The importance of place

Explaining the characteristics underpinning the Brexit vote across different parts of the UK

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In analysing the EU referendum vote, geography matters

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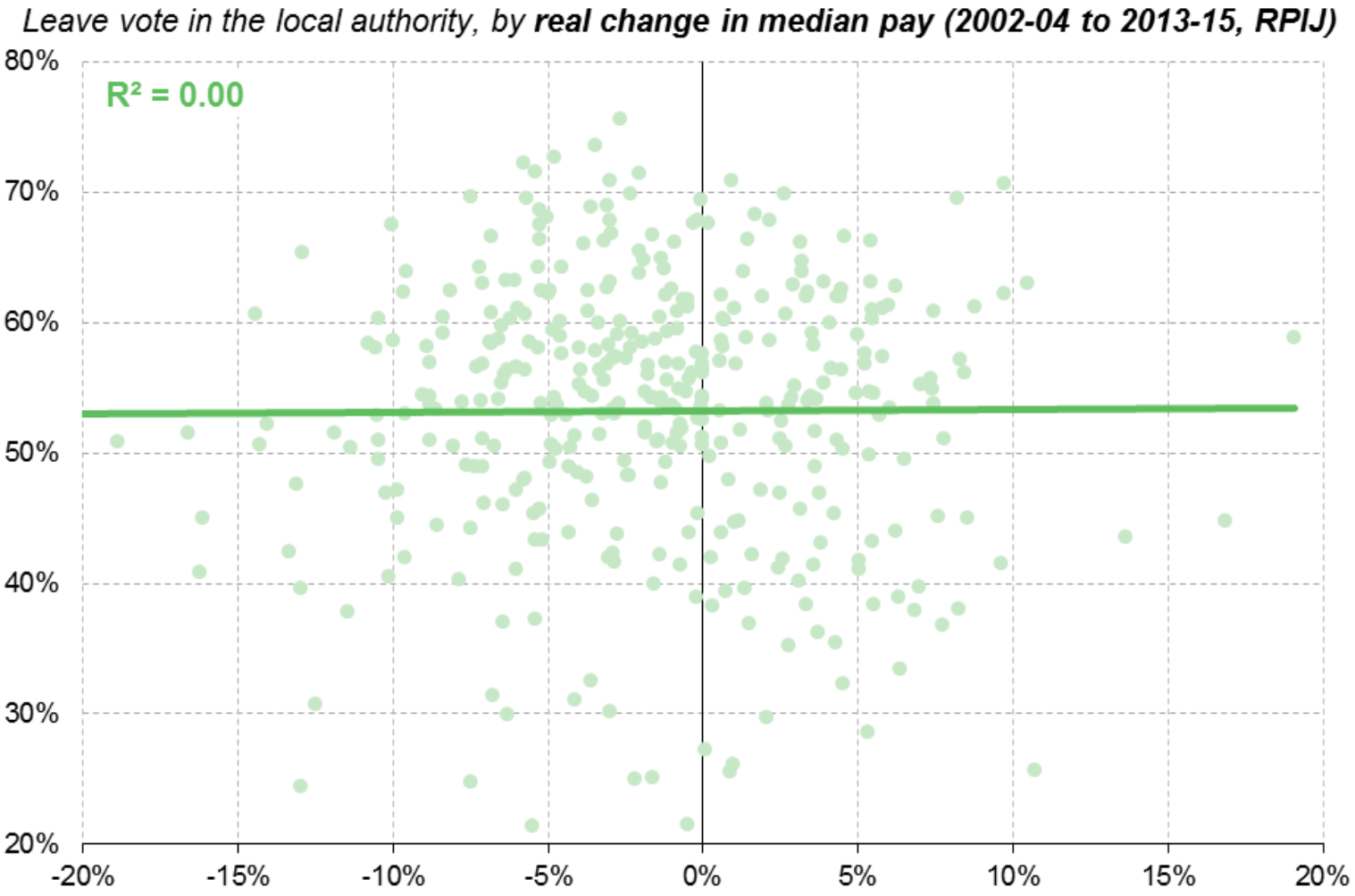
- Post-referendum analysis has highlighted the importance of demographic, economic and cultural factors on individuals' vote
- In this note, we consider the importance of *place*; highlighting the extent to which those same factors matter across 378 of Britain's 380 local authorities
- We test the strength of the relationship between these different factors and the vote while holding all else constant (using a series of regression models) for England, Wales and Scotland
- We highlight some of the more important economic factors in Section 1; demographics in Section 2; and cultural issues in Section 3
- We provide a full description of the regression results in Section 4

1 PLACE AND ECONOMICS

Pay, employment and housing tenure

No relationship between voting patterns and median hourly pay change since the early 2000s



Source: ONS, NOMIS

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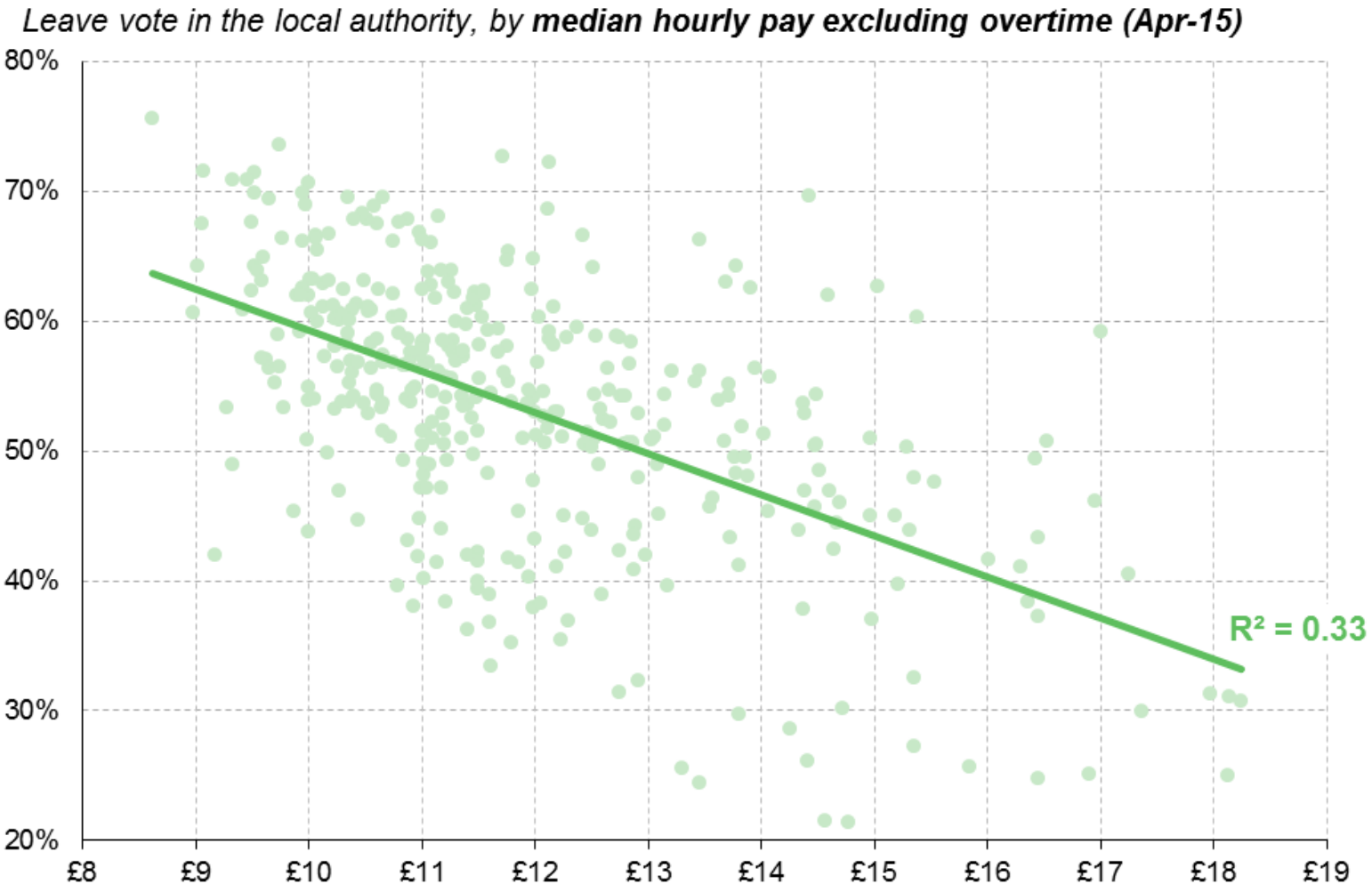
Earnings were subject to a pre-crisis slowdown across much of the distribution, followed by a six year squeeze that was relatively evenly felt

