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Explaining EU citizens' trust in the ECB in normal and crisis times

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EXPLAINING EU CITIZENS' TRUST IN THE ECB IN NORMAL AND CRISIS TIMES

Michael Ehrmann, Michel Soudan
and Livio Stracca



In 2012 all ECB
publications
feature a motif
taken from
the €50 banknote.



NOTE: This Working Paper should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB.

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Abstract

We study the determinants of trust in the ECB as measured by the European Commission's Eurobarometer survey. The formulation of the corresponding question in this survey is very general, and compatible with very different notions of "trust" by respondents. In particular, the survey does not ask whether respondents trust that the ECB delivers on its mandate. Still, the ECB started with a relatively high level of trust right from the outset, especially in comparison with national institutions (other than central banks). However, with the onset of the global financial crisis, trust started to fall. It also continued to fall after 2010, a period not covered by our analysis. We find that the fall in trust until spring 2010 can be rather well explained based on the pre-crisis determinants, and show that it reflected the macroeconomic deterioration, a more generalised fall in the trust in European institutions in the wake of the crisis as well as the severity of the banking sector's problems, with which the ECB was associated in the public opinion. Finally, we show that a higher degree of knowledge about the ECB generates more trust in normal times and even more so during the financial crisis.

Keywords: Trust, Eurobarometer, global financial crisis, public opinion, European Central Bank.

JEL: E58, G21, Z13.

Non-technical summary

We provide an analysis of the determinants of the trust in the ECB both in normal and crisis times, i.e. during the global financial crisis using individual-level data from the European Commission's Eurobarometer survey, during the period from 1999 to the spring of 2010. The formulation of the corresponding question is very general, and compatible with very different notions of "trust" by respondents. In particular, the survey does not ask whether respondents trust that the ECB delivers on its mandate. Still, it is notable that the ECB started with a high level of trust right from the outset, with around 50% of respondents stating that they tend to trust the ECB, whereas only around 25% expressed a lack of trust. This is remarkable for a newly established institution. The level of trust in the ECB remained broadly unchanged until spring 2010. In the pre-crisis period, i.e. until August 2007, we find that demographic factors, the economy (in particular the unemployment rate) and the attitude towards Europe and European institutions (the latter possibly influenced by the design of the survey) are all important determinants of trust in the ECB.

The paper then moves on to explaining the fall in the public trust in the ECB during the financial crisis by testing three, not necessarily mutually exclusive, hypotheses. First, economic developments could be behind the fall in trust in the ECB. Since the central bank is an important economic policy actor, the global financial crisis and the associated economic contraction are likely to reduce the central bank's popularity in the public opinion. Second, it is possible that the global financial crisis has exposed European policy makers' limitations in preventing and solving global problems and trust in the ECB has suffered because it is a European institution. Third, as the banking sector was at the epicentre of the global financial crisis, its problems may have negatively impacted trust in the ECB through several channels: either the ECB is (perceived to be) a "bank", or it is (wrongly) assumed to have had direct supervisory and regulatory responsibilities for the banking sector, or, finally, its actions are seen as implying some form of bail-out of the financial sector which was seen as undeserved or inappropriate in the public opinion. From the empirical analysis we conclude that the fall in the public trust in the ECB during the global financial crisis can be entirely explained by a combination of (i) the large and abrupt economic contraction due to the financial crisis, (ii) a generalised loss of confidence in Europe and European institutions, and (iii) the fact that the ECB is somehow associated to the banking sector in the public opinion.

Importantly, we find that these determinants are able to explain the fall in trust during the global financial crisis using the same elasticities estimated in the pre-crisis period. In other words, the crisis has brought no fundamental change in the way economic agents form trust in the ECB.

Our results also imply that, in the period covered, we do not find any "euro-specific" residual loss in trust to be explained, i.e. loss in public support for the euro (area) itself. This is consistent with the observation that, according to the Eurobarometer surveys, public support for the euro has consistently fluctuated around 60% between 2003 and the autumn of 2009, with no noticeable crisis impact. The absence of a strong correlation between these two measures – trust in the ECB and public support for the euro – can be interpreted to mean that

the reasons for the loss of trust in the ECB should be sought in other determinants than the public's attitude towards the euro. This is consistent with the high credibility as an inflation fighter that the ECB has maintained in financial markets during both the financial crisis, as shown by consistently low and stable long term inflation expectations. Additional research will have to show whether this has changed since spring 2010, a period not covered by this paper and in which, according to the Eurobarometer data, trust in the ECB declined further significantly.

Another important result of this paper is the observed nexus between knowledge about the ECB and trust in it. We show that not only does a higher degree of knowledge lead to a higher degree of trust on average, but also in particular during the global financial crisis. This result suggests that the ECB, and central banks more generally, should invest more in getting themselves known to the general public, for example by using more intensely communication channels especially targeted at the general public.

I Introduction

While trust in public institutions is a well established research field in the political science literature, trust in central banks is a field where relatively little empirical evidence exists. In economic terms, trust can be defined as "the belief or perception by one party (e.g. a principal) that the other party (e.g. an agent) to a particular transaction will not cheat" (Knack 2001). In the case of citizens and a central bank, trust can be defined as a belief that the central bank, as the agent in a principal-agent relationship, will deliver on its stated goals - in the case of the European Central Bank (ECB) price stability - to its principal-citizens. There is little doubt that public trust in policy-making institutions, not only central banks, is of fundamental importance for their long-term success. This is even more so for independent central banks, which ultimately derive their democratic legitimacy from the public's trust in them.

There is already a large literature emphasising how important trust is for economic performance. Most of the literature has focused on interpersonal trust as being a key determinant of economic growth.¹ There is, however, also a literature on how higher social cohesion and trust influence the quality of public policies (e.g., Putnam 1993). Moreover, interpersonal trust and confidence in government are found to be positively related (Knack and Keefer 1997). Trust in public institutions creates a positive payoff in terms of economic efficiency: as citizens have to spend less time and effort protecting themselves from the possible poor functioning of institutions, they can devote more resources to productive activities. If (especially high-profile) public institutions are trusted and have a reputation for integrity, this can set a good example for the other public institutions, as well as the private sector. In a nutshell, more trust leads to better functioning public institutions.

That higher trust leads to better functioning institutions for the specific case of central banks in particular. For example, central banks rely on announcements regarding how to interpret economic facts in order to steer expectations. How can one believe these announcements and statements if one does not trust the institution? Moreover, trust is needed because central banks – particularly in crisis times – are granted delegation about decisions that the general public does not see, cannot monitor and thus cannot judge. At times, such decisions need to be taken in a confidential way to be effective. Trust in the central bank is what guarantees consensus to a non-elected body and grants it freedom (for instance from political pressure) in making this type of decisions. On the other hand, lack of trust weakens the central banks and makes it vulnerable to political pressure (Ehrmann and Fratzscher 2011). These considerations suggest that it is important to understand the determinants of trust in central banks.

Another field in which public trust in central banks may prove important is for the understanding of the formation of *household* inflation expectations, which has been the subject of a few studies recently (see Carroll 2003; Blanchflower and Mac Coille

¹A classic reference here is North (1990).

2009; and Easaw et al. 2010).² Easaw et al. (2010), for example, is based on Italian individual-level data and finds that individuals' long-run inflation expectations are consistently higher than the ECB's definition of price stability. This could be consistent with an awareness of the ECB's definition and trust in it if Italian inflation was systematically deviating from the euro area average (Van der Cruysen and Demertzis 2011); however, given that on average Italian inflation has been close to the euro area average, this evidence suggests that respondents are either unaware of the ECB's definition of price stability or do not trust the ECB to deliver on it. If low public trust in central banks is associated with higher household inflation expectations, then swings in public trust in the ECB also directly affect its ability to deliver on its mandate, though the empirical relevance of this proposition is yet to be tested.

In this paper, we provide an analysis of the determinants of trust in the ECB both in normal and crisis times, i.e. during the global financial crisis, using individual-level data from the European Commission's Eurobarometer survey. This is a survey conducted at least twice a year covering around 27,000 individuals in 27 EU countries. We look at trust behaviour, as measured by the survey, both in normal and crisis times. Looking at crisis times is interesting in general, but it seems particularly so for a currency union such as the euro area. Given the specific set-up of economic policies within the euro area (with its centralised monetary policy and decentralised fiscal and macroeconomic policies), a financial crisis was always seen as the litmus test for the existence and success of the euro even before the common currency was introduced. The information contained in the Eurobarometer survey is therefore of great interest and uniquely placed, also in an international perspective, in order to provide an answer to these important questions. As a caveat, note that in our analysis we do not cover the period from 2010 onwards, i.e. the period of the euro debt crisis. Additional research will have to show whether adding these additional two years may change the conclusions of this analysis somewhat.

There is as yet not much formal empirical evidence available on the effect of the global financial crisis on public opinion. Stevenson and Wolfers (2011) document a fall in trust in public institutions generally (both government and private) during the Great Recession, but do not investigate whether this reflects the business cycle, as a similar fall may have happened in other (though less severe) cyclical downturns. For Europe, Roth (2009) notes an erosion of trust in European institutions, an increase in confidence in national institutions and the rise of strong anti-capitalist sentiments, but does not explain them in relation to personal or country characteristics. Gros and Roth (2010) match the Eurobarometer data on trust in the ECB, aggregated to the country level, with macroeconomic data also during the financial crisis, finding that GDP growth appears to be an important determinant of trust in crisis times, but not otherwise. Coffey and Hellwig (2011) study the effect of the financial crisis on the British public opinion, using an original opinion survey conducted in November

²There is, of course, a larger literature on the effect of central bank actions and policies on *financial market* inflation expectations, which we do not touch upon here.

and December 2008. They find that perceptions of who is to blame for the crisis depend on education and political orientation; however, the scope of their analysis is quite limited, in particular on economic issues. Hayo (2005) is an earlier reference for this type of analysis for the Asian financial crisis of 1998-99, using survey data from South Korea.

For a first look at the evolution of trust in the ECB, *Figure 1* reports how respondents in the euro area answered the Eurobarometer question *"Please tell me if you tend to trust the European Central Bank or not to trust it?"*. As the formulation of the question is rather vague, it is important to bear in mind that respondents might have very different notions of "trust" when answering to the survey. In particular, it is important to note that the survey does not ask whether respondents trust that the ECB delivers on its mandate. Still, it is notable that the ECB started with a relatively high level of trust right from the outset, with around 50% of respondents stating that they tend to trust the ECB, whereas only around 25% expressed a lack of trust. This is remarkable for a newly established institution. This general tendency remained broadly unchanged until the global financial crisis: the share of those responding "no trust" in the ECB increased to above 40% in late 2008 and early 2009, and was, for the first time, approximately equal to the share of respondents who reported to trust the ECB. In the light of the pre-crisis variability of the series, the evolution of the "no trust" answers in autumn 2008 represents a five standard deviations event. While there has been some recovery in trust in the intermediate Eurobarometer surveys, the observation in the last survey that we cover in our paper (spring 2010) is again over five standard deviations above the pre-crisis average for "no trust". The further deterioration in trust seen since 2010 is, as noted, not covered by our analysis.

The decline in public trust in the ECB during the global financial crisis might arguably also reflect a more general fall in trust in policy-making institutions, both at national and supra-national level, and it is important to understand whether trust in the ECB and other European institutions follows the same trend as national institutions. *Figure 2* reports net trust in the ECB and other two European institutions (the European Commission and the European Parliament) as well as the national government, the national parliament and political parties. A first issue to note is that trust in European institutions, including the ECB, is consistently above trust in national governments and parliaments, even during the crisis. While the reported trust clearly follows a common trend for the European institutions, the decline in trust in the ECB during the crisis was somewhat larger. Interestingly, net trust in national governments, despite remaining below the ECB in terms of levels, has gone *up*, rather than down, at the peak of the crisis in 2008.³ Subsequently, however, trust

³Indeed, Roth et al. (2011) find that trust in national institutions has actually *increased* in the direct aftermath of the financial crisis, in a rally-around-the-flag fashion. The EU institutions have not been part of this positive effect. After the peak of the crisis, however, trust in national institutions is found to plunge again.

in national governments falls drastically in the latest survey.

Among central banks, the loss of trust during the crisis is not limited to the ECB: *Figure 3* reports results from a survey conducted by the Bank of England where it is clearly visible how the share of those being "dissatisfied" with the Bank's monetary policy rises sharply during the financial crisis, mainly at the expense of the share of those declaring themselves "satisfied" with it (note that the indicator is different from the Eurobarometer measure of trust, due to the different structure of the survey).

To our knowledge, we are the first to investigate the public trust in a central bank both in normal and in crisis times using *individual-level*, as opposed to aggregate, data. The availability of individual-level data allows us to control for the effect of different variables that influence trust in the ECB and identify the marginal effect at the individual level. There are some other papers analysing the public attitude towards the euro based on individual-level Eurobarometer data (e.g. Banducci et al. 2009), but none of them focuses on the trust in the ECB nor on the very special circumstances of the financial crisis. Van der Cruysen and Eijffinger (2008) report on a survey of Dutch households on the perceived transparency of the ECB. They find that trust in the ECB and perceived transparency are positively correlated. Mosch and Prast (2008), in a comprehensive study of trust in the Netherlands, also provide a micro-level data analysis of trust in the Dutch central bank. Finally, Kaltenthaler et al. (2010) use the micro data from one single Eurobarometer wave to test whether trust in the ECB is related to the perception of respondents that they cannot control the institution. Turning to papers using macro level data and variables, Fischer and Volker (2008) study the determinants of trust in the ECB using country-level information from the Eurobarometer survey, finding that higher inflation reduces trust.

Against this background, in this paper we contemplate and test three, not necessarily mutually exclusive, hypotheses for the fall in public trust in the ECB associated with the global financial crisis. First, it could be that the fall in trust in the ECB is explained by economic developments (henceforth the *Economy Hypothesis*). Since the central bank is an important economic policy actor, the global financial crisis and the associated economic contraction are likely to reduce the central bank's popularity in the public opinion. Second, it is possible that the global financial crisis has exposed European policy makers' limitations in preventing and solving global problems and the trust in the ECB has suffered because it is a European institution (the *Europe Hypothesis*). Third, as the banking sector was at the epicentre of the global financial crisis, its problems may have negatively impacted trust in the ECB through several channels: either the ECB is (perceived to be) a "bank", or it is (wrongly) assumed to have direct supervisory and regulatory responsibilities for the banking sector, or, finally, its actions are seen as implying some form of bail-out of the financial sector which was seen as undeserved or inappropriate in the public opinion (henceforth the *Banks Hypothesis*).

We try to come up with testable implications of the three hypotheses and we

conclude, from the empirical analysis, that *all of them appear to have played a role*. Hence, the fall in the public trust in the ECB in crisis times can be explained by a combination of (i) the large and abrupt economic contraction due to the financial crisis, (ii) a generalised loss of confidence in Europe and European institutions, and (iii) the fact that the ECB is somehow associated to the banking sector in the public opinion, either as a supervisor and regulator or because its policies were seen as a bail-out of the banking sector. Importantly, we find that these determinants are able to explain the fall in trust during the crisis entirely, using essentially the same elasticities estimated in the pre-crisis period. In other words, the crisis has brought no fundamental change in the way economic agents form trust in the ECB. We again emphasise that these conclusions do not necessarily extend to the post-2010 period, during the euro debt crisis.

Our results also imply that we do not find any "euro-specific" residual loss in trust to be explained, possibly reflecting a loss in trust in the euro (area) itself. Indeed, the Eurobarometer surveys shows that, between 2003 and the autumn of 2009, public support for the euro has consistently fluctuated around 60%, with no noticeable crisis impact. The fall in the trust in the ECB during the crisis does not therefore appear to be associated with a fall in trust in the ECB as the central bank *of the euro area specifically*. This is consistent with the high credibility as an inflation fighter that the ECB has maintained in financial markets during the financial crisis, as evidenced by the low and stable inflation expectations.

Another important result of this paper is the observed nexus between knowledge about the ECB and trust in it. We show that not only does a higher degree of knowledge lead to a higher degree of trust on average, but also in particular during the global financial crisis. This result suggests that the ECB, and central banks more generally, should invest more in getting themselves known to the general public, for example by using more intensely communication channels especially targeted at the general public.

The paper is organised as follows. Section II describes the data used in the study. Section III presents the empirical model and Section IV the results for the euro area countries. Section V examines the role of public knowledge of the ECB in determining the trust in it, both in normal times and during the crisis. Section VI looks at some issues related to the design of the Eurobarometer survey. Section VII looks at the trust in the ECB in the non-euro area countries, which might have different determinants than in euro area countries. Section VIII concludes.

