✓
Individual-Level Controls	✓	✓	✓
F Statistics	20.47	20.87	20.78
Chi2(1) p-value	0.777	0.953	0.82

t statistics in parentheses. Errors clustered at region-year level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

independent of other drivers of trust in the ECB, such as unemployment, as shown by (Roth et al. 2016).

Results from Table 2 show that the exogenous component of regional social trust is positively and strongly correlated with individual trust in the ECB. Instead, no causal interpretation can be attributed to the effects of sophistication and knowledge on central bank trust. However, this relationship has a significant predictive value, and contributes to informing the policy implications highlighted in the discussion section below.

Robustness Checks and Additional Analyses

In this section, we discuss the robustness of the results to different model specifications and measures of social trust and ECB trust. Moreover, we verify whether social trust has a causal impact also on other institutions. Table 3 presents estimates from 2SLS regressions, using the same model specification of column (2) in Table 2. We decide not to include individual financial sophistication and knowledge of the ECB out of concerns of post-treatment bias induced by these measures⁷.

Table 3: Robustness Checks: 2SLS Regressions

Survey	(1) K&A	(2) K&A	(3) EB	(4) EB
Social Trust (WVS)	0.549*** (2.62)			1.011** (2.02)
Social Trust (ESS)		0.711*** (3.33)	1.235* (1.78)	
Constant	0.700*** (5.52)	0.436*** (2.29)	-0.159 (-0.34)	0.442** (2.02)
Observations	18129	18129	29782	29782
Country Fixed Effects	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓
Regional Controls	✓	✓	✓	✓
Weights		✓		

t statistics in parentheses. Errors clustered at region-year level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In column (1) of Table 3 we maintain the same dependent variable used above, but employ a measure of

⁷Nonetheless, the results presented in Table are robust to the introduction of the variables on individual financial sophistication and knowledge of the ECB. The results are available upon request

regional social trust from the World Values Survey (WVS). The WVS question on social trust has the same wording of the ESS. The advantage of using the WVS is that it allows to measure social trust even before the 2000s. Thus, as in [Tabellini \(2010\)](#), we aggregate at the regional level individual responses collected in the opinion polls of the WVS in the 1990s to obtain the WVS social trust measure. In column (2), we regress the measure of ECB trust from the K&A survey on the ESS measure of social trust, but introduce weights in our specification. In both cases, the coefficient for regional social trust remains highly statistically significant.

In columns (3) and (4), we analyse whether regional social trust has a causal effect on trust in the ECB and other institutions based on Eurobarometer responses. In order to have a sample that is comparable to that of the K&A, we make use of data from Eurobarometer waves fielded in 2016, 2017, and 2018. In column (3) and (4) we consider trust in the ECB based on Eurobarometer responses as a dependent variable. In column (3) we make use of the ESS measure of regional social trust as the main independent variable. In column (4) we employ the WVS measure. Both variables attain statistical significance at conventional levels, although the coefficient of the WVS measure is more precisely estimated.

Table 4: Additional Analyses: 2SLS Regressions

DV	(1) EU	(2) EU w/ ECB	(3) Nat. Inst.
Social Trust (ESS)	1.124** (2.07)	0.998* (1.87)	0.497 (1.35)
Constant	0.104 (0.28)	-2.094 (-0.96)	0.0971 (0.40)
Observations	33854	33854	33854
Country Fixed Effects	✓	✓	✓
Individual Controls	✓	✓	✓
Regional Controls	✓	✓	✓

t statistics in parentheses. Errors clustered at region-year level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 4 we extend the analysis to trust in other European institutions covered in the Eurobarometer survey. Even in this case, we use 2SLS regressions. In column (1) we employ an index that summarises

Eurobarometer respondents' trust in the EU, the European Commission, and the European Parliament. This offers a measure of individual attitudes towards the EU as a political project. The index is created by adding up the results of the responses, after attributing value 1 to each response in case the respondent indicates that she trusts the institution, value 0 if she doesn't know, and value -1 if she doesn't trust. In column (2) we take an index constructed in the same manner, but only considering the Commission, the Parliament, and the ECB. This provides a measure of respondents' attitudes towards EU institutions, more narrowly defined. In both columns (1) and (2) we use the ESS measure of social trust, which is estimated to be statistically significant at the 5% level in the former case, and at the 10% level in the latter⁸. Based on the results, it seems that the effect of social trust on institutional trust is not limited to the ECB, but it also extends to other European institutions. Nonetheless, it is difficult to verify to what extent this is due to the survey design of the Eurobarometer.