Simple correlation finds no evidence to suggest depth of the pay squeeze affected the vote

Though the strength of the leave vote does appear to vary with the pay level

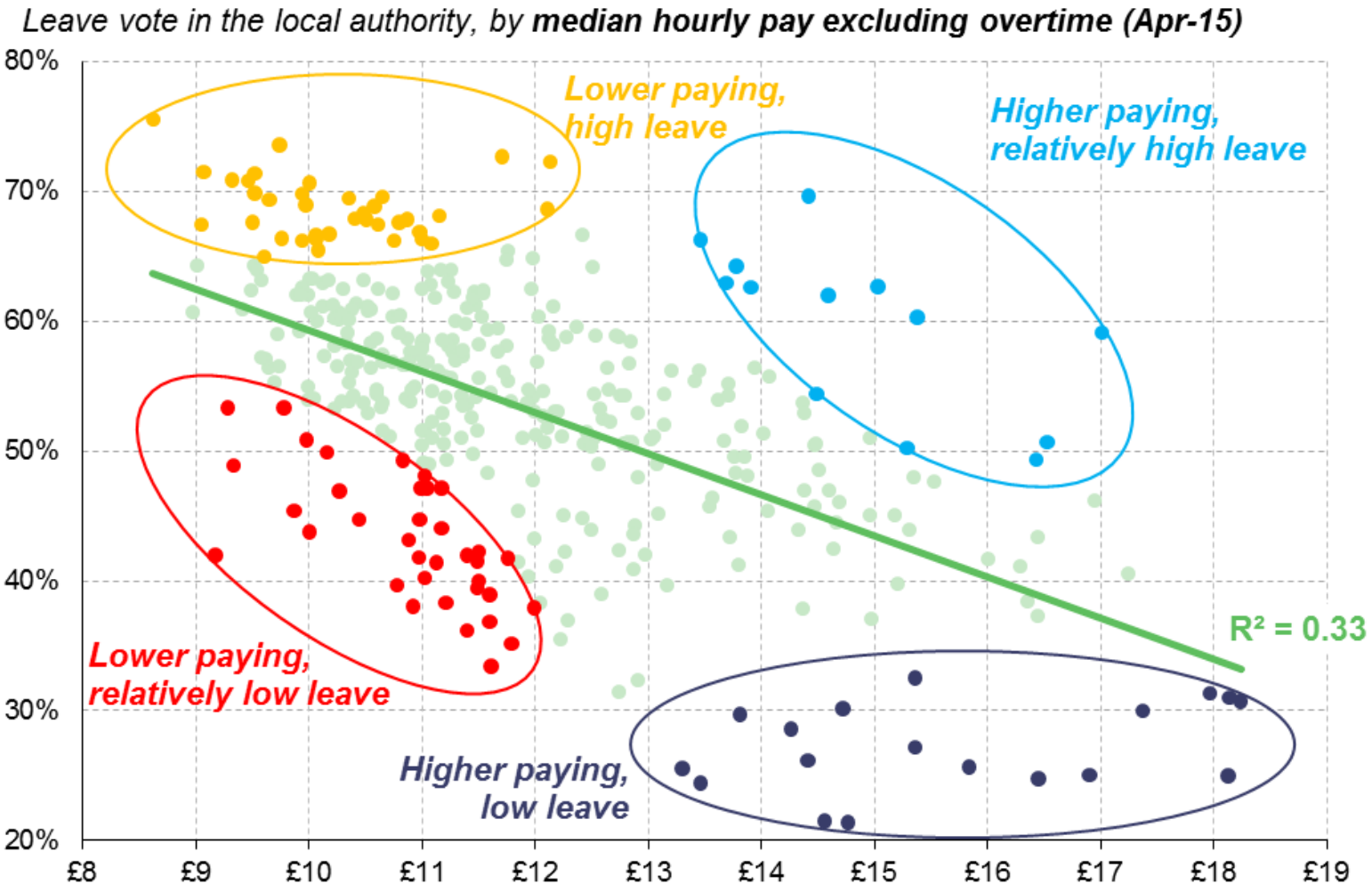


In the main, local authorities with higher levels of median pay recorded lower votes for leave

Simple correlation implies relatively strong relationship

Source: ONS, NOMIS

But there are exceptions… with a clear division between higher and lower paying groups



Source: ONS, NOMIS

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Can split lower paying areas into those with high leave votes and those with relatively low leave votes

Can similarly split higher paying areas into those with low leave votes and those with relatively high leave votes

Four groups of interest

Lower paying; high leave		
Boston	Stoke-on-Trent	N Warwickshire
South Holland	Doncaster	Sandwell
Castle Point	Cannock Chase	Burnley
Thurrock	Basildon	King's Lynn & W Norfolk
Great Yarmouth	Barnsley	Wakefield
Fenland	Harlow	N Lincs
Mansfield	Rotherham	Hyndburn
Bolsover	Walsall	Nuneaton & Bedworth
East Lindsey	Bassetlaw	Middlesbrough
NE Lincs	Hull	Thanet
Ashfield	Dudley	Telford & Wrekin
Hartlepool	Tamworth	E Staffordshire
Tendring	Blackpool	Pendle

Higher paying; relatively high leave	
Havering	Spelthorne
Broxbourne	Brentwood
Dartford	Sevenoaks
Bexley	South Bucks
Epping Forest	Watford
Maldon	Bromley
Copeland	

Lower paying; relatively low leave		
Glasgow City	Scottish Borders	Dumfries & Galloway
Renfrewshire	West Lothian	South Lakeland
Inverclyde	Liverpool	South Hams
Orkney Islands	Gwynedd	Newham
Midlothian	York	Sefton
West Dunbartonshire	Clackmannanshire	Leicester
North Lanarkshire	North Ayrshire	Newcastle upon Tyne
Perth & Kinross	Norwich	Moray
Argyll & Bute	Highland	Nottingham
Manchester	Exeter	Preston
Cardiff	Angus	Eden
East Ayrshire	Ceredigion	

Higher paying; low leave	
Lambeth	Southwark
Hackney	E Dunbartonshire
Haringey	Oxford
Islington	Hammersmith & Fulham
Wandsworth	Lewisham
Camden	Richmond upon Thames
Edinburgh	Westminster
East Renfrewshire	Kensington & Chelsea
Cambridge	Tower Hamlets

No obvious correlation with employment levels, and no clear differences across the four groups

