RIVISTA ITALIANA DI ECONOMIA DEMOGRAFIA E STATISTICA

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INDICE

DEMOGRAPHIC AND SOCIO-ECONOMIC FACTORS INFLUENCING THE BREXIT VOTE

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1. Introduction

The referendum on the United Kingdom' staying in the European Union ("British exit" or "Brexit") took place on Thursday 23rd June 2016. It was probably the most important political event in recent British history and a central theme in the political agenda because of the possible implications and consequences of citizens' choices. The interest of the electorate on this issue was reflected in the fact that turnout, at 72.2%, was the highest since the general election in 1992. On the question: "*Should the United Kingdom remain a member of the European Union or leave the European Union?*", 51.9% of the electorate (17,410,742) voted to leave the EU.

Figure 1 – *Referendum 23rd June 2016: Turnout and Percentage of Leave by local government district.*
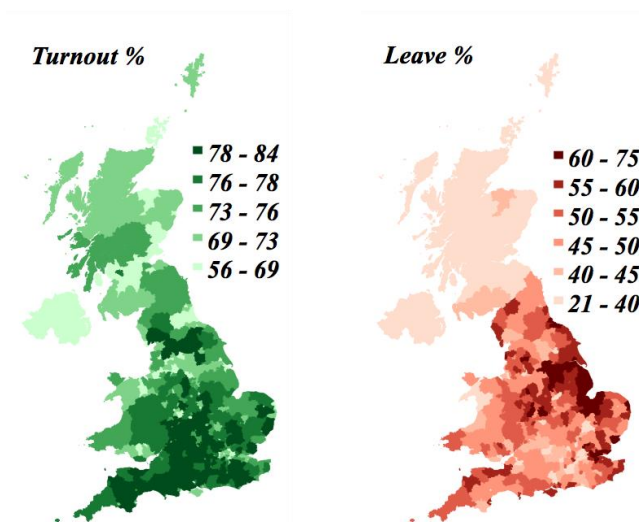
Personal processing of data of the UK Electoral Commission Office (www.electoralcommission.org.uk)

The 2016 referendum was the second time that citizens were asked for their point of view on the issue of staying within the *"Europe system"*. The so-called "*Common Market Referendum*" was held on 5th June 1975. It was the first ever national referendum in the history of the UK[1] and the electorate had to vote yes or no on the question: "*Do you think the UK should stay in the European Community (Common Market)?*". The valid votes were just under 26 million (with a turnout of about 65%)[2] and 67% voted on continued British membership of the European Community. The image that emerged was that of a country "strongly pro-European". At the 2016 referendum the result was profoundly different and the situation was overturned compared to 1975, returning the image of the country as one divided between Euroskeptics and pro-Europeans.

In this paper, I will try to provide a possible key to the Brexit vote and, above all, to identify some of the potential factors behind a far different electoral choice than that made 40 years previously.

Did the "European theme" truly affect the electoral outcome? How did the main issues of the electoral campaign, immigration and economic crisis, influence the electoral choices? Which demographic and socio-economic factors have had an impact on the voting pattern? How much did they influence the results?

The paper is structured as follows. Section 2 presents the hypotheses dealt with in this work about the main determinants of Brexit vote. Section 3 describes data, variables and methodology. Section 4 presents the empirical results and discussion and section 5 the conclusion.

2. Determinants of the Brexit vote

One useful starting point for explaining the results is to focus on the electoral issue: the relationship between UK and EU, which has always been rather controversial. This has always been a central issue in British public opinion. Britain is, in fact, the country where the term Euroscepticism was created in the 1980s. Over the years this sentiment has been manifest in politics, the media and public opinion. The main findings of the EU sponsored public opinion survey, *Eurobarometer*, consistently show that in the UK public regard for EU membership is significantly lower than the EU average. For example, in the Standard Eurobarometer Survey of spring 2016 (EB85), 36% of British respondents had a negative image of the EU[3] (in the survey of spring 2015 - EB83 - the percentage

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[1] It was, in fact, the first referendum taking place in all four parts of the United Kingdom: England, Wales, Scotland and Northern Ireland

[2] In Northern Ireland the turnout was lower than the national average: 47.3%.

[3] The weighted average for the 28 European Member States is 27%, increased by 8 percentage points compared to EU83. Only in Greece (51%), the Republic of Cyprus (41%) and Austria (37%) the percentages of people having a negative image of EU are higher than in UK.

was 28%). Concerning the future of the EU, British respondents are divided between pessimists (46%) and optimists (44%)[4].