As a placebo test, in column (3) of Table 4 we consider an index of trust in national institutions as a dependent variable. The index is given by the sum of respondents' answers to the trust question for the national parliament and government. This allows us to assess whether the causal effect of social trust on institutional trust is specific to the ECB (and potentially other EU institutions), or whether this extends to a much broader set of economic and political institutions. The lack of statistical significance of the social trust variable in this case suggests that the link between culture and institutional trust is stronger for European institutions than for national ones. This may be due to several reasons. For instance, citizens may face greater difficulty in evaluating policy outcomes at the European vis-à-vis the national level, thereby relying more on their cultural priors. Relatedly, higher salience attributed to national issues in the media might make citizens more subject to a wider array of cues in the formation of their attitudes towards national institutions. This may downplay the importance of cultural factors. Future research will have to scrutinise these hypotheses in greater detail.

⁸One caveat that should be observed is that the estimated coefficients are not directly comparable due to the different ranges of the indexes used as dependent variables.

Discussion

The results of this analysis have significant implications for interpreting the evolution of public trust in the ECB and other European institutions in the near future. The importance of cultural factors as an explanatory variable for institutional trust in the euro area suggests that large variations in ECB trust might take place in the upcoming months and years, inasmuch as changing trust dynamics can be triggered by the COVID-19 crisis.

While it is still too early to assess the long-term effects of the COVID-19 shock on citizen socio-political attitudes, there is already evidence pointing to a link between the experience of the COVID-19 crisis and lower levels of social and institutional trust (Daniele et al. 2020; Brück et al. 2020). These findings resonate with studies documenting that epidemic exposure has a persistent negative effect on individuals' social trust (Aassve et al. 2020) and confidence in institutions (Aksoy, Eichengreen and Saka 2020).

In normal times, regional social trust is the product of long-term processes and constitutes an essentially slow-moving phenomenon that remains stable over approximately two decades (Hauser et al. 2015). However, pandemics are associated with sizeable economic and political changes in areas that are hardly stricken (Blickle 2020). It is reasonable to expect that these changes have the potential to activate and catalyze changing dynamics of social trust. The analysis in this paper implies that, if the negative effects of the COVID-19 crisis on social trust are confirmed, these effects may easily reflect on the trust of European citizens towards European institutions, including the ECB.

This implication calls for paying particular attention in the evaluation of potential drops in ECB trust in the wake of the pandemic. A recent strand of the literature suggests that citizen trust in the ECB depends on the satisfaction of citizens with the policy outputs and performance of the EU, especially in times of crisis (Bergbauer et al. 2020). Following this line of reasoning, the observation of a drop in ECB trust following the COVID-19 crisis might be taken as evidence of a negative assessment of the citizens regarding the ECB's management of the crisis. Our analysis suggests that the picture might be more nuanced.

In the evaluation of the future dynamics of citizen trust in the ECB, it will be extremely important to take into account the role of changes in social trust and other cultural variables. Besides constituting a source of significant statistical bias, the omission of these variables in the analysis could lead to an undue attribution of negative variations in ECB trust exclusively to citizen output-based assessments. This paper calls for a more comprehensive view of the determinants of institutional trust, which is all the more important in view of potential structural changes in socio-political attitudes caused by the COVID-19 shock in Europe.

The findings of this paper may also provide useful inputs for designing the communication policy of the ECB and euro area NCBs. Special attention should be paid to areas where the levels of central bank trust are lower than predicted when taking into account long-standing cultural factors. While the ECB cannot target its monetary policy at different euro area regions, its communication policy may be tailored in such a way to be region-specific. Thanks to their link to their territory, infrastructural capacity and outreach experience, the NCBs of the euro area may play an important role in this regard.

Different strategies may be employed to bring some regions' low level of ECB trust in line with its expected value. For instance, recent evidence shows that public comprehension of, and trust in, central banks can be improved if communications are more relatable to people's daily lives ([Bholat et al. 2018](#)). The evidence provided by this paper suggests that efforts to promote a greater understanding of the ECB's functions should be targeted at individuals in the low end of the distribution of factual and self-assessed knowledge.

