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EXTENDED ABSTRACT

Title:
"The grass is greener on the other side of the hill": relationship between the Brexit referendum results and income inequality

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Measuring spatial justice and territorial inequalities in Europe at local level (IMAJINE project)

Abstract:

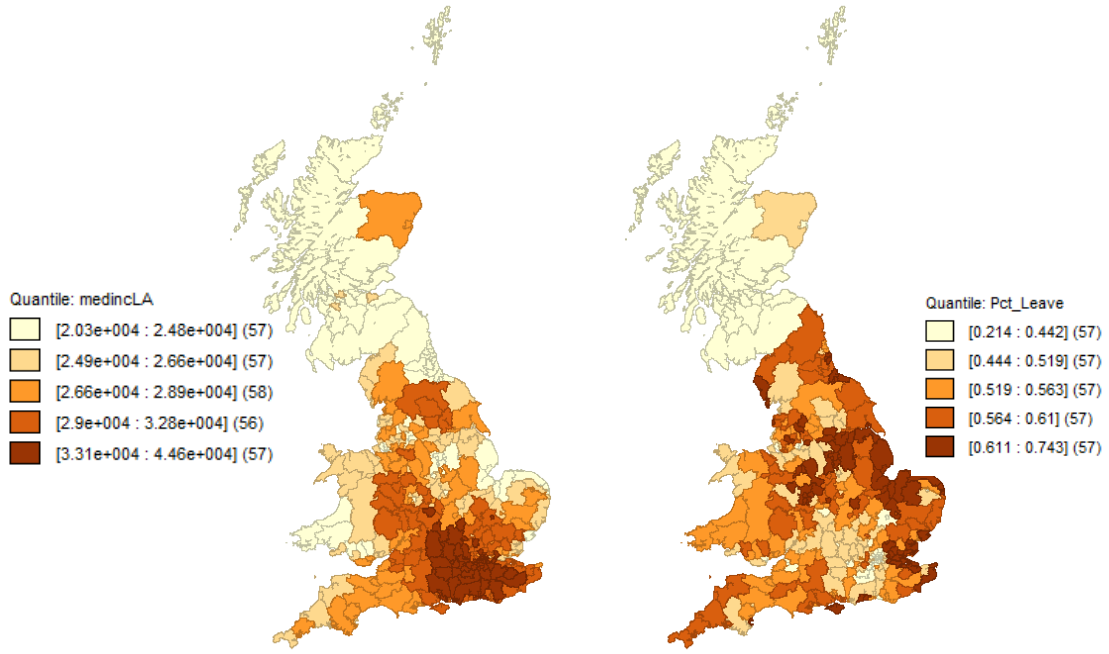
The Brexit has been attracting a great deal of attention from both the political and academic arena ever since the results of the referendum celebrated in 2016 revealed the will to leave the EU of slightly more than 50% of the voters. Provided the magnitude of the issue, it comes as no surprise that a myriad of recent analyses tried to provide evidence on the prospective impacts that such an event will have on the UK and the European economies. Likewise, some studies have focused on the possible determinants behind the result of the vote as it reflects the deep differences that prevail in the society and that are a source of discontent and conflict. This latter line of research shows that a large part of the variation in the vote outcome can be related to demographic, educational and economic factors, which shaped the spatial patterns observed across the country.

One of the causes discussed is the growing inequality that have been hitting the UK in the last decades, which is regarded as a possible explanation for the lower turnout of young population and, at the same time, for the high leave support of the older electorate. Acknowledging the importance of the spatial context on political issues, the aim of this paper is to provide an assessment of the influence of the existing economic disparity on the Brexit support, taking into account the level of inequality suffered in an area in relation to the neighbouring regions. We implement a spatial specification in order to evaluate the direct and indirect marginal impacts of several characteristics, focusing the attention on the relative effect of income on the referendum results.

The voting patterns seem to divide along the lines of age, social attitudes, and education, with older citizens, with a conservative ideology and lower educational level more prone to favour leaving the EU than younger, liberal and better educated people (Harris and Charlton, 2017; Manley et al., 2017). The underlying hypothesis is that the better educated population perceive the belonging to the EU as beneficial, both in terms of international opportunities and in relation to the availability funding and access to the single market. Under this assumption, well-paid jobs are readily available to their profile, as opposite to the position of the less-well educated, who feel that the competition effect they have to bear from EU immigrants is harming their prospects. The economic inequality, which widened in the UK in the last decades, has been another factor contributing to deepen this negative believe into certain parts of the population. Consistently, older electorate might had associated the EU with the decline in their living standards as the UK has been a member the same period that economic inequality has accelerated (Colantone and Stagni, 2016). As a result, a large share of the leaving votes can be interpreted as a reaction from those who have felt more and more powerless in a scenario of greater openness, but also greater economic inequalities that hadn't been appropriately faced by the government. The lower turnout of the younger generations can be also interpreted under this lenses, as higher indebtedness, precarious and expensive housing market, and the harsher labour conditions (Clarke and Whittaker, 2016) could had been channelled through lower political engagement and participation.

The effect of economic inequality on the referendum outcome is patent when the regional distribution of income and the spread of the leave vote are confronted. As Figure 1 shows, the share of leave votes is higher in economically deprived areas.

Fig.1. Income (left) and leave votes share (right) in Local Authorities in the UK



Own elaboration with data on income from the IMAJINE project (H2020 ref. 726950) and with data from The Electoral Commission of the UK.

