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Visegrad trust in the European Central Bank: common and country specific determinants 2005–2018

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Abstract

This is an analysis of the determinants of trust in the ECB, from 2005 to 2018, using twice yearly Eurobarometer surveys of a thousand citizens in each of the four Visegrad states. A probit model links their opinions to their socio-demographic positions, political views, and the macroeconomic situations they faced. Slovakia joined the Eurozone in 2005, but the other Visegrad states, although committed to eventual membership, are unlikely to join in the foreseeable future. But because the ECB's decisions have a critical influence on their economies, their trust in it is of significant importance. The four countries' views have varied over time, with the financial crisis of 2007–2008 an important watershed. Our results show that the ECB is trusted more by politically left-oriented Hungarians and Poles, and right-oriented Czechs and Slovaks. In the Czech Republic, living in a village or rural location increases trust. But in the other countries the reverse holds true. Trust increases the more people know of the ECB. It is greater for married respondents, for those with more positive views of the economic outlook and greater trust in the EU. Surprisingly the importance of macroeconomic influences differs considerably across both citizens and states. Taking all country comparisons together, Slovakia and the Czech Republic exhibit significantly similar results. But there is much less homogeneity in other pairwise comparisons.

Keywords: trust, European Central Bank, Eurobarometer, Visegrad Group

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1. Introduction

The credibility of economic institutions can play an important role in determining the effectiveness of the economic policy they pursue, at a national and international level. The European Central Bank (ECB) as the monetary policy maker of the Eurozone, is no exception. The ECB's primary objective is price stability. This helps create a favourable economic environment that enhances employment and fosters sustainable economic growth. The ECB can deploy a wide range of instruments to achieve its primary objective. But to a large extent its success depends on the trust it commands within and indeed beyond the Eurozone, including amongst non-Eurozone EU members.

Trust and transparency are intimately linked. The ECB aims to provide timely and understandable information on its activities and strategy, and on the economic and political development of the monetary union (Horváth, Katuščáková 2016; van der Cruijsen, Eijffinger 2010; Woodford 2005). By providing this information, the European Central Bank seeks to influence the ideas and decisions of economic actors to produce a stable economic environment, especially for the price level.

So here by trust we mean that individual economic actors make decisions on the basis of how they believe others will act in future. The stronger their trust, the more confident they are about how others will act. The stronger their trust in the ECB, the greater their confidence that it will act in accordance with its objectives. This encourages more rapid settlements of market dislocations, and provides a more stable background for longer-term investment decisions.

But since the financial crisis of 2008, many countries have suffered from institutional distrust. This is damaging in several ways, because trust is a cornerstone of democracy, and the foundation of the European Union (EU), whose institutions were constructed on this principle. For example, a trusted central bank finds it easier to manage monetary policy, for example, to attain, maintain or reattain an inflation target. In addition other economic actors can reliably assume that such a central bank will prevail, and so they can minimise their efforts to forecast the future and can devote their resources to more productive activities (Ehrmann, Soudan, Stracca 2012).

However the 2008 financial crisis, originating in the banking sector, revealed that the EU was ill-prepared for a crisis, and its economy shrank by 4.5% in 2009, leaving many member states in significant difficulties. The ECB was unable to restore stability and trust in the financial sector by conventional means, and so resorted to unconventional policies, including quantitative easing. That determination to regain control seems eventually to have been decisive in generating the trust that was the key to the ECB regaining control. However the former degree of trust in the ECB and the euro was not fully reestablished. In part this was because the crisis had revealed that several Eurozone members were excessively indebted. Their continuing membership required significant assistance from other members, and the imposition of domestically unpopular austerity measures.

More generally, since the 2007–2008 financial crisis, the EU has seen a series of crises that have weakened trust in the organisation and its institutions. These include a mass migration crisis, Brexit, and crises in democracy in some member states. Here we explore what determines trust in the ECB by the citizens of the Visegrad states, comprising the Czech Republic, Hungary, Poland and Slovakia. There is novelty in focussing on this group, and in separating the four countries to produce a comparative assessment. Studies hitherto have tended to use panel data analysis to assess EU citizens' trust in the ECB. Here we focus on what determines that trust for a significant political subgroup of EU members.

Using micro-level data from the Eurobarometer surveys for 2005–2018, the paper examines which sociodemographic, political and economic determinants influence the level of Czechs', Hungarians', Poles' and Slovaks' trust in the ECB. The Visegrad group is a regional cultural and political alliance of four countries, that in its modern guise has been active since 1991. Its members have certain common objectives and experiences significantly linked to their geopolitical location. In particular they lie on or uncomforably close to the classic east-west expansion routes of powerful empires. Indeed in the past some members have played significant imperial roles. But since 1991 they have loosely cooperated to advance their security, cultural, economic and energy cooperation, and most importantly their integration into the EU. This study reveals some similarities between them in what determines their trust in the EC. But it also emphasises the heterogeneity of their views. It is unclear whether that signals significant differences in their national values.

The paper is organised as follows. Section 2 reviews the literature. Section 3 describes the data and methodology. The empirical results are presented in Section 4, and conclusions drawn in Section 5.

2. Literature review

Institutional trust plays an important role in influencing policy makers' decisions. In general, a higher level of trust by private decision makers helps maintain public policy rules, and contributes to a business friendly environment. This reduces uncertainty and fosters increased investment, and so higher employment. Trust has been and is of decisive importance in the pursuit of stable economic development during both the financial crisis and post-crisis periods. But according to Albinowski, Ciżkowicz and Rzońca (2013), the ECB could not draw on a reliable account of what determined trust in itself during the crisis period. However the continuing crisis of trust creates evidence to help identify its determining factors.

Most studies that have examined public trust in the European Central Bank use data from the Eurobarometer survey conducted by the European Commission. They fall into three categories:

– micro-level studies that examine the determinants of citizens' trust in the ECB – Christelis et al. (2020), Hayo and Neuenkirch (2014), van der Cruijsen and Eijffinger (2010), Mosch and Prast (2008), Hudson (2006);

– macro-level studies of the relation between aggregated trust data on the ECB and indicators of economic performance, for example economic growth, inflation and unemployment – Roth et al. (2019), Albinowski, Ciżkowicz and Rzońca (2013), Gros, Roth and Nowak-Lehmann (2012), Wälti (2012), Gros and Roth (2010), Fischer and Hahn (2008);

– mixed-level studies that include the interaction between the determinants of citizens' trust in the ECB and micro-level indicators of economic performance – Farvaque, Hayat and Mihailov (2017), Horváth and Katuščáková (2016), Bursian and Fürth (2015), Ehrmann, Soudan and Stracca (2012).

Hudson (2006) examined the impact of institutional trust on welfare, and was one of the first researchers to explore which socio-demographic factors affected institutional trust, using the 2001 Eurobarometer survey. He concluded that increased trust in some institutions, for example national governments, the ECB, and the legal system, increased people's well-being.

Fischer and Hahn (2008) analyzed the macroeconomic determinants of Eurozone countries' trust in the ECB, for the period 1999–2004. Using panel regression, they found that a high inflation rate

reduced trust in the ECB, but economic growth and spending on unemployment relief increased it. The level of unemployment did not seem to impact on trust. However they concluded that public trust in the ECB fell during this period, because the public felt it was partly responsible for the business crisis.

Gros and Roth (2010) followed up on the results of previous authors. They examined the impact of rates of growth, unemployment, and inflation on net trust in the ECB, before and during the crisis. They found that economic growth was a statistically significant factor affecting the level of trust in the pre-crisis period. They argued that Europeans heavily criticised the ECB for failing to maintain financial stability and for failing to manage the economic downturn caused by the financial crisis. This led to a decline in trust, associated with increased inflation and unemployment. These findings were confirmed by Gros, Roth and Nowak-Lehmann (2012).

Farvaque, Hayat and Mihailov (2017) examine socio-demographic, economic and political determinants affecting euro area citizens' trust in the ECB. They stress that a successful ECB communications policy requires both a knowledge of how trust varies across groups, and flexible implementation. In their view the communication channel is the most important factor in managing monetary policy and inflation expectations.

Albinowski et al. (2013) examined whether public trust in the ECB was influenced by its interest rate policy. Their reasoning used Schmitt-Grohé and Uribe's (2012) "lack-of-confidence shock" hypothesis, which rejects standard interpretations of the post-crisis recession, and so also rejects their resulting monetary policy recommendations. Albinowski, et al. (2013) argued that the ECB's setting the interest rate close to zero further weakened already pessimistic consumer expectations. Hence trust in the ECB fell even further.

Using a unique 2011 opinion survey, Hayo and Neuenkirch (2014) examined the trust of German households in the ECB. They focussed on the role of knowledge about the ECB's activities. They concluded that as Germans' self-declared knowledge of the ECB's activities rose, so did their level of trust in the bank. But a possible puzzle was their finding that respondents' trust in the ECB fell as the number of media channels they used to get information about it rose.

There has been a significant increase in monetary policy transparency in recent decades. Monetary policy decisions have become more predictable, which generally makes it easier for agents to alter their decisions in the light of revised central bank decisions (Dincer, Eichengreen 2007). The impact of those decisions on other economic actors' behaviour, is influenced by those actors' trust in the ECB. Three sub-groups of factors influence actors' trust in the ECB: socio-demographic variables, political variables, and macroeconomic variables. In the following section we set out to estimate a model of how they impact on trust.

3. Data and methodology

Our paper uses micro-level data from Eurobarometer surveys conducted by the European Commission.[1] The Eurobarometer survey is semi-annual, usually in spring and autumn. It covers all EU states, with approximately 1,000 respondents for each. We used data from 28 Eurobarometer surveys between 2005–2018. The survey also identifies demographic, social and political attitudes and the circumstances

[1] Data are available at https://zacat.gesis.org/.

of respondents. Our research focuses on the Visegrad group countries: the Czech Republic, Hungary, Poland and Slovakia, and reveals which determinants are significant in explaining their respondents' trust in the ECB.

The Eurobarometer survey asks the respondents many questions related to the European Union, including whether they trust national institutions, certain media, and major EU institutions, in particular the ECB. Respondents can choose between the following answers: "tend to trust", "tend not to trust", or "don't know". For trust analysis, we used a similar methodology to Farvaque, Hayat and Mihailov (2017) and Cisková (2019). We measure trust in the ECB by transforming this categorical variable into a binary one, excluding the answer "don't know". The binary variable has a value "1" for the answer "tend to trust", and a value "0" for the answer "tend not to trust". This is our dependent variable "a" in the probit regression analysis.

Aggregate values from the Eurobarometer survey can be used in macro-level analysis. Our paper provides separate analyses of trust for each Visegrad country. So, taken together they may reveal results common to all four countries, and those that are specific to subsets of states. Some determinants of trust may have a similar sized impact on trust across countries, others may be very country-specific in their impact.

The aim of the paper is to assess the impact of socio-demographic, political and economic determinants on the level of trust in the ECB, as the monetary policy maker of the Eurozone (euro area). Although Slovakia is the only Visegrad state to be a Eurozone member, the ECB is the key external influence on the monetary policy-makers of all non-Eurozone member countries of the European Union.

Data on micro-economic determinants were obtained from the Eurobarometer. Macroecomic determinants were taken from Eurostat. The selected variables are defined in Table 1. Corresponding descriptive statistics are in Table 2.

Our dependent variable is a binary categorical variable, taking a value 1 or 0 according to whether the respondent has, or does not have trust in the ECB. To analyze the determinants of the Visegrad group citizens' trust in the ECB, we use binary probit regression models that correspond to a probabilistic model with the form:

$$P\left(y_{ij(t)} = 1 \middle| x_{ik}, \beta_{jk}\right) = \Phi\left(c_j + \beta_{j1}x_{i1} + \beta_{j1}x_{i2} + \ldots + \beta_{j18}x_{i18} + T_{(t)}\right) \tag{1}$$

where: $\Phi(.)$ is the distribution function of a normal distribution $N(0, 1)$.

The model can be written:

$$y_{ij(t)} = f\left(dem'_{ij(t)}; pol'_{ij(t)}; eco'_{j(t)}; T_{j(t)}; c_j\right) + \varepsilon_j \tag{2}$$

where:

$$\begin{aligned} dem'_{ij(t)} &= \left(x_{i1(t)}, x_{i2(t)}, x_{i3(t)}, x_{i4(t)}, x_{i5(t)}, x_{i6(t)}, x_{i7(t)}, x_{i8(t)}, x_{i9(t)}\right), \\ pol'_{ih(t)} &= \left(x_{i10(t)}, x_{i11(t)}, x_{i12(t)}, x_{i13(t)}\right), \\ eco'_{j(t)} &= \left(x_{14(t)}, x_{15(t)}, x_{16(t)}, x_{17(t)}, x_{18(t)}\right), \end{aligned} \tag{3}$$

and i is an opinion of a respondent at time t in country j. The dependent variable $y_{ij(t)}$ reflects the respondent's trust in the ECB and it depends on three vectors $dem'_{ij(t)}$, $pol'_{ij(t)}$, and $eco'_{ij(t)}$. The first vector $dem'_{ij(t)}$ contains nine socio-demographic variables. These are age $x_{i1(t)}$; gender $x_{i2(t)}$; education level $x_{i3(t)}$; whether the respondent is married $x_{i4(t)}$; retired $x_{i5(t)}$; or unemployed $x_{i6(t)}$; $x_{i7(t)}$ indicates that the respondent is a manager. Variable $x_{i8(t)}$ records student status; and $x_{i9(t)}$ notes if a respondent lives in a village or rural area. The second vector $pol'_{ij(t)}$ is a political vector and includes four variables. Variable $x_{i10(t)}$ records political orientation, $x_{i11(t)}$ reflects the respondent's expectation of their country's economic situation over the next twelve months. Variable $x_{i12(t)}$ records whether the respondent has heard of the ECB, and $x_{i13(t)}$ expresses the respondent's trust in the European Union. The last vector $eco'_{ij(t)}$ records macroeconomic variables that may influence trust in the ECB, including the unemployment rate $x_{14(t)}$; inflation rate $x_{15(t)}$; economic growth $x_{16(t)}$; government debt (as a percentage of GDP) $x_{17(t)}$; and the yield on 10-year government bonds $x_{18(t)}$. A time (year) effect is the variable $T_{j(t)}$; c_j is an intercept and ε_j is an error term.

We can rewrite a system (1) corresponding to (2) in the following probabilistic models:

$$P\left(y_{ij(t)}=1\middle|\cdot\right)=F\left(f\left(dem'_{ij(t)};\ pol'_{ij(t)};\ eco'_{j(t)};\ T_{j(t)};\ c_j\right)\right) \tag{4}$$

4. Results

4.1. Levels of trust

Many studies have tried to explain trust in institutions, including trust in the ECB and in the euro. We focus on the ECB, and on what determines the trust in it of Visegrad group citizens – from the Czech Republic, Hungary, Poland and Slovakia. Figure 1 shows the development of those citizens' trust in the ECB 2005–2018, and the levels of trust in the ECB for EU citizens taken as a whole. In general, the decline in the level of trust was associated with the emergence of the financial crisis that began in 2007–2008. This is also confirmed by the fact that the highest level of Europeans', Czechs', Hungarians' and Poles' trust in the selected time period was achieved before the financial crisis.

In contrast, Slovaks' trust in the ECB was highest in 2010. This most likely reflects the fact that the ECB became Slovakia's official monetary policy maker in 2009, on its entry into the Eurozone. A Eurobarometer survey recorded that most Slovaks thought that adopting the euro had reduced the impact of the financial crisis, because exchange rate risk had been eliminated. Looking at Figure 1 as a whole, there appear to be two different patterns in the development of trust for the EU and for the four selected member states. The Czech Republic and Slovakia show fairly steady declines in trust after relatively high starts. The EU as a whole, certainly up to 2016, follows a similar path. Poland and Hungary, on the other hand, start by showing relatively low levels of trust in the ECB, and remain so throughout the period.

Poland is one of the fastest-growing, and arguably the most successful of the new EU member states. During the financial crisis, it was the only one to avoid recession. The fact that it consistently records the lowest level of trust in the ECB may well be due to its long held disinterest in adopting

the euro. This became more pronounced after the 2007 financial crisis, with the EU economy shrinking by 4.5% in 2009, and especially so after that crisis morphed into one of sovereign debt (Osińska, Torój 2012).

Zimková et al. (2018) make a key extension to this last point. They focus on the heterogeneity of experiences and how the dynamics of changes in economic performance altered the perceptions of the euro across EU members. Analysing data from 2008 to 2017, they conclude that "membership of the European Monetary Union… does not seem to be the key variable that differentiates between the countries that suffered the most from the 2007–2008 financial crunch, or the ensuing sovereign debt crisis, and those that did not experience major difficulties." (Osińska, Torój 2012, pp. 1–2).

In fact there is evidence that in itself euro adoption did not increase trade in those countries that joined the EU in 2004. Cieślik, Michałek and Mycielski (2014), using data from 1990–2010, show that the key to increased trade was the elimination of exchange rate instability, rather than Eurozone membership.

The Eurobarometer survey of April 2019 reported that 51% of Poles were opposed to the euro as the national currency and 82% thought Poland was not ready to introduce it. 70% of Czechs and 65% of Hungarians also thought their countries were unprepared for its introduction. 60% of Czechs, but only 28% of Hungarians were opposed to its introduction. Most respondents from these three countries did not expect to see it introduced in the next decade.

One of the main reasons for the observed decline in the level of trust in the ECB after 2010, especially in Slovakia and the Czech Republic, was the creation by the EU of the European Financial Stability Facility (EFSF – also known as Euroval). This was a temporary crisis resolution mechanism to help indebted countries repay their debts. The 2010 vote on the EFSF in Slovakia was also connected to the fall of the government in that year, and more generally to an increase in institutional distrust. The ECB's use, at a turbulent time, of unconventional monetary policy to support indebted countries, led to a fall in trust. On the one hand, it could be argued that that a transparent policy should help build trust. But on the other hand, as Horváth and Katuščáková (2016, p. 11) stress, "too much transparency may also expose the central bank's uncertainty about the optimal monetary policy."

4.2. Independent variables

Table 1 lists and defines the variables, while Table 2 provides average summary descriptive statistics for all variables, for the whole 2005–2018 period. Here we focus briefly on noteworthy patterns in the independent variables. As noted above, these fall into three groups, corresponding to the three sub-models to be tested together in our empirical results: demographic variables, political views and expectations of respondents, and macroeconomic variables characterising their economies.

Looking at the demographic data, it is worth noting that on average Hungarian respondents had benefited from a markedly shorter period of education than those of the other countries. They also included a substantially higher proportion of retirees – 36%, and at 3%, less than half the others' proportion of managerial respondents. The other standout fact is that Poland (35%) and Slovakia (42%) have particularly high proportions of village and rural area respondents.

The political variables signal two potentially interesting comparisons. First, on average Slovak respondents have very slightly left-of-centre views. The other countries have clear right-of-centre majorities of respondents, markedly so for Poland. Second, while Polish respondents expect economic

progress to continue in a stable fashion, on average those from other Visegrad countries are slightly more pessimistic than optimistic about future economic performance.

The macroeconomic variables tell a group story of success, with clear similarities in some dimensions, and sizeable differences in others. Poland was arguably the best performer, with average growth rates of 4.5%, the joint lowest average inflation rate of 1.7%, but the second highest level of government debt, at 50% of GDP, and a relatively high average unemployment rate of 5.0%. Hungary was the worst performer, with the group's lowest average growth rate (2.3%); the highest inflation rate (3.1%), and the highest levels of government debt (74%) and yields on government bonds (5.5%).

The Czech Republic and Slovakia had similar levels of inflation and cost of borrowing. The latter's average growth rate of 4.2% was higher than the former's 3.1%, which led to significant convergence in their incomes per capita. But Slovakia's historical legacy of relatively inefficient heavy industry, especially in Eastern Slovakia, contributed to its high average unemployment rate of 7.2%. This compares unfavourably to the Czech Republic's average unemployment level of 3.4%, the lowest in the group.

4.3. Regression results

We noted above that there were some changes in trust in the ECB after the financial crisis that began in 2007–2008. Therefore, we ran three sets of maximum likelihood estimated probit regressions on the model we set out in Section 3 above. They were for the whole time period 2005–2018, and for two sub-periods, 2005–2008 and 2009–2018. The results, for the four countries are set out in Tables 3, 4, and 5. To help identify patterns in the results, in Table 6 we record the signs and the levels of significance of the variables. Here we begin by looking at the results for the full period model, 2005–2018, and then we briefly compare and contrast those results with the two shorter period models.

We employ socio-demographic, political and macroeconomic variabes to explain the Visegrad group citizens' trust in the ECB. Looking at the socio-demographic variables in Table 3, age is statistically significant in explaining trust in the ECB only for the Czech Republic and Slovakia. The ECB is less trusted by older people. The respondents' gender is statistically significant for Hungary, Poland and Slovakia. The ECB is more trusted by women than by men. These findings contradicts the results of Farvaque, Hayat and Mihailov (2017) and Ehrmann, Soudan and Stracca (2012). Both these studies examine the determinants of trust in the ECB by using quasi-panel[2] data from the Eurobarometer survey. But as Table 6 shows, our results hold for several of our sample countries, and time periods. So the differences between our findings and earlier results may reflect different sample periods and different sets of contributory explanatory variables.

A higher level of education is positively and significantly linked with a higher level of trust in the Czech Republic and Poland. The results also indicate that throughout the Visegrad group, married respondents are more likely to trust the ECB than unmarried respondents. If respondents are unemployed and come from the Czech Republic or Slovakia, they are less likely to trust the ECB. General or middle management respondents in the Czech Republic are positively associated with a higher level of trust in the ECB. Trust was more common amongst Hungarian than Polish students. Living in a village or rural area in Hungary, Poland or Slovakia had a significant downward impact on trust in the ECB, whereas the opposite was true for the Czech Republic.

[2] The Eurobarometer survey does not produce true panel data. Each survey has different respondents.

Politically right-oriented citizens in the Czech Republic and Slovakia and left-oriented Hungarians and Poles are more likely to trust the ECB, and vice versa. There is also a strong positive association between trust in the ECB and individuals' expectations of improved national economic performance over the following year. The ECB strives to be transparent in all its activities and to raise awareness of its activities amongst the general public. The transparency policy is applied across all European institutions, not just the ECB. A very important factor affecting trust is whether the respondent had ever heard of the ECB. On average over the sample period, around 89% of Slovaks, 85% of Czechs, 84% of Poles, and 80% of Hungarians had heard of it. This variable is highly associated with the level of trust in the ECB. Moreover, we were interested whether trust in the EU affects trust in the ECB. We expected and found a close positive relation.

The third group of variables are macroeconomic indicators, including the unemployment rate, the rate of inflation, GDP growth, government debt as a percentage of GDP, and the yield on 10-year government bonds. Price stability is the primary objective of the ECB's monetary policy, but the only countries to show significant relations between inflation and trust, Hungary and Poland, produced positive relations. Higher inflation was associated with higher trust. Perhaps higher domestic inflation, for these two countries outside of the Eurozone, was interpreted as the ECB controlling inflation better than the domestic authorities.

Appropriate monetary policy can also promote economic growth. In the Visegrad group, higher economic growth leads to higher trust for all countries except Slovakia. It is unclear why Slovak respondents are different, but as for the others, it may be that they associate growth with largely successful transitions to free market economies. Higher economic growth is typical for these economies, and they are among the fastest growing economies in the European Union.

The Czech Republic, Poland and Slovakia are among the EU countries with the lowest levels of government debt. Curiously, government debt has a significant downward impact on trust in the ECB only for Slovakia.

The final macroeconomic indicator included in the analysis is the yield on 10-year government bonds. This variable is positively related to trust in the ECB, except for Poland.

The quality of estimated models with a binary explained variable is assessed by using a McFadden R^2 (or pseudo R^2). It is computed as:

$$R^2_{McFadden} = 1 - \frac{L_U}{L_R} \tag{5}$$

where L_U is the log-likelihood of the estimated specification and L_R is the maximized log likelihood value, when all slope coefficients are restricted to zero.

Values of McFadden R^2 are considered satisfactory in the range 0.2–0.4 (Hensher, Johnson 1981). Our four probit regression models meet this criterion.

We now switch to a comparative analysis of the three sets of probit regression results. Table 6 provides a good overview of coefficient signs and significance levels. Four general conclusions stand out. First, there is considerable similarity between the two longer period regressions, 2005–2018 and 2009–2018. Given the large overlap between the samples this was to be expected, but there is perhaps a suggestion of continuities across the whole period. However, leaving aside for the moment the results on the political sub-group of variables, there are clear differences between the 2005–2008 and

2009–2018 regressions. This suggests the continuties across the periods are limited. Limited, except for the Czech Republic, and for the political position sub-group. This second general conclusion is the clearest general result from the analysis. Economic expectations, knowledge of the ECB, and trust in the EU have predictable effects on trust in the ECB. So do respondents' political positions, but in different directions depending on whether they are Czechs and Slovaks, or Hungarians and Poles.

The third general conclusion is that, with the exception of Slovakia, the influence of macroeconomic indicators on trust in the ECB is surprisingly small. But the Slovak exception is reassuring. After all, Slovakia joined the Eurozone in 2009, and its membership was widely seen, then and since, as a key stabilising and enabling factor in the country's development. The ECB is the main monetary policymaker for the country, and it would be very surprising if Slovaks did not judge the ECB, in part, on how well their macroeconomic indicators performed.

The fourth general conclusion is that of all the pairwise country comparisons that could be made amongst Visegrad group members, the two that most resemble each other are the Czech Republic and Slovakia. We judge closeness in determining trust in the ECB by first identifying the number of significant independent variables each possible pair of countries has in common for the three sets of regressions summarised in Table 6. Then, if the two countries have any pairs of significant variables with opposite signs, we remove that variable from the comparison. For example, for the 2005–2018 equations, the Czech-Slovak comparison has ten common significant variables. But one, living in a village or rural area, has different signs, giving a net score of nine. For these equations this is the same net score as the Hungarian-Polish comparison. The least similar pairwise comparisons, with net scores of six, are Czech-Polish and Polish-Slovak. For the 2005–2008 equations, the closest pairings are Czech-Slovak, and Hungarian-Polish, with net scores of 4. Four comparisons tie for the least similar comparison. Finally, for the 2009–2018 equations, the most similar pairings are Czech-Slovak (net 7). The least similar are Hungarian-Polish and Hungarian-Czech (net 4).

5. Conclusion

Trust plays an important role, especially for an institution like the European Central Bank. A higher level of trust helps the central bank to achieve its objectives in managing monetary policy. Even though there are many papers focused on examining the determinants of trust in the ECB across the European countries, only a small percentage of them analyse trust in the ECB by country, using individuals' data. The aim of this paper was do this for Visegrad group members. Using micro-level data from the Eurobarometer surveys from 2005 to 2018, we sought to identify the socio-demographic, political and macroeconomic determinants of trust in the ECB.

We found that all the political variables included in the models were statistically significant. In addition, knowing that there was such an institution as the ECB increased trust, as did having positive views of the economic outlook. The ECB is trusted more by politically left-oriented Hungarians and Poles, and by right-oriented Czechs and Slovaks. As to socio-demographic variables, all of them were significant in at least one country, but only two variables were significant in all the Visegrad countries. These were marital status and village or rural location. However the latter variable had a positive impact on trust in the Czech Republic, but a negative impact for the other three countries.

As for the macroeconomic variables, none were statistically significant in all four countries. The most relevant macroeconomic variables in explaining trust in the ECB were economic growth (in the Czech Republic, Hungary and Poland), and the yield on 10-year government bonds (in the Czech Republic, Hungary and Slovakia). By country, Hungary had the highest number of significant macroeconomic variables affecting trust in the ECB. These were the unemployment rate, inflation rate, economic growth and the yield on 10-year government bonds.

We would argue that the ECB should place greater emphasis on communication, especially with the citizens of those countries that are not members of the Eurozone, but have committed to eventually adopt the euro, such as the Czech Republic, Hungary and Poland. By identifying what influences their citizens' views of the ECB, we hope to provide ideas that can improve trust in this key European Union institution.

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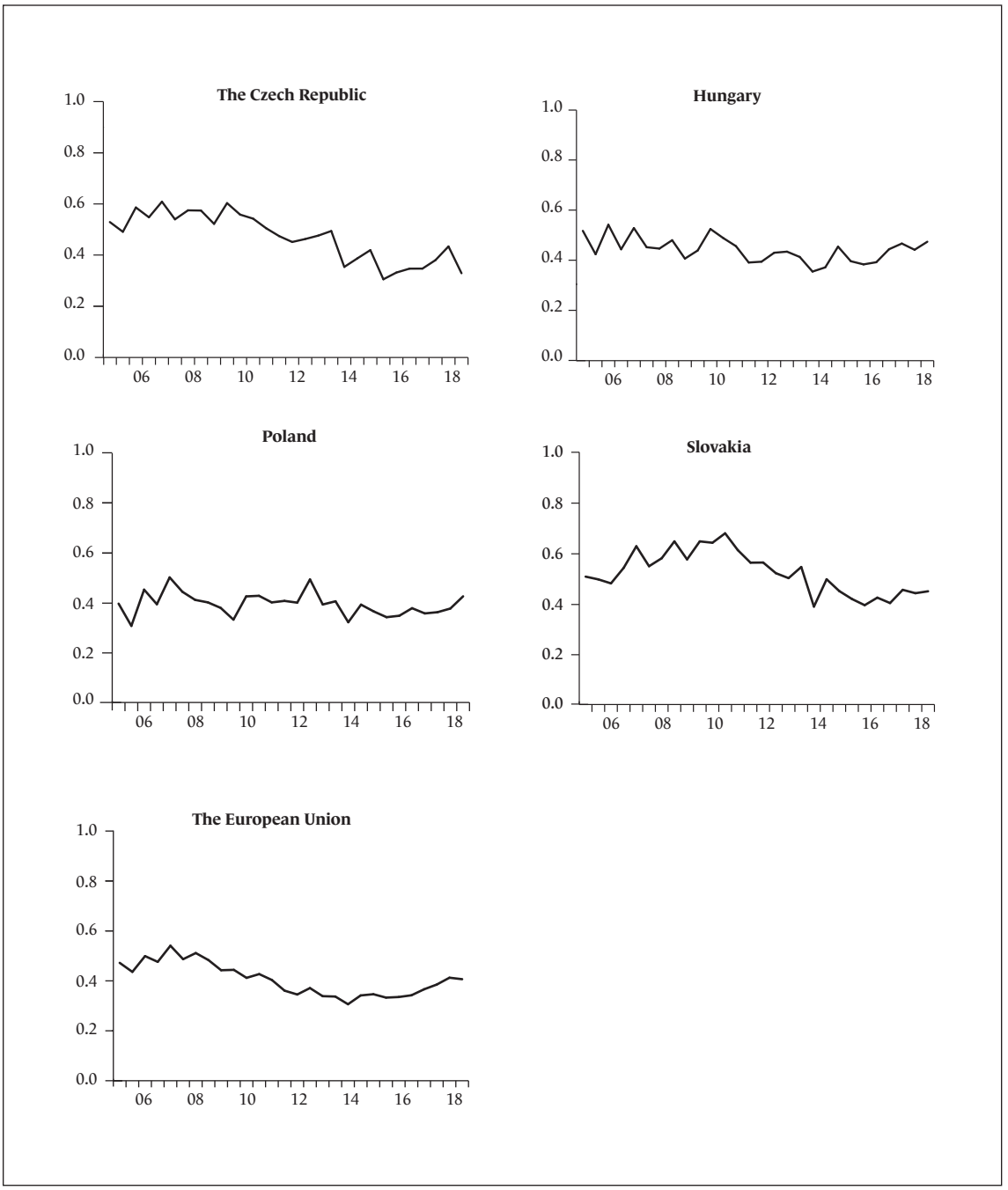
Appendix

Figure 1
Trust in the European Central Bank



Source: Eurobarometer.

Table 1
Characteristics of the selected determinants

Determinant	Characteristics	Source
Socio-demographic variables		
Trust in the ECB	1 – trust in the ECB, 0 – no trust in the ECB	Eurobarometer
Age $x_{i1(t)}$	1 – age ≤ 30, 2 – 30 < age ≤ 45, 3 – 45 < age ≤ 60, 4 – age > 60	Eurobarometer
Gender $x_{i2(t)}$	1 – female, 0 – male	Eurobarometer
Education $x_{i3(t)}$	1 – up to 15, 2 – 16–19 , 3 – 20+, 4 – still studying	Eurobarometer
Marital status $x_{i4(t)}$	1 – married, 0 – other	Eurobarometer
Retired $x_{i5(t)}$	1 – retired, 0 – other	Eurobarometer
Unemployed $x_{i6(t)}$	1 – unemployed, 0 – other	Eurobarometer
Manager $x_{i7(t)}$	1 – general management or middle management, 0 – other	Eurobarometer
Student $x_{i8(t)}$	1 – student, 0 – other	Eurobarometer
Village $x_{i9(t)}$	1 – live in village or rural area, 0 – other	Eurobarometer
Political variables		
Political placement $x_{i10(t)}$	-1 – left-oriented, 0 – centre-oriented, 1 – right-oriented	Eurobarometer
Economic expectation $x_{i11(t)}$	The economic situation in your country in the next twelve months will be: -1 – worse, 0 – same, 1 – better	Eurobarometer
Heard about ECB $x_{i12(t)}$	1 – heard about ECB, 0 – other	Eurobarometer
Trust in the EU $x_{i13(t)}$	1 – trust in the EU, 0 – do not have trust in the EU	Eurobarometer
Macroeconomic variables		
Unemployment $x_{i14(t)}$	Unemployment rate in the survey period	Eurostat
Inflation rate $x_{i15(t)}$	Inflation rate in the survey period	Eurostat
Economic growth $x_{i16(t)}$	Economic growth in the survey period	Eurostat
Government debt $x_{i17(t)}$	Government debt (% of GDP) in the survey period	Eurostat
10-year government bond yield $x_{i18(t)}$	10-year government bond yield in the survey period	Eurostat

Table 2
Descriptive statistics

Variables	Czech Republic		Hungary		Poland		Slovakia	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Trust in the ECB	0.5862	0.4925	0.5856	0.4926	0.6342	0.4817	0.6333	0.4819
Age x_{i1}	2.5527	1.0317	2.7476	1.0645	2.5387	1.0896	2.6319	1.0317
Gender x_{i2}	0.5434	0.4981	0.5505	0.4975	0.5253	0.4994	0.5631	0.4960
Education x_{i3}	2.2836	0.6355	2.0523	0.7465	2.4832	0.7574	2.2434	0.6366
Marital status x_{i4}	0.5493	0.4976	0.5245	0.4994	0.6019	0.4895	0.6181	0.4859
Retired x_{i5}	0.2399	0.4270	0.3623	0.4829	0.2965	0.4567	0.2634	0.4405
Unemployed x_{i6}	0.0528	0.2237	0.0775	0.2675	0.0686	0.2528	0.0679	0.2516
Manager x_{i7}	0.0768	0.2662	0.0359	0.1861	0.0801	0.2714	0.0712	0.2572
Student x_{i8}	0.0574	0.2326	0.0432	0.2033	0.0817	0.2740	0.0489	0.2158
Village x_{i9}	0.2814	0.4497	0.2591	0.4381	0.3565	0.4790	0.4269	0.4946
Political placement x_{i10}	0.0895	0.7867	0.1390	0.7654	0.2173	0.7527	-0.0510	0.7647
Economic expectation x_{i11}	-0.1070	0.7240	-0.1730	0.7562	0.0138	0.7598	-0.0940	0.7579
Heard about ECB x_{i12}	0.8492	0.3579	0.7966	0.4026	0.8373	0.3691	0.8877	0.3158
Trust in the EU x_{i13}	0.5120	0.4999	0.5863	0.4925	0.6304	0.4827	0.6114	0.4874
Unemployment x_{14}	0.0341	0.0112	0.0403	0.0118	0.0498	0.0205	0.0722	0.0164
Inflation rate x_{15}	0.0178	0.0163	0.0310	0.0233	0.0169	0.0158	0.0165	0.0159
Economic growth x_{16}	0.0305	0.0347	0.0227	0.0308	0.0449	0.0169	0.0424	0.0414
Government debt x_{17}	0.3406	0.0522	0.7365	0.0611	0.4986	0.0314	0.4220	0.0952
10-year government bond yield x_{18}	0.0287	0.0162	0.0545	0.0216	0.0450	0.0133	0.0291	0.0167

Table 3
Results from probit regressions 2005–2018

Explanatory variable	Explained variables			
	Czech Republic	Hungary	Poland	Slovakia
Age x_{i1}	-0.0712*** (0.0171)[0.0175]	-0.0240 (0.0177)[0.0177]	-0.0101 (0.0214)[0.0218]	-0.0292* (0.0171)[0.0171]
Gender x_{i2}	0.0203 (0.0236)[0.0237]	0.0473** (0.0241)[0.0241]	0.0907*** (0.0302)[0.3012]	0.0936*** (0.0217)[0.0242]
Education x_{i3}	0.0620** (0.0262)[0.0263]	0.0136 (0.0208)[0.0208]	0.0893*** (0.0270)[0.0271]	0.0147 (0.0230)[0.0263]
Marital status x_{i4}	0.1033*** (0.0248)[0.0248]	0.0501** (0.0246)[0.0246]	0.0859*** (0.0332)[0.0331]	0.0597** (0.0260)[0.0259]
Retired x_{i5}	0.0486 (0.0382)[0.0385]	0.0128 (0.038)[0.0381]	-0.1037** (0.0478)[0.0489]	-0.0197 (0.0375)[0.03735]
Unemployed x_{i6}	-0.2041*** (0.0534)[0.0526]	-0.0616 (0.0463)[0.0462]	-0.0455 (0.0614)[0.0608]	-0.125** (0.0491)[0.0473]
Manager x_{i7}	0.1159** (0.0475)[0.0468]	0.0743 (0.0674)[0.0669]	0.07222 (0.0603)[0.0583]	0.0307 (0.0512)[0.0504]
Student x_{i8}	0.0106 (0.0752)[0.0757]	0.1563** (0.076)[0.0786]	-0.1435* (0.0769)[0.0773]	0.0052 (0.0787)[0.0791]
Village x_{i9}	0.0632** (0.0263)[0.0262]	-0.0625** (0.0275)[0.0274]	-0.0808** (0.0316)[0.0319]	-0.0456* (0.0247)[0.0245]
Political placement x_{i10}	0.1616*** (0.0156)[0.0156]	-0.0641*** (0.0158)[0.0158]	-0.0421** (0.0202)[0203]	0.0976*** (0.0161)[0.0161]
Economic expectation x_{i11}	0.1577*** (0.0170)[0.0173]	0.012*** (0.0164)[0.0164]	0.1158*** (0.0201)[0.0204]	0.1916*** (0.0161)[0.0170]
Heard about ECB x_{i12}	0.9341*** (0.0342)[0.0350]	0.7059*** (0.0309)[00311]	0.9083*** (0.0406)[0.0424]	0.9870*** (0.0387)[0.0412]
Trust in the EU x_{i13}	1.4137*** (0.0244)[0.0244]	1.3462*** (0.0243)[0.0243]	1.3654*** (0.0307)[0.0308]	1.3894*** (0.0246)[0.0246]
Unemployment x_{14}	-5.3762 (5.1518)[5.1559]	-11.6063*** (3.5572)[3.5305]	-1.9605 (1.8867)[1.8817]	4.2359* (2.2232)[2.2471]
Inflation rate x_{15}	-2.5437 (1.7492)[1.7637]	1.8787** (0.8174)[0.8091]	5.2458* (2.8076)[2.8033]	0.2848 (1.0523)[1.0555]
Economic growth x_{16}	1.1576** (0.5665)[0.5645]	1.0031* (0.6043)[0.5894]	2.1099** (0.9998)[0.9923]	-0.1033 (0.3836)[0.3848]
Government debt x_{17}	0.2166 (0.7910)[0.7995]	-0.2885 (0.6495)[0.6497]	-0.6085 (0.8237)[0.8274]	-1.4777** (0.6683)[0.6771]
10-year government bond yield x_{18}	11.3688*** (2.4032)[2.4292]	5.7396*** (1.7929)[1.7604]	-8.7439 (5.4576)[5.4061]	4.8316** (2.0538)[2.0824]
c_j	-1.2710*** (0.2233)[0.2218]	-0.6588* (0.3547)[0.3599]	-0.3782 (0.3535)[0.3445]	-1.1669*** (0.2018)[0.203]
Time effect $T_{(t)}$	Yes	Yes	Yes	Yes

Table 3, cont'd

Explanatory variable	Explained variables			
	Czech Republic	**Hungary**	**Poland**	**Slovakia**
Observations	16168	14393	9617	15506
Log likelihood	-7511.5	-7409.3	-4594.7	-7189.9
AIC	0.9317	1.0323	0.9597	0.9299
SIC	0.9412	1.0429	0.9746	0.9398
McFadden R^2	0.315	0.2412	0.2725	0.2944
% correctly predicted	78.46	76.53	78.17	79.52

Notes:
Hessian based standard errors are in round brackets, Huber White robust standard errors are in square brackets.
*p < 0.1, **p < 0.05, ***p < 0.01.

Table 4
Results from probit regressions 2005–2008

Explanatory variable	Explained variables			
	Czech Republic	Hungary	Poland	Slovakia
Age x_{i1}	-0.0373 (0.0303)[0.0309]	-0.0151 (0.0333)[0.0337]	0.0341 (0.040)[0.0408]	-0.0354 (0.0289)[0.0284]
Gender x_{i2}	0.0048 (0.0416)[0.0418]	-0.0270 (0.0456) [0.0478]	0.0728 (0.0558) [0.0556]	0.1081** (0.0428)[0.0429]
Education x_{i3}	-0.05224 (0.0452)[0.0456]	0.0479 (0.0389)[0.0397]	0.0640 (0.0489)[0.0499]	0.0935** (0.0447)[0.0443]
Marital status x_{i4}	0.1481*** (0.0439)[0.0436]	-0.0133 (0.0462)[0.0465]	0.0128 (0.0617)[0.0615]	-0.0013 (0.0459)[0.0455]
Retired x_{i5}	0.0703 (0.0673)[0.0679]	-0.0073 (0.0720)[0.0720]	-0.1165 (0.0896)[0.0911]	-0.0445 (0.0652)[0.0644]
Unemployed x_{i6}	-0.2076** (0.0962)[0.0968]	0.0264 (0.0851)[0.0852]	0.0360 (0.1036)[0.1056]	-0.0899 (0.0887)[0.0853]
Manager x_{i7}	0.1548* (0.0864)[0.0844]	0.0310 (0.1292)[0.1228]	0.1263 (0.1226)[0.120]	0.0495 (0.0890)[0.0868]
Student x_{i8}	0.3659*** (0.1288)[0.1301]	-0.1646 (0.1306)[0.1331]	-0.0803 (0.1328)[0.1346]	-0.3200** (0.1301)[0.1270]
Village x_{i9}	0.0089 (0.0447)[0.0443]	-0.0710 (0.0483)[0.0479]	-0.1606*** (0.0599)[0.0602]	0.0215 (0.0435)[0.0431]
Political placement x_{i10}	0.1528*** (0.0268)[0.0267]	-0.0839*** (0.0294)[0.0292]	-0.0974*** (0.0369)[0.0366]	0.0958*** (0.0283)[0.0286]
Economic expectation x_{i11}	0.1266*** (0.0293)[0.0299]	0.2443*** (0.0338)[0.0346]	0.1858*** (0.0372)[0.038]	0.2065*** (0.0282)[0.0286]
Heard about ECB x_{i12}	0.9070*** (0.0492)[0.0496]	0.6023*** (0.0478)[0.0480]	0.7457*** (0.0685)[0.0691]	0.9888*** (0.0542)[0.0554]
Trust in the EU x_{i13}	1.3428*** (0.0425)[0.0427]	1.3892*** (0.0468)[0.0467]	1.3635*** (0.0580)[0.0582]	1.1452*** (0.0440)[0.0439]
Unemployment x_{14}	-15.4286 (21.709)[22.4106]	-51.792*** (13.3999)[12.9390]	-4.9032 (5.9402)[5.7906]	14.2659 (16.2567)[16.4929]
Inflation rate x_{15}	6.6874 (4.4373)[4.4625]	-1.4770 (1.8037)[1.7831]	12.9706** (6.4455)[6.5809]	-3.7770 (3.9082)[3.9624]
Economic growth x_{16}	3.3549* (1.9563)[1.9611]	-1.6849 (1.8048)[1.7864]	1.1034 (1.8773)[1.8554]	-0.2592 (0.8109)[0.804]
Government debt x_{17}	-3.2012 (23.3538)[23.8569]	0.3720 (1.3285)[1.3576]	-0.3693 (2.8270)[2.8435]	1.8517 (2.9056)[2.9171]
10-year government bond yield x_{18}	-75.3460* (43.0141)[42.9335]	6.6147 (4.9742)[4.9135]	-32.3440* (16.692)[16.6823]	12.4093 (31.5725)[32.1854]
c_j	3.0995 (6.9418)[7.0192]	0.7824 (0.9280)[0.9308]	1.1824 (1.5642)[1.5366]	-3.6788 (2.6254)[2.6632]

Table 4, cont'd

Explanatory variable	Explained variables			
	Czech Republic	**Hungary**	**Poland**	**Slovakia**
Time effect $T_{(t)}$	Yes	Yes	Yes	Yes
Observations	5620	4466	3149	5187
Log likelihood	-2434.871	-2083.279	-1337.964	-2324.991
AIC	0.8736	0.9419	0.8625	0.9052
SIC	0.8972	0.9706	0.9009	0.9305
McFadden R^2	0.2944	0.2721	0.2621	0.2485
% correctly predicted	79.64	79.29	81.42	78.94

Notes:
Hessian based standard errors are in round brackets, Huber White robust standard errors are in square brackets.
*p < 0.1, **p < 0.05, ***p < 0.01.

Table 5
Results from probit regressions 2009–2018

Explanatory variable	Explained variables			
	Czech Republic	Hungary	Poland	Slovakia
Age x_{i1}	-0.0868*** (0.0206)[0.0213]	0.0087 (0.0338)[0.0327]	-0.0284 (0.0254)[0.0259]	-0.0263 (0.0213)[0.0215]
Gender x_{i2}	0.0288 (0.0289)[0.0288]	0.1168** (0.0459)[0.0455]	0.0994*** (0.0361)[0.030]	0.0901*** (0.0294)[0.0294]
Education x_{i3}	0.1208*** (0.0322)[0.0322]	-0.0075 (0.0391)[0.0384]	0.0973*** (0.0326)[0.0325]	-0.0224 (0.0321)[0.033]
Marital status x_{i4}	0.0861*** (0.0302)[0.0302]	0.0692 (0.0464)[0.04562]	0.1152*** (0.0396)[0.0399]	0.0884*** (0.0318)[0.0318]
Retired x_{i5}	0.0364 (0.0467)[0.0470]	0.0018 (0.0724)[0.0717]	-0.1076* (0.057)[0.0585]	-0.0150 (0.0462)[0.0463]
Unemployed x_{i6}	-0.2003*** (0.0644)[0.0627]	-0.0753 (0.0781)[0.0773]	-0.1093 (0.0769)[0.0746]	-0.1297** (0.0594)[0.0592]
Manager x_{i7}	0.0939* (0.057)[0.0561]	0.2813** (0.1250)[0.1271]	0.0560 (0.0560)[0.0670]	0.0290 (0.0629)[0.0621]
Student x_{i8}	-0.1576* (0.0932)[0.0934]	0.5703*** (0.1408)[0.1473]	-0.1672* (0.0956)[0.0947]	0.2048** (0.0996)[0.1001]
Village x_{i9}	0.0822** (0.0327)[0.0325]	-0.0350 (0.0504)[0.0499]	-0.0521 (0.0375)[0.0377]	-0.0775*** (0.0302)[0.0301]
Political placement x_{i10}	0.1667*** (0.0193)[0.0193]	-0.0829*** (0.0304)[0.0306]	-0.0189 (0.0243)[0.0245]	0.1030*** (0.0196)[0.0195]
Economic expectation x_{i11}	0.1755*** (0.0211)[0.0214]	0.0760*** (0.0293)[0.0292]	0.0887*** (0.0241)[0.0244]	0.1822*** (0.0211)[0.0214]
Heard about ECB x_{i12}	0.9645*** (0.0479)[0.0492]	0.6995*** (0.0623)[0.0621]	0.9961*** (0.0514)[0.0550]	1.0067*** (0.0553)[0.0601]
Trust in the EU x_{i13}	1.4539*** (0.0301)[0.0300]	1.3869*** (0.0465)[0.0465]	1.3700*** (0.0363)[0.0365]	1.5036*** (0.030)[0.030]
Unemployment x_{14}	-2.3485 (9.3786)[9.3338]	-31.209 (38.8533)[38.932]	5.3213 (4.520)[4.4233]	22.6358*** (6.3593)[6.2613]
Inflation rate x_{15}	-4.8813 (3.0346)[3.0206]	21.044* (12.1891)[12.308]	1.9735 (3.9197)[3.8606]	1.5904 (2.0625)[2.0638]
Economic growth x_{16}	2.3857** (1.119)[1.1175]	1.5211 (4.7107)[4.7333]	1,1875 (3.1971)[3.0848]	-2.2493*** (0.8411)[0.8391]
Government debt x_{17}	-1.0886 (1.3658)[1.3701]	0.0924 (1.0334)[1.0252]	-0.5960 (1.0259)[1.0364]	-4.5113*** (1.2488)[1.2406]
10-year government bond yield x_{18}	10.5780*** (3.1145)[3.1661]	9.8386 (10.455)[10.4037]	3.3320 (6.5343)[6.4408]	6.8165 (4.2572)[4.2341]
c_j	-1.0887*** (0.4189)[0.4204]	-1.4095 (1.3978)[1.4298]	-1.7765*** (0.6434)[0.6284]	-1.9044*** (0.3412)[0.3427]

Table 5, cont'd

Explanatory variable	Explained variables			
	Czech Republic	**Hungary**	**Poland**	**Slovakia**
Time effect $T_{(t)}$	Yes	Yes	Yes	Yes
Observations	10548	4035	6468	10319
Log likelihood	-5052.764	-2080.155	-1055.91	-4822.483
AIC	0.9618	1.0410	1.009	0.9386
SIC	0.9756	1.0722	1.030	0.9526
McFadden R^2	0.3074	0.2489	0.2618	0.3088
% correctly predicted	77.92	77.05	76.92	80.18

Notes:
Hessian based standard errors are in round brackets, Huber White robust standard errors are in square brackets.
*p < 0.1, **p < 0.05, ***p < 0.01.

Table 6
Significance map

	Explained variables											
	Czech Republic			Hungary			Poland			Slovakia		
	2005-2018	2005-2008	2009-2018	2005-2018	2005-2008	2009-2018	2005-2018	2005-2008	2009-2018	2005-2018	2005-2008	2009-2018
Age x_{i1}	–	–	–	–	–	+	–	+	–	–	–	–
Gender x_{i2}	+	+	+	+	–	+	+	+	+	+	+	+
Education x_{i3}	+	–	+	+	+	–	+	+	+	+	+	–
Marital status x_{i4}	+	+	+	+	–	+	+	+	+	+	–	+
Retired x_{i5}	+	+	+	+	–	+	–	–	–	–	–	–
Unemployed x_{i6}	–	–	–	–	+	–	–	+	–	–	–	–
Manager x_{i7}	+	+	+	+	+	+	+	+	+	+	+	+
Student x_{i8}	+	+	–	+	–	+	–	–	–	+	–	+
Village x_{i9}	+	+	+	–	–	–	–	–	–	–	+	–
Political placement x_{i10}	+	+	+	–	–	–	–	–	–	+	+	+
Economic expectation x_{i11}	+	+	+	+	+	+	+	+	+	+	+	+
Heard about ECB x_{i12}	+	+	+	+	+	+	+	+	+	+	+	+
Trust in the EU x_{i13}	+	+	+	+	+	+	+	+	+	+	+	+
Unemployment x_{14}	–	–	–	–	–	–	–	–	+	+	+	+
Inflation rate x_{15}	–	+	–	+	–	+	+	+	+	+	–	+
Economic growth x_{16}	+	+	+	+	–	+	+	+	+	–	–	–
Government debt x_{17}	+	–	–	–	+	+	–	–	–	–	+	–
10-year government bond yield x_{18}	+	–	+	+	+	+	–	–	+	+	+	+
c_j	–	+	–	–	+	–	–	+	–	–	–	–

Notes: colours in the table represent the significance of the parameters, light grey is $p < 0.01$, dark grey is $p < 0.05$ and black is $p < 0.1$. Sign + (–) means positive (negative) impact on trust in the ECB.