Reaching out to these segments of population may require the use of media channels that have traditionally remained outside the realm of central bank communication, such as television. The increase and simplification of central bank communication would be particularly effective if supported by complementary initiatives aimed at promoting financial literacy. A higher level of financial education of citizens may increase the chances of their engagement: this would help the ECB and the NCBs explain complex policy decisions and address the "twin deficit" of public understanding and trust in economics ([Haldane et al. 2020](#)).

Conclusion

This paper has argued that, in Europe, institutional trust is affected by non-economic determinants at the level of sub-national regions. Considering the case of public trust in the ECB, the study makes use of a novel dataset of citizen perceptions and knowledge of the ECB and measures regional culture with indicators of social trust at the level of euro area sub-national regions.

Evidence shows that individuals living in regions with lower social trust systematically exhibit less trust in the ECB. An instrumental variable approach based on historical variables of regional literacy rates and political institutions before the 20th century supports a causal interpretation of our findings. Moreover, results suggest that individuals with greater financial sophistication and knowledge of the ECB are more likely to trust the institution, with the relationship between knowledge and central bank trust being non-linear. These results are robust to different model specifications and measures of social trust and ECB trust.

The findings of the paper have important implications in the light of severe drops in social and institutional trust brought about by the COVID-19 crisis. The paper suggests that, to obtain an accurate picture of citizens' views of the ECB in the upcoming months and years, future analyses will have to consider changes in cultural attitudes caused by the COVID-19 shock as an explanation for potential variations in institutional trust in the euro area.

Future research may extend the findings of this paper to consider trust towards other European institutions, as the European Parliament and the Commission, measured with surveys different from the Eurobarometer. Also, the evidence of this paper may be strengthened by taking into account different proxies of cultural traits at the regional level and how these affect household economic expectations and behaviour in a cross-country setting. Finally, further scrutiny is needed on the effects of central bank communication via broadcast channel on public trust towards and knowledge of central banks.

References

- Aassve, A., Alfani, G., Gandolfi, F. and Moglie, M. L. (2020), ‘Epidemics and Trust: The Case of the Spanish Flu’, *IGIER Working Paper No. 661* .
- Aghion, P., Algan, Y., Cahuc, P. and Shleifer, A. (2010), ‘Regulation and Distrust’, *The Quarterly Journal of Economics* **125**(3), 1015–1049.
- Aksoy, C. G., Eichengreen, B. and Saka, O. (2020), ‘The Political Scar of Epidemics’, *NBER Working Paper No. 27401* .
- Angrist, J. D. and Pischke, J.-S. (2008), *Mostly Harmless Econometrics: An Empiricist’s Companion*, Princeton university press.
- Armingeon, K. and Ceka, B. (2013), ‘The Loss of Trust in the European Union during the Great Recession since 2007: The Role of Heuristics from the National Political System’, *European Union Politics* **15**(1), 82–107.
- Baerg, N., Duell, D. and Lowe, W. (2018), ‘Central Bank Communication as Public Opinion: Experimental Evidence’, *Paper Presented at the 2018 IPES Conference in Boston, Massachusetts* .
- Bergbauer, S., Hernborg, N., Jamet, J.-F. and Persson, E. (2020), ‘The Reputation of the Euro and the European Central Bank: Interlinked or Disconnected?’, *Journal of European Public Policy* **27**(8), 1178–1194.
- Berman, S. and McNamara, K. R. (1999), ‘Bank on Democracy’, *Foreign Affairs* (**March/April**).
- Beugelsdijk, S. and Schaik, T. (2005), ‘Social Capital and Growth in European Regions: An Empirical Test’, *European Journal of Political Economy* **21**(2), 1095–1131.
- Bholat, D., Broughton, N., Parker, A., Meer, J. T. and Walczak, E. (2018), ‘Enhancing Central Bank Communications with Behavioural Insights’, *Bank of England Staff Working Paper No. 750* .
- Blickle, K. (2020), ‘Pandemics Change Cities: Municipal Spending and Voter Extremism in Germany, 1918–1933’, *Federal Reserve Bank of New York Staff Report No. 921* .
- Brück, T., Ferguson, N. T. N., Justino, P. and Stojetz, W. (2020), ‘Trust in the Time of Corona’, *WIDER Working Paper 2020/82* .
- Bursian, D. and Fürth, S. (2015), ‘Trust Me! I am a European Central Banker’, *Journal of Money, Credit and Banking* **47**(8), 1503–1530.
- Castellani, M. (2019), ‘Does Culture Matter for the Economic Performance of Countries? An Overview of the Literature’, *Journal of Policy Modeling* **41**(4), 700–717.
- Christelis, D., Georgarakos, D., Jappelli, T. and van Rooij, M. (2020), ‘Trust in the Central Bank and Inflation Expectations’, *International Journal of Central Banking* .
- Daniele, G., Martinangeli, A. F. M., Passarelli, F., Sas, W. and Windstegier, L. (2020), ‘Wind of Change? Experimental Survey Evidence on the COVID-19 Shock and Socio-Political Attitudes in Europe’, *Covid Economics* **1**(44), 72–153.
- Ehrmann, M., Soudan, M. and Stracca, L. (2013), ‘Explaining European Union Citizens Trust in the European Central Bank in Normal and Crisis Times’, *The Scandinavian Journal of Economics* **115**(3), 781–807.
- Farvaque, E., Hayat, M. A. and Mihailov, A. (2017), ‘Who Supports the ECB? Evidence from Eurobarometer Survey Data’, *The World Economy* **40**(4), 654–677.
- Fernández, R. (2010), ‘Does Culture Matter?’, *NBER Working Paper No. 16277* .

- Fischer, J. and Hahn, V. (2008), ‘Determinants of Trust in the European Central Bank’, *University of Konstanz Research Paper Series No. 26* .
- Foster, C. and Frieden, J. (2017), ‘Crisis of Trust: Socio-Economic Determinants of Europeans Confidence in Government’, *European Union Politics* **18**(4), 511–535.
- Fraccaroli, N., Giovannini, A. and Jamet, J. (2018), ‘The Evolution of the ECBs Accountability Practices during the Crisis’, *ECB Economic Bulletin, Issue 5/2018* .
- Fukuyama, F. (1995), *Trust: The Social Virtues and the Creation of Prosperity* , Free Press.
- Guiso, L., Sapienza, P. and Zingales, L. (2004), ‘The Role of Social Capital in Financial Development’, *American Economic Review* **20**(2), 526–556.
- Guiso, L., Sapienza, P. and Zingales, L. (2006), ‘Does Culture Affect Economic Outcomes?’, *Journal of Economic Perspectives* **20**(2), 23–48.
- Guiso, L., Sapienza, P. and Zingales, L. (2008), ‘Trusting the Stock Market?’, *Journal of Finance* **63**(6), 2557–2600.
- Guiso, L., Sapienza, P. and Zingales, L. (2009), ‘Cultural Biases in Economic Exchange?’, *The Quarterly Journal of Economics* **124**(3), 1095–1131.
- Hakhverdian, A. and Mayne, Q. (2012), ‘Institutional Trust, Education, and Corruption: a Micro-Macro Interactive Approach’, *Journal of Politics* **74**(3), 739–750.
- Haldane, A., Macaulay, A. and McMahon, M. (2020), ‘The 3 E’s of Central Bank Communication with the Public’, *Bank of England Staff Working Paper No. 847* .
- Hauser, C., Tappeiner, G. and Walde, J. (2015), ‘The Roots of Regional Trust’, *University of Innsbruck Working Papers in Economics and Statistics No. 2015-13* .
- Hayo, B. and Neuenkirch, E. (2014), ‘The German Public and Its Trust in the ECB: The Role of Knowledge and Information Search’, *Journal of International Money and Finance* **47**, 286–303.
- Högenauer, A.-L. and Howarth, D. (2016), ‘Unconventional Monetary Policies and the European Central Bank’s Problematic Democratic Legitimacy’, *Journal of Public Law* **17**(2), 1–24.
- Horvath, R. and Katuscakova, D. (2010), ‘Transparency and Trust: The Case of the European Central Bank’, *Applied Economics* **48**(57), 5625–5638.
- Jost, A. (2018), ‘Cultural Differences in Monetary Policy Preferences’, *Swiss National Bank Working Papers 2/2018* .
- Kaltenthaler, K., Anderson, C. J. and Miller, W. J. (2010), ‘Accountability and Independent Central Banks: Europeans and Distrust of the European Central Bank’, *Journal of Common Market Studies* **48**(5), 1261–1281.
- Knack, S. and Keefer, P. (1997), ‘Does Social Capital Have an Economic Payoff? A Cross-Country Investigation’, *The Quarterly Journal of Economics* **112**(4), 1251–1288.
- La Porta, R., de Silanes, F. L., Shleifer, A. and Vishny, R. W. (1997), ‘Trust in Large Organizations’, *American Economic Review* **87**(2), 333–338.
- Levi, M. and Stoker, L. (2000), ‘Political Trust and Trustworthiness’, *Annual Review of Political Science* **3**, 475–507.
- Marien, S. and Hooghe, M. (2011), ‘Does Political Trust Matter? An Empirical Investigation into the Relation between Political Trust and Support for Law Compliance’, *European Journal of Political Research* **50**, 267–291.

- Mellina, S. and Schmidt, T. (2018), ‘The Role of Central Bank Knowledge and Trust for the Public’s Inflation Expectations’, *Deutsche Bundesbank Discussion Paper No. 32* .
- Mishler, W. and Rose, R. (2001), ‘What Are the Origins of Political Trust? Testing Institutional and Cultural Theories in Post-communist Societies’, *Comparative Political Studies* **34**(1), 30–62.
- Montgomery, J. M., Nyhan, B. and Torres, M. (2018), ‘How Conditioning on Posttreatment Variables Can Ruin Your Experiment and What to Do about It’, *American Journal of Political Science* **62**(3), 760–775.
- Muñoz, J., Torcal, M. and Bonet, E. (2011), ‘Institutional Trust and Multilevel Government in the European Union: Congruence or Compensation?’, *European Union Politics* **12**(4), 551–574.
- Putnam, R. D. (1993), *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.
- Roland, G. (2015), Economics and Culture, in R. A. Scott and S. Kosslyn, eds, ‘Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary Searchable, and Linkable Reference for the 21st Century’, John Wiley & Sons.
- Roth, F. (2009), ‘The Effect of the Financial Crisis on Systemic Trust’, *Intereconomics* **44**(4), 203–208.
- Roth, F., Gros, D. and Nowak-Lehmann D., F. (2014), ‘Crisis and Citizens’ Trust in the European Central Bank – Panel Data Evidence for the Euro Area, 1999-2012’, *Journal of European Integration* **36**(3), 303–320.
- Roth, F. and Jonung, L. (2020), Public Support for the Euro and Trust in the ECB: The First Two Decades of the Common Currency, in J. E. Castaeda, A. Roselli and G. E. Wood, eds, ‘The Economics of Monetary Unions: Past Experiences and the Eurozone’, Routledge.
- Roth, F., Jonung, L. and Nowak-Lehmann D., F. (2016), ‘Crisis and Public Support for the Euro, 1990-2014’, *Journal of Common Market Studies* **54**(4), 944–960.
- Sinn, H.-W. and Wollmershaeuser, T. (2011), ‘Target Loans, Current Account Balances and Capital Flows: The ECB’s Rescue Facility’, *NBER Working Paper No. 17626* .
- Sønderskov, K. M. and Dinesen, P. T. (2016), ‘Trusting the State, Trusting Each Other? The Effect of Institutional Trust on Social Trust’, *Political Behavior* **38**(1), 179–202.
- Stevenson, B. and Wolfers, J. (2011), ‘Trust in Public Institutions over the Business Cycle’, *NBER Working Paper No. 16891* .
- Tabellini, G. (2010), ‘Culture and Institutions: Economic Development in the Regions of Europe’, *Journal of the European Economic Association* **8**(4), 677–716.
- Torgler, B. (2008), ‘Trust in International Organizations: An Empirical Investigation Focusing on the United Nations’, *The Review of International Organizations* **3**(1), 6593.
- Tortola, P. D. (2020), ‘The Politicization of the European Central Bank: What Is It, and How to Study It?’, *Journal of Common Market Studies* **58**(3), 501–513.
- van der Cruijssen, C. and Eijffinger, S. (2010), ‘From Actual to Perceived Transparency: The Case of the European Central Bank’, *Journal of Economic Psychology* **31**(3), 388–399.
- Wälti, S. (2012), ‘Trust No More? The Impact of the Crisis on Citizens Trust in Central Banks’, *Journal of International Money and Finance* **31**(3), 593–605.
- Zak, P. J. and Knack, S. (2001), ‘Trust and Growth’, *The Economic Journal* **111**(470), 295–321.