The figure presented shows a heterogeneous landscape where some areas exhibit a high concentration income like London and its neighbouring Local Authorities to the west (Oxfordshire and Hampshire) and the south (Surrey, West Sussex and East Sussex), which coincides with areas with a lower share of leave votes. On the other side, some localities in western Britain, namely the coasts of Lincolnshire and Norfolk, are in the lowest part of the income distribution, and also show the higher support to the leave option. This spatial distribution at stake suggests that the location both variables is not random, and that there exist an interplay between the regional economic situation and the attitude towards Brexit, pointing out to the necessity of handling any associated phenomenon with a toolbox that accounts for the possible spatial spillover effects that might arise from the interaction of both factors.

As mentioned earlier, the literature on this matter considers demographic, educational and cultural variables as drivers of the vote result, along with the labour market conditions, the ideological position regarding the international economic integration (euroscepticism), and the economic inequality (Arnosson and Zoega, 2016; Becker et al., 2017; Clarke et al., 2017, Crescenzi et al., 2018). Following the line set in previous empirical exercises, is this paper we will include a variety of the already reviewed possible divers to explain the share of leave votes in Local Authorities across the UK, being the main focus of the analysis to capture the effect of the spatial relative economic inequality. This indicator is expressed as the relative average difference in the local median income (as estimated using Generalized Cross Entropy in the course of the IMAJINE Project) between a Local Authority and its nearest fifteen neighbours:

$$Diff_i = 1/n \sum_{i,j}^{n} \left(\frac{Minc_i - Minc_j}{Minc_i} \right)$$

$$i \neq j \; ; n = 15$$

The absolute value of this factor shows how near or far is a Local Authority to its neighbours in terms of median income, being positive if the region is above the average of the defined vicinity, and negative if it sits below. This latter case is especially interesting, as some sociological studies claim that perceived economic deprivation with respect to the surrounding areas might be one of the reasons that motivated certain segments of the population to vote for leaving the EU. These claims are supported from the economic studies of Los et al. (2017) and Rodríguez-Pose (2018) that show how the referendum gave an opportunity to those discontent with their lagging-behind situation to take “revenge” on the “metropolitan elites”. According to this, we expect a negative and significant relationship between the leave votes share and the spatial relative inequality indicator introduced earlier: the lower the value of the indicator (meaning more negative, and subsequently, a worst relative economic performance of the area regarded in comparison to their neighbours), the higher the share of leave votes.

Although the study of the effect of the economic inequality on the result of the Brexit referendum is not new, to our knowledge this is the first study to use local income data to assess the spatial effect of relative income differences. From the methodological point of view, the indicator included is also a novelty, although its use is complemented by the several options available to deal with spatial dependence (autocorrelation in the error term induced by the spatial structure of the data), as

reviewed extensively in Anselin (1988 and 2006), Anselin and Bera (2004), Arbia (2006), LeSage and Pace (2009) or Elhorst (2014). In order to assess the influence of the neighbouring localities from a global perspective, in this analysis we will rely on a definition of neighbourhood as the fifteen nearest municipalities (the same used in the construction of the relative income difference indicator), contained in matrix W, using centroids as reference points. The proposed spatial scheme reflects properly the distribution of the percentage of leave votes, as indicated by a preliminary examination of the data through an Exploratory Spatial Data Analysis (ESDA) (Anselin 1999).

Provided that in the first part of this study we will focus on the potential role played by the spatial spillovers, as shown by the clustering of Local Authorities with a high and low share of leave votes that can be seen in Fig. 1, and that the Moran's I test confirms the existence of spatial autocorrelation, the specification chosen to deal with it is the Spatial Lag model:

$$Pct\_Leave_i = \alpha + \rho WPct\_Leave_i + \beta_1 Diff_i + \beta_2 Theil_i + \sum_{j=3}^{6} \beta_j Dem\ Struc_i + \sum_{j=7}^{9} \beta_j Ed\ Struc_i + \sum_{j=10}^{12} \beta_j Tenure\ reg_i + \sum_{j=13}^{16} \beta_j HH\ size_i + \sum_{j=17}^{20} \beta_j Occupation_i + \sum_{j=21}^{32} \beta_j Sector_i + \sum_{j=33}^{34} \beta_j Labourmkt_i + \varepsilon_i$$

Where the percentage of leave votes is regressed against the proposed income difference indicator, the Theil index of the Local Authority, demographic and educational variables, the household tenure regime and size, the occupational and sectoral shares of employment, and the labour market. Table 1 summarizes the preliminary results of this first estimation. As expected, the income inequality indicators has a negative and significant coefficient, which is interestingly higher than the inequality in the region as represented by the Theil index. The spatial effect is positive and also significant, reflecting the clustering of deprived areas in the UK, which also corresponds to Local Authorities whose citizens had a higher preference for leaving. The other variables present in the model behave as shown in previous studies: a younger population (lower mean age in the area) is related to a lower leave share, a higher share of native population corresponds to a higher taste for leaving, so as a higher local unemployment rate. Regions specialized (higher employment share) in mining and construction sectors also relate to a higher leave vote.

Table 1. Spatial Lag Model estimation

	SLM	
Constant	-2.988	***
Rho	0.190	***
Diff. income neighbours	-0.147	***
Theil	0.123	*
Demographic Structure	Yes	
Education	Yes	
Household tenure regime	Yes	
Household size	Yes	
Occupation	Yes	
Sector	Yes	
Labour market conditions	Yes	
Akaike Information Criterion (AIC)	*-1198.2*	
Log Likelihood	*638.12*	
Likelihood Ratio Test	*12.77*	***
LM Test for residual sp. autocorrel.	*6.85*	

Keywords: *Income inequality, Brexit, Spatial Econometrics.*
JEL codes: