Determinants of Trust in the European Central Bank [1]

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Abstract

In this paper we study the determinants of citizens' trust in the European Central Bank during the start-up phase from 1999-2004. Using a country panel based on the Eurobarometer survey, we find that higher inflation rates reduce trust. Thus people appear to evaluate the performance of the ECB on the basis of its success in achieving its primary objective, namely price stability. However, national income also has a strong impact, which poses a dilemma to the ECB, as it cannot increase economic growth in the long run. Unemployment does not have a significant impact on trust in the ECB, while unemployment spending exerts a trust-building impact. Possibly, automatic stabilizers serve as substitutes for ECB interventions, which would lower people's trust. Interestingly, active labor market policies, which can be interpreted as proxies for the public's perception of the urgency of the problem of high unemployment, tend to decrease trust.

Keywords: ECB, trust, European Union, Eurobarometer, panel data, behavioral economics

JEL codes: Z130; H500; E580; C330

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1 Introduction

When the Euro coins and banknotes were introduced in 2002 many citizens had the impression that it was accompanied by a jump in prices. Perceived inflation, which can be constructed from the European Commission's Consumer Survey, showed a surge in this period (see ECB (2002) and ECB (2007)). These perceptions are puzzling, because Euro area-wide inflation, measured by the Harmonized Index of Consumer Prices (HICP), has been remarkably stable and low since the inception of the European Monetary Union. Interestingly, even five years after the Euro cash changeover, there is a striking discrepancy between perceived inflation and measured inflation (see ECB (2007)). This difference might indicate a pervasive lack of confidence and trust in the European Central Bank (ECB) and in its ability to keep inflation under control.

Why is trust in the ECB as a political and economic institution important? First, the significance of reputation and credibility for the conduct of monetary policy is well-known since the pioneering works of Kydland and Prescott (1977) and Barro and Gordon (1983). In a similar vein, New Keynesian models imply that expectations about future inflation, which in turn are influenced by agents' expectations about future monetary policy, play a key role in the determination of inflation.[2] A high level of confidence in a central bank's ability and determination to keep inflation at bay therefore enhances the effectiveness of monetary policy. By contrast, low levels of trust pose a problem for monetary policy makers. For example, disinflations are more costly when high inflation expectations manifest themselves in high nominal wage increases.

Second and following from that, reduced functionality of the ECB through lower trust may reduce political support for the ECB, raising the demand for government control over monetary policy. Thus, ultimately, lower trust may endanger the ECB's independence. Given the commonly held view that central bank independence is a prerequisite for successful monetary policy, this should be worrying.[3]

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2 See Clarida et al. (1999).

3 For a formal analysis of the delegation of monetary policy to a conservative central banker, compare the seminal article by Rogoff (1985). For a more recent contribution see Herrendorf and Lockwood (1997).

Third, public support for the ECB may be an important determinant for the decision of non-EMU members like Denmark, UK, and Sweden to join the Euro area.[4] For example, in an atmosphere of nationwide dominating EU-criticism, Denmark has refused to adopt the Euro, following a referendum in 2000.

This leads us to the question of what determines people's confidence in the ECB, which this paper aims to test empirically in a panel for Euro zone countries with data from the Eurobarometer survey, from 1999 to 2004.[5] According to the Maastricht treaty, guaranteeing price stability is the ECB's paramount objective. Thus, it is plausible that inflation and changes therein affect trust in the ECB. However, as there may be a connection between monetary policy and economic performance, at least in the short run, or from an ordinary economically inexperienced person's viewpoint, we also test the impact of national income and unemployment. Finally, we investigate the effects of labor market policies and economic stabilizers, which might equally correlate with economic performance.

We find that, in line with our expectations, higher inflation lowers confidence in the ECB. Moreover, national income appears conducive, while unemployment does not exert any significant impact. Finally, more active labor market policies, possible serving as a signal of the state of the economy, lower trust, while unemployment spending increases it, possibly substituting for trust destroying ECB interventions.

The remainder of the paper is organized as follows: section 2 develops our hypotheses, while section 3 describes the data and introduces the methodology. The findings are presented and discussed in section 4. Finally, section 5 concludes.

Among others, Alesina (1989) has found empirical support for the hypothesis that central bank independence is beneficial.

4 Formally, only UK and Denmark have a right to decide whether or not to adopt the Euro. However, the example of Sweden shows that a country can deliberately remain outside the EMU by violating the membership criteria.

5 Using data from the Eurobarometer survey, Hudson (2006) examines the determinants of trust for various institutions and the relationship between institutional trust and individual well-being. However, his focus is not on the ECB and he does not consider inflation and GDP, which we find are major factors influencing people's trust in the ECB.

2 Factors that are Likely to Influence the Trust in the ECB

We have already mentioned that maintaining price stability is the ECB's main objective. It is therefore plausible that the public's trust in the ECB depends on how successful the ECB is in this respect. While the ECB aims at stabilizing HICP inflation aggregated over the entire EMU, there have been substantial differences in national inflation rates. In September 2007, for example, the 12-month average inflation rate amounted to 1.4% in Finland and France and 2.9% in Greece.[6] It is likely that citizens' confidence in the ECB is affected by national inflation rates rather than EMU aggregates. We would surmise that higher inflation leads to a lower level of trust.

Many central banks also have other objectives, in addition to the goal of maintaining price-stability. For example, one of the Federal Reserve's additional goals is maximum employment. That most central banks are often also made accountable for employment and output is reflected by the standard central bank's loss function that is used in many macroeconomic models. This loss function captures a trade-off between two goals, namely price-stability and employment.[7] There is another reason to believe that the public might hold the ECB accountable for high levels of unemployment and low growth. In particular, politicians sometimes accuse the ECB of pursuing an excessively tight monetary policy that is detrimental to their national economy. For example, the French President Sarkozy demanded that the ECB adopt looser monetary policy in order to boost French exports.[8] To sum up, although the Maastricht treaty assigns only a subordinate role to other targets than price stability, we conjecture that citizens make the ECB equally responsible for other key economic variables like the unemployment rate and GDP growth. Again, we assume that citizens are more concerned (and better informed) about national variables than about EMU-wide aggregates. Obviously, one would expect that high levels of unemployment and GDP growth reduce the public's confidence in the ECB.[9]

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6 See http://europa.eu.int/rapid.

7 Compare Kydland and Prescott (1977) and Barro and Gordon (1983).

8 "The Economist", July 10th 2007, "Nicolas Sarkozy wants a bigger budget deficit".

