Public Attitudes towards Central Bank Independence: Lessons From the Foundation of the ECB

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Muhammad Azmat Hayat
PRES Université Lille Nord de France, Université Lille 1, Laboratoire EQUIPPE
EA 4018, Villeneuve d'Ascq, France.
muhammad-azmat.hayat@ed.univ-lille1.fr

Etienne Farvaque
Corresponding Author: Université du Havre, Faculté des Affaires Internationales, 25 rue Philippe Lebon BP 1123 76063 Le Havre Cedex & Skema Business School.
Etienne.Farvaque@univ-lehavre.fr.

Public Attitudes towards Central Bank Independence: Lessons From the Foundation of the ECB

Muhammad Azmat Hayat[a], Etienne Farvaque[b]

[a] *Equippe – Université de Lille, Faculté des Sciences Economiques et Sociales, Université de Lille 1, 59655 Villeneuve d'Ascq Cedex, France and State Bank of Pakistan ; muhammad-azmat.hayat@ed.univ-lille1.fr*

[b] *Corresponding Author: Université du Havre, Faculté des Affaires Internationales, 25 rue Philippe Lebon BP 1123 76063 Le Havre Cedex & Skema Business School; Etienne.Farvaque@univ-lehavre.fr.*

Abstract

This study examines public opinion in 15 European countries, on the proposal to establish an independent European Central Bank (ECB). Using data from Eurobarometer surveys for 1998 to 2000, which included a specific question on this issue, we show that inflation performance is not sufficient to explain people's preference for an independent central bank: personal characteristics and circumstances have a stronger impact, with gender, employment status, education level, income quartiles, and degree of information and civic concern showing particular relevance.

Keywords: Central Bank Independence, Public Opinion, European Central Bank

1. Introduction

In the most recent decades, academics and governments have endorsed central bank independence as a decisive feature in the achievement of lower, actual and expected, inflation rates. Crowe and Meade (2007), notably, observe that countries with higher levels of inflation in the past, have granted their central banks greater independence. On the one hand, independence implies that the central bank is insulated against influence and pressure from government officials, especially elected ones. On the other hand, the central bank has to shoulder the blame if its policy does not align with the needs of politicians or particular pressure groups. Central bank

"bashing" might produce interesting pay offs for critical politicians (Waller, 1991) unless the bank has the support of the population, in which case it may produce a backlash, and the politicians' political capital may be impaired, to the benefit of the central bank's credibility.

It is somewhat surprising, that public support for a central bank has not received much research attention, with the exceptions of Leertouwer and Maier (2001), Maier (2002), and Maier and Bezoen (2004), who focus on the Bundesbank and the European Central Bank and their policies, and rely mostly on media content analysis.

It could be argued that central bank would receive stronger support, and would be able to implement even restrictive policies if the pros and cons of these policies are understood by the general public, among which stand the foundations of its statutes, i.e. its independence.

Our aim in this paper is to analyze public attitudes to central bank independence. To do so, we make use of the case study provided by the foundation of the European Central Bank (ECB). This historic event received great official attention and provoked the inclusion in the Eurobarometer survey of a specific question in the period of its founding. Although some authors study inflation aversion (Hayo, 1999) or support for the euro (Gärtner, 1997), the attitude of the general public towards central bank independence has been overlooked. We rely here on the Eurobarometer surveys conducted in 1998 to 2000, in 15 European countries to analyze opinions on central bank independence.

Using data on the socio-demographic profiles of respondents and on inflation, this paper examines the variation in the degree of support for an independent ECB and investigates the following questions. First, how much does inflation performance, and overall inflation history, influence public support for an independent central bank? Second, to what extent are public attitudes to central bank independence shaped by political ideology and demographic attributes?

Our results show that a country's inflation history cannot, by itself, explain variations in the preferences of its population in favor of an independent central bank, except if one considers that the current level of central bank independence reflects such an history. If not, then it appears that individual personal characteristics and

circumstances have a much greater impact. Among those characteristics, gender, education, income, satisfaction with national democracy, interest in politics, level of knowledge about regional policies and institutions, importance given to EU Parliament, access and use of media, and employment status are shown to have the greatest relevance. The stakes are high because they involve the ECB's legitimacy (and, ultimately the Euro area's sustainability) and a lack of understanding may threaten the support for its degree of independence. This historical experience also offers lessons for building, or reinforcing, independent monetary institutions.

The paper is structured as follows: Section 2 reviews the background literature; Section 3 discusses the data and methodology; and Section 4 presents the results of the estimates. Section 5 concludes with some suggestions for further research.

2. Literature Review

Studying attitudes and values is now recognized as an important source of information for economists. For instance, Walstad (1997) and Walstad and Rebeck (2002) show that economic knowledge has a direct and significant effect on public viewpoints on many economic issues, and that this knowledge is affected by factors such as education, income, age, gender, race, and political party affiliation. Mayda and Rodrik (2005) study attitudes to protectionism in a large set of countries and find that attitudes towards trade are shaped by a complex set of both economic and non-economic determinants. They find that the latter (socio-demographic background, values, identities, attachments) play a very important role in explaining variations in attitudes to trade. In another study on attitudes to trade, Hainmueller and Hiscox (2006) examine the impact of education and find that individuals with college-level educations are far more likely than others to favor trade openness.

In macroeconomics more particularly, survey data has proved useful. Scheve (2004), for example, uses data on 20 advanced economies to examine public preferences about macroeconomic priorities, defined by inflation and unemployment performance. He finds that lower income earners and women are less inflation averse, while the politically conservative population is more inflation averse. Scheve also finds a substantial difference in inflation aversion across countries and an increased

inflation aversion over time. Along similar lines, Jayadev (2006) assesses the preferences of rich and poor towards anti-inflationary and anti-unemployment policy, using data from the 1996 wave of the ISSP (International Social Survey Program) survey. He finds that the poor are less likely than the rich to prioritize combating inflation rather than unemployment.