II Data

This study is based on data from the Eurobarometer survey, a large cross-national individual-level survey performed on behalf of the European Commission since 1973. The standard Eurobarometer surveys are conducted twice a year, in the spring and in the autumn. Each survey consists of around 1,000 face-to-face interviews per member

state (around 2,000 in Germany, 600 in Luxembourg and 1,300 in the United Kingdom), up to a total of over 27,000 individuals in the whole EU. The fieldwork normally straddles two months, for example the autumn survey is conducted in October and November.⁴ Note that the survey is not a panel, i.e. the subjects are changed in each iteration. Therefore, it is not possible to control for individual fixed effects, which is a key advantage of the longitudinal data. On the other hand, the true sample size is larger since different individuals are sampled in each survey.

Since we want to ensure a consistent set of variables in the surveys, in our empirical analysis we only rely on data from the biannual standard Eurobarometer surveys, up to the first survey of 2010. However, we also draw data from the special Eurobarometer survey "*Europeans and the economic crisis*" conducted in mid-January to mid-February 2009.⁵

In addition to the individual-level data from the Eurobarometer survey we also include a number of macroeconomic variables at the country level. These include annual HICP inflation and the unemployment rate, from Eurostat; total monthly stock returns and monthly bank stock returns, from Datastream; and an indicator of Expected Default Frequency (EDF) of the financial sector (median across financial institutions in each country), compiled by the ECB based on Moody's data on individual institutions. The macroeconomic data are integrated into the biannual survey data in the following way: we assume that the relevant observation is the average value of the variable in the six months before the fieldwork is conducted. For example, stock returns are the average monthly stock returns between month $t - 7$ and month $t - 1$, if t is the month when the fieldwork is conducted. An overview of the precise definitions of all variables is provided in the data appendix table.

The sample period for our analysis is 1999-2010. *Table 1* reports some descriptive statistics of the individual-level and macroeconomic data that we use in our estimations. We have around 178,000 individual-level observations in our sample for the euro area (around 140,000 in the pre-crisis period and 38,000 in the crisis period); the average age of the respondents is 45 years, with a (slight) majority of male, married and employed individuals.

Table 2 reports summary statistics specifically for the "trust in the ECB" variable. In the full sample, 63% of respondents report to trust the ECB, while 29% report not to trust it, and 8% give no answer. Gender, age, marital status, working status and especially education and political orientation appear to matter for trust in the ECB. For example, while only 56% of respondents without a high school degree report to

⁴Importantly for our paper, the fieldwork for the autumn 2008 survey was carried out between 6 October and 6 November 2008, which coincides with the most acute phase of the global financial crisis.

⁵Note that we take the survey data from the "Mannheim EB Trendfile" maintained by the Leibnitz Institut für Sozialwissenschaften up to 2002, and we integrate the post-2002 data. The last Eurobarometer data covered in this paper are those of Eurobarometer 73.4 (conducted in Spring 2010).

trust the ECB, this percentage rises to 70% for respondents with a University degree.

III The empirical model

We estimate the following probit model,

$$trust_{it}^j = \alpha x_{it}^j + \beta z_t^j + \gamma crisis_t + \delta v_{it}^j * crisis_t + \varepsilon_{it}^j \quad (1)$$

where $trust_{it}^j$ is the binary variable capturing trust in the ECB, at time t for individual i in country j , x_{it}^j is a vector of individual-specific variables (such as gender, age, political affiliation), z_t^j is a vector of country-level variables (such as inflation and the unemployment rate), $crisis_t$ is a dummy variable capturing the global financial crisis⁶ and v_{it}^j is a subset of $[x_{it}^j, z_t^j]$ that we let interact with the crisis dummy, in order to understand the mechanisms through which the crisis has propagated to the public opinion. Note that, in this baseline version of the analysis, we only estimate the model for euro area countries, since the ECB is the central bank of these countries only.⁷ Later on, we also look at the pre-ins, i.e. the EU countries which have not yet adopted the euro as their currency.

In order to control for selection bias, we apply the Heckman correction procedure, for two reasons. First, the number of individuals taking part in the Eurobarometer surveys expressing no opinion on trust in the ECB is non-negligible, at around 8% of "don't know" answers across the full sample. If the decision to form an opinion is not random, this might introduce a bias in the estimated coefficients. Second, the number of respondents expressing an opinion rises during the crisis and the share of "don't know" answers falls to less than 5%, potentially further biasing the estimation of a standard probit model.

The Heckman procedure corrects the bias introduced by sample selection by treating the latter as an omitted variable problem. The procedure involves a two-stage estimation method. In the first stage (selection), the probability of being included in the sample (in our application the decision of the respondent to provide an opinion on the ECB) is estimated by way of a probit model. In the second stage (option), the respondents' opinion about the ECB is modelled, where the estimated probabilities from the first stage are included in the full model as explanatory variables.⁸ Also the second stage model is in the form of a probit specification. As an identification device, we estimate the probability of expressing an opinion on the ECB based on whether the respondent has expressed an opinion on the European Parliament. This is based on the assumption that the decision to express an opinion on the European

⁶The crisis dummy is taken to be 1 for the Eurobarometer surveys in autumn 2008 onwards and 0 otherwise. Later on, we also provide some robustness analysis by considering a different definition.

⁷In the baseline exercise we consider the euro area in changing composition, including a country as soon as it adopts the euro.

⁸See Puhani (2000).

Parliament is relatively independent of whether the respondent trusts, or does not trust, the ECB (second stage of the Heckman probit model). We find indeed that this variable is highly relevant to explain the decision to provide an answer, which is not at all surprising since trust in the European Parliament is part of the same set of questions.⁹

Operationally, we start from the model estimated in normal times, i.e. on the pre-crisis sample. This gives us a benchmark model upon which we subsequently investigate the behaviour of trust in the ECB during crisis times. A fully successful explanation of the fall in the trust in the ECB in the wake of the global financial crisis would require that $\gamma = \delta = 0$, i.e. that the behaviour of the trust variable is entirely explained by the variables in $[x_{it}^j, z_t^j]$, with the same elasticities as during the *pre-crisis* period. If $\gamma = 0$ but $\delta \neq 0$, then the model points to a *change of behaviour* of the public opinion during the crisis period compared with normal times.

We estimate the model without correcting for survey weights. A robustness test (not reported here for brevity) shows that a weighted estimation does not affect the results in any significant fashion, which is to be expected given that the survey design of the Eurobarometer is relatively standard. All results reported in the paper refer to marginal effects, and we only report the overall effects of a given variable on trust in the ECB, i.e. taking account of a possible effect of a variable in both the selection and the option stage of the Heckman model.

IV Results for the euro area

Table 3 reports the results of the model in the pre-crisis period, i.e. until the spring 2008 survey, in the euro area in changing composition (about 121,000 observations). Results indicate that respondents are more likely to trust the ECB if they are male, older, married, with higher education and have a centre-right political orientation.¹⁰ A higher satisfaction with life is also associated with higher trust in the ECB. Because the ECB is an EU institution as well as due to the design of the survey, which groups together the questions on trust in European institutions, we can expect a tight link with trust in other EU institutions, and in fact we find a strong association with

⁹Even though we find that the Heckman procedure is warranted (e.g., the inverse mills ratio in the second stage is estimated to be statistically significant), a robustness test where we disregard all "don't know" answers and estimate a simple probit model for the remaining observations shows that our results are qualitatively robust.

¹⁰It is interesting to compare our results with those of Easaw et al. (2010) on household inflation expectations. We find that older, highly educated individuals have more trust in the ECB, and they find that they have lower expected inflation (see Table 1, page 26 in their paper). This somehow suggests that trust and expected inflation may be negatively correlated at the individual level, as may be expected. Our results are also consistent with those of Mosch and Prast (2008) on the trust in Netherlands' central bank, the DNB. In particular, they find that trust in the DNB is higher for older and male individuals, with a more optimistic stance and a higher trust in the national parliament.

trust in the European Commission. More pro-European citizens also trust the ECB more, as shown by the positive coefficient associated to affirmative responses to the question "EU membership is a good thing". At the country level, we find that lower stock returns and higher inflation and unemployment are negatively related to trust in the ECB, while measures of the health of the financial system (the EDF and the excess return on bank stocks over the whole stock market) are insignificant in normal times, as could have been expected.¹¹

In *Table 4* we turn to analyse the behaviour of the trust variable also in crisis times, expanding the sample up to the spring 2010 survey. Starting with the first column, we observe that the crisis leads to a strong and statistically significant fall in trust in the ECB, of about 7%, in line with the visual inspection of Figure 1. Hence, the crisis in itself had a significant downward impact on trust in the ECB. In the remainder of the table we endeavour to explain why. In the second column we add the demographic variables (and will retain them from thereon), in the third column the economic variables, in the fourth column the variables which relate to attitudes towards Europe and European institutions, and in the fifth column the variables capturing the health (or lack thereof) of the financial sector (EDF of the financial sector and excess returns on bank stocks). We find that, individually, none of these factors are able to explain away the crisis dummy. However, when included together (sixth column), we find that the crisis dummy is eventually insignificant ($\gamma = 0$). In order to test whether also $\delta = 0$ (determinants of trust in the ECB are the same in normal and crisis times) we add the interaction terms in the last column of Table 4. We find that, compared with normal times, in crisis times (i) the sensitivity to inflation is lower, but it is larger for inflation perceptions; (ii) the trust in the other European institutions (the European Commission in particular) matters a bit less, and (iii) excess bank stock returns matter in crisis periods, and not otherwise. Just how important are these differences between normal and crisis times to explain the fall in trust in the ECB during the crisis? Very little, it turns out. We conduct an "out-of-sample" analysis whereby trust in the ECB is regressed, over the whole sample, on the crisis dummy, taking the coefficients in α and β at their *pre-crisis* values:

$$trust_{it}^j = \widehat{\alpha}x_{it}^j + \widehat{\beta}z_t^j + \gamma crisis_t + \varepsilon_{it}^j \quad (2)$$

where the superscript " $\widehat{}$ " indicates that the coefficients are imposed and not estimated. If there was an economically significant change in behaviour between normal and crisis times, this would show up in a statistically significant coefficient γ . However (test not reported for brevity) we find this not to be the case: the γ coefficient is insignificant, indicating that the pre-crisis model does a good job in explaining the behaviour of trust in crisis times. Overall, this evidence suggests that, by and large,

¹¹We also included additional macroeconomic variables (industrial production growth, private consumption growth, consumer confidence, real GDP growth) but these were all statistically insignificant.

a change in the elasticities was not a fundamental factor in determining the loss of trust in the ECB during the crisis. Hence, we find that the pre-crisis regularities and the evolution of the macroeconomy are sufficient to explain the deterioration of trust in the ECB during the crisis.

We also conducted a number of robustness checks on the baseline results reported in Table 4 (not reported here for brevity). In particular, our results are qualitatively robust when estimating the models for the euro area in fixed composition (euro-12, i.e. the sample only contains observations for those 12 countries that have been euro area members since at least 2001), when we change the definition of the crisis dummy (starting from the autumn 2007 Eurobarometer survey wave rather than from autumn 2008) and when including country fixed effects.

V The role of knowledge of the ECB to explain trust

An important variable that might affect the degree of trust in the ECB, as indeed in any other European or domestic institution, is the individual level of knowledge about it. It is of course difficult to trust an institution whose main characteristics are not well known. In the Eurobarometer survey, the following question is asked: *"Have you heard about the ECB?"* where possible answers are "Yes" and "No". About 85% of respondents report to have heard about the ECB, while a minority of about 15% has not. It turns out, however, that these 15% express a considerably lower level of trust in the ECB than those who say that they have heard about it.

Asking people who report not to have heard about the ECB prior to the survey about their level of trust in the institution might at first sight seem nonsensical, and one might ask whether these answers should be used in our estimations at all. On the one hand, it should be assumed that economic agents who have never heard about the ECB take their economic decisions and form perceptions without trust in the ECB being a relevant factor at all. On the other hand, the answer to this survey question might still be relevant, for a number of reasons. First, participation in the Eurobarometer survey imparts knowledge about the existence of the ECB. Second, even if the respondent had not previously developed an explicit opinion about the ECB, a spontaneous answer is very likely to reflect a general attitude of the respondent, which in turn affects his or her behaviour. Third, the fact that a substantial part of the population does not know the ECB, yet reports lower trust in the institution, is still important from a public policy point of view. It strongly suggests that the ECB should enhance its communication efforts so as to increase public knowledge about and trust in itself, so as to improve its ability to steer inflation expectations. Finally, in practice, there is a continuum of degree of knowledge, from knowing nothing at all, to being fully and perfectly informed.

The knowledge variable was not included in the baseline analysis due to limited data availability, but some results are reported in this section. *Table 5* clearly illustrates that trust in the ECB is much higher among those who have previously heard about it: individuals who know the ECB are 30% more likely to trust it. Moreover, the loss of trust has been significantly lower among respondents who report to have heard about the ECB. We also repeat the baseline estimation only for those respondents who report to know the ECB, and find that results are very similar to the benchmark model.¹²

These results have clear important implications for central bank communication, as they suggest that the best way to strengthen trust, also during a financial crisis, is to increase the public's knowledge about the central bank itself and its policies. While there is an enormous literature in other domains of central bank communication (see Blinder et al. 2008 for a survey), the role of communication with and to the general public is a very under-researched field, no doubt due to data limitations. This is likely to apply with particular force to the ECB and the euro area, with its plurality of languages and cultures.¹³

In most models used for monetary policy analysis, the private sector is presented as an indistinct representative agent who has a very good understanding of the macroeconomic environment and of the central bank policies. The degree of transparency and communication by a central bank is typically either on its current assessment of macroeconomic conditions or on the policies that the central banks intends to pursue in the future (see, e.g., Woodford 2005). That may be rather far from the truth for the household sector. Van der Crujisen et al. (2010) have conducted a survey among Dutch households about their degree of knowledge of the ECB. Their main result is that the public has limited knowledge about the ECB. Indeed, the average number of correct answers to eleven straightforward statements about the ECB's objectives is less than five; for example, many respondents think that the ECB's inflation target applies to individual countries, rather than the euro area as a whole. Van der Crujisen et al. also report that many individuals have a rather weak desire to be informed about the central bank, and this is an important barrier for central bank communication. Nevertheless, clear and comprehensible messages should contribute to making the ECB, and other central banks, better known to the general public.

VI Issues in the Eurobarometer survey design

As mentioned earlier, a key characteristic of the Eurobarometer survey that could be important for the purposes of our study is the fact that the question on trust in the ECB is lumped together with questions on trust in other European institutions. It

¹²We don't report results for the "ECB not known" sample since we have too few observations to meaningfully estimate the model.

¹³See Padoa-Schioppa (2004).

may therefore become automatic to give a collective answer to the trust questions, unless a respondent really has a strong view of any particular institution. There is no easy way to overcome this problem, but we attempt to correct it at least to some extent in *Table 6*. There, we exclude those respondents who have given exactly the same answer (group answer) for *all* European institutions that are covered in the Eurobarometer survey (Commission, Parliament, ECB, Ombudsman, Court of Justice, Council of Ministers). Note that two thirds of all respondents fall into this category, as the number of observations drops from around 180,000 to just above 60,000. This suggests that the survey design is a potentially serious matter. However, rather reassuringly, results are remarkably consistent with the baseline analysis. Predictably, the coefficient on trust in the European Commission goes down significantly, although it remains positive and significant. Moreover, the coefficient for the EDF of the financial sector becomes negative in crisis times only. In spite of these reassuring results, however, the survey design issue represents an important caveat to our analysis, suggesting that the way the Eurobarometer phrases its questions puts the respondent in a frame of mind where he or she is concerned with a general notion of Europe. This makes it difficult to differentiate between various individual European institutions.

VII Trust in the ECB in non-euro area member states

So far, we have looked at trust in the ECB in euro area members, since the ECB is the central bank of the euro area. Nonetheless, it may also be interesting to look at trust in other EU countries, not least because most of these countries are expected, sooner or later, to join the euro area and therefore to have the ECB as their own central bank. In these countries, it is possible that what matters in terms of trust in the ECB is not the absolute economic performance of the country of the respondent but also the performance of the euro area and *the comparison* between the two (relative performance). For example, individuals in a country with higher inflation than the euro area may trust the ECB more because its performance is better than that of their own central bank. Therefore, we expand our specification to include not only the euro area macroeconomic variables, but also the differentials between the country and the euro area. If the differential receives a positive coefficient, say for the inflation rate, this implies that citizens in countries with higher inflation have higher trust in the ECB because the inflation performance of the euro area is better than the national performance.

Table 7 reports the regression results for the euro area (based on our preferred specification, namely column (6) of *Table 4*), the whole set of non-euro area member states, the 'old' non-euro area member states and the 'new' non-euro area member states (i.e. member states which joined the EU from 2004 onwards), since the determinants might be different across the two groups. Many of the determinants are

the same as in the euro area countries, in particular the demographic factors and the variables capturing the attitudes towards Europe (trust in the European Commission and the assessment of whether EU membership is a good thing). This is particularly true for the old EU member states, while respondents in the new member states are somewhat different and variables are generally less statistically significant. In the old non-euro area member states, euro area inflation is positively signed but inflation in the country is insignificant. The inflation perception and unemployment differentials are *negatively signed*, suggesting that what matters for citizens' trust is the country performance rather than the relative performance vs. the euro area. In new member states, we find support for the relative performance concept for HICP inflation, but not for inflation perceptions. Overall, the hypothesis that the ECB would be *more* trusted the worse national economic performance relative to the euro area is thus generally not supported by the data. The financial sector variables are wrongly signed, in particular in the old non-euro area member states, where a healthier financial sector in the country leads to less, not more trust in the ECB. This is also consistent with the crisis dummy variable, which is significant and *positive* in old non-euro area member states.

VIII Conclusions

This paper has analysed the evolution and determinants of public opinion towards the ECB during normal and crisis times (notably during the global financial crisis). We first establish some stylised facts on the public trust in the ECB in pre-crisis times. We find that demographic factors, the economy (in particular the unemployment rate) and the attitude towards Europe and European institutions (the latter possibly influenced by the design of the survey) are all important determinants of trust in the ECB.

Subsequently, the paper focuses on explaining the fall in the public trust in the ECB during the financial crisis. We find that it can be well explained by a combination of three effects: (i) the sharp deterioration in the economic situation during the crisis, (ii) the overall fall in public trust in the European project during the crisis, possibly because citizens saw Europe as being unable to prevent or solve the global crisis, and (iii) the fact that the ECB was associated, in the public opinion, with the troubles of the financial sector. These three factors are needed *jointly* for a satisfactory explanation. While the impact of the third factor appears to be partly specific to the crisis, the impact of the first two appear to matter in approximately the same way both in normal times and during the crisis. A main finding of our paper is that the fall in public trust in the ECB is therefore very well described based on the pre-crisis elasticities and the macroeconomic outcomes. We conclude, therefore, that the loss of trust in the ECB reflects the fact that the ECB is viewed as an important economic policy actor, as European *and* as a bank.

Finally, we also shed light on the important role played by the degree of knowledge

of the ECB in influencing trust in it. Indeed, respondents who are sufficiently aware of the ECB reported not only higher trust, but also a relatively smaller fall in trust in the period covered by this paper. It appears, therefore, that our study has a straightforward policy implication, namely that central banks such as the ECB should make themselves better known among the general public, to increase the public's trust in them, both in normal and crisis times. As mentioned by Blinder et al. (2008), communication to the general public is an under-researched and yet fascinating area for future research.

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TABLE 1. Descriptive statistics for euro area countries

Variable	Full sample					Pre-crisis					Crisis				
	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max
Trust in ECB	164099	0.680	0.466	0.000	1.000	128392	0.698	0.459	0.000	1.000	35707	0.617	0.486	0.000	1.000
Gender: female	178028	0.488	0.500	0.000	1.000	140533	0.487	0.500	0.000	1.000	37495	0.492	0.500	0.000	1.000
Age	178028	45.072	17.877	0.000	99.000	140533	44.772	17.843	0.000	99.000	37495	46.199	17.961	15.000	97.000
Married	178028	0.600	0.490	0.000	1.000	140533	0.606	0.489	0.000	1.000	37495	0.578	0.494	0.000	1.000
Educational attainment	178028	2.001	0.774	1.000	3.000	140533	1.980	0.776	1.000	3.000	37495	2.079	0.759	1.000	3.000
Employed	178028	0.524	0.499	0.000	1.000	140533	0.529	0.499	0.000	1.000	37495	0.506	0.500	0.000	1.000
Retired	178028	0.216	0.411	0.000	1.000	140533	0.210	0.407	0.000	1.000	37495	0.239	0.427	0.000	1.000
Political orientation	178028	-0.056	0.528	-1.000	1.000	140533	-0.053	0.526	-1.000	1.000	37495	-0.067	0.536	-1.000	1.000
Total stock returns	178028	-0.260	3.578	-12.757	8.678	140533	-0.117	2.752	-7.710	5.140	37495	-0.796	5.664	-12.757	8.678
HICP inflation	178028	2.331	1.211	-1.308	5.587	140533	2.410	0.985	0.016	5.587	37495	2.035	1.795	-1.308	5.278
Inflation perceptions	178028	36.947	22.623	-24.683	80.733	140533	36.055	20.754	-24.683	76.533	37495	40.297	28.324	-21.733	80.733
Unemployment rate	178028	7.331	2.473	2.548	18.246	140533	7.297	2.339	2.548	12.423	37495	7.461	2.919	3.032	18.246
General satisfaction with life	178028	3.023	0.715	1.000	4.000	140533	3.038	0.705	1.000	4.000	37495	2.964	0.750	1.000	4.000
Trust in the European Commission	178028	0.659	0.474	0.000	1.000	140533	0.673	0.469	0.000	1.000	37495	0.607	0.488	0.000	1.000
EU membership is a good thing	178028	0.461	0.748	-1.000	1.000	140533	0.480	0.730	-1.000	1.000	37495	0.390	0.806	-1.000	1.000
Expected default frequency	178028	0.310	1.801	0.010	25.677	140533	0.121	0.122	0.010	0.908	37495	1.020	3.838	0.013	25.677
Excess return of bank stocks	178028	0.265	2.882	-10.445	15.686	140533	0.220	1.675	-7.124	8.582	37495	0.433	5.380	-10.445	15.686
Heard of ECB	135342	0.844	0.363	0.000	1.000	106963	0.834	0.372	0.000	1.000	28379	0.880	0.325	0.000	1.000

Note: The table reports descriptive statistics for the variables employed in this paper. For details on data sources and definitions, see data appendix. Full sample period from 1999 (autumn survey) to 2010 (spring survey); pre-crisis sample period from 1999 (autumn survey) to 2008 (spring survey); crisis sample period from 2008 (autumn survey) to 2010 (spring survey).

TABLE 2. Summary statistics on trust in the ECB

		Total	Gender		Age				Marital status		Education until age			Employment status		Working status		Political orientation		
			Female	Male	<=30	31-45	46-60	>60	Not married	Married	<16	16 - 19	>19	Unem- ployed	Em- ployed	Not retired	Retired	Left	Center	Right
Full sample	Trust	62.8	65.3	60.1	64.4	63.3	62.4	60.6	61.2	63.8	56.6	61.9	70.0	61.7	63.7	63.5	59.9	58.9	63.4	64.7
	No trust	29.5	28.3	30.7	27.0	29.5	30.4	31.2	30.4	28.8	34.4	30.1	23.7	30.1	29.0	28.8	32.1	33.6	28.7	28.6
	Don't know	7.8	6.4	9.2	8.6	7.2	7.2	8.3	8.4	7.4	9.0	8.0	6.3	8.3	7.3	7.7	8.0	7.6	8.0	6.8
Pre-crisis	Trust	63.8	66.1	61.4	65.6	64.2	63.7	61.4	62.3	64.8	58.3	63.2	70.6	62.3	65.2	64.6	60.9	59.7	64.5	65.2
	No trust	27.6	26.8	28.4	25.0	27.8	28.4	29.5	28.4	27.1	31.9	27.9	22.6	28.4	26.9	26.9	30.3	31.9	26.7	27.4
	Don't know	8.6	7.0	10.2	9.4	8.0	7.9	9.2	9.3	8.1	9.8	8.9	6.8	9.3	7.9	8.5	8.8	8.4	8.8	7.4
Crisis	Trust	58.8	62.0	55.4	59.2	59.7	58.2	57.9	57.2	59.9	48.9	57.2	68.2	59.6	58.0	59.5	56.6	55.8	59.0	62.4
	No trust	36.5	34.0	39.0	35.5	36.2	37.4	36.9	37.5	35.7	46.1	38.0	27.3	36.0	37.0	36.0	38.1	39.4	36.3	33.3
	Don't know	4.7	3.9	5.6	5.3	4.2	4.4	5.2	5.2	4.4	5.1	4.8	4.5	4.5	5.0	4.6	5.3	4.8	4.8	4.3

Note: The table reports summary statistics on trust in the ECB, as reported in the Eurobarometer survey by euro area respondents. Numbers are in percentages. Sample period from 1999 (autumn survey) to 2010 (spring survey). Data reported are percentages.

TABLE 3: Determinants of trust in the ECB
(euro area changing composition, pre-crisis period)

	(1)	(2)	(3)	(4)	(5)
Gender: female	-0.032*** (0.009)	-0.031*** (0.009)	-0.033*** (0.006)	-0.032*** (0.009)	-0.033*** (0.007)
Age	-0.000 (0.000)	-0.000 (0.000)	0.001*** (0.000)	-0.000 (0.000)	0.001*** (0.000)
Married	0.028*** (0.003)	0.013*** (0.003)	0.021*** (0.003)	0.027*** (0.003)	0.014*** (0.003)
Educational attainment	0.051*** (0.008)	0.042*** (0.008)	0.026*** (0.007)	0.051*** (0.008)	0.018*** (0.005)
Employed	0.001 (0.006)	-0.000 (0.005)	0.014*** (0.004)	0.001 (0.006)	0.007** (0.003)
Retired	-0.002 (0.012)	-0.000 (0.007)	0.002 (0.007)	-0.001 (0.012)	-0.004 (0.005)
Political orientation	0.033*** (0.013)	0.027** (0.012)	0.032*** (0.009)	0.034*** (0.012)	0.028*** (0.007)
Total stock returns		-0.001 (0.002)			0.005** (0.002)
HICP inflation		0.015 (0.010)			-0.021** (0.010)
Inflation perceptions		0.000 (0.000)			-0.001 (0.001)
Unemployment rate		-0.012** (0.006)			-0.018*** (0.006)
General satisfaction with life		0.095*** (0.008)			0.039*** (0.005)
Trust in the European Commission			0.605*** (0.040)		0.613*** (0.039)
EU membership is a good thing			0.098*** (0.010)		0.098*** (0.007)
Expected default frequency				-0.037 (0.078)	0.083 (0.062)
Excess return of bank stocks				-0.002 (0.003)	0.002 (0.005)
AIC	206248	203081	154425	206180	152864
BIC	206355	203197	154532	206287	152981
# of observations	121217	121217	121217	121217	121217
# of censored observations	10763	10763	10763	10763	10763
Log likelihood	-103113	-101528	-77202	-103079	-76420
chi-squared for comparison test	2.077	1.753	28.290	2.055	12.405
p-value for comparison test	0.150	0.185	0.000	0.152	0.000

Note: The table reports the determinants of trust in the ECB in the euro area (changing composition), estimated using equation (1). Sample period from 1999 (autumn survey) to 2008 (spring survey). Coefficients report marginal effects from Heckman probit regressions. Standard errors are robust and clustered at the country level. *, ** and *** denote significant at the 10, 5 and 1 percent level respectively (two-tailed tests).

TABLE 4: Determinants of trust in the ECB
(euro area changing composition, full sample period)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crisis dummy	-0.068*** (0.026)	-0.071*** (0.024)	-0.051** (0.022)	-0.047** (0.020)	-0.068*** (0.025)	-0.033 (0.030)	-0.050 (0.108)
Gender: female		-0.040*** (0.010)	-0.039*** (0.010)	-0.041*** (0.007)	-0.040*** (0.010)	-0.040*** (0.007)	-0.038*** (0.007)
Age		0.000 (0.000)	0.000 (0.000)	0.001*** (0.000)	0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)
Married		0.027*** (0.003)	0.012*** (0.004)	0.020*** (0.003)	0.027*** (0.003)	0.014*** (0.004)	0.012*** (0.003)
Educational attainment		0.069*** (0.009)	0.053*** (0.010)	0.041*** (0.008)	0.069*** (0.009)	0.030*** (0.005)	0.027*** (0.005)
Employed		-0.004 (0.005)	-0.006 (0.004)	0.007* (0.004)	-0.004 (0.005)	0.003 (0.003)	0.002 (0.002)
Retired		-0.006 (0.010)	-0.011 (0.008)	-0.006 (0.009)	-0.005 (0.011)	-0.009 (0.006)	-0.010* (0.006)
Political orientation		0.035*** (0.013)	0.027** (0.012)	0.033*** (0.008)	0.035*** (0.013)	0.028*** (0.006)	0.026*** (0.006)
Total stock returns			0.003*** (0.001)			0.002 (0.002)	0.003* (0.002)
HICP inflation			0.020** (0.009)			0.002 (0.012)	-0.017* (0.009)
Inflation perceptions			-0.001 (0.000)			-0.001* (0.001)	-0.001* (0.001)
Unemployment rate			-0.011** (0.005)			-0.018*** (0.004)	-0.020*** (0.006)
General satisfaction with life			0.098*** (0.009)			0.042*** (0.004)	0.042*** (0.005)
Trust in the European Commission				0.596*** (0.040)		0.603*** (0.040)	0.616*** (0.037)
EU membership is a good thing				0.092*** (0.012)		0.089*** (0.007)	0.091*** (0.008)
Expected default frequency					-0.004** (0.002)	-0.003* (0.002)	0.093 (0.070)
Excess return of bank stocks					-0.000 (0.002)	0.001 (0.001)	-0.003 (0.005)
<i>Interaction terms with crisis dummy</i>							
Total stock returns							-0.002 (0.004)
HICP inflation							0.053*** (0.015)
Inflation perceptions							-0.002** (0.001)
Unemployment rate							0.002 (0.009)
General satisfaction with life							-0.002 (0.009)
Trust in the European Commission							-0.042** (0.019)
EU membership is a good thing							-0.004 (0.007)
Expected default frequency							-0.094 (0.070)
Excess return of bank stocks							0.007* (0.004)
AIC	301213	297991	293135	223569	297958	221076	220503
BIC	301273	298112	293266	223700	298079	221197	220635
# of observations	178028	178028	178028	178028	178028	178028	178028
# of censored observations	13929	13929	13929	13929	13929	13929	13929
Log likelihood	-150600	-148984	-146554	-111771	-148967	-110526	-110239
chi-squared for comparison test	1.045	1.931	1.098	36.084	1.850	13.675	6.213
p-value for comparison test	0.307	0.165	0.295	0.000	0.174	0.000	0.013

Note: The table reports the determinants of trust in the ECB in the euro area (changing composition), estimated using equation (1). Sample period from 1999 (autumn survey) to 2010 (spring survey). Coefficients report marginal effects from Heckman probit regressions. Standard errors are robust and clustered at the country level. *, ** and *** denote significant at the 10, 5 and 1 percent level respectively (two-tailed tests).

TABLE 5: The effect of the crisis and prior knowledge about the ECB on trust

	(1)	(2)
Heard of ECB	0.305*** (0.036)	0.290*** (0.034)
Crisis dummy		-0.096*** (0.020)
Heard of ECB interacted with crisis dummy		0.063*** (0.022)
AIC	212628	212218
BIC	212687	212316
# of observations	135342	135342
# of censored observations	9607	9607
Log likelihood	-106,308	-106,099
chi-squared for comparison test	0.263	0.425
p-value for comparison test	0.608	0.514

Note: The table reports the determinants of trust in the ECB in the euro area (changing composition) as a function of prior knowledge about the ECB. Sample period from 1999 (autumn survey) to 2010 (spring survey). Coefficients report marginal effects from Heckman probit regressions. Standard errors are robust and clustered at the country level. *, ** and *** denote significant at the 10, 5 and 1 percent level respectively (two-tailed tests).

TABLE 6: Determinants of trust in the ECB
(euro area changing composition, sub-sample of individuals who express different levels of trust in EU institutions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crisis dummy	-0.070* (0.039)	-0.072** (0.036)	-0.088*** (0.030)	-0.032* (0.018)	-0.070* (0.036)	-0.047 (0.029)	-0.073 (0.137)
Gender: female		-0.046** (0.021)	-0.038** (0.018)	-0.059*** (0.012)	-0.046** (0.020)	-0.051*** (0.014)	-0.045*** (0.013)
Age		0.001** (0.001)	0.001*** (0.000)	0.002*** (0.001)	0.001** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Married		0.019** (0.008)	0.006 (0.007)	0.020*** (0.006)	0.018** (0.008)	0.009 (0.006)	0.006 (0.005)
Educational attainment		0.055*** (0.016)	0.038*** (0.011)	0.053*** (0.012)	0.054*** (0.015)	0.037*** (0.009)	0.033*** (0.008)
Employed		0.014 (0.009)	0.009 (0.007)	0.021*** (0.007)	0.014 (0.009)	0.015*** (0.006)	0.014*** (0.005)
Retired		0.011 (0.013)	0.009 (0.009)	0.011 (0.013)	0.012 (0.013)	0.008 (0.009)	0.005 (0.009)
Political orientation		0.035*** (0.013)	0.030*** (0.010)	0.033** (0.014)	0.035*** (0.013)	0.032*** (0.011)	0.031*** (0.010)
Total stock returns			-0.002 (0.002)			-0.002 (0.002)	0.000 (0.002)
HICP inflation			-0.010 (0.012)			-0.022 (0.015)	-0.034** (0.013)
Inflation perceptions			-0.001 (0.001)			-0.001 (0.001)	-0.001* (0.001)
Unemployment rate			-0.022** (0.010)			-0.025*** (0.009)	-0.028*** (0.009)
General satisfaction with life			0.067*** (0.009)			0.052*** (0.005)	0.051*** (0.006)
Trust in the European Commission				0.157*** (0.027)		0.181*** (0.026)	0.199*** (0.022)
EU membership is a good thing				0.085*** (0.014)		0.085*** (0.009)	0.083*** (0.008)
Expected default frequency					-0.003 (0.004)	-0.003 (0.002)	0.192** (0.086)
Excess return of bank stocks					-0.003 (0.004)	-0.003 (0.002)	-0.004 (0.006)
<i>Interaction terms with crisis dummy</i>							
Total stock returns							-0.001 (0.005)
HICP inflation							0.065** (0.027)
Inflation perceptions							-0.002 (0.001)
Unemployment rate							-0.003 (0.013)
General satisfaction with life							0.008 (0.013)
Trust in the European Commission							-0.058*** (0.022)
EU membership is a good thing							0.004 (0.012)
Expected default frequency							-0.193** (0.085)
Excess return of bank stocks							0.008 (0.006)
AIC	119438	117879	116109	113632	117855	111939	111583
BIC	119493	117988	116226	113740	117963	112048	111701
# of observations	62433	62433	62433	62433	62433	62433	62433
# of censored observations	11057	11057	11057	11057	11057	11057	11057
Log likelihood	-59713	-58928	-58041	-56804	-58915	-55958	-55779
chi-squared for comparison test	0.285	1.070	0.438	6.036	1.061	4.108	2.521
p-value for comparison test	0.593	0.301	0.508	0.014	0.303	0.043	0.112

Note: The table reports the determinants of trust in the ECB in the euro area (changing composition), estimated using equation (1), but excluding respondents who answered the question about trust in all European institutions in the same fashion. Sample period from 1999 (autumn survey) to 2010 (spring survey). Coefficients report marginal effects from Heckman probit regressions. Standard errors are robust and clustered at the country level. *, ** and *** denote significant at the 10, 5 and 1 percent level respectively (two-tailed tests).

TABLE 7: Determinants of trust in the ECB – euro area and non-euro area member states

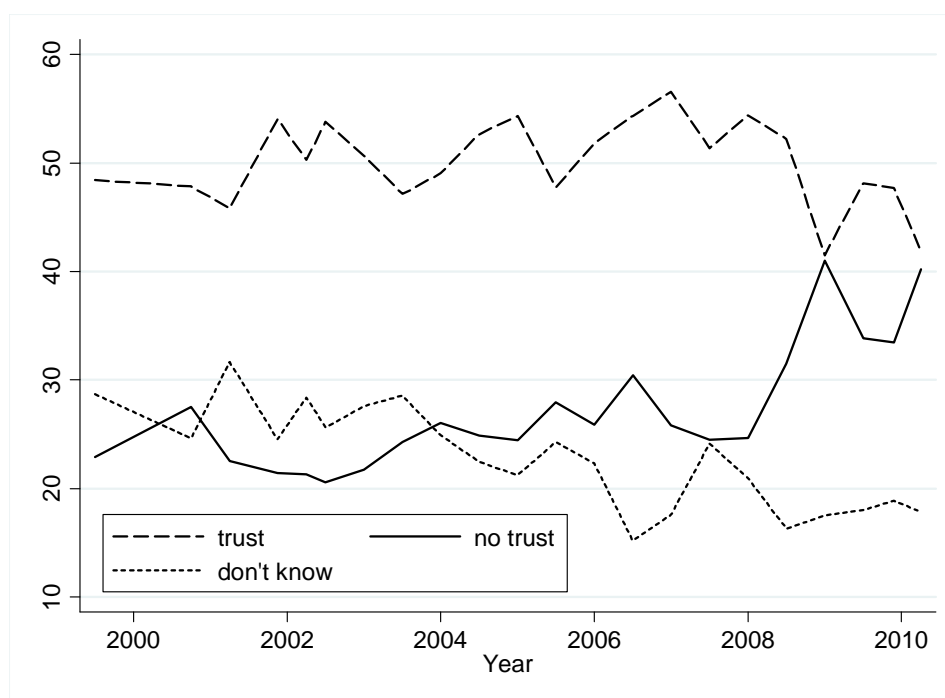
	euro area	non-euro area MS	DK, SW, UK	non-euro area new MS
	(1)	(2)	(3)	(4)
Crisis dummy	-0.033 (0.030)	0.062** (0.027)	0.188*** (0.019)	-0.049 (0.059)
Gender: female	-0.040*** (0.007)	-0.069*** (0.020)	-0.100*** (0.005)	-0.013 (0.011)
Age	0.001*** (0.000)	0.001** (0.000)	0.001*** (0.000)	-0.001*** (0.000)
Married	0.014*** (0.004)	0.015 (0.011)	0.021 (0.022)	0.005 (0.016)
Educational attainment	0.030*** (0.005)	0.039*** (0.015)	0.043*** (0.013)	0.002 (0.006)
Employed	0.003 (0.003)	-0.003 (0.004)	-0.003 (0.005)	0.009** (0.004)
Retired	-0.009 (0.006)	-0.031** (0.014)	-0.049* (0.026)	-0.006 (0.009)
Political orientation	0.028*** (0.006)	0.039** (0.019)	0.053*** (0.016)	0.010 (0.037)
Euro area total stock returns	0.002 (0.002)	0.016*** (0.002)	0.014*** (0.001)	0.011** (0.005)
Euro area HICP	0.002 (0.012)	0.067* (0.035)	0.090*** (0.013)	-0.108 (0.095)
Euro area inflation perceptions	-0.001* (0.001)	-0.003 (0.002)	-0.006*** (0.001)	0.007 (0.008)
Euro area unemployment rate	-0.018*** (0.004)	-0.035*** (0.009)	-0.058*** (0.010)	-0.017 (0.040)
Total stock return differential		0.002 (0.003)	0.000 (0.001)	-0.008 (0.005)
HICP differential		0.021 (0.014)	0.007 (0.020)	0.006** (0.003)
Inflation perception differential		-0.004*** (0.001)	-0.006*** (0.000)	-0.004*** (0.001)
Unemployment rate differential		-0.000 (0.009)	-0.045*** (0.011)	0.001 (0.003)
General satisfaction with life	0.042*** (0.004)	0.051*** (0.009)	0.046*** (0.010)	0.039*** (0.006)
Trust in the European Commission	0.603*** (0.040)	0.626*** (0.039)	0.571*** (0.037)	0.714*** (0.042)
EU membership is a good thing	0.089*** (0.007)	0.106*** (0.007)	0.111*** (0.008)	0.097*** (0.006)
Expected default frequency	-0.003* (0.002)	0.064** (0.030)	0.100*** (0.022)	0.022** (0.011)
Excess return of bank stocks	0.001 (0.001)	-0.003 (0.003)	-0.007*** (0.002)	0.007 (0.009)
AIC	221076	107963	66136	37797
BIC	221197	108019	66154	37830
# of observations	178028	77624	47783	29841
# of censored observations	13929	10713	5584	5129
Log likelihood	-110526	-53976	-33066	-18895
chi-squared for comparison test	13.675	11.969	44.838	3.331
p-value for comparison test	0.000	0.001	0.000	0.068

Note: The table reports the determinants of trust in the ECB in the euro area (changing composition) and non-euro area member states, estimated using equation (1). “Pre-ins”: Denmark, Sweden, UK, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Bulgaria and Romania; “DK,SW,UK”: Denmark, Sweden, UK; “non euro area new MS”: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Bulgaria and Romania. Sample period from 1999 (autumn survey) to 2010 (spring survey). Coefficients report marginal effects from Heckman probit regressions. Standard errors are robust and clustered at the country level. *, ** and *** denote significant at the 10, 5 and 1 percent level respectively (two-tailed tests).