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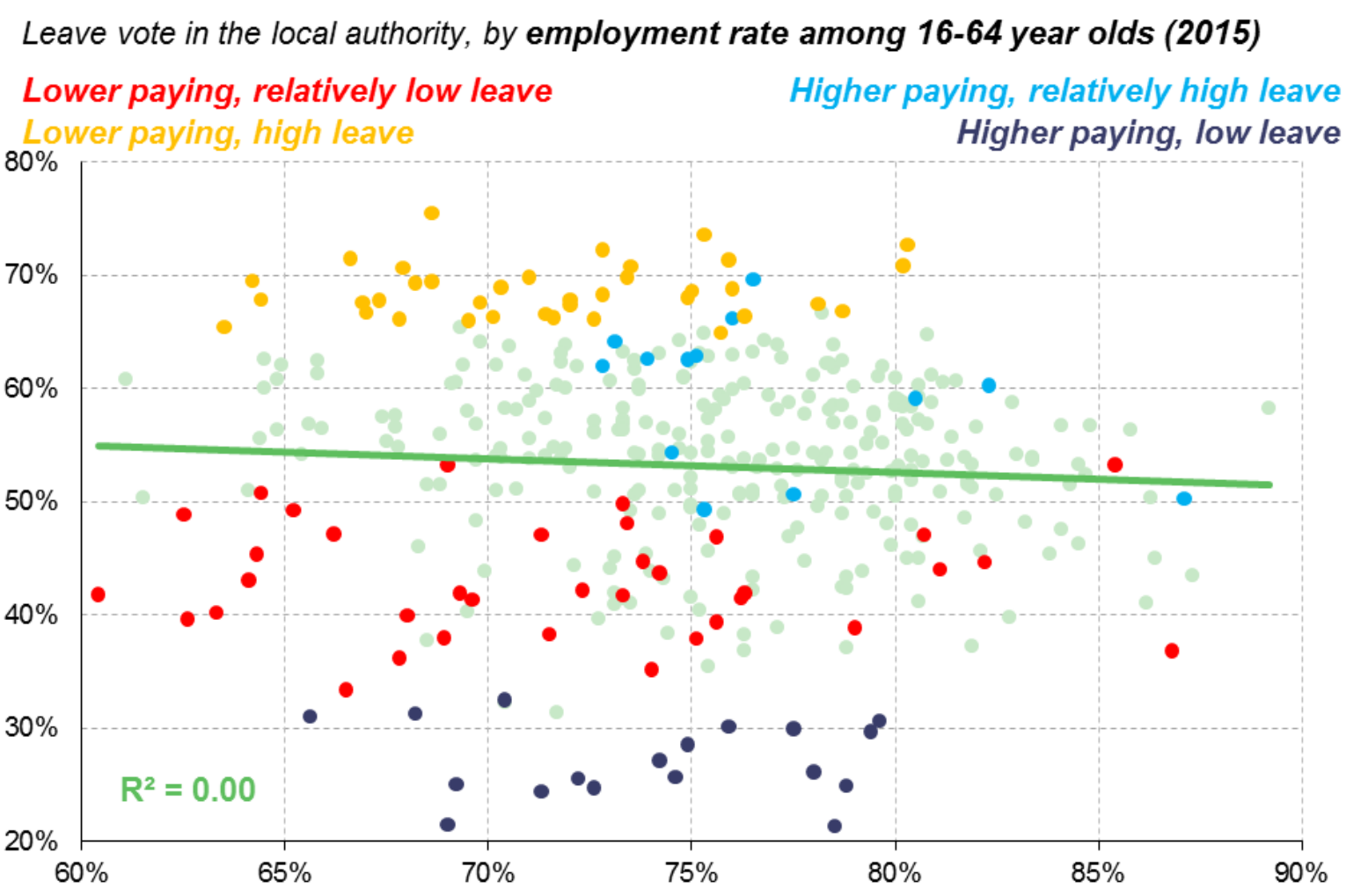

Higher paying, relatively high leave areas marginally more likely to have higher employment rates than higher paying, low leave areas, but the differences are slight

Source: ONS, NOMIS

But employment-vote relationship becomes much clearer when we control for student numbers

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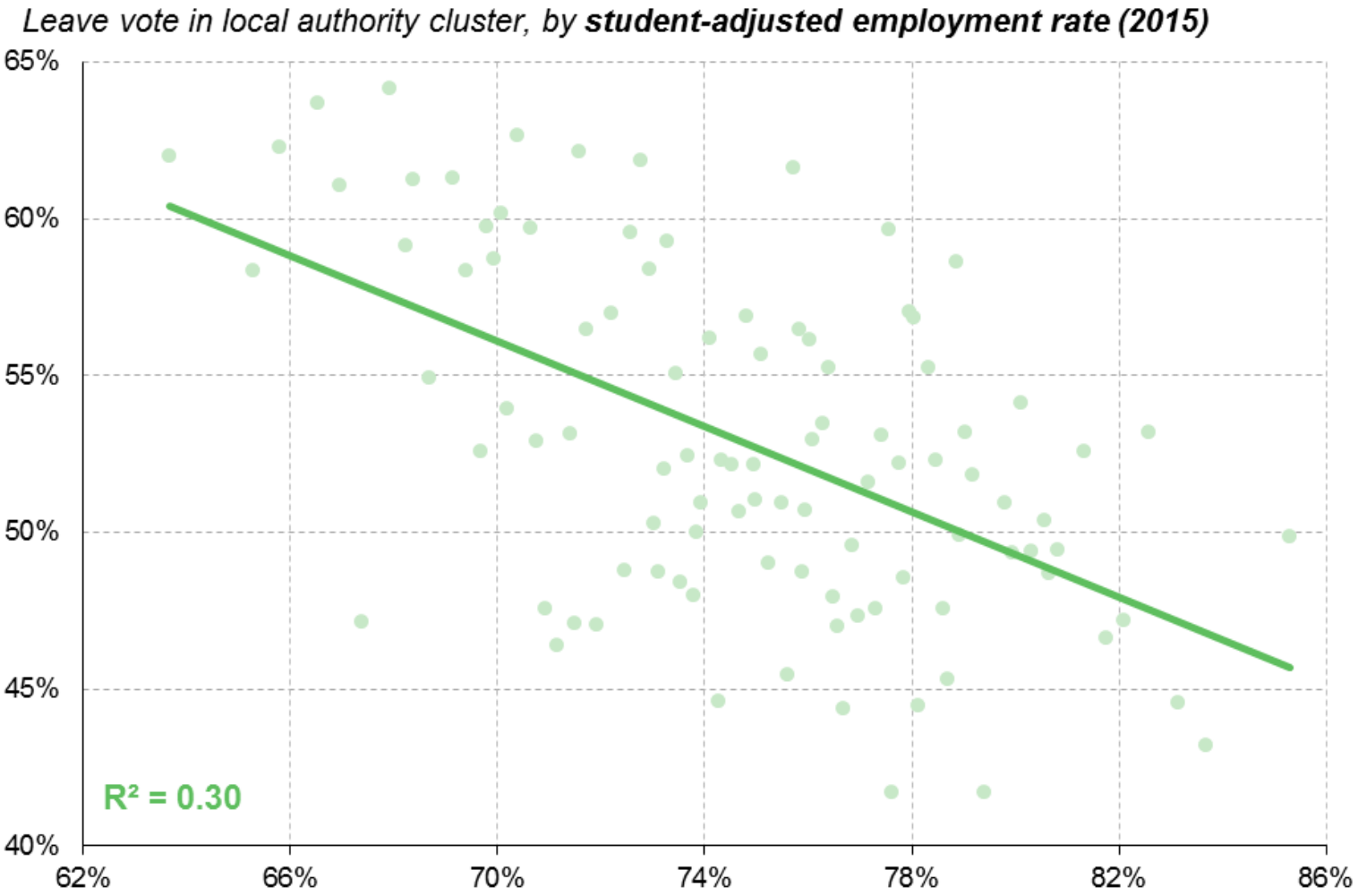
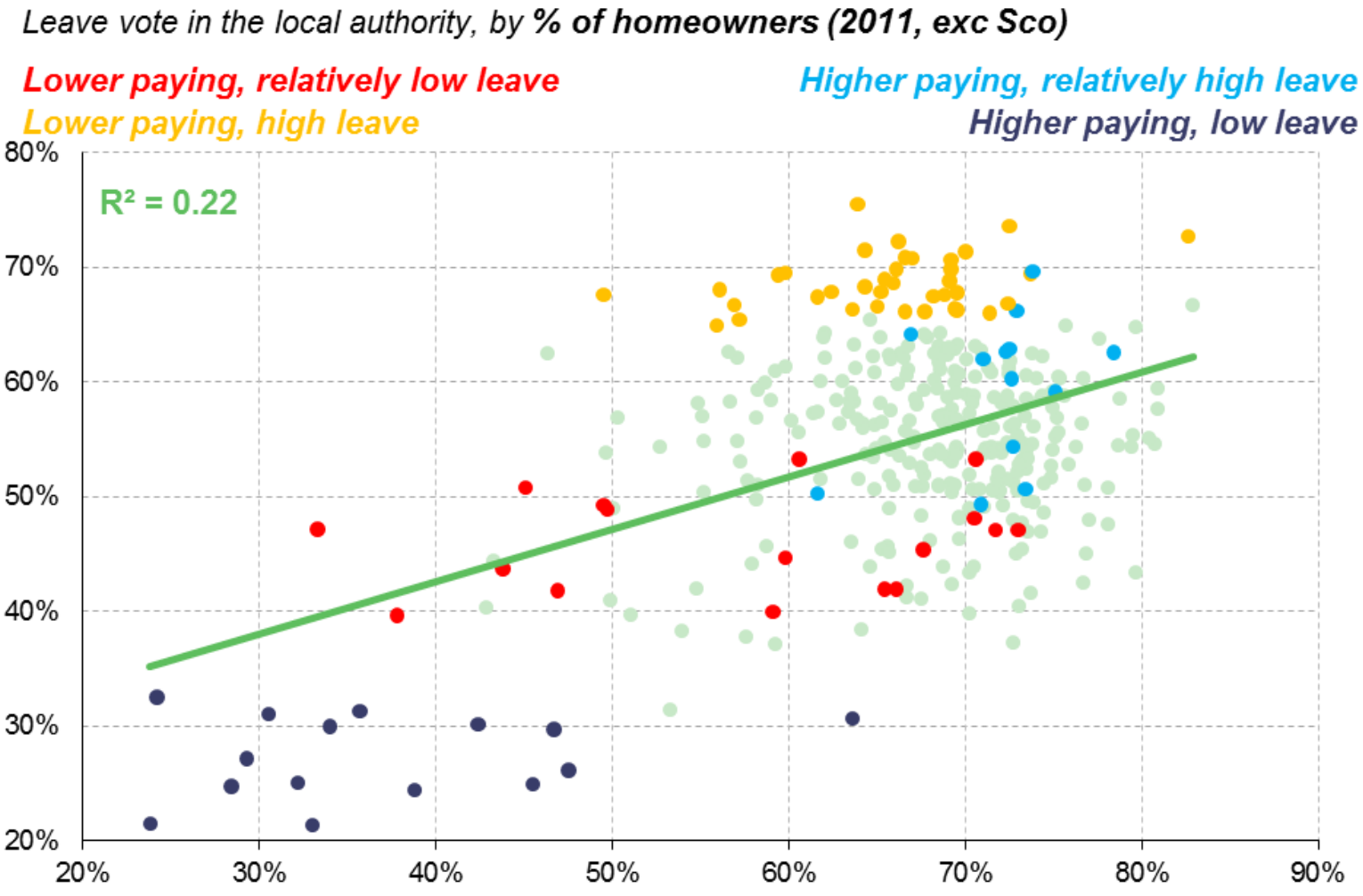


Moving beyond the simple scatter chart, regression analysis shows that employment is important once the number of students in an area is controlled for

Dots now show clusters of LAs

Source: ONS, NOMIS

Home ownership levels also appear to matter, with high owning areas more likely to vote leave



Source: ONS, NOMIS

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Big distinction between ownership in the two higher paying groups: low leave areas record much lower levels of ownership than relatively high leave areas

But this distinction is less marked between the two lower paying groups

2 PLACE AND DEMOGRAPHICS

Age, student population and immigration

The older an area is (measured by ratio of older to younger people) the higher the leave vote

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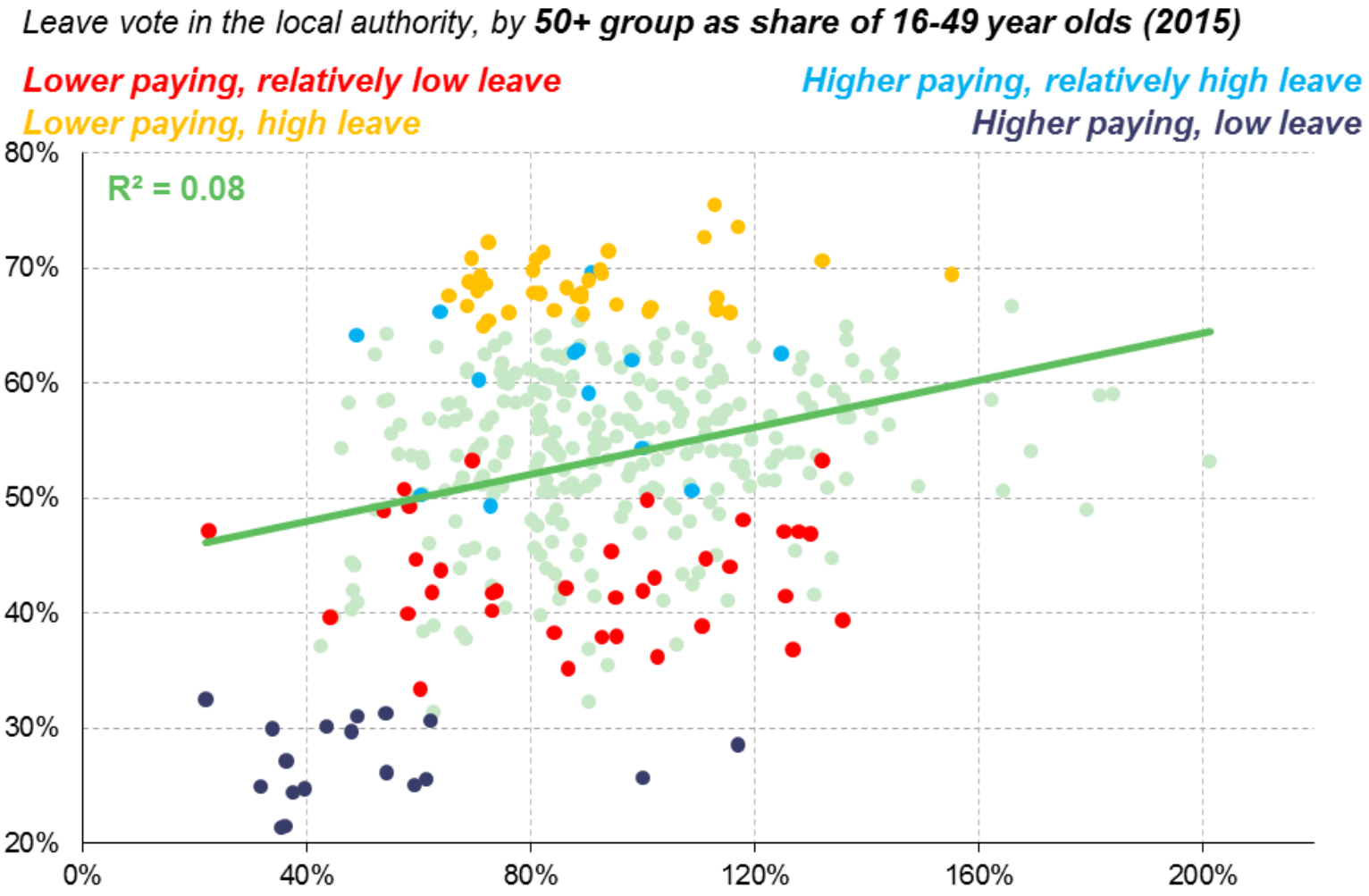
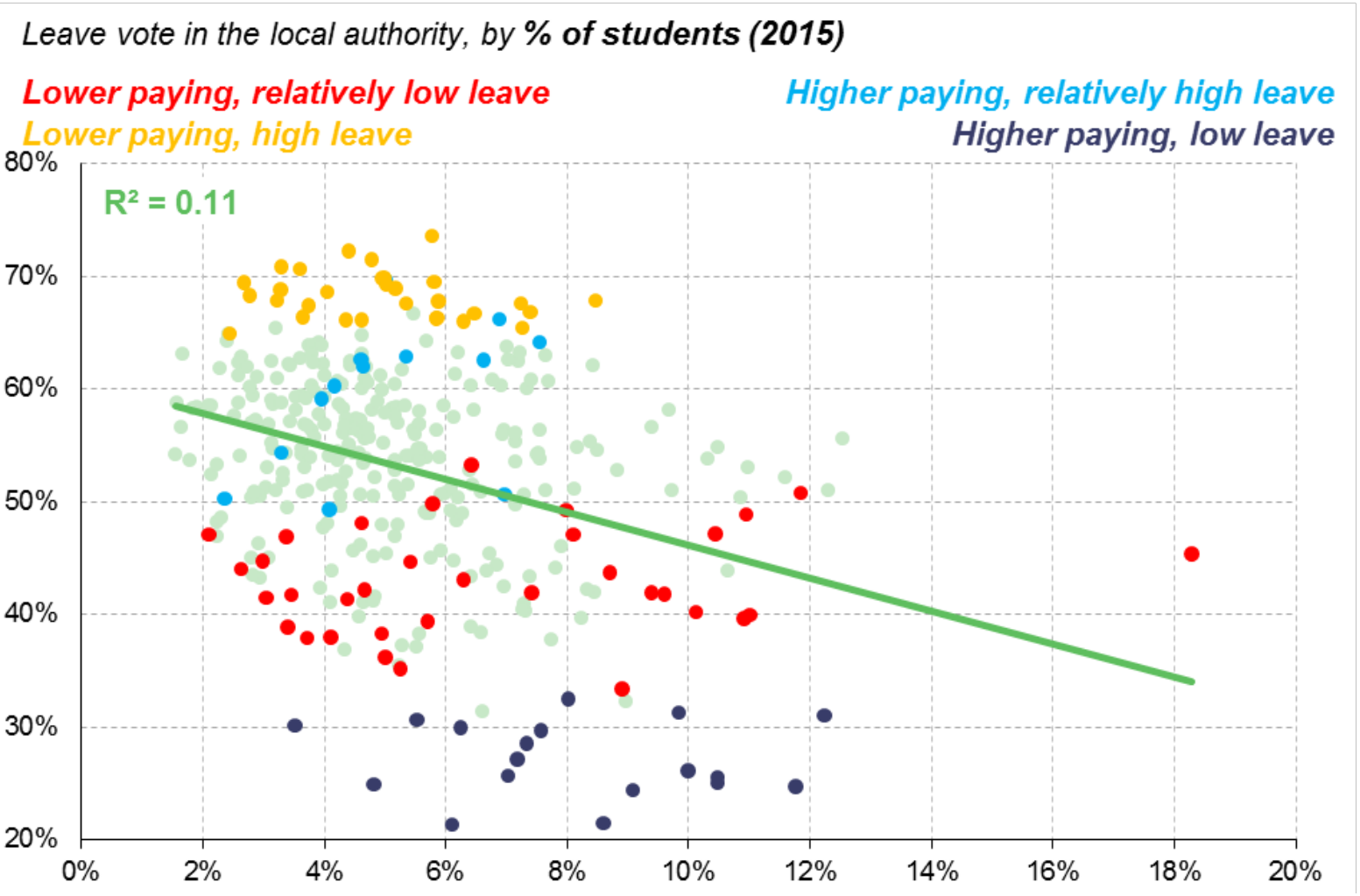


Higher paying, low leave areas are typically younger than higher paying, relatively high leave areas

Don't see the same distinction between the two lower paying groups

Source: ONS, NOMIS

As already touched on, the link with the number of current students runs in the opposite direction



Source: ONS, NOMIS

Students form a higher proportion of the population in low leave vote areas, marking a clear difference between some of the lower paying areas

Higher paying, relatively high leave vote tend to have relatively few students

As does the size of the migrant population – i.e. the higher the proportion of migrants in the local population the lower the leave vote

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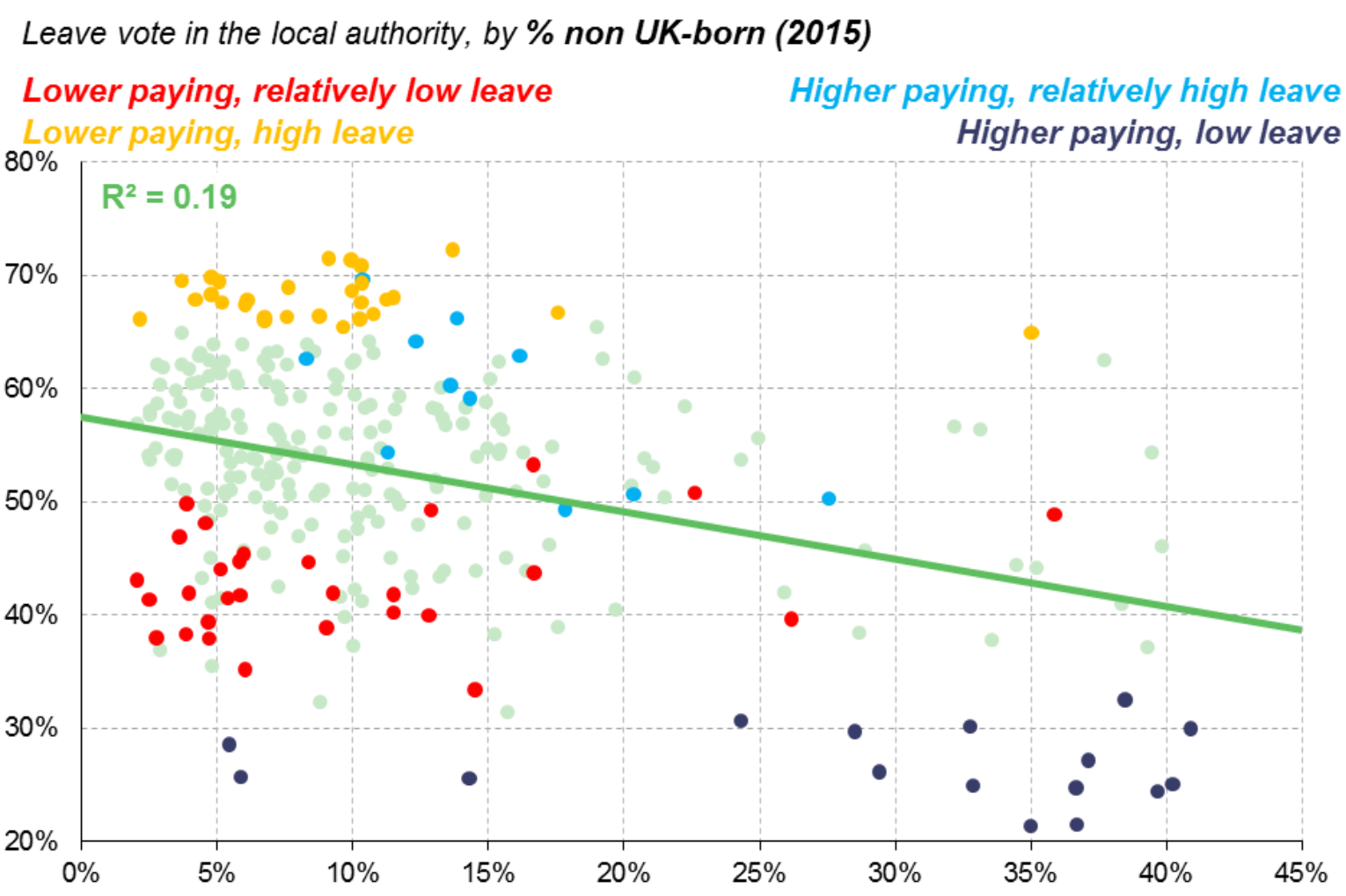

Source: ONS, NOMIS

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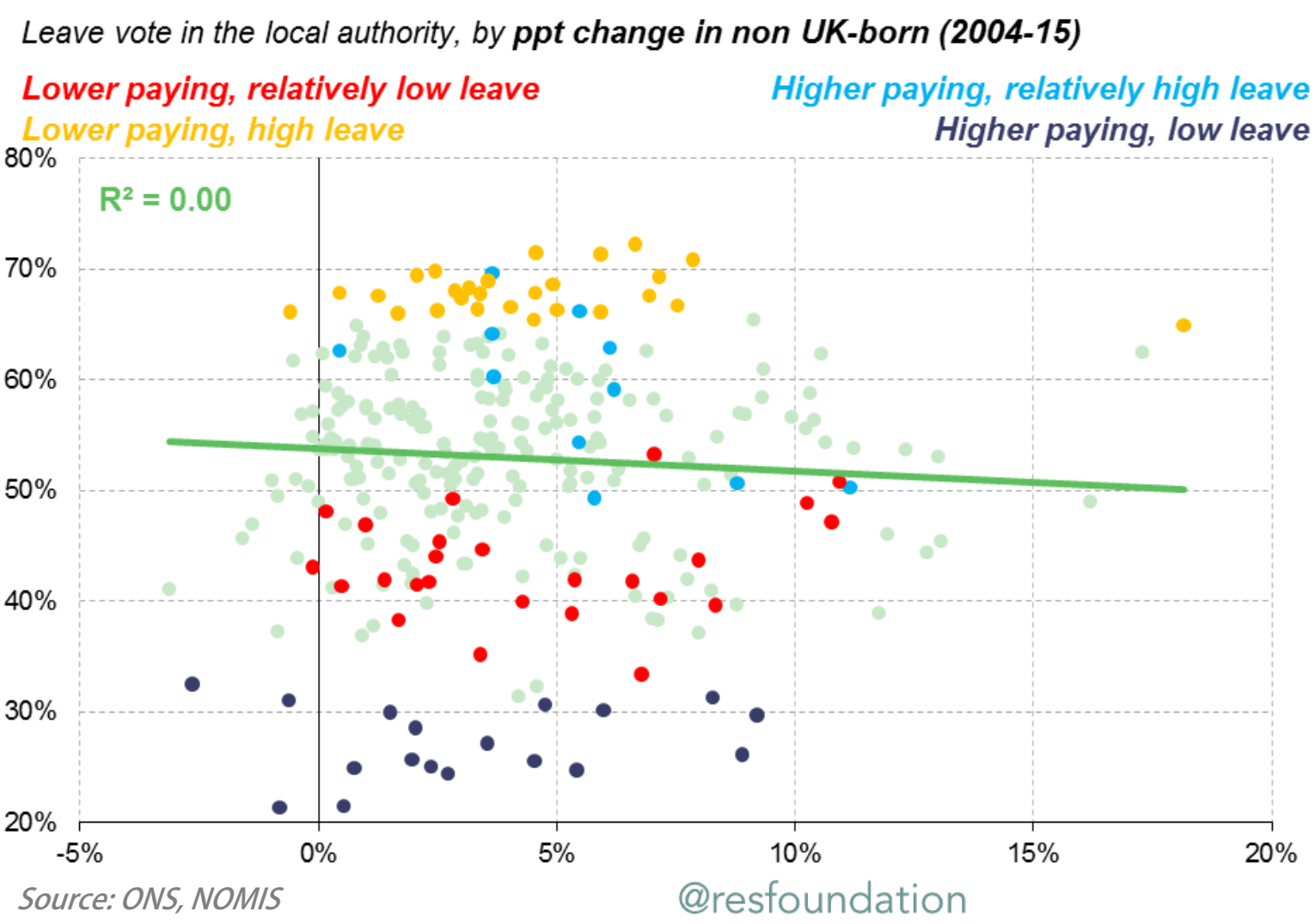
Clear distinction between higher paying, low leave and higher paying, relatively high leave areas

But distinction not obvious in relation to the two lower paying groups

Yet on the face of it, there is no clear relationship between the change in migrant population and leave vote



Source: ONS, NOMIS

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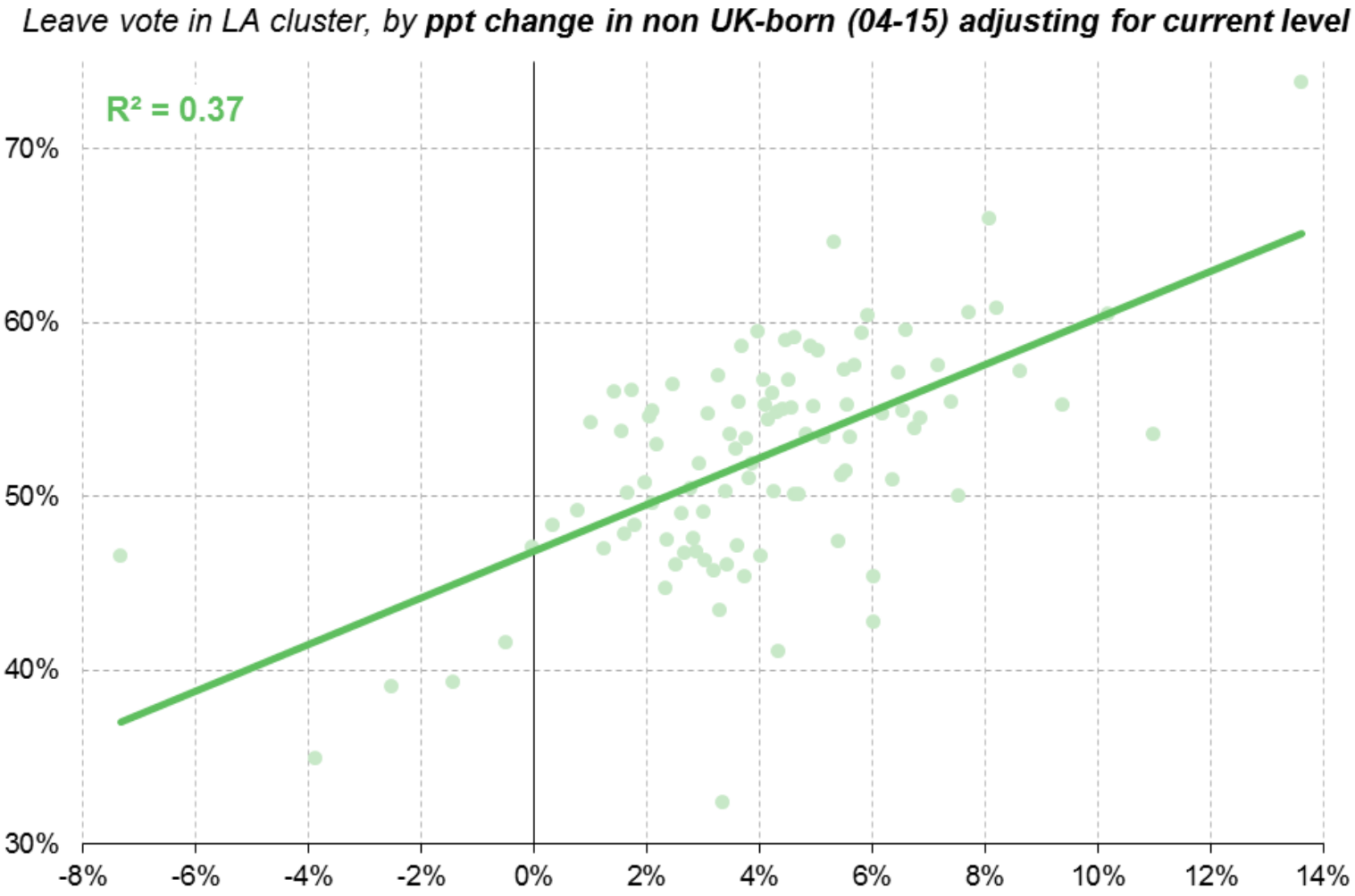
Based on a simple correlation, the extent to which the migrant population has changed in an area since 2004 has little correlation with the leave vote

Data limitations mean a number of local authorities are missing from this analysis

But the change in the migrant population does have an effect once we take into account the size of the migrant population in an area



Source: ONS, NOMIS

Regression analysis controls for the number of migrants already in an area

The leave vote was higher in areas that started the period with relatively few migrants but which saw sizeable increases – includes ***Redditch, Maidstone, Gravesham and Lincoln***

3 PLACE AND CULTURE

Cohesion and education

Higher leave vote in areas that report lower levels of 'cohesion' (where different backgrounds 'get on')

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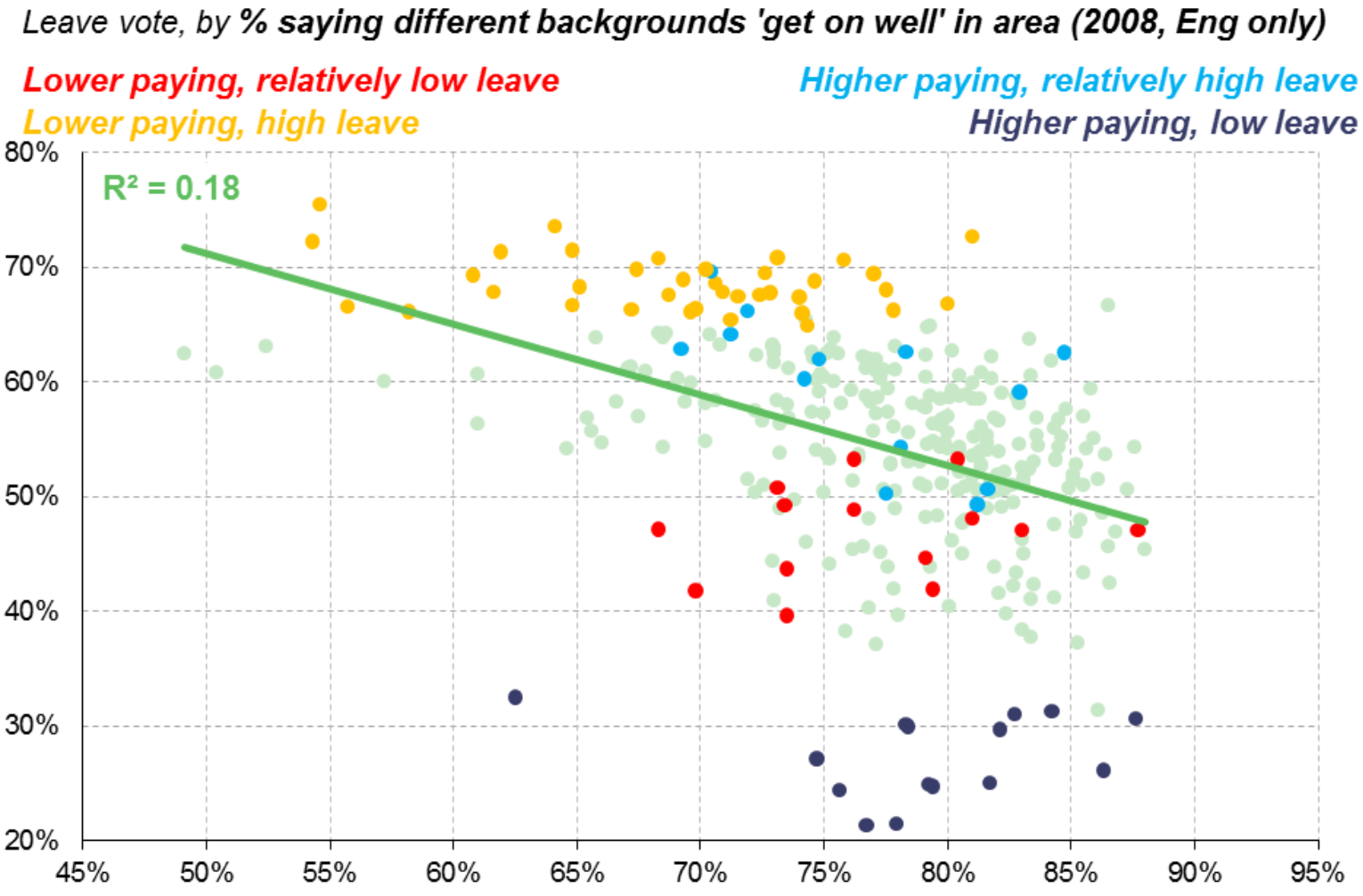

Source: DCLG, Hub Interchange

Difference is most marked between the two lower paying groups: lower paying, high leave areas record lower cohesion than lower paying, relatively low leave areas

Findings remain even after holding all other factors constant

Simple correlation highlights apparently very strong correlation with education levels

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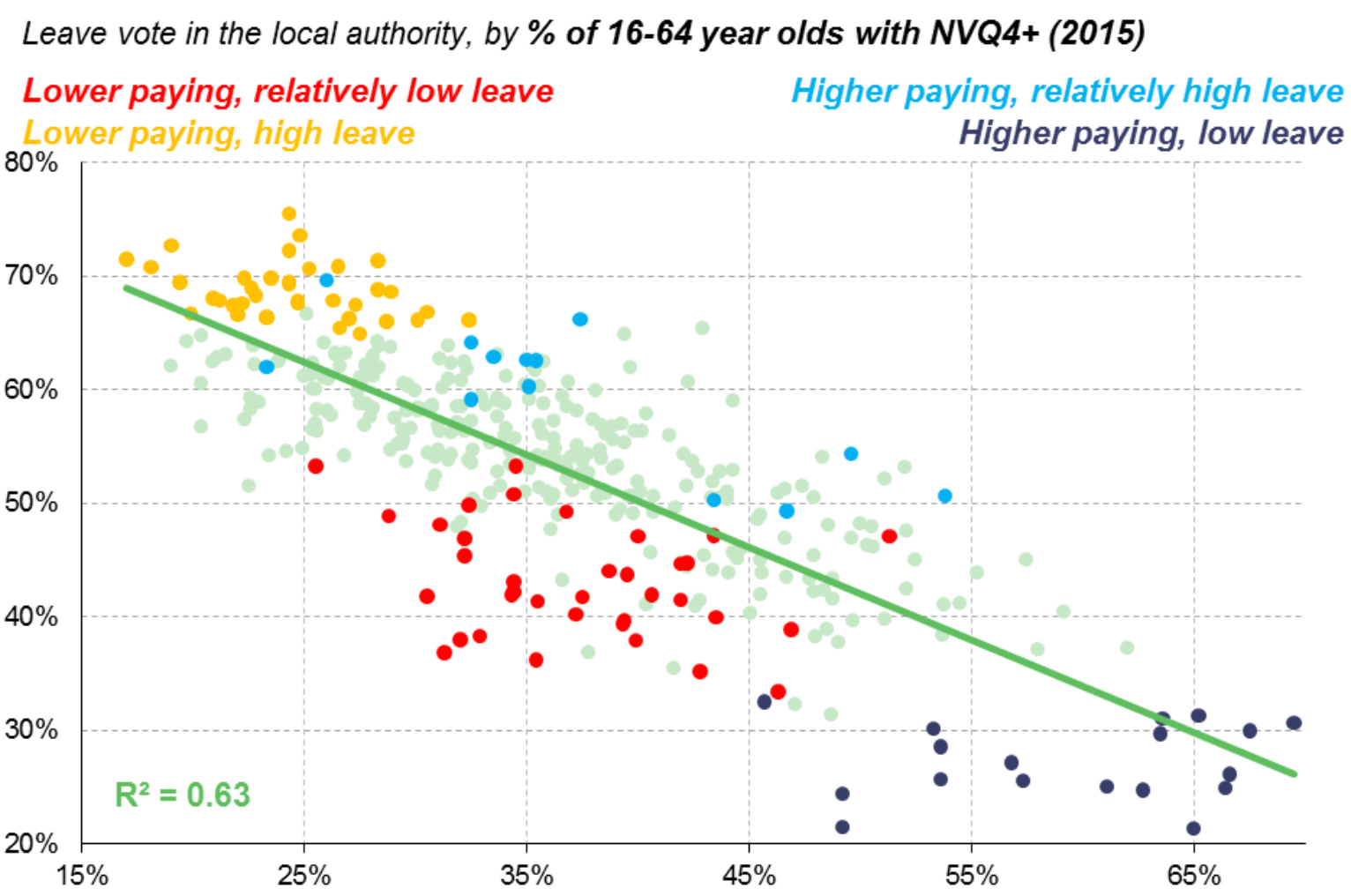

Having a qualification equivalent to NVQ level 4 (i.e. degree level) or higher is key difference

Separates both the two higher paying groups and the two lower paying groups

Source: ONS, NOMIS

With education showing correlation with culture, demographics and economics – *'cohesion'*