The Eurobarometer survey data has been given relevance in several contexts. For instance, Gabel (1998) analyzes the surveys conducted in the period 1978-1992 to assess the relative significance of five theories of European integration. He shows gender, age, and occupation to be relevant variables in explaining support for the European integration process. Nelsen and Guth (2000) analyze the attitudes of men and women to European integration. Based on data from Eurobarometer 42, they find that gender has a significant impact on attitudes to European integration across the European Union (EU) and Norway, with women showing less enthusiasm for the process than men. They show also that women's attitudes are influenced more by greater knowledge about the EU and economic pessimism; men's attitudes are determined more by an interest in politics and a working-class status.[1]

Some studies examine macroeconomic and specific monetary issues using such datasets. Hayo (1999), for example, investigates public attitudes to European Monetary Union (EMU), making use of survey data from Eurobarometer 39 for the 12 original members of the EU. He concludes that a high level of knowledge about EMU positively influences people's opinions on monetary integration. Gärtner (1997) observes that public attitudes towards the euro as a single currency depend on the experience of past national monetary and fiscal policies and on the length of membership in the European Monetary System. People in countries that had experienced high inflation and looser fiscal policies in the past were more in favor of the euro.

[1]In terms of European integration where heterogeneities inside countries can also be a concern for the sustainability of the process, variations in domestic attitudes have been scrutinized. For example, Méon (2002) studies approval rates during the referendum on the Maastricht Treaty in France in 1992. His results show that approval rates were higher in departments where unemployment, long-term unemployment and past geographical mobility were low and social mobility was high.

In a study that is closer to our research, Hayo (1998) finds that inflation is explained not just by central bank independence, and that public attitudes towards inflation exist and are interconnected with central bank independence.[2] Based on Eurobarometer survey data for the period 1976-1993 for European Community members, Hayo finds evidence of a culture of stability in low-inflation countries whose populations are more sensitive to increases in inflation.

However, and whatever the respective merits of the cited studies, there are no existing ones on the determinants of support for central bank independence, and no-one has exploited the responses to the specific questions on this which were included in the Eurobarometer survey during the time of the ECB's foundation. This paper contributes by filling this gap.

3. Data and Methodology

The creation of the ECB was a historic event in modern history that was observed with great attention, and the drafters of the constitution of the ECB made necessary decisions about its [future] independence. The ECB was established by the so-called Treaty of Maastricht (1992) and the Treaty of Amsterdam (1998). Both treaties contain all the conditions imposed by governments to gain access to the monetary union. It was stated that monetary union could not take place later than 1 January 1999, that the European Central Bank in charge of managing the single currency was to be created before that date, and that the work of its predecessor, the European Monetary Institute (EMI) had to be completed before. The independence of the ECB is ensured in its founding treaty. According to Article 108 of the Treaty establishing the European Community (EC):"Neither the European Central Bank (ECB), nor a national central bank (NCB), nor any member of their decision-making bodies may seek or take instructions from Community institutions or bodies, governments of the Member States or any other body". The institutional independence of the ECB is further strengthened by its financial independence, as the ECB has its own

[2]Results in Vaubel (2003) also point to the fact that the sensitivity of the general public to inflation is more significant than central bank independence to explain inflation performance.

budget and cannot bail governments. Some other provisions are also held to ensure the independence of the ECB which include the security tenure of governors of the ECB. An extensive theoretical analysis and empirical evidence on central bank independence laid down the institutional framework of independence of the ECB. As a part of that process, a specific question was included in Eurobarometer surveys to ask Europeans about the independence of their [future] central bank.

We use these data from the Eurobarometer surveys. These surveys, on issues of general interest, have been conducted on behalf of the European Commission since 1973. The results are published in Eurobarometer and are available to researchers at the Gesis website.[3] We use information from Eurobarometer 49 to 53, covering the surveys conducted from May 1998 to April 2000. In 1998 and 1999, there were two surveys per year; in 2000 there was only one survey that included the question that we are interested in. We pooled data on these five waves.[4] The surveys were administered to citizens from Austria, Belgium, Denmark, Finland, France, Germany[5], Great Britain, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden. Tables 1 provides some descriptive statistics. Respondents from the representative samples in each country were asked to assess the following statement (Question n 25 in Eurobarometer 49) about the proposal for an independent European central bank:

"With the European currency, the Euro, there has to be a European Central Bank which is independent of the member states."

The responses are recorded as follows: 1 "in favor", 2 "against", 3 "don't know".[6]

[3]http://zacat.gesis.org/webview/index.jsp

[4]We also estimated the regressions using data from only three surveys conducted in the same period of time over three years; the results (available on request from the authors) do not differ significantly.

[5]East and West.

[6]The respondents in this category were imputed using multiple imputation technique and all equations were re-estimated to check the robustness of our results, without any qualitative modifications of the results. Moreover, as one cannot reject the possibility that respondents first decide to have an opinion and then decide which opinion to have, we run a Heckman selection model. However we conclude in favor of the absence of a selection bias. Full results are available upon request.

Table 1: Support for Central Bank Independence in 15 EU countries

Countries	**Code**	**1998**		**1999**		**2000**	
		For	**Against**	**For**	**Against**	**For**	**Against**
France	FRA	1,485	302	1,406	373	693	195
Belgium	BEL	1,354	255	1,547	275	787	164
Netherlands	NLD	1,754	179	1,680	159	808	79
Germany$^{\Omega}$	DEU	2,722	595	2,868	641	1,335	417
Italy	ITA	1,419	185	1,464	199	732	124
Luxembourg	LUX	963	147	940	112	461	76
Denmark	DNK	1,323	470	1,303	487	631	269
Ireland	IRL	1,346	155	1,509	138	694	108
Great Britain	GBR	1,150	510	969	587	420	363
Greece	GRC	1,384	300	1,303	379	612	178
Spain	ESP	1,248	216	1,242	243	700	118
Portugal	PRT	1,106	186	1,285	207	672	109
Finland	FIN	1,481	290	1,486	333	668	189
Sweden	SWE	1,348	365	1,365	350	605	285
Austria	AUT	1,289	288	1,314	289	635	163
Total		**21,372**	**4,443**	**21,681**	**4,772**	**10,453**	**2,837**

Ω East+West

We measure support or otherwise for the proposal for an independent European central bank based on "in favor" or "against" responses.[7] Public attitudes in favor of an independent ECB during the three years are depicted in Figure 1. Support was strongest in Ireland and the Netherlands[8]; Great Britain's citizens - consistently over the three years – were the least supportive of an independent ECB. Countries belonging to the EMU and current non-EMU members show clear differences in their support for an independent ECB (see Figure 1). However, in both groups of

[7]As in every survey, the framing of the question may suffer from interpretative biases from the respondents, which cannot be avoided. Among these, the possibility that respondents answer while having in mind the independence of any central bank (i.e. not the particular case of the ECB) figures out prominently, as will become apparent below in our results. Also, if one assumes that the general public does not know much about monetary policy, the importance of the independence from the member states may be misunderstood. As a consequence, all our conclusions have to be read with this cautionary note in mind.

[8]Of course, one reason for the relatively strong support for the ECB observed in the Netherlands may be the fact that Wim Duisenberg was the first president of the ECB.

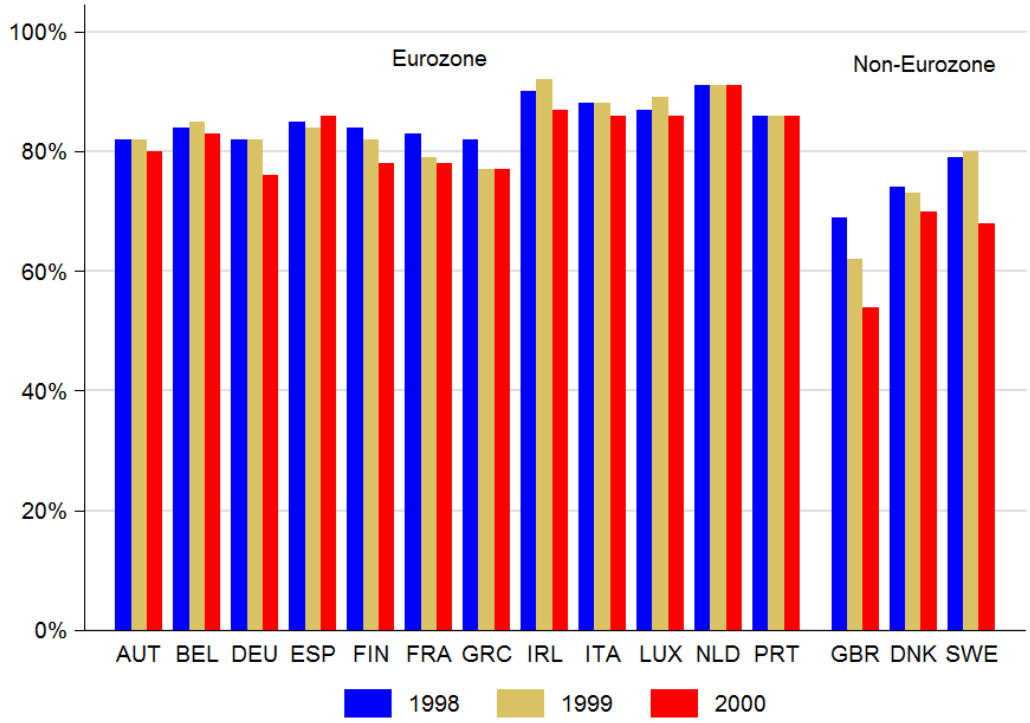

Figure 1: Support of an independent ECB–by Country

countries, there is a slight trend (apparent in Figure 1) towards decreasing support as time passes and the prospect of European monetary union (and the establishment of the ECB) gets closer.

In line with the literature investigating public preferences for economic issues, socio-demographic variables are considered to evaluate their influence on the opinions of individuals about the desirability of central bank independence. The role of individual characteristics and circumstances is measured through gender, age, education, income, employment status, political placement, level of knowledge about the EU, degree of political information and civic concern, and importance given to EU Parliament. Gender has been shown to be important in evaluations of individuals' responses, with Nelsen and Guth (2000) and Scheve (2004) indicating that women are less enthusiastic about economic issues.

Age can also be a decisive factor: Farvaque et al. (2010) show that the share of older people in the population acts as a strong weight against inflation, and Malmendier and Nagel (2009) show that individuals of different ages react differently to past inflation experience.

Walstad (1997) and Walstad and Rebeck (2002) observe that education plays as a vital role in shaping an individual's preference for an economic issue, as in measuring labor market skills and cognitive abilities (a feature confirmed in, e.g., Scheve, 2004). But there is a lack of consensus about the effect of education on specific economic issues: for example, Hainmueller and Hiscox (2006) find that if people with college education are relatively pro-trade, other education degrees are not significant for evaluating trade policy. Here, the variable Education is the age of the respondent when full-time education was discontinued, and is an ordered categorical variable measured on a 1 to 4 scale where 1 is "up to 15 years", 2 is "still studying", 3 is "16 to 19 years", and 4 is "20+ years".

The income variable ranges from 1 to 4, and indicates whether the respondent is in the first, second, third, or fourth quartile of the income distribution in the respondent's country. As stated above, this variable proved influential in Jayadev (2006) in terms of people's aversion to inflation and therefore might be relevant in terms of supporting the establishment of an independent central bank.