9 Transparency may also have an impact on trust in the ECB. Using a Dutch household survey, van der Cruijsen and Eijffinger (2008) find that respondents with higher transparency perceptions are likely to have more trust in the ECB.

Closely related to a country's economic performance and changes therein are national governments' responses to it, such as subsidies for the unemployed and expenses for programs that aim at re-integrating jobless persons into the employed population. More specifically, since it is difficult for an ordinary citizen to judge when the current state of economy should be of a major concern or not, such government activities as reactions to economic changes may serve as signal of the seriousness of the situation. For this reason, we also conjecture that spending on unemployment benefits and expenses for so-called active labor market policies may affect confidence in the ECB.

3 Data and Methodology

Data

Trust in the ECB is obtained from various Eurobarometer surveys between 1999, the first year trust in the ECB was assessed, and 2004, the last year the survey was available.[10] We measure the national level of trust in the ECB as the share of respondents in the national sample answering "yes, tend to" to the question "And, for each of them, please tell me if you tend to trust it or tend not to trust it? (READ OUT): 'The European Central Bank'". The possible answers were "1, Tend to trust", "2, Tend not to trust", and "3, Don't know". With 12 countries constituting the Eurozone observed for 5 years since the establishment of the ECB and the introduction of the Euro as a fixed exchange rate regime, we obtain a balanced panel of 72 data points.[11]

Macroeconomic variables are obtained from the Word Development Indicators database (WDI 2007), the EUROSTAT, and the OECD. These include GDP per capita (measured in PPP constant 2000 int'l US$) and population size for the baseline model. Furthermore, we also

[10] On average, there were four Eurobarometer rounds per year covering differing topics. If the question of interest was posed twice within the same year, we employed an unweighted average of the round-specific population shares. We calculated round-specific population shares using cross-sectional individual weights supplied by the Eurobarometer surveys.

[11] In principle, we could have calculated the share of yes-sayers in responding population, neglecting those who chose not to answer the trust question. However, although the correlation coefficient between these two alternative definitions exceeds 0.9 in each single wave, the share of confident residents has, by definition, to be expressed in terms of total population.

employ the national inflation rate (measured by the CPI and the HCPI), the unemployment rate, and government spending on unemployment benefits as well as on active labor market policies, measured as shares of GDP. Table A1 of the Appendix provides descriptive statistics.[12]

The development of people's trust in the ECB, expressed in percentage of the total population, from the years 1999 to 2004 is illustrated in Graphs 1 to 3. In general, three types of development can be roughly distinguished: a deterioration of people's trust in the ECB over time is observable for the Netherlands, France, and Ireland (Graph 1). In contrast, an upward trend, indicating that the population gained confidence in the ECB, is observable for Finland, Greece, Luxembourg, and Italy, as Graph 2 illustrates. Graph 3 depicts the percentages of the trusting population for the remaining countries Austria, Belgium, Germany, Portugal, and Spain. For these countries, no clear trend is observable – rather, the time series appear somewhat stationary with values fluctuating around some constant mean.[13]

Insert Graphs 1, 2 and 3 about here

Model

For this analysis, we view people's trust in the European Central Bank in EMU-member country i at time t (Y_{it}) as a function of the macroeconomic state of the participants' economies (ECO_{it}). The macroeconomic state is proxied by various measures relating to GDP, inflation and unemployment, as described in the previous section. Since it may take some time until a country's population becomes fully aware of changes in its economy's state, most of the objective economic variables enter the model lagged by one period.

[12] Most of these variables are employed in their logarithmic form. The sole exception pertains to the various inflation indices.

[13] A graph displaying the time series for all 12 Eurozone countries jointly is presented in the Appendix.

As both the actual and the perceived state of the economy and trust in the ECB might be correlated with other basic national characteristics of the country (X_{it}), we also control for population size, which may, for example, reflect the size of the domestic market.

$$Y_{it} = b' ECO_{it} + g' X_{it} + C_i + T_t + \varepsilon_{it}$$

Unobserved individual heterogeneity due to e.g. national differences in mentality, history, and national institutions is taken account by employing country fixed effects (C_i). Moreover, year fixed effects (T_t) proxy characteristics in the environment that are identical for all countries in the sample, but change on an annual basis, such as e.g. the Euro cash changeover, EU enlargements, and the state of the world economy. Finally, an individual-specific error term (ε_{it}) complements the model. Given the nature of our dependent variable, which is measured in continuous percentage points, we apply a fixed effects GLS estimator.

Our empirical approach is to start with a very simple baseline specification, and to investigate the impact of further economic determinants via step-by-step model extensions. The first analysis deals with the effect of national income, followed by an investigation into the role of inflation, while the last two analyses relate to the effects of unemployment and labor market policies.

4 Trust in the ECB, 1999 – 2004

The influence of national income

The results for the effects of national income, measured by GDP per capita, for trust in the ECB are reported in Table 1. As regards our baseline variables, which we include in all models further on, there is a tendency that more populous countries are less trusting in the European Central Bank.

Our variable of interest in this analysis, national income of the past period, appears strongly positively correlated with a population's trust in the ECB, statistically significant at the 1 percent level. Comparable results are obtained when using the two-period lagged GDP. The

similar coefficient sizes and equal significance levels suggest that national income two years ago is of comparable importance for trust in the ECB compared to when employing the one-period lagged value.[14] Alternatively, due to the extremely high correlation of GDP over time (with an autocorrelation coefficient of 0.99) the two-period lag might just proxy the one-period lagged value. Unfortunately, this strong correlation prevents simultaneous inclusion in the same model. Overall, the results in columns 1 and 2 indicate that between 1999 and 2004 wealthier countries had more confidence in the ECB.

The influences of GDP growth are analyzed in columns 3 and 4, with our variable of interest added to the baseline model consisting of population size, country and time fixed effects. The model in column 3 employs current GDP growth defined as the change between actual GDP and past GDP, divided by past GDP, while column 4 uses the GDP growth rate lagged by one period. Both estimates for either measure are insignificant, suggesting that GDP growth has no effect for a nation's trust in the ECB.[15] However, these results might well be driven by the fact that we compare unconditional GDP growth across countries.

More specifically, classical macroeconomic models of growth imply that poorer countries grow faster than richer countries. Hence, we can expect the effect of GDP growth be assessed differently by the population, depending on the economic stage a country is currently in. More specifically, a moderate growth rate is most likely to be judged unfavorably if the country is at the beginning of its economic development, while the same rate may be highly appreciated in a prosperous economy. The estimations in columns 5 and 6 take account of path dependency and conditional effects by simultaneously employing the past level of GDP and GDP growth rates in the same model. While model 5 combines current growth with the lagged GDP level, model 6 employs the same set of GDP variables, but all lagged by one additional period.

Both models 5 and 6 suggest that national richness is an important trust-building device, independent of the number of lags. (However, again, past values may well only approximate current values, with the structure of the data not permitting us to disentangle both effects). Contrasting results are obtained for GDP growth. While current economic growth does not appear to influence the confidence in the ECB, past year's growth appears highly conducive to

[14] A Wald-test across models 1 and 2 does not reject the hypothesis of equality of coefficients ($\chi_{2(1)} = 2.02$ with p-value = 0.1552).

[15] Please note the change in sign between column 3 and 4, with only the latter being in line with our predictions.

it (significance at the 1 percent level).[16] In line with our prediction, higher growth rates contribute positively to a nation's trust in the ECB. Thus, as model 6 suggests, both national income as well as increases therein appear to trigger more trust.

However, a statistical test based on a more simple specification (using only past GDP levels (GDP_{t-2}) and changes therein ($GDP_{t-1} - GDP_{t-2}$) cannot reject the hypothesis of equality of coefficients of both variables.[17] Thus, one might conclude that both variables jointly represent only the effect of GDP in period t-1 (as $GDP_{t-2} + (GDP_{t-1} - GDP_{t-2}) = GDP_{t-1}$). On the other hand, the fact that both levels of national income and changes therein are independently significant determinants of trust supports the interpretation that both exert an impact of their own. For simplicity, from now on we will account for the positive effects of national income and its growth rate on trust in the ECB by using the one-period lagged GDP level.

To sum up, we find a robust trust-enhancing effect of GDP per capita and its growth rate. One possible interpretation is that people hold the ECB accountable for the general economic development, despite the fact that influencing economic growth is only one of its subordinate objectives. However, it is equally conceivable that growing wealth leads to more trust in a country's political and economic institution in general, generating positive spill-overs for European institutions.

Insert Table 1 about here

The effects of inflation and unemployment

Table 2 investigates the impact of inflation and unemployment on trust in the ECB for the Eurozone countries. Allowing for non-linearity in the effects of inflation, we employ not only the simple inflation rate, but also its squared term. In the first model we add the current inflation rate, while in model 2 the lagged inflation rate is employed. Model 3 then employs

[16] Estimating a model with both current and past GDP growth, which are only moderately correlated (ρ = 0.49), yields qualitatively identical results, with only past GDP level and growth exerting significant impacts.

[17] The null hypothesis is not rejected with prob. = 0.89 ($F(1, 52) = 0.02$).

both current and lagged values. The results show clearly that it is the current inflation rather than the one of the last year that matters to people's trust in the ECB (columns 1 and 2). This finding is corroborated by the estimates of model 3, although decreases in significances are observable for all inflation variables likewise. The results for model 1 also show that the marginal effect of current inflation on trust is slightly decreasing. Thus, in line with our predictions, the performance of the ECB with respect to its major goal, namely maintaining price stability, matters to people's confidence in this institution.

Models in columns 4 through 7 analyze the effects of unemployment (and changes therein), also controlling for current inflation. In all models, as observed before, rising inflation appears to lower trust in the ECB. Columns 4 and 5 report the results for the current and the lagged changes in unemployment rates. The estimates show that, in contrast to expectations, a change in unemployment is not significantly associated with confidence in the ECB.

In contrast, turning to the effects of the level of unemployment (column 6), we find that more unemployment in the past period exerts a positive influence on trust, contradicting our expectations.[18]

However, people's assessment of a change in the unemployment rate might be different when conditioned on the initial level of unemployment in the economy. For example, an increase by 2 percentage points may be viewed as detrimental in an economy that was used to extremely low unemployment rates of 2%, potentially mirroring a doubling of the absolute number of unemployed. In contrast, an economy with already 20% of jobless persons might not be concerned about a 2 percentage point increase, resulting in a relative change of only 10%. Model 7 takes this into account by combining models 5 and 6, considering the levels and changes in the unemployment rate simultaneously. The estimates show that only the level exerts a significant impact, but not its change.[19]

Overall, the analyses of this section support our prediction that higher inflation is destructive to people's trust in the ECB, reflecting their satisfaction with ECB's performance regarding her main task. In contrast, changes in unemployment are not associated with people's trust, potentially reflecting that the population does not hold the ECB responsible for this aspect of the state of the national economy. More astonishing is the finding that higher levels of

[18] A qualitatively identical result is obtained for present values of unemployment rates.
[19] These results prevail when our variables of interest are lagged by one additional period.

unemployment appear beneficial to trust, contradicting our expectations. We will return to this paradoxical point in the next section.

Insert Table 2 about here

The effects of labor market policies

Because of the counter-intuitive finding that higher levels of unemployment are associated with more trust it is worthwhile to investigate this point in more detail. Table 3 reports the results for the models in which two government spending variables have been added: first, unemployment benefits spending, measured as share of GDP, which is automatically triggered by rising unemployment rates. Second, they also test the effects of active labor market policy spending, such as spending on training and re-employment programs, the level of which is usually at the discretion of the ruling governments. Put differently, while unemployment spending works as an *automatic* stabilizer, active labor market policy spending constitutes a means of deliberate policy-making.

The baseline model results (based on a specification obtained from the previous section) are reported in column 1, with a significant negative impact of inflation and a positive impact of unemployment. Model 2 adds lagged government unemployment spending to the new baseline, while model 3 includes lagged spending on active labor market policies. Both labor market policy variables are simultaneously tested in Model 4.

The results for model 2 reveal that neither unemployment spending nor the unemployment rate affect trust in the ECB significantly, at least not in this model specification. However, the coefficient on unemployment spending is only slightly below the 10 percent level of significance, while the one on unemployment rate is far below conventional significance levels. The most important conclusion from these findings is that the previously observed positive impact of the unemployment rate was driven by (unobserved) unemployment spending, which it must have approximated.

In contrast, the estimates of model 3 clearly indicate that more active labor market spending triggers lower levels of trust in the ECB, for any given unemployment rate. Possibly, a government's stronger engagement in such policies might serve as a signal to the citizenry that contemporary unemployment rates are of serious concern, possibly combined with a not so rosy outlook of the overall economic development. Moreover, higher spending on active labor market policies might also be a political manifestation of the voters' growing concern about high unemployment. Note also that unemployment rates themselves are still positively associated with trust in the ECB, suggesting that these are not approximated by active labor market spending, which, thus, does not appear to serve as automatic stabilizer.

Finally, when employing both labor market variables (model 4), we find that either type of government spending matters for people's trust in the ECB, with a significance at least at the 5 percent level. Qualitatively, the results are identical compared to those of the previous two models, with a trust decreasing impact of active labor market policies and a trust increasing effect of unemployment spending. Please note that the unemployment rate itself does not influence trust in the ECB any more.

Why is there a positive impact of unemployment spending on trust in the ECB? A first guess would be that higher unemployment rates and, thus, higher unemployment spending serve as signals for a deteriorating or bad economic state – for which the ECB may be to blame. Thus, one would rather expect a negative effect of unemployment benefit spending. However, an alternative and opposing prediction is based on a substitute relation between national and European institutions, in particular, between the national parliament and the ECB, in their guiding national economies. More specifically, strong national economic stabilizers, for example a generous unemployment insurance, may mitigate the adverse effects of a bad economic state, thus lowering political pressure on the ECB to intervene. As both political pressure and possible interventions induced by this pressure may be detrimental to trust, automatic stabilizers may be conducive to trust in the ECB.[20] Based on these arguments, it is not entirely implausible that we observe a positive relation between an automatic national stabilizer and this country's confidence in the ECB.

[20] We conjecture that people assess an ECB intervention to stabilize the real economy negatively, because, for example, it may serve as a negative signal on the economy's state or might be viewed as a general failure of this institution's policy-making. As support for this claim, please note the media response to the Fed's intervention as reaction to the US financial market and bank crisis in spring 2008.

Insert Table 3 about here

Extension: The influence of increases in the prices of non-durable goods

It is often argued that it is 'felt' rather than 'actual' inflation that matters to people's assessment of the state of the economy. In particular, as ECB (2007) argues, consumers may pay closer attention to the prices of those goods they are frequently confronted with and are less attentive with respect to some other prices. In consequence, we conjecture that consumers' trust in the ECB is likely to be influenced in particular by the price developments for typical non-durable goods and services such as fuel (mobility and heating), food, and goods and services for routine household maintenance. Therefore one might expect that the previously observed effect of the all-items CPI is driven by the impact of price increases in non-durable goods.

In Table 4, we analyze whether the price changes for these goods dominate the effects of overall-inflation by including the inflation rates for these subindices in addition to CPI inflation, based on the baseline specification displayed in column 1.[21] The impact of the CPI inflation remains negative, with coefficient sizes appearing more or less equal across models, although significance levels appear slightly changed. Interestingly, there is no significant influence of the subindices' inflation rates for models 2-4.

To draw a conclusion, we find no empirical evidence for the hypothesis that the trust-lowering effect of overall price level is driven by prices for non-durable goods that are paid on a frequent basis by households.

Insert Table 4 about here

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[21] For simplicity, we have assumed a linear functional form of inflation. However, the results are qualitatively identical when we allow for non-linearities.

Robustness tests: trust in national institutions, long-term growth, knowledge on the EU and subjective expectations on economic development

To challenge our findings, it might be argued that the average person does not differentiate between European and national institutions when she develops her confidence in such governance structures. In the perception of the average citizen, national organs of governance might well appear to dominate the decision-making process in the political realms and, thus, economic policy outcomes like national income, unemployment and inflation. For this reason, the effects observed for the ECB might actually constitute spill-overs of the determinants of trust in the national organs. In other words, trust in the ECB would be a mere proxy for trust in the national government or the national parliament. Similarly, one might surmise that citizens do not distinguish between different EU institutions; then trust in the ECB may approximate trust in the EU in general.

Table 5 tests these conjectures for trust in the national government, national parliament and the European Union as a whole. The measures of trust are constructed in the identical way as those for the ECB, using the Eurobarometer waves during the period of investigation, 1999 – 2004.[22] We estimate the determinants of trust using the regression model of Table 2, column 1, and that of Table 3, column 4. The first model focuses on the impact of inflation, while the second analyzes the effect of labor market policies. In contrast to the corresponding regression outcomes for the ECB, confidence in the national government, the national parliament and the European Union do not appear to be influenced by the state of the macroeconomy – at least during the rather short period under investigation. Thus, trust in the ECB does not appear as a side-product of trust in national governing bodies.

Insert Table5 about here

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[22] Trust is measured as the weighted share of the interviewees reporting ‚tend to trust'. The questions on trust in the national government and the EU are missing for the year 2000. For the years 2001 and 2004, the trust questions have been posed twice. For these years we employ a yearly average.

However, if citizens held the national bodies responsible for the economic state in their country, trust in national institutions might mediate the influence of the national economy for trust in the ECB. A similar argument applies to trust in the EU as a whole, which might equally mediate the effects of labor market policies for trust in the ECB. Table 6 analyzes the potential transmission channel function exerted by trust in different institutions of governance. Thus we add these vertical trust variables to the baseline model of Table 3, column 4. Not surprisingly, trust in the various institutions is positively correlated with trust in the ECB (columns 1, 2, and 3).[23] Nevertheless, in all four regressions our labor market spending variables remain significant and keep their previously observed direction of influence. We conclude that trust in national or supranational institutions of governance do not mediate the effects of the macroeconomic factor for trust in the ECB.

Insert Table 6 about here

Our model might be misspecified because of the omission of long-term growth rates. Table 7 tests this conjecture by inclusion of the 5-year, 10-year and 20-year growth rates to the regression model that consists only of the current GDP growth rate and population size (Table 1, column 3).[24] Column 1 of Table 7 suggests that both current and 10-year growth rates are determinants of trust in the ECB, a finding that is corroborated for the 10-year growth rate only when it is separately included (columns 2 and 3). However, columns 4 through 6 clearly show that there is no economic growth effect for trust in the ECB when the level of national income is accounted for in the specification. In column 6, the four growth coefficients are not only independently, but also jointly insignificant ($F(4, 49) = 0.68$; $Prob > F = 0.6072$). Like Table 1, Table 6 shows that short-term and long-term growth effects are either non-existent or captured by the national income effect. Indeed, the correlation coefficient of long-term 20-year

[23] The among the two trust variables relating to national organs is 0.93 in our sample. In column 4, they are both jointly insignificant. It appears consistent that only influence in the EU exerts an influence on trust in the ECB. For the effects of political trust on the United Nations, see Torgler (2007).

[24] The simple correlations of the four growth variables range from 0.42 up to 0.89 which allows their joint inclusion in the model.

growth rates with current per capita income is 0.6142. Thus, our results are insensitive to variations in the time span covered by economic growth.

Insert Table 7 about here

It might also be argued that the effect of macroeconomic conditions of an economy for a citizen's trust in the ECB depends on her knowledge on the European Union and its institutions. To test this conjecture we employ the share of those in the population who report themselves as highly knowledgeable on the EU, reaching the highest categories from 8 to 10 out of 10. Interaction effects between this variable and macroeconomic variables should yield significant coefficients in case of a knowledge dependency of the macroeconomic conditions. Table 8 provides the results of this exercise. In both columns 1 and 2, the share of informed persons is simply added to the two baseline models (obtained from Table 2, column 1, and Table 3, column 4, respectively), but turn out insignificant. Columns 3, 4 and 6 show that there is no significant interaction between the share of well informed and inflation, national income or active labor market policies when it comes to trusting the ECB.[25] In contrast, the effects of unemployment spending interact negatively with the share of informed population (column 5), counterweighting the positive impact of unemployment spending per se. Thus, for a more informed population the positive effect of unemployment spending is reduced, and the total effect might even reach zero for the maximum share of knowledgeable persons (maximum: .157 = 15.7% in the sample). Given that we interpreted the positive effect of unemployment spending as a proxy for lower political pressure on the ECB to intervene, better information on the EU might well reduce the call for ECB interventions in the face of a bad economic state. However, for most of the nations and time periods in our sample the net impact of unemployment spending remains positive, only reduced in size. Even though information on the EU reduces the bias in column 5, we should however note that the negative impact of inflation and that of active labor market policy spending well prevail. Overall, even

[25] In column 6, all three variables are jointly highly significant ($F(3, 46) = 4.28$, p-value = 0.0096), but pair-wise tests of joint significance suggest that the interaction term should be omitted from the model specification.

when taking into account the role of information on the EU in our model, all main findings of our previous analyses still hold.

Insert Table 8 about here

Finally, we have tested the hypothesis that expectations on the economic development might influence trust in the ECB, and also partly mediate the effects of the macroeconomic factors in our model, particularly in case these factors serve as basis for the formation of such expectations. In particular, we separately include the share of those in the population who expect a worsening of the overall economy, their financial household situation, the general employment situation in the economy and their personal job situation.[26] Unfortunately, no information on inflation expectations was available. Column 1 of Table 9 presents the results for the baseline model. Not surprisingly, having a gloomy view on the economy, the labor market or on one's own economic state is negatively correlated with trust in the ECB (columns 2 - 5). Striking is, however, that most coefficients on the macroeconomic indicators unemployment spending, active labor market policy spending and national income remain unaffected in their magnitude. The sole exception pertains to the impact of active labor market policy spending, that appears reduced when controlling for pessimistic expectations on the whole economy, which is not the case when a 'bad general employment situation' is expected. This finding is in line with our previous interpretation that a stronger engagement in active labor market policy spending is viewed as a signal of the general state of the economy rather than a sector-specific indicator.

Insert Table 9 about here

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[26] Calculated as share of respondents who assess the specific expected economic situation as 'worse'. Alternative possible answers are 'better' and 'the same'.

5 Conclusions

In this paper we have analyzed which factors determine the trust of EMU citizens in the European Central Bank. Because the European Central Bank's primary objective amounts to price stability, it is plausible that the inflation rate is a major determinant of trust. We confirm this presumption, as the inflation rate always has a significantly negative impact.

One might equally conjecture that people make the ECB responsible for the general state of the economy, as it is reflected by unemployment and output. However, the unemployment rate or changes therein do not affect trust in the ECB, while confidence in this institution significantly benefits from higher national income. Active labor market policies, which may serve as a proxy for the perceived severity of the unemployment problem and signal for the general state of the economy, are associated with lower levels of trust. In contrast, government spending on unemployment benefits appears as trust-building device, potentially because it lowers the need for an ECB intervention policy.

It is important to stress that our empirical analysis concerns the startup phase of the EMU. This period is particularly interesting, because trust in the ECB is likely to be more sensitive to changes in the economic environment compared to later periods. Indeed, it seems plausible that people's attention to the single European currency will diminish over time. Then trust in the ECB can be expected to be less dependent on current economic variables but rather on the national economy's long-run performance.

This finding represents a dilemma for the ECB. Obviously, trust in the ECB is to a large part attributable to national policies which the ECB cannot influence. More specifically, while the ECB's success in achieving price stability actually has a beneficial effect on trust, other important macroeconomic factors like national income, labor market policies and the welfare state equally have a substantial effect on its perception by citizens. However, the ECB has no means to influence these latter factors in the long-run, since only national governments could contribute to higher economic growth. According to our findings, embarking on growth-enhancing reforms might ultimately lead to a more favorable public assessment not only of national political institutions, but also of the ECB. However, we also find some support for a trust-enhancing role of automatic stabilizers.

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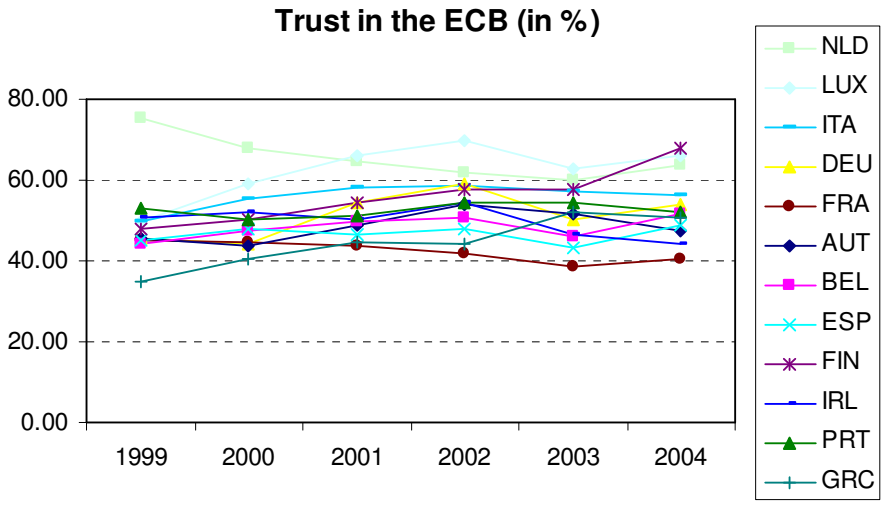
Appendix

Table A1: Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
trust	72	0.52	0.08	0.35	0.76
population	72	25307.54	26278.42	421.50	82507.94
Population (log)	72	16.34	1.41	12.95	18.23
GDP per capita	72	27422.73	9491.45	15927.59	61641.15
GDP (log)	72	10.17	0.29	9.68	11.03
GDP growth rates	72	0.03	0.03	-0.02	0.16
Unemployment rate	72	7.50	3.55	1.80	18.60
Unemployment rate (log)	72	1.89	0.53	0.59	2.92
Change in (log of) unemployment rate	72	1.10	1.98	0.00	11.56
Spending on active labor market policies (% GDP)	72	0.80	0.37	0.20	1.40
Spending on active labor market policies (log)	72	-0.37	0.61	-1.61	0.34
Spending on unemployment benefits (%GDP)	72	1.36	0.79	0.40	3.30
Spending on unemployment benefits (log)	72	0.13	0.64	-0.92	1.19
inflation	72	2.39	1.05	0.19	5.57
food	72	2.65	1.82	-2.60	7.00
household maintenance	72	1.41	1.99	-7.00	7.10
fuels	72	5.44	8.80	-6.90	31.60
year	72	2001.50	1.72	1999	2004

Notes: Except for the inflation-related variables and the trust variable, values are lagged by on period.

Graph A2


Trust in the ECB (in %)
80.00
60.00
40.00
20.00
0.00
1999
2000
2001
2002
2003
2004
NLD
LUX
ITA
DEU
FRA
AUT
BEL
ESP
FIN
IRL
PRT
GRC

Tables

Table 1: The influence of GDP

	1	2	3	4	5	6
GDP (lagged)	0.853**				0.890**	
	[4.89]				[4.66]	
GDP (lagged by 2)		0.705**				0.871**
		[3.64]				[4.60]
GDP growth			-0.411		0.156	
			[1.20]		[0.50]	
GDP growth (lagged)				0.418		0.788**
				[1.39]		[2.93]
population (lagged)	-2.826**	-2.824**	-0.612	0.235	-2.738**	-2.904**
	[3.34]	[2.78]	[0.70]	[0.30]	[3.15]	[3.06]
Constant	38.041**	39.535*	10.552	-3.31	36.230**	39.139**
	[2.99]	[2.60]	[0.74]	[0.26]	[2.72]	[2.75]
Observations	72	72	72	72	72	72
Number of id	12	12	12	12	12	12
R-squared	0.45	0.36	0.22	0.23	0.45	0.45

Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Table 2: The effects of inflation and unemployment

	1	2	3	4	5	6	7
inflation	-0.035+		-0.034	-0.035+	-0.038+	-0.036+	-0.036+
	[1.73]		[1.36]	[1.70]	[1.85]	[1.84]	[1.82]
infl. squared	0.004		0.004	0.004	0.004	0.005	0.005
	[1.19]		[1.01]	[1.18]	[1.29]	[1.42]	[1.40]
infl. (lagged)		-0.007	0.01				
		[0.28]	[0.33]				
infl. squared (lagged)		-0.001	-0.003				
		[0.36]	[0.69]				
Δ unemployment				-0.023			-0.011
				[0.44]			[0.22]
Δ unempl. (lagged)					-0.044		
					[0.88]		
unempl. (lagged)						0.083*	0.082*
						[2.10]	[2.05]
unempl. (lagged by 2)							
GDP (lagged)	0.873**	0.864**	0.879**	0.868**	0.824**	0.941**	0.938**
	[5.05]	[4.97]	[5.04]	[4.96]	[4.52]	[5.52]	[5.42]
population (lagged)	-2.761**	-2.552**	-2.621**	-2.634**	-2.335*	-2.729**	-2.668**
	[3.23]	[2.96]	[2.99]	[2.90]	[2.37]	[3.30]	[3.03]
Constant	36.811**	33.439*	34.458*	34.773*	30.343*	35.420**	34.451*
	[2.86]	[2.57]	[2.61]	[2.53]	[2.04]	[2.84]	[2.58]
Observations	72	72	72	72	72	72	72
Number of id	12	12	12	12	12	12	12
R-squared	0.49	0.48	0.5	0.49	0.49	0.53	0.53

Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Table 3: The effects of labor market policies

	1	2	3	4
unempl. spending (lagged)		0.065		0.083*
		[1.58]		[2.18]
labor market policies spending (lagged)			-0.105**	-0.117**
			[2.80]	[3.20]
unemployment (lagged)	0.083*	0.041	0.122**	0.072
	[2.10]	[0.87]	[3.07]	[1.63]
inflation	-0.036+	-0.039+	-0.026	-0.029
	[1.84]	[2.01]	[1.38]	[1.56]
infl. squared	0.005	0.005	0.003	0.003
	[1.42]	[1.48]	[0.97]	[1.01]
GDP (lagged)	0.941**	0.941**	0.992**	0.998**
	[5.52]	[5.60]	[6.16]	[6.43]
population (lagged)	-2.729**	-3.112**	-3.078**	-3.610**
	[3.30]	[3.66]	[3.92]	[4.54]
Constant	35.420**	41.759**	40.476**	49.188**
	[2.84]	[3.23]	[3.42]	[4.07]
Observations	72	72	72	72
Number of id	12	12	12	12
R-squared	0.53	0.55	0.59	0.63

Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Table 4: The effects of inflation of non-durable goods

	1	2	3	4
inflation	-0.014+	-0.013	-0.019*	-0.013
	[1.85]	[1.19]	[2.23]	[1.62]
labor market policies spending (lagged)	-0.111**	-0.108**	-0.119**	-0.112**
	[3.11]	[2.86]	[3.31]	[3.09]
unempl. spending (lagged)	0.115**	0.117**	0.114**	0.114**
	[3.44]	[3.38]	[3.44]	[3.39]
population (lagged)	-3.938**	-3.941**	-3.694**	-3.902**
	[5.03]	[4.98]	[4.60]	[4.88]
GDP (lagged)	0.960**	0.955**	0.940**	0.954**
	[6.20]	[6.03]	[6.07]	[6.05]
inflation (food)		-0.001		
		[0.23]		
Inflation (goods and services			0.004	
household maintenance)			[1.24]	
Inflation (fuels)				0.000
				[0.31]
Constant	55.092**	55.169**	51.308**	54.560**
	[4.67]	[4.63]	[4.23]	[4.54]
Observations	72	72	72	72
Number of id	12	12	12	12
R-squared	0.6	0.6	0.61	0.6

Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Table 5: Trust in national Government, national Parliament, and in the European Union

	1	2	3	4	5	6
	Trust in the national Government		Trust in the national Parliament		Trust in the EU	
unempl. spending (lagged)		0.042		-0.014		-0.022
		[0.58]		[0.25]		[0.52]
labor market policies spending (lagged)		0.026		-0.049		-0.047
		[0.37]		[0.93]		[1.14]
unemployment (lagged)		-0.107		-0.021		0.035
		[1.28]		[0.32]		[0.70]
inflation	0.02	0.014	0.039	0.042	0.006	0.013
	[0.49]	[0.33]	[1.31]	[1.37]	[0.26]	[0.53]
infl. squared	-0.001	-0.001	-0.003	-0.004	0	-0.001
	[0.11]	[0.11]	[0.65]	[0.78]	[0.08]	[0.16]
population (lagged)	-1.199	-1.496	-0.279	-0.436	-0.177	-0.141
	[0.85]	[0.98]	[0.26]	[0.37]	[0.21]	[0.15]
GDP (lagged)	0.462	0.421	0.19	0.186	0.27	0.277
	[1.58]	[1.40]	[0.85]	[0.81]	[1.54]	[1.54]
Constant	15.346	20.837	3.061	5.683	0.665	-0.099
	[0.72]	[0.90]	[0.19]	[0.32]	[0.05]	[0.01]
Observations	59	59	71	71	59	59
Number of id	12	12	12	12	12	12
R-squared	0.45	0.47	0.42	0.44	0.65	0.67
F-test	0.4398	0.1584	1.9463	1.7134	0.3164	0.4334
p-value	0.65	0.85	0.15	0.19	0.73	0.65

Notes: Dependent variable is percentage of population expressing trust in the national Government, parliament or in the European Union, respectively. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Table 6: Trust in other institutions as mediating factors

	1	2	3	4
unempl. spending (lagged)	0.083*	0.085*	0.107**	0.101**
	[2.44]	[2.25]	[2.88]	[2.73]
labor market policies spending (lagged)	-0.098**	-0.107**	-0.077*	-0.083*
	[2.97]	[2.93]	[2.14]	[2.31]
unemployment (lagged)	0.091*	0.094*	0.049	0.074
	[2.26]	[2.09]	[1.13]	[1.67]
inflation	-0.02	-0.013	-0.016	-0.02
	[1.05]	[0.59]	[0.72]	[0.91]
infl. squared	0.001	0.000	0.000	0.001
	[0.50]	[0.04]	[0.07]	[0.15]
population (lagged)	-3.074**	-2.835**	-3.165**	-3.070**
	[4.17]	[3.48]	[4.01]	[3.81]
GDP (lagged)	0.875**	0.868**	0.849**	0.852**
	[6.11]	[5.33]	[5.28]	[5.05]
Trust in national Parliament (% pop)	0.289**			0.163
	[3.19]			[0.72]
Trust in national Government (% pop)		0.265**		0.062
		[3.03]		[0.34]
Trust in the EU (% pop)			0.473**	0.323*
			[3.28]	[2.05]
Constant	41.547**	37.747**	43.317**	41.658**
	[3.72]	[3.08]	[3.64]	[3.46]
Observations	71	59	59	59
Number of id	12	12	12	12
R-squared	0.68	0.7	0.72	0.75
F-test	1.2641	0.8871	1.2197	1.6314
p-value	0.29	0.42	0.31	0.21

Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Table 7: Long-term GDP growth

	1	2	3	4	5	6
GDP growth	-0.687*		-0.411		0.156	-0.141
	[2.13]		[1.20]		[0.50]	[0.36]
GDP growth 5 years	0.189					0.12
	[0.89]					[0.58]
GDP growth 10 years	0.321*	0.347**		0.171		0.204
	[2.50]	[3.07]		[1.55]		[1.53]
GDP growth 20 years	0.14					-0.062
	[0.95]					[0.37]
population (lagged)	-0.718	0.23	-0.612	-2.289*	-2.738**	-1.787
	[0.60]	[0.33]	[0.70]	[2.53]	[3.15]	[1.44]
GDP (lagged)				0.732**	0.890**	0.701*
				[3.87]	[4.66]	[2.32]
Constant	12.078	-3.337	10.552	30.433*	36.230**	22.576
	[0.61]	[0.29]	[0.74]	[2.26]	[2.72]	[1.16]
Observations	72	72	72	72	72	72
Number of id	12	12	12	12	12	12
R-squared	0.42	0.32	0.22	0.47	0.45	0.48

Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Table 8: Having profound knowledge on the EU

	1	3	4	2	5	6
inflation	-0.032	-0.05	-0.033	-0.028	-0.034+	-0.031+
	[1.54]	[1.05]	[1.57]	[1.50]	[1.88]	[1.69]
infl. squared	0.003	0.004	0.003	0.003	0.004	0.004
	[0.93]	[0.46]	[0.96]	[0.92]	[1.33]	[1.20]
population (lagged)	-2.736**	-2.599**	-2.753**	-3.602**	-3.407**	-3.271**
	[3.22]	[2.97]	[3.21]	[4.48]	[4.39]	[3.99]
GDP (lagged)	0.828**	0.829**	0.809**	0.984**	0.971**	0.933**
	[4.71]	[4.66]	[4.41]	[6.00]	[6.17]	[5.66]
unempl. spending (lagged)				0.084*	0.159**	0.085*
				[2.17]	[3.17]	[2.24]
labor market policies spending (lagged)				-0.115**	-0.105**	-0.071
				[3.08]	[2.91]	[1.54]
unemployment (lagged)				0.068	0.065	0.078
				[1.42]	[1.43]	[1.64]
know EU, % pop	0.55	0.153	-3.043	0.122	-0.103	-0.627
	[1.26]	[0.19]	[0.35]	[0.29]	[0.25]	[0.99]
inflation*know EU		0.151				
		[0.25]				
inflation squared*know EU		0.009				
		[0.06]				
active labor market policies*know EU						-0.824
						[1.56]
unempl. spending*know EU					-0.993*	
					[2.23]	
GDP*know EU			0.347			
			[0.41]			
Constant	36.806**	34.602*	37.292**	49.206**	46.175**	44.335**
	[2.88]	[2.62]	[2.88]	[4.04]	[3.92]	[3.57]
Observations	72	72	72	72	72	72
Number of id	12	12	12	12	12	12
R-squared	0.5	0.51	0.5	0.63	0.67	0.65

Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

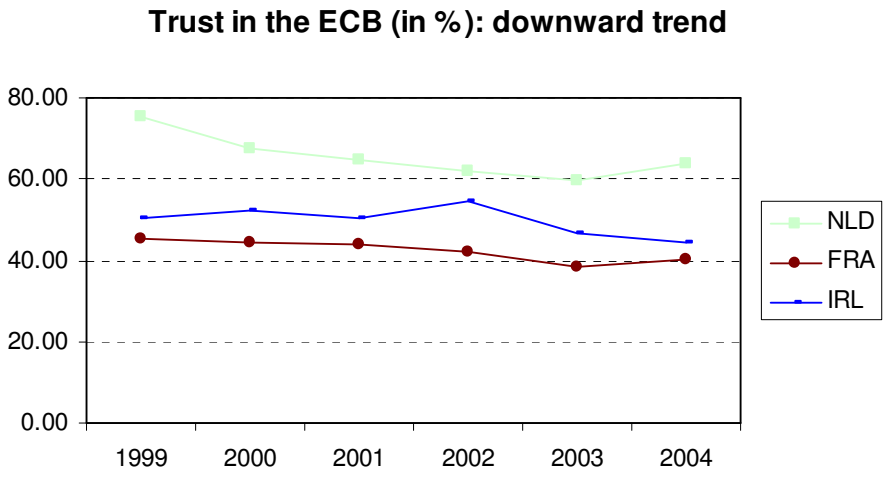
Table 9: Expectations on the economy and personal household

	1	2	3	4	5
unempl. spending (lagged)	0.083*	0.082*	0.077*	0.088*	0.089*
	[2.18]	[2.19]	[2.16]	[2.36]	[2.34]
labor market policies spending (lagged)	-0.117**	-0.105**	-0.115**	-0.118**	-0.116**
	[3.20]	[2.91]	[3.36]	[3.30]	[3.22]
unemployment (lagged)	0.072	0.066	0.093*	0.083+	0.07
	[1.63]	[1.53]	[2.21]	[1.90]	[1.59]
Inflation	-0.029	-0.028	-0.027	-0.029	-0.033+
	[1.56]	[1.60]	[1.60]	[1.63]	[1.80]
Inflation squared	0.003	0.004	0.004	0.004	0.004
	[1.01]	[1.27]	[1.32]	[1.22]	[1.31]
population (lagged)	-3.610**	-3.233**	-3.313**	-3.350**	-3.347**
	[4.54]	[4.05]	[4.41]	[4.23]	[4.14]
GDP (lagged)	0.998**	0.924**	0.914**	0.925**	0.949**
	[6.43]	[5.94]	[6.17]	[5.89]	[6.02]
Expected: Bad state of the economy		-0.101+			
		[1.94]			
Expected: Bad household finances			-0.255**		
			[2.82]		
Expected: Bad personal job situation				-0.304+	
				[1.80]	
Expected: Bad general employment situation					-0.065
					[1.42]
Constant	49.188**	43.824**	45.181**	45.673**	45.426**
	[4.07]	[3.63]	[3.97]	[3.82]	[3.71]
Observations	72	72	72	72	72
Number of id	12	12	12	12	12
R-squared	0.63	0.66	0.68	0.65	0.65

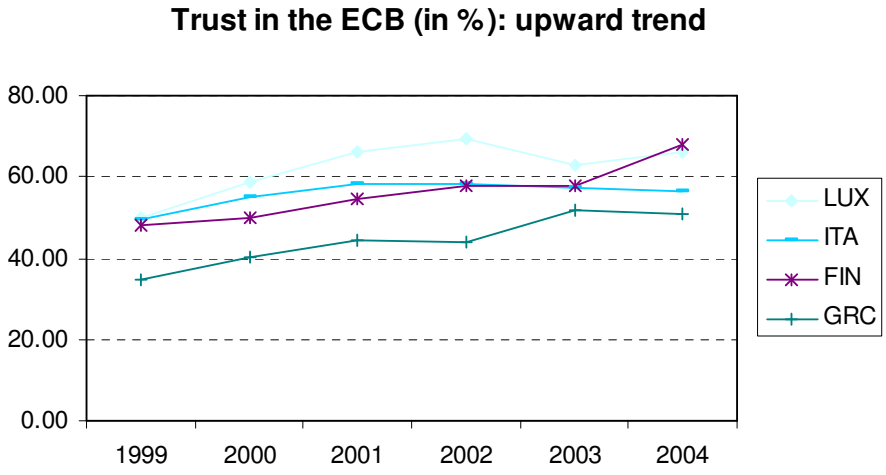
Notes: Dependent variable is percentage of population expressing trust in the ECB. GLS fixed effects estimation. Year effects are included but not reported. '+', '*', '**' denote significant at the 10, 5, or 1 percent levels, respectively.

Graphs

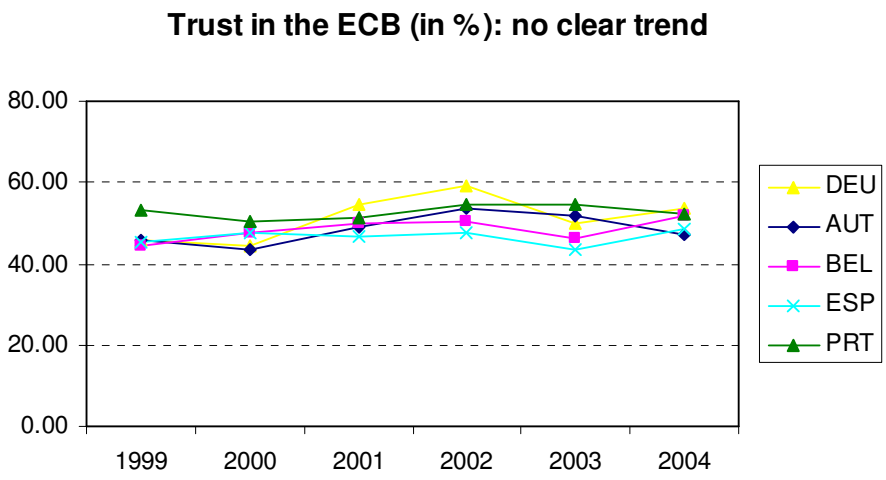
Graph 1



Graph 2:



Graph 3


Trust in the ECB (in %): no clear trend
80.00
60.00
40.00
20.00
0.00
1999
2000
2001
2002
2003
2004
DEU
AUT
BEL
ESP
PRT