Which individual and local factors spurred a majority of UK voters to decide against continued membership of the European Union? Monica Langella and Alan Manning explore the effects of the demographic and industrial composition of local areas on the share of the Leave vote.

Who voted Leave?
The UK’s vote to leave the European Union (EU) has induced much speculation about the key factors behind people’s decisions. Opinion polls (such as the Ashcroft Polls¹) show that older and less educated people were more likely to vote Leave. Other dimensions that could have affected the voting outcome are those related to the local areas where people live. Indeed, one of the main hypotheses put forward for the Leave vote is that it represents the reaction of those parts of the country that have been left behind by globalisation or that feel threatened by immigration.

Our research tests to what extent the characteristics of local areas influenced the voting outcomes, with a particular focus on aspects that a great deal of public discussion has suggested were the main drivers of the Leave vote: age; education; immigration; and changes over time in industrial structure. We therefore analyse the impact of a set of area-level characteristics on the share of the Leave vote.

The characteristics we look at derive from the most recent census data (2011) and earlier decades for the 380 local authorities and unitary authorities in Britain. These data give us an overall picture of the demographic, ethnic and industrial composition of each area, not only of the pool of people who were eligible to vote, registered to vote and/or actual voters in the referendum. The results show that area-level characteristics are strongly connected with the Leave vote.

Table 1: Correlations between area-level characteristics and the vote for Leave

<table>
<thead>
<tr>
<th>Percentage point change in the vote for Leave</th>
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<tr>
<td>Share of graduates (2011)</td>
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<td>Share of students (2011)</td>
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<tr>
<td>Share of people aged 60 and older (2011)</td>
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<tr>
<td>Share of white people (2011)</td>
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<tr>
<td>Share of migrants (2011)</td>
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<tr>
<td>Change in migrant shares (1991-2011)</td>
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<tr>
<td>Change in heavy industry employment (1981-2011)</td>
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<td>Change in public sector employment (1981-2011)</td>
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<td>Share of working age population (2015)</td>
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<td>Scotland</td>
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¹ http://lordashcroftpolls.com/2016/06/how-the-united-kingdom-voted-and-why

Local traits and EU aversion
A number of the area-level characteristics evaluated in our study have a non-zero correlation with the share of the Leave vote in an area – and together, the characteristics that we include in our empirical analysis explain 90% of the variation in the Leave vote. Table 1 reports the magnitude of each relationship:

- More graduates and more students in an area are related to a lower Leave vote.
- A higher incidence of people aged 60 and older in an area is related to a higher Leave vote.
- Both the share of white people and the share of people born outside the UK in an area are related to a higher Leave vote.
- The rise in immigration shares from 1991 to 2011 is related to a higher Leave vote.
- As discussion about the role of globalisation suggests, changes in the industrial structure of the area are important: falls in employment in heavy industry and the public sector between 1981 and 2011 are both related to an increase in the Leave vote.
- The higher the share of working age population, the higher the Leave vote.
- The voting behaviour of Scottish residents shows a lower propensity to vote Leave even after accounting for the demographic and industrial composition of an area. But contrary to much discussion, there is no ‘London effect’: the London vote is more or less what one would expect given its demographic structure.

Together, these variables explain most of the variation in the Leave vote. But while our results are not exhaustive of all the dimensions that could potentially influence voting, they do suggest that, in general, area-level characteristics did play a role.

For example, areas with younger and more educated people had a lower Leave vote, confirming individual-level results from polls. The opposite is true for areas with recent increases in immigration and where industrial decline has been stronger. Moreover, the results for Scotland suggest that politics may have also played an important role in driving the result.

![Figure 1: Components of the Leave vote](image-url)

**Panel A:**
**Education**

**Panel B:**
**Immigration**

**Note:** Blue corresponds to the Leave vote predicted by the corresponding component; red to a higher predicted Leave vote. Intervals are defined on a common scale based on all components and residuals.
Visualising area-level components

As the outcome of the referendum became clear, the media immediately reported that the geographical distribution of the Leave vote revealed considerable differences across Britain, with lower shares in Scotland, London, Oxford, Cambridge and Brighton, and higher shares in the Centre-North and the East of England.\(^2\)

The empirical exercise we have run allows us to decompose the variation of the Leave vote into different components related to different area-level characteristics. Figure 1 maps the incidence of some of the most relevant ones. Higher values in the maps mean that the corresponding factor is more important in explaining the Leave vote in the area.

- Areas where the level of education and the proportion of students predict a lower Leave vote are concentrated in the Centre-South and in urban areas in the North of England and Scotland.
- Areas where the current level of immigration and its increase over time predict a higher Leave vote are mostly concentrated in London.
- Mapping the contribution related to the share of people aged 60 or older, the picture mirrors the distribution of the education component.
- The geographical distribution of the industrial change component is more homogeneous across areas and is less likely to show extreme values than the other components. It predicts a higher Leave vote in the central part of England and in the Stirling area of Scotland.

\(^2\) Panel A of Figure 3 on page 11 shows the geographical distribution of the Leave vote.
Figure 2 maps the part of the variation that is not explained by the variables included in the analysis (for example, political preferences and preferences for redistribution, which may affect the referendum outcome) together with the part of the effect related to Scotland. If the unexplained variation in the Leave vote is uncorrelated with area-level characteristics not included in our study, we should observe that residuals are not concentrated in any specific regions. But Figure 2 indicates that high values of the residuals are concentrated in some particular areas in the North of England and close to London. This suggests that there may still be room for other factors explaining the variation in the Leave vote.
In a parallel world

A great deal of pre- and post-referendum debate has focused on the role of immigration and concerns about EU agreements on freedom of movement and possibly their interplay with the current immigration crisis related to tensions in the Middle East. Although we would not address whether these concerns actually reflect the reality and effectiveness of EU immigration policies, we still want to examine the extent to which immigration is able to explain variations in the Leave vote.

Using the results obtained in our empirical exercise, we predict what would have been the voting distribution if the level of people born outside the UK had stayed at its 1991 level. The results are mapped in Panel B of Figure 3.

On the one hand – from a qualitative comparison of Panels A and B of Figure 3 – the ranking of the vote for Leave across areas does not seem to be altered by this exercise, and high and low Leave areas seem to be the same. On the other hand, the level of the vote for Leave appears to be lower under our scenario, and this reflects the average share of the Leave vote, which goes from the 52.1% of the actual share to 46.9% under our hypothesis. This confirms that immigration levels had a sizeable correlation with the voting outcomes, although the channel driving this correlation remains to be analysed.

If EU immigration had remained at its 1991 level, the Leave vote share may have been considerably lower.

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