So British citizens, the media, public opinion and the political class have always been deeply critical and skeptical about Europe. The UK has never played a very strong and active role in Europe. The EU is not only considered distant and inadequate to resolve everyday issues (immigration, unemployment, and so on), but it is often perceived as their major cause. In this way, the 2016 referendum was an occasion to clearly express this position. Leave became a resentful vote, through which citizens expressed their dissatisfaction primarily with the government unable to define politics in favor of them, and secondly with the EU, accused of restricting the political and economic power of the UK. I want to demonstrate that Leave was an expression of what Robert Putnam (1993) has defined *politics of issues*: the electoral outcome expressed *civic involvement* on the issue of the relationship between the UK and the EU. Thus, the vote was not influenced by partisanship or the possibility of obtaining immediate, personal benefits (what Putnam called *politics of patronage*): it was the clear and unambiguous way in which British citizens expressed their position on Europe.

The electoral outcome created disbelief all over the world. While, in fact, it is clear that a large proportion of UK residents are skeptical about Europe, it is not clear enough that this position coincides with the wish to leave the EU. Euroscepticism should not be, however, confused with this wish. Szczerbiak and Taggart (2008) have distinguished two different types of Euroscepticism.

> *Hard Euroscepticism is where there is a principled opposition to the EU and European integration and therefore can be seen in parties who think that their counties should withdraw from membership, or whose policies towards the EU are tantamount to being opposed to the whole project of European integration as it is currently conceived.*
> *Soft Euroscepticism is where there is not a principled objection to European integration or EU membership but where concerns on one (or a number) of policy areas lead to the expression of qualified opposition to the EU, or where there is a sense that 'national interest' is currently at odds with the EU's trajectory.*
> (Szczerbiak and Taggart, 2008:7,8)

Before the referendum, it was thought that Soft Euroscepticism was the dominant position held by British public opinion. For example, a report of the NatCen Social Research, published on 26 February 2016 using data from the British Social Attitudes survey for the period July–November 2015, showed that

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[4] 50% of Europeans are optimistic and 44% pessimist.

while 65% of respondents were skeptical about the EU, only 30% supported Britain's leaving the EU.

I want to try to identify some potential factors which have favored the spread of Hard Euroscepticism leading to the victory of Leave. Obviously, since my analysis is based on aggregate data, I am unable to formulate an hypothesis about the factors influencing attitudes and voting behaviors of individuals. But I can identify those factors that might have affected the overall result and which then led to Leave. Many studies have identified these factors in the main issues of the electoral campaign, for example, immigration and economic crisis.

Immigration is the most important issue for public opinion in the UK, as shown by the aforementioned EB85[5] and it was also central for the Leave electoral campaign. Many post-voting analyses have therefore tried to examine the link between immigration and electoral results. Most of these studies (for example, Goodwin and Heath 2016; Picascia, Romano and Capineri 2016) focused exclusively on the presence of resident immigrants in the territory. In this way, they concluded that immigration was not significant in explaining the electoral results and that it was linked to the Leave by an inverse relationship: the higher the vote for the Leave, the smaller the presence of immigrants in the local governement district (LGD). However, taking into consideration only the stock of immigrants resident in an LGD as an immigration indicator can lead to misleading conclusions. It is rather obvious that immigrants are concentrated in the richer areas with more job opportunities. Therefore, the inverse link between Leave vote and the presence of immigrants can probably be explained by economic factors. By more fully interpreting whether and by how much immigration influenced the vote, other aspects must be taken into account, first of all how the presence of immigrants is changed over the years.

Economic crisis was also an important factor determining the result of the 1975 referendum. According to Clarke, Goodwin and Whiteley (2017) the decision to stay in ECC was influenced by the so-called *British Disease*, an economic situation, plaguing England in the 1960s and 1970s, characterized by inflation, high unemployment, low productivity and industrial unrest. In that situation, the UK staying in the EEC was considered by the electorate as a potential necessity to revitalize the internal economy. In 2016 the situation changed completely. The Leave electoral campaign, in fact, described the EU as the main cause - with immigration - of the economic crisis, limiting the autonomy of British economic choices. Thus, the EU became the ideal scapegoat on which people living in a situation of economic disadvantage because of the economic crisis could give vent to their frustration. This paper analyzes the link between Leave and the economic

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[5] 38% of British respondents consider immigration the most important problem of their country.

crisis, taking into consideration the economic disadvantage dimension, defined from a set of economic indicators.

I also try to identify the main features of the Pro-Leave voter. Goodwin and Heath (2016) linked the Leave vote to the so-called *"left-behind voters"*. This is a class of voters where the changes to the British socio-economic structure have pushed them to the margin: *"older, working class, white voters, citizens with few qualifications, who live on low incomes and lack the skills that are required to adapt and prosper amid the modern, post-industrial economy"* (Goodwin and Heath, 2016:325). According to this work, I analyse the relationship between the Leave vote and the presence in the territory of people with the main characteristics of the left-behind voters.

3. Data, variables and methodology

Referendum data originated from the Electoral Commission Office[6] and was concerned with the turnout, count and percentages of voters in the 380 Btitish LGDs[7]. The demographic structure of the population was reconstructed on 30th June 2015, using the datasets *Population Estimates for the UK, England and Wales, Scotland and Northern Ireland* produced annually by the Office for National Statistics[8]. Economic and social variables come from the *Annual Population Survey* (APS), a continuous sample survey providing a cover on households within the UK with the aim of providing local estimates for many important variables regarding many topics (for example, employment and unemployment, ethnicity, religion, health and education, etc.). The APS datasets comprise 12 months of survey data and are disseminated quarterly; the sample size is approximately 320,000 respondents. The data used in this work refers to the situation of 30th June 2016.

I employed the fraction of total counted votes that was for Leave in any LGD as a dependent variable.

As suggested by Robert Putnam, I used the turnout of the 2016 referendum as an indicator of civic involvement. *"The primary motivation of the referendum voter is concern for public issues, perhaps enhanced by a keener than average sense of civic duty, so that turnout for referenda offers a relatively clean measure of civic involvement"* (Putnam, 1993:93). As a measure of the partisanship, I used the average turnout at the European Parliament elections in 2009 and 2014.

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[6] www.electoralcommission.org.uk
[7] Results from Gibraltar and the Isle of Scilly were excluded from this analysis, because og the absence of comparable data. Northern Ireland was included in one single district.
[8] I used the latest data available, released on 26th June 2016 www.ons.gov.uk

For analyzing the effect of immigration on the Leave vote, this analysis focuses, on the one hand, on the presence and inflows of non-UK born population resident in UK in 2015; on the other hand, on their variations in individual LGD in a 10-year time span. I used four variables: the percentage of non-UK born resident population in England in 2015, the non-UK born inflows rate per hundreds resident population in 2015 and the variations of these two variables from 2005 to 2015.

Table 1 - *Descriptive statistics of the dependent and independent variables: situation at 30 June 2015 if not differently shown*

Variable	Mean	SD	Min	Max
Proportion of votes to Leave 2016	0.53	0.10	0.21	0.76
Turnout 2016 Referendum %	73.71	5.08	56.25	83.57
Average Turnout PE elections 2009-2014 %	35.37	4.18	23.38	47.14
Non-UK born presence in LGDs %	11.30	10.18	0.00	54.1
Non-UK born inflows in LGDs %	0.80	0.97	0.07	9.3
Diff. Non-UK presence in LGDs 2015-2005	3.32	3.54	-5.99	22.52
Diff. Non-UK inflows in LGDs 2015-2005	-0.09	0.49	-3.79	3.90
Economic disadvantage	0.00	1.00	-1.85	3.19
Male %	46.68	0.98	46.51	56.04
People over 65 years %	24.23	5.33	7.68	38.73
Workers without any qualification %	8.06	3.47	1.60	22.20
Population in thousands	171.34	143.51	8.76	1851.62
GVA per head in thousands	23.95	14.12	10.98	221.10

Table 2 – *Empirical measures of economic disadvantage: economic variables at 30 June 2016 if not differently shown; factor loadings; eigenvalue; variance explained; Kaiser-Meyer-Olkin test*

Economic disadvantage	
Unemployment rate	0.92
Inactivity rate	0.74
Workless Households - All unemployed 2015	0.81
Jobseeker's Allowance	0.91
Jobseeker's Allowance for over 12 monhts	0.67
Claimant Count Rate	0.95
Eigenvalue	4.25
Variance explained	0.71
Kaiser-Meyer-Olkin Test	0.83

The dimension of economic disadvantage was constructed from a set of variables, as shown in table 2, through Factor Analysis[9]. All these variables relate to a situation of economic difficulty: the higher their value, the worse the economic situation in the LGD and indeed the higher the economic disadvantage.

The set of demographic variables, selected from the main characteristics of the left-behind voters, includes the percentage of male population of electoral age, the percentage of people over 65 years of age and the percentage of workers without any qualification.

The analysis includes two control variables, chosen to consider the differences of LGDs: the amount of the population in thousands and the gross value added (GVA) per capita in thousands.

The dependent variable is linked to independent variables through a regression model. The regression model used was chosen based on the nature of the dependent variable studied: a fractional response variable bounded (0.1). The histogram of the proportion of Leave, displayed in figure 2, suggests that it does not follow a normal distribution, as also confirmed by the Shapiro-Wilk W test, reported in table 3.

**Figure 2 –** *Distribution of proportion of votes going to Leave with Kernel density plot*
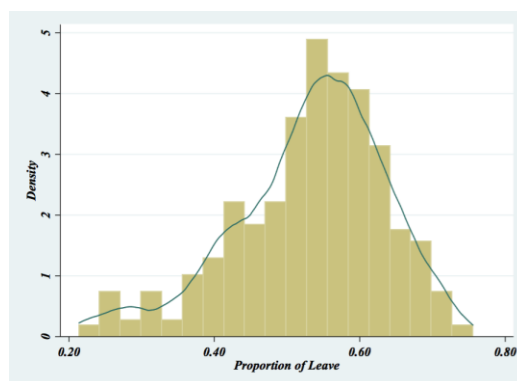
Table 3 - *Shapiro-Wilk W test for normal data[10]*

Variable	Obs	W	V	Z	Prob>z
Leave %	380	0.96819	8.363	5.042	0.0000

[9] The type of estimation used to analyze the correlation matrix was the principal-component factor method: the communalities are assumed to be 1. After estimation, I used an orthogonal rotation quartimax.

[10] The test is implemented by the command swilk of Stata, that can be used with $4 \leq n \leq 2000$ observations. The value reported under W is the Shapiro–Wilk test statistics. The p-value is based on the assumption that the distribution is normal; in our case, it is very small, indicating that we can reject that r is normally distributed. The test also report V, which is more appealing index for departure from normality. The median values of V is "1" for samples from normal populations; large values indicate non-normality.

According to a consolidated literature (Papke and Wooldridge 1996, Zhao, Chen and Schaffner 2001, Kieschnick and McCullough 2003, Ferrari and Cribari-Net 2004, Smithson and Verkuilen 2006, Baum 2008, Papke and Wooldridge 2008, Cook, Kieschnick and McCullough 2008), if we want to model a variable $0 \leq y \leq 1$ through a set of explanatory variables $X \equiv (x_1, x_2, x_3, \ldots, x_k)$, the use of a linear model:

$$E(y \mid x) = \beta_1 + \beta_2 x_2 + \beta_3 x_3 \ldots + \beta_k x_k$$

rarely provides the best description of $E(y \mid x)$ and is based on erroneous assumptions, although it is often the most common approach used by researchers. According to Kieschnick and McCullough (2003), the main problems associated with the use of a linear model for the study of this type of variables are mainly two. The most stringent characterization of these models is that when they are used, implicitly assuming that the dependent variable distribution is normal. However, it is logical that the fractional response variables bounded (0.1) are not distributed normally, because they are not defined beyond their range, which is the domain beyond which the normal distribution is defined. Furthermore, the fact that these variables are observed only in a limited range implies that the function of the conditioned mean is non-linear and that the conditioned variance is a function of the mean.

In this paper, the model used was the *fractional logit regression model* developed by Papke and Wooldrigde (1996). It does not have the limits of the linear one and it ensures all the fitted values will always be in (0,1). For fitting fractional response variables, they consider this model:

$$E(y \mid x) = G(x_i \beta)$$

where $G(.)$ is a known function satisfying the following condition

$$0 \leq G(z) \leq 1 \quad \forall z \in \mathbb{R}$$

While one can use different specifications of $G(.)$, the two authors use in their analysis the following logistic function:

$$E(y \mid x) = \frac{\exp(x_i \beta)}{1 + \exp(x_i \beta)}$$

The estimation procedure proposed and used by Papke and Wooldridge is a particular quasi-likelihood method, which consists of maximizing the Bernoulli log likelihood function:

$$l_i(b) = y_i \ln[G(x_i \beta)] + (1 - y_i) \ln[1 - G(x_i \beta)]$$

4. Empirical results and discussion

The four regression models are presented in table 3. Model 1 includes the two variables selected as measure of civic involvement and partisanship; model 2 adds the control variables; model 3 adds the immigration variables and the economic disadvantage dimension; model 4 includes the demographic variables.

Table 4 – *Fractional logit regression models of proportion of Leave on socio-economic and demographic variables: marginal effects; standard errors; observations; Akaike information criterion*

Variable	Model 1	Model 2	Model 3	Model 4
Turnout 2016 %	0.0092***	0.0062***	0.0056*	0.0069***
	(0.0017)	(0.0016)	(0.0022)	(0.0020)
Average turnout 2009-2014 %	-0.0118***	-0.0086***	-0.0042**	-0.0051***
	(0.0019)	(0.0018)	(0.0016)	(0.0014)
Population in thousands		-0.0001	-0.0001	-0.0001
		(0.0001)	(0.0001)	(0.0001)
GVA per head in thousands		-0.0029**	0.0001	0.0004
		(0.0011)	(0.0008)	(0.0004)
Non-UK born presence %			-0.0015	0.0007
			(0.0009)	(0.0009)
Non-UK born inflows %			-0.0465***	-0.0659***
			(0.0115)	(0.0110)
Non-UK presence Δ 2015-2005			0.0094***	0.0085***
			(0.0016)	(0.0015)
Non-UK inflows Δ 2015-2005			0.0374***	0.0282***
			(0.0098)	(0.0069)
Economic disadvantage			0.0281***	0.0264***
			(0.0082)	(0.0077)
Male %				0.0421***
				(0.0069)
Workers without any qualif. %				0.0058***
				(0.0014)
People over 65 years %				0.0061***
				(0.0014)
N	378	377	366	365
AIC	526.46	526.92	519.27	521.88

*Standard errors in parentheses. Constant included but not reported. * p<0.05, ** p<0.01, *** p<0.001*

Turnout of the 2016 referendum and the average turnout of the European Parliament elections 2009-2014 are significant and have the expected effects in all four models. About the two control variables, the amount of population is never significant in all the models; indeed, the gross value added per capita is significant and has the expected negative sign only in the model 2. The immigration variables are all significant and have the expected signs, with the exception of the amount of non-UK born population, which is never significant. The economic disadvantage

dimension is significant and has the expected effect in all the models. The demographic variables are all significant and present the expected positive sign.

The referendum turnout, considered an indicator of civic involvement, is highly related positively to Leave. This seems to indicate not only that the membership in the EU was and continue to be a very important issue in Britain, leading to vote also people not usually doing it, but also that, nowadays, civic involvement on this issue is largely specified in terms of the wish to leave the EU. The civic involvement did not depend on parties loyalty or membership. In fact, where there were higher levels of partisanship, the Leave vote decreased: the higher the loyalty to the parties, the lowest the vote for Leave.

The difference in population and GVA per capita among the LGDs did not influence the Leave vote. Immigration and economic crisis had an important role in the definition of the electoral results. About immigration, the analysis highlighted a difference among the variables taken into account, in relation to their effect on electoral outcomes. If we consider the variables about the situation of immigration in 2015, we observe that only the non-UK born inflows rate per hundreds resident population is significant. This variable is negatively related to Leave vote; this indicates that the Leave vote decreased in those LGDs where there were higher inflows of non-UK born people. However, taking into account the variation in the presence and the inflows of non-UK born in LGDs from 2005 to 2015, the situation is overturned: the results indicate that increases in these variations have a statistical significant positive relationship with the Leave vote. The vote for Leave increased where there were higher level of economic disadvantage; this indicates that the economic crisis influenced the electoral results and that people probably considered the European Union as the main cause of the British economic problems, as sustained by the Leave supporters during the electoral campaign.

The analysis confirmed a relationship between some demographic characteristics and Leave; in fact, it increased in those LGDs where there were higher percentages of male population, people over 65 years and unqualified workers.

5. Conclusion

Britain has always been skeptical about the staying in the European Union. The 2016 referendum showed how this was a central issue for British people and how the wish to leave the EU was largely widespread among citizens.
Immigration and the economic crisis have played a decisive role in defining the electoral results. In areas with high presence and inflows of non-UK population

there have often been expressions of vote for remain in the European Union: as we said, this was probably explained by the fact that these areas were also the ones with more wealth and with better economic conditions. Leave had, instead, higher percentages in areas where more frequent changes in the population structure occurred, both in terms of presence and inflows of non-UK born population and in those where there were high levels of economic disadvantage.

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SUMMARY

Demographic and socio-economic factors influencing the Brexit vote

On 23rd June 2016, a referendum on Britain's staying in the European Union was held. The electoral turnout was very high (72%) 52% of the preferences were for Leave. So, the referendum result returned the image of a country divided between Euroskeptics and pro-Europeans. The aim of this article is to highlight whether the vote was not only an expression of the opinion about the European Union, but also the clear manifestation of a malaise linked to the influence of other factors, such as the economic crisis and the immigration.

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