DATA APPENDIX TABLE: Coding of variables

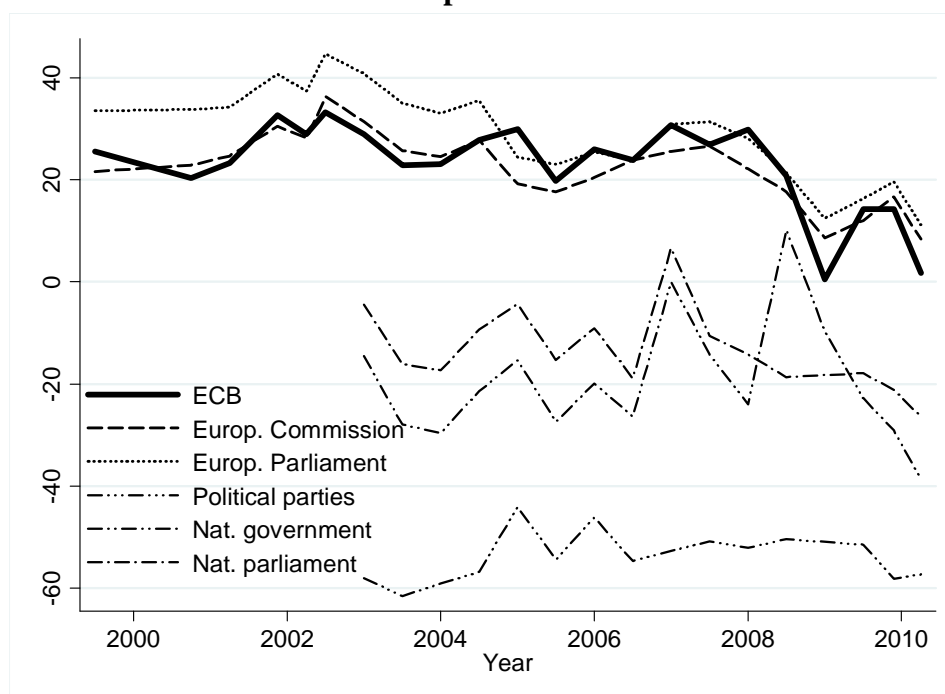
Variable	Source	Coding
Trust in ECB	Eurobarometer survey	1 if answered "tend to trust", 0 if answered "tend not to trust", missing if answered "don't know"
Gender: female	Eurobarometer survey	1 if female, 0 otherwise
Age	Eurobarometer survey	Age in years
Married	Eurobarometer survey	1 if married, 0 otherwise
Educational attainment	Eurobarometer survey	1 if education ended before age of 16, 2 if ended between 16 and 19, 3 if ended after 19
Employed	Eurobarometer survey	1 if employed, 0 otherwise
Retired	Eurobarometer survey	1 if retired, 0 otherwise
Political orientation	Eurobarometer survey	-1 if relatively left-wing, +1 if relatively right-wing, 0 otherwise
Total stock returns	Datastream	National total stock returns, 6-month average prior to the survey fieldwork
HICP inflation	Eurostat	National HICP inflation in percentage points, 6-month average prior to the survey fieldwork
Inflation perceptions	European Commission consumer survey	Balance statistic, difference between the weighted proportion of respondents stating that prices have risen over the past twelve months and the weighted proportion of respondents stating that prices have fallen or remained unchanged over the same period, 6-month average prior to the survey fieldwork
Unemployment rate	Eurostat	National unemployment in percentage points, 6-month average prior to the survey fieldwork
General satisfaction with life	Eurobarometer survey	4: very satisfied, 3: fairly; 2: not very; 1: not at all
Trust in the European Commission	Eurobarometer survey	1 if answered "tend to trust", 0 if answered "tend not to trust", missing if answered "don't know"
EU membership is a good thing	Eurobarometer survey	-1: bad; 0: good nor bad; 1: good
Expected default frequency	Moody's and ECB	Median Expected Default Frequency within the financial sector (in percent) 1 year in the future, 6-month average prior to the survey fieldwork
Excess return of bank stocks	Datastream	Difference between national bank stock returns and national total stock returns, 6-month average prior to the survey fieldwork
Heard of ECB	Eurobarometer survey	1 if answered "yes", 0 if answered "no"

FIGURE 1. Trust in the ECB by euro area respondents



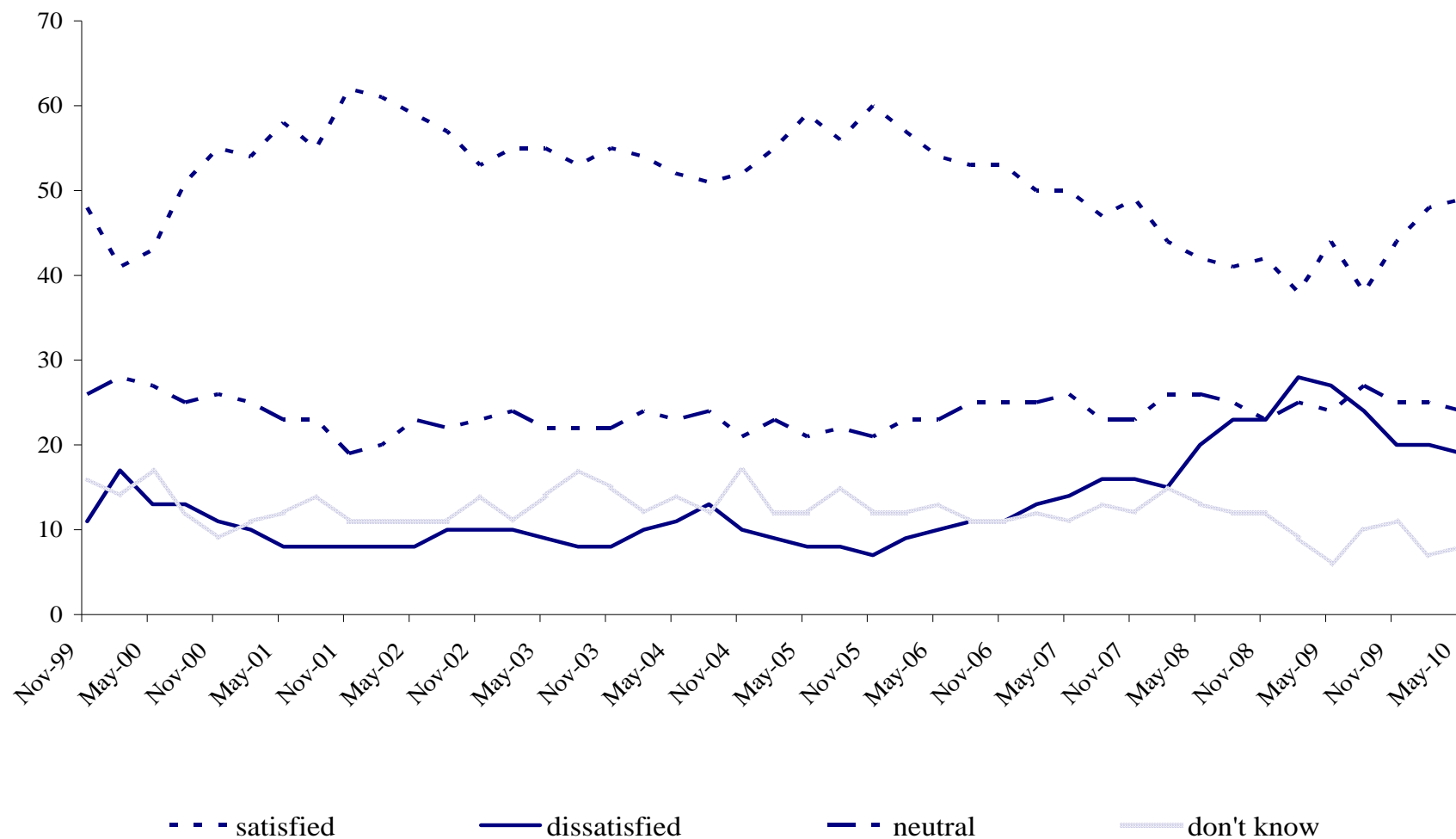
Source: The chart displays the answers by euro area respondents to the Eurobarometer survey question “Please tell me if you tend to trust the European Central Bank or tend not to trust it”. Data are in percentages.

FIGURE 2. Net trust in European and national institutions by euro area respondents



Source: The chart displays the answers by euro area respondents to the Eurobarometer survey questions “For each of the following institutions, please tell me if you tend to trust it or tend not to trust it.” Percentage share of respondents that tend to trust the respective institution minus share of respondents that tend not to trust it.

FIGURE 3. Trust in the Bank of England



Source: The chart displays the answers by respondents to the Bank of England inflation attitudes survey question “Overall, how satisfied or dissatisfied are you with the way the Bank of England is doing its job to set interest rates in order to control inflation?” Data are in percentages.