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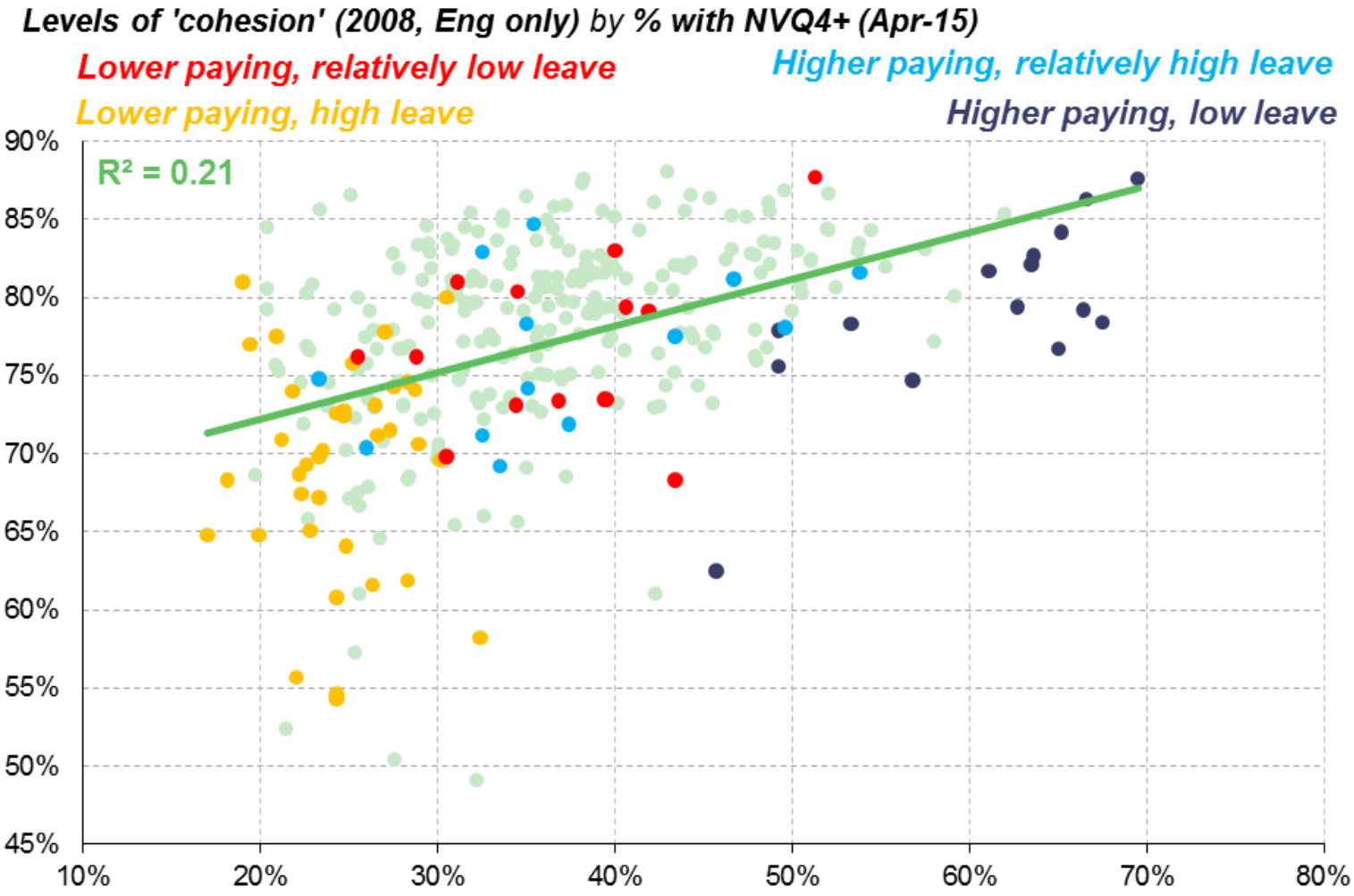

Source: ONS, NOMIS

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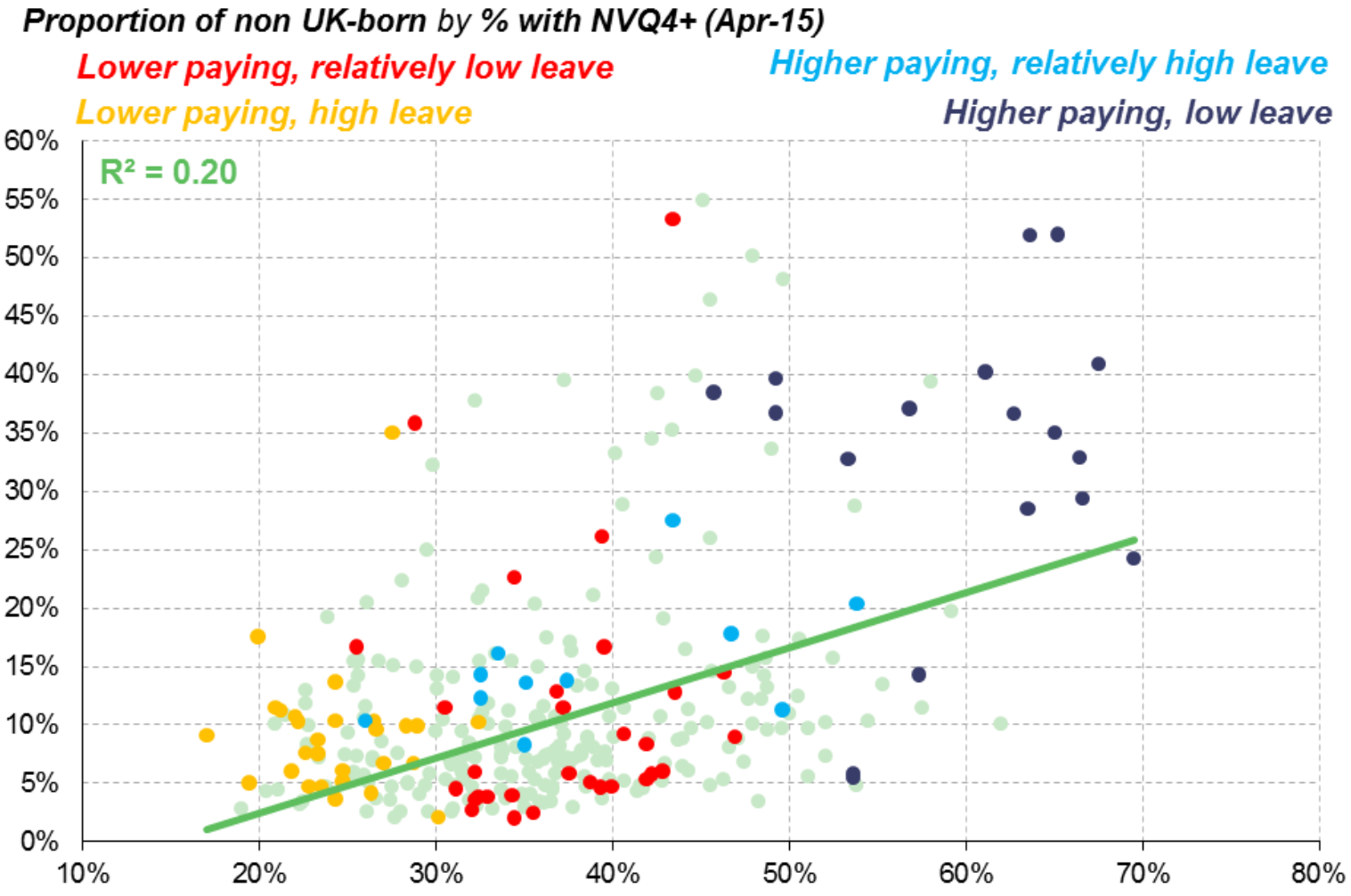
Clear distinction between levels of 'cohesion' in areas with highest and lowest proportions with NVQ4+

Lower-skilled, less-cohesive, high-leave areas include ***Thurrock, Boston & Burnley***

With education showing correlation with culture, demographics and economics – *non UK-born population*