Hudson (2006) presents evidence that personal circumstance have a strong impact on an individual's trust in institutions. Among these circumstances, employment status is of course important: unemployed people may be more averse to an independent (and thus more conservative) central bank since independence might lead to a distortion of the Phillips curve trade-off that can arise at very low levels of inflation (see Akerlof et al., 1996; Stock and Watson, 2010). This distortion can increase the sacrifice ratio, and may be perceived as costly by (part of) the electorate, notably the unemployed segment of the society.[9]

[9]Even though the precise mechanism may not be fully understood by laypeople, the results of the literature (see for example Scheve, 2004, or van Lelyveld, 1999) can be understood as a confirming such an interpretation.

Political ideology is accounted for by a political placement indicator (i.e. the way people position themselves on the political axis from "left" to "right" through "center"). Political placement obviously can change peoples' attitudes to important economic issues, especially inflation. We add to this indicator others related to frequency of "discussion of political matters" and "satisfaction with democracy in [one's] country". These should reflect the degree of political information and civic concern of the individual. More precisely, frequency of the political discussions is indicative of the individual's interest in current politics.

Respondents that are more interested in political discussion and debate can be expected to be more informed about current political scenarios and affairs, and thus about the costs/benefits of central bank independence. The degree of satisfaction with national democracy captures the respondent's trust in the current national political system. As Anderson (1998) shows, a higher degree of satisfaction with domestic politics increases the support for European institutions. However, as Carey (2002) and Sánchez-Cuenca (2000) claim, it might also be the case that people dissatisfied with national politics might support the EU because they see it as a remedy for unsatisfactory domestic politics. The sign of this relation (which can be understood as a matter of complementarity or substitutability between national and European institutions) therefore needs to be settled empirically in the case of the foundation of a European central bank.

We include two variables that measure the level of knowledge about the EU, its policies and institutions, and access to and use of information sources, in order to check the respondent's level of information and awareness.[10] Knowledge about the EU and its policies is measured on a three point scale of low, good and very good, while access to and use of information sources is captured by a media use index. Nelson (1975) observes that newspapers are important in disseminating the knowledge that the individuals incorporate into their information set. The index of

[10]Blinder and Krueger (2004) observe that a majority of respondents in a representative sample of America show a strong desire to be well informed about major economic policy issues and that the main sources of information they consider are television and newspapers.

media use is constructed based on the frequency of watching the news on television, reading a daily newspaper, and listening to the news on the radio, in a week. This index is an ordered categorical variable with four categories: low, fair, frequent, and very frequent. The first category *low* (use of information sources) is based on the use of three media (television, newspapers, radio) no more than once or twice a week. *Fair* captures one of the three media every day or several times a week, and the other two, not more than once or twice a week. *Frequent* is based on two media every day or several times a week, the third medium not more than once or twice a week. The last group, the *more frequent* users, are the respondents who follow news on TV, radio, and newspapers every day or several times a week. This index determines the information level of a respondent about current economic and political issues in the country. Unfortunately, this index is only available for three surveys, in 1998 and 1999.

To account for the general attitudes of the respondents towards the EU and its institutions, we include the responses for the question about the importance of the European Parliament. Euro-skeptics are probably much less likely to favor an independent European institution, if only because it is another European one. The importance of the European Parliament is asked to be judged on a four point scale: not at all, not very important, important and very important. Table 2 presents the descriptive statistics of variables while summary statistics in favor of central bank independence are presented Table 3.

As already stated, central bank independence and inflation are strongly (and negatively) correlated, a feature repeatedly evidenced in the literature (see e.g., Carlstrom and Fuerst, 2009). Also, inflation shapes public opinion on the policies of a central bank. To account for this, we include the current and historical inflation, and the maximum inflation that the respondent has known in her lifetime. We also consider the degree of central bank independence in the respondent's country (data taken from Polillo and Guillén (2005), which allows to have time-varying measures of central bank independence). These form the baseline variables in our estimates of public opinion on the desirability of central bank independence. Data on inflation come from the *International Financial Statistics* which measure inflation as the an-

Table 2: Descriptive Statistics

Variables	**Mean**	**Std.**	**Min**	**Max**
Gender	0.52	0.5	0	1
Age (Exact)	43.87	17.87	15	99
Age (categories)	2.45	0.95	1	4
Age Education (categories)	2.19	0.96	1	4
Income Quartiles	2.47	1.11	1	4
Unemployed	0.06	0.23	1	0
Retired	0.2	0.41	1	0
Political Ideology	1.93	0.76	1	3
Political Discussion	1.83	0.63	1	3
Democracy Satisfaction	2.62	0.79	1	4
EU Parliament Importance	3.09	0.79	1	4
EU Knowledge	1.52	0.62	1	3
Use of Media	3.14	0.9	1	4
Inflation(t)	1.79	1.12	–0.27	5.56
Inflation (t-1)	1.74	1.11	–0.27	5.54
5 years average Inflation	2.57	1.70	0.77	9.60
10 years average Inflation	3.89	2.58	1.88	13.09
Maximum Inflation	16.48	7.12	3.18	30.0
CBI Index	0.81	0.14	0.47	0.92

nual percentage change in the consumer price index.[11] Introducing macroeconomic variables is standard in the type of research implemented here, and is even more pertinent to the questions in this study since macroeconomic experience can strongly shape people's preferences and thus their attitudes. This is even more important that De Haan and Van't Hag (1995) and Vaubel (2003) show that the experience of hyperinflation since 1900 has a significantly positive effect on central bank independence. However, it also has to be acknowledged that the impact of such extreme

[11]Data on maximum inflation for Germany before 1992 is obtained from Reinhart and Rogoff (2010).

Table 3: Summary Statistics for the Opinion in Favor of an Independent ECB

Variables	**Mean**	**Std.**	**Observations**
Full Sample	0.82	0.39	65,558
Breakdown by:			
Gender			
Male	0.83	0.38	33,105
Female	0.81	0.40	32,453
Age			
15-24 years	0.83	0.38	10,755
25-44 years	0.82	0.38	25,678
45-64 years	0.82	0.39	19,387
65+ years	0.78	0.42	9,730
Education			
Less than 15 years	0.77	0.42	15,968
16-19 years	0.81	0.39	24,876
20+ years	0.85	0.35	17,290
Still Studying	0.84	0.37	7,350
Occupation			
Unemployed	0.78	0.41	3,680
Retired	0.78	0.41	13,005
Income Quartiles			
Q1	0.76	0.43	10,907
Q2	0.8	0.40	11,815
Q3	0.83	0.37	12,450
Q4	0.86	0.35	11,990
Political Ideology			
Left	0.81	0.39	17,827
Center	0.82	0.38	23,232
Right	0.83	0.38	14,212
Political Discussion			
Never	0.78	0.42	17,354
Occasional	0.83	0.38	38,663
Frequent	0.83	0.38	9,162
Democracy Satisfaction			
Not at all satisfied	0.69	0.46	4,634
Not very satisfied	0.78	0.42	14,531
Fairly satisfied	0.85	0.36	26,595
Very satisfied	0.85	0.36	5,318
EU Parliament Importance			
Not at all important	0.59	0.49	1,740
Not very important	0.77	0.42	9,454
Important	0.85	0.36	27,701
Very important	0.85	0.36	19,071
EU Knowledge			
Low	0.79	0.41	32,367
Good	0.85	0.36	27,336
Very good	0.85	0.36	4,881
Use of Media			
Low use	0.76	0.43	1,663
Fair use	0.81	0.39	7,106
Frequent use	0.82	0.38	12,589
More frequent use	0.84	0.36	17,988

experiences may decay, as shown by Ehrmann and Tzamourani (2011).[12]

Since our dependent variable is a binary variable that takes the values of one and zero depending on the respondent's opinion in favor or against the proposal of independence of ECB, we observe that

$y_{ijt} = 1$ if $y^*_{ijt} > 0$

$y_{ijt} = 0$ if $y^*_{ijt} \leq 0$

where

$$y^*_{ijt} = X^{'}_{ijt}\beta + \varphi_j + \tau_t + \epsilon_{ijt} \tag{1}$$

Equation (1) represents how an individual's support for central bank independence y^*_{ijt} depends on the vectors of the observed variables (X_{ijt}), unobserved country effects (φ_j) and time effects (τ_t) and a random error (ϵ_{ijt}). The probability of support can be written as

$$\Pr\left(y_{ijt} = 1 \mid X\right) = \Pr\left(y^*_{ijt} > 0 \mid X\right) = \Pr[\epsilon_{ijt} > -(X^{'}_{ijt}\beta + \varphi_j + \tau_t) \mid X] = F(X^{'}_{ijt}\beta + \varphi_j + \tau_t)$$

So our regression equation takes the form

$$CBOP_{ijt} = \alpha + \beta^{'}_l Inf_{jt} + \gamma^{'}_m CBI_{jt} + \lambda^{'}_n D_{ijt} + \delta^{'}_v P_{ijt} + \eta^{'}_u I_{ijt} + \varphi_j + \tau_t + \varepsilon_{ijt} \tag{2}$$

where $CBOP_{ijt}$ is the opinion of a respondent i in country j at the time of the survey, Inf_{jt} is the inflation (historical inflation or maximum inflation experienced) at time of survey in the jth country, CBI_{jt} is the central bank independence index in country j at the time of the survey, D_{ijt} is a vector of "socio-demographic" characteristics such as gender, age, education, employment status and income, P_{ijt} is the political ideology of the ith respondent at the time of the survey, I_{ijt} is the level of information and civic concern of the respondent. Unobserved country effects and time effects are represented by φ_j and τ_t respectively whereas ε_{ijt} is the error term.

We estimate the parameters of model (2) using logit regressions. Also, since

[12]Note however that the analysis in Vaubel (2003) does not only indicate that central bank independence is less significant than sensitivity to inflation in explaining inflation, but that central bank independence drops out if sensitivity to inflation is included.

we are merging country level inflation with micro data, it is important to consider the possibility that disturbances will be correlated across countries. Moulton (1990) shows that standard errors from a usual maximum likelihood estimation can be biased seriously downwards if the disturbances are correlated within the groupings that are used to merge aggregate with individual-level data. Hence, standard errors are clustered by country and require the much weaker assumption that errors are independent across countries but not necessarily across every survey respondent within a country.

Another important issue in the analysis is the weighting of the survey data. We follow the suggestion of Dumouchel and Duncan (1983) to include sampling weights and interaction terms between the weights and the independent variables in the regressions to detect possible misspecifications. In almost all cases, we cannot reject the hypothesis that the coefficients of the sampling weights and the interactions terms are equal to zero. This indicates that our results are not sensitive to the weighting and thus we base our results on unweighted data.

Finally, it has to be acknowledged that every econometric analysis of survey data, as in this study, has some intrinsic limitations. Firstly, much of the data is categorical in nature, even for the variables of continuous nature, like income. Secondly, as with any survey data, there is limited item non-responses for some variables. The large number of observations cannot fully offset these caveats: the statistical robustness of the results should not forbid one to consider them with a pinch of salt.

4. Empirical Evidence

We first present the baseline evidence on the influence of current and historical inflation experience and the level of central bank independence on public opinion for the establishment of an independent central bank. Historical inflation is successively defined by the one-year lagged, and the five- and ten-year average inflation experienced by each country prior to the survey and maximum inflation known in the respondent's lifetime. Results are reported in Table 4.

The estimated marginal effects for all inflation types (current inflation, lagged inflation and historical long-term inflations, measured by the five- and ten-year av-

erages) are insignificant. The only significant measure related to inflation is the maximum inflation known in the respondent's lifetime. The negative sign however indicates that respondents consider that independence of the central bank may not by itself reduce the possibility of high or hyper-inflation in the future, except if the central bank of the respondent's country is already independent, as the level of current independence of the central bank is positive and significant, with a coefficient superior to the one on maximum inflation. Hence, all in all, our results suggests that inflation aversion may be mediated by central bank independence.

The results in Table 4 show important cross-country variations. If Germany is considered as the reference country, the coefficient estimates of each country indicate whether support for an independent ECB is lower or higher than in Germany holding all other variables at their mean. We see that respondents in Denmark, Great Britain, and Sweden show much lower degrees of support for an independent ECB. The substantial difference in the magnitudes of the coefficients is the highest for the marginal effects for estimate (1), with coefficients equal, for Great Britain, to -0.155, compared to 0.097, for the Netherlands. This means that, controlling for economic performance, the average UK citizen is estimated to have an expected probability of 0.58 in favor of an independent ECB, compared to 0.88 for the Netherlands and 0.76 for Germany. Hence, there are clear national differences in attitudes towards ECB independence, with an apparent cleavage between the prospective members of the (present) Euro area and the more reluctant candidates.

Table 5 details the results of an extended equation, adding individual respondent characteristics to maximum inflation and country and year effects. Note that the measure of maximum inflation also loses its significance when combined with individual characteristics. These attributes clearly dominate respondents' behavior, but it is not the case with central bank independence, which is generally significant and positive. Hence, living in a country with a high degree of independence of the central bank strongly impacts the support for a new independent central bank, which hints at a perception by the general public of the benefits of such an institutional

Table 4: Impact of Current and Historical Inflation Experience

Regressors	(1)	(2)	(3)	(4)	(5)
Inflation(t)	0.008				
	(0.006)				
Inflation(t-1)		0.005			
		(0.007)			
5-Years Average Inflation			-0.003		
			(0.008)		
10-Years Average Inflation				0.01	
				(0.012)	
Maximum Inflation					-0.002***
					(0.001)
CBI Index	0.056***	0.063***	0.060***	0.052**	0.061***
	(0.016)	(0.022)	(0.021)	(0.025)	(0.022)
France	0.005**	0.007**	0.005*	0.009**	0.002
	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)
Belgium	0.032***	0.036***	0.038***	0.038***	0.030***
	(0.004)	(0.003)	(0.002)	(0.001)	(0.003)
The Netherlands	0.097***	0.102***	0.109***	0.102***	0.101***
	(0.007)	(0.007)	(0.006)	(0.005)	(0.002)
Italy	0.062***	0.067***	0.077***	0.053**	0.076***
	(0.007)	(0.007)	(0.013)	(0.022)	(0.002)
Luxembourg	0.065***	0.070***	0.072***	0.069***	0.063***
	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
Denmark	-0.065***	-0.054***	-0.049***	-0.049***	-0.054***
	(0.010)	(0.014)	(0.012)	(0.011)	(0.011)
Ireland	0.084***	0.093***	0.099***	0.092***	0.100***
	(0.009)	(0.007)	(0.005)	(0.006)	(0.003)
Great Britain	-0.155***	-0.144***	-0.131***	-0.159***	-0.119***
	(0.013)	(0.022)	(0.019)	(0.033)	(0.016)
Greece	-0.037**	-0.032	0.01	-0.135	0.005
	(0.018)	(0.029)	(0.055)	(0.165)	(0.006)
Spain	0.032***	0.040***	0.050***	0.024	0.053***
	(0.009)	(0.008)	(0.014)	(0.025)	(0.004)
Portugal	0.043***	0.050***	0.062***	0.015	0.071***
	(0.010)	(0.010)	(0.015)	(0.052)	(0.006)
Finland	0.012**	0.019***	0.019***	0.017***	0.020***
	(0.005)	(0.004)	(0.005)	(0.006)	(0.004)
Sweden	-0.023***	-0.023***	-0.029***	-0.044**	-0.032***
	(0.006)	(0.007)	(0.005)	(0.020)	(0.004)
Austria	0.012***	0.016***	0.016***	0.014***	0.007*
	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)
Observations	65,558	65,558	65,558	65,558	65,558
Pseudo R-Sq	0.03	0.03	0.03	0.03	0.03

Notes: The table reports estimated average marginal effects with robust standard errors clustered by country in parentheses. All models are estimated using time fixed effects. Germany is the reference country. ** $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

arrangement.[13]

Gender is significant across all the estimated models, and has a negative sign indicating that women, ceteris paribus, are less passionate about ECB independence. As already stated, this is be related to the more general trend in women's attitudes to economic issues, or to a more asserted knowledge by men (Williamson and Wearing, 1996). In considering how the age of the respondent impacts on his or her support for the CBI, our estimates show that age reveals no significance on the support.

The most prominent impact, visible in nearly all the specifications, is related to education. Number of years of education has a positive influence on respondents' support for an independent ECB. Recall that the variable is defined as the age when the respondent finished full time education; note also that the reference category is those individuals who left full time education at age 15 or before. We can see then that respondents with the highest education levels are more supportive of an independent ECB. This is consistent with the literature on public opinions on economic issues. The coefficients of the people who left education at age 20 or over are nearly twice as high as the coefficients of those who left in their teenage years. This may also signal a knowledge of foreign languages, which could help to understand what is going on at the European level.

In comparing occupations, unemployed and retired respondents are less enthusiastic about central bank independence. The result for unemployment is consistent with the hypothesis of a higher concern for a worse unemployment-inflation trade-off at low levels of inflation.[14] Retired people are less negative about central bank independence than the unemployed, which may be a sign that they would be less affected by the existence of an independent central bank since their preferences intrinsically tend towards low inflation (if only because the degree of nominal indexation of pen-

[13]Such a result qualifies Van Lelyveld (1999), who could not find a relation between historical inflation experience and survey respondents degree of inflation aversion. This relation could be mediated by the independence the central bank has received (Farvaque and Mihailov, 2009).

[14]In such a situation, the unemployment rate in the country may appear as a natural macroeconomic determinant, but due to a strong degree of correlation between inflation and unemployment rates, we are unable to introduce it at this stage.

sions is generally lower than for wages, or because their accumulated assets may not be protected against inflation).[15]

The coefficients of income quartiles are positive, showing (with the first - lowest - quartile as the reference) that support for an independent central bank is increasing with income. This result is consistent with those in Scheve (2004) and Jayadev (2006) on inflation aversion. Scheve (2004) explains that all else being equal, low-income groups have a higher probability of unemployment. Consequently lower-income groups are more concerned about unemployment than inflation. This section of the population may be more fearful of the implications, in terms of a less active monetary policy for instance, of a more independent central bank. This result is also confirmed by the negative coefficient of Unemployed (the priorities of people on the dole will more likely be a greater concern for a less active monetary policy, see above), and a positive coefficient of the higher income quartiles, revealing that higher income individuals are more in favor of an independent central bank. Schneider and Frey (1987) also observe that high income recipients are more concerned about inflation because they are more seriously affected by it.

Affiliation to a political spectrum in the country has no effect on support for an independent central bank. These results on political orientation are in line with those in Kaltenthaler et al. (2010) but contrast with those in Scheve (2004). However, although political affiliation does not seem to matter, knowledge about politics and intensity of political discussions have significant positive impacts for an independent ECB. Individuals who discuss politics occasionally or frequently place higher support for independence than people who never discuss political matters. These results tend to show that people with greater awareness and/or greater civic concern are more supportive of independence. This is confirmed by the result that better access and use of information (measured by the media use index) has a sizeable impact on people's opinions. The coefficients of the three categories are positive and significant (with lowest use of media as the reference level), and show that higher levels of media use promote higher support for an independent ECB. This result

[15]Note that the retirement variable is potentially picking up the age effect.

for the European population as a whole echoes a study by van der Cruijsen et al. (2010) on Dutch households, which shows that use of media correlates with knowledge and understanding of the ECB's monetary policy. Our results also show that more knowledge about regional politics and institutions has a positive impact on support for the independence of a ECB, as well as the perceived importance of the European Parliament . The latter shows that the higher the degree of perception of the importance of the European Parliament, the higher the support for the European central bank independence.[16]

Finally, satisfaction with national democracy is positive and significant. Individuals more satisfied with their national democracy are more supportive of the independence of the ECB, compared to the respondents with lower levels of satisfaction. The magnitudes of the coefficients of the 'fairly satisfied' and 'very satisfied' groups are nearly twice as high as those in the 'not very satisfied' category. This could mean that respondents consider that the national government was right to agree to an independent ECB.

This provides another important insight, that people who tend to be satisfied with their national political system are more supportive of an independent ECB. This adds to the support for the now traditional view of the gains from delegating monetary policy to an independent institution (Rogoff, 1985), and to the idea that national and European institutions are complementary more than substitutes (see, e.g., Anderson, 1998), since dissatisfied populations think that upper-tier levels of government will help remedy the misery of national politics.

If the data were available, it would be interesting to compare our dataset on attitudes with data related to other periods and other continents; nevertheless, our results from the founding period of the ECB are important.

First, even though central bank independence is now recognized by pundits to be an important feature of any monetary institutional setting, our results tend to

[16]Note that, in line with the potential interpretative biases we mentioned above, the respondents who know more about the EU and the European Parliament may also be more supportive of a European Central Bank, whatever its degree of independence.

Table 5: Socio-demographic Factors and Political Ideology

Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Maximum Inflation	-0.001	-0.001	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CBI Index	0.059***	-0.013	0.068***	0.074***	0.086**	0.022	-0.039	0.092***	1.328***
	(0.023)	(0.019)	(0.024)	(0.024)	(0.034)	(0.020)	(0.030)	(0.021)	(0.133)
Gender	-0.019***	-0.018***	-0.018***	-0.015**	-0.016***	-0.015**	-0.016***	-0.013**	-0.011
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.005)	(0.007)	(0.007)
Unemployed	-0.032***	-0.013	-0.032***	-0.031***	-0.021***	-0.029***	0.001	-0.033***	-0.014
	(0.006)	(0.009)	(0.007)	(0.007)	(0.006)	(0.008)	(0.010)	(0.009)	(0.011)
Retired	-0.015**	-0.004	-0.017**	-0.016**	-0.013*	-0.014*	-0.002	-0.019**	-0.011
	(0.006)	(0.005)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.007)	(0.008)
Age (BL:65+ years)									
15-24 years	-0.006	-0.023	-0.003	0.003	-0.01	-0.011	-0.034**	0.012	-0.027
	(0.017)	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)	(0.022)	(0.027)
25-44 years	0.002	-0.006	0.004	0.004	0.006	-0.006	-0.008	0.008	-0.006
	(0.011)	(0.012)	(0.010)	(0.011)	(0.012)	(0.011)	(0.013)	(0.013)	(0.014)
45-64 years	0.013	0.003	0.013*	0.012	0.013	0.005	-0.004	0.016	-0.003
	(0.008)	(0.009)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.011)	(0.011)
Education (BL:Up to 15 years)									
Still studying	0.068***	0.067***	0.065***	0.059***	0.060***	0.052***	0.051***	0.059***	0.048**
	(0.012)	(0.015)	(0.013)	(0.013)	(0.014)	(0.012)	(0.016)	(0.014)	(0.020)
16-19 years	0.043***	0.027***	0.042***	0.038***	0.035***	0.034***	0.017*	0.035***	0.008
	(0.009)	(0.008)	(0.009)	(0.009)	(0.011)	(0.009)	(0.010)	(0.008)	(0.013)
20 and above	0.093***	0.071***	0.088***	0.081***	0.075***	0.073***	0.052***	0.081***	0.046***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.010)	(0.013)	(0.009)	(0.015)
Income Quartiles (BL:Q1)									
Q2		0.032***					0.012		0.016*
		(0.007)					(0.009)		(0.009)
Q3		0.056***					0.040***		0.043***
		(0.009)					(0.011)		(0.012)
Q4		0.079***					0.056***		0.051***
		(0.007)					(0.009)		(0.012)
Political Ideology (BL:Centre)									
Left			-0.013	-0.016	-0.013		-0.012		-0.02
			(0.010)	(0.010)	(0.009)		(0.009)		(0.013)
Right			0.006	0.005	0.01		0.012		0.012
			(0.012)	(0.012)	(0.013)		(0.013)		(0.012)
Political Discussion (BL:Never)									
Occasionally				0.044***	0.041***		0.019***		0.014*
				(0.007)	(0.006)		(0.005)		(0.008)
Frequently				0.041***	0.047***		0.016**		0.007
				(0.011)	(0.011)		(0.008)		(0.012)
Satisfaction with Democracy (BL:Not at all satisfied)									
Not very satisfied					0.090***		0.082***		0.065***
					(0.009)		(0.009)		(0.013)
Fairly satisfied					0.156***		0.134***		0.106***
					(0.011)		(0.011)		(0.013)
Very satisfied					0.170***		0.155***		0.123***
					(0.013)		(0.013)		(0.017)
EU Knowledge (BL:Low)									
Good						0.029***	0.028***		0.030***
						(0.007)	(0.008)		(0.009)
Very good						0.035***	0.031***		0.027***
						(0.009)	(0.011)		(0.010)
EU Parliament Importance (BL:Not at all important)									
Not very important						0.182***	0.143***		0.159***
						(0.019)	(0.024)		(0.023)
Important						0.268***	0.224***		0.252***
						(0.031)	(0.029)		(0.033)
Very important						0.315***	0.275***		0.299***
						(0.036)	(0.031)		(0.030)
Media use Index(BL:Low use)$^{\xi}$									
Fair use								0.060***	0.070***
								(0.009)	(0.016)
Frequent Use								0.070***	0.061***
								(0.016)	(0.019)
More Frequent Use								0.092***	0.072***
								(0.015)	(0.019)
Observations$^{\neq}$	65,476	47,118	55,207	54,934	42,923	57,156	29,195	39,310	14,656
Adjusted Pseudo R-Sq	0.04	0.04	0.04	0.04	0.06	0.06	0.08	0.04	0.08

Notes: The table reports estimated average marginal effect.All regressions include country and year dummy variables. Robust standard errors clustered by country are presented under each marginal effect. ξ Not available for 2000.

$\neq$ All models were also re-estimated after imputing the missing observations using multiple imputation technique; results were qualitatively unchanged and are available on request. BL:Basline; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

show that the general public is able to endorse its importance. Second, for countries considering whether to establish a new central bank or to revise/amend central bank laws, our results show clearly that the general public can be driven to understand these reforms, and the window of opportunity for their introduction may be larger than had been assumed (Acemoglu et al., 2008). Thirdly, our results have some implications for central bank policies and communication strategies. Although they indicate a fairly good support for their independence, they reveal that some parts of society are less enthusiastic. Central banks need to maintain communication and diffusion of information to the public generally and also focus on and provide more specific information to those groups that our study has revealed as being less convinced.

To check for the robustness of our results, we have run several other estimates. First, even though the surveys we make use of do not include the specific inflation perceptions or expectations, they however include an "Economic expectations" variable. Even though this variable (asking respondents if they think that future economic situation will be worse, better or if they expect no change) is not available for all the surveys, we have run estimates that provide for a robustness check of our result with regard to the inclusion of specific economic perceptions from the respondents. Our results are basically identical and including this variable, although estimates are based on a much smaller number of observations, are fully supportive of our baseline estimates. Second, we have computed respondents' maximum adult lifetime inflation rates ("maximum inflation experienced after the age of 15"). This variable is also insignificant and our results are in conformity with the previous ones with the maximum inflation experienced.[17]

5. Conclusion

This study examines public opinion in Europe on the proposal to establish an independent European Central Bank (ECB). The benefits of central bank independence have been extensively examined and are no longer disputed since there is

[17]The results are available from the authors upon request.

ample empirical evidence that it results in lower inflation and ensures a more stable economic environment. As a consequence, central bank independence has increased since the 1990s. Yet, there has been no comprehensive analysis of public preferences for central bank independence. This paper provides such an investigation, based on Eurobarometer opinion surveys in 15 European countries over the period 1998 to 2000, building on the historical event of the foundation of the European Central Bank.

We study individual level characteristics and inflation factors that shape mass opinion in favor of central bank independence. Our logistic regression estimates demonstrate that inflation by itself is not sufficient to explain peoples' support for an independent central bank in Europe. Individual characteristics and circumstances play a bigger role in shaping preferences for central bank independence. Significant features include gender (women are less supportive), education (support increases with education), income (higher income means higher support), satisfaction with national democracy (greater satisfaction increases support), frequent discussion of politics (more frequent discussion results in more support), knowledge about the EU (higher level of information leads to higher support), importance given to EU Parliament (higher importance given leads to higher support), use of media (more regular news consumption translates into more support) and employment status (unemployed and retired are less supportive). Moreover, our results show that current level of central bank independence strongly impacts public opinion in favor of establishing an independent central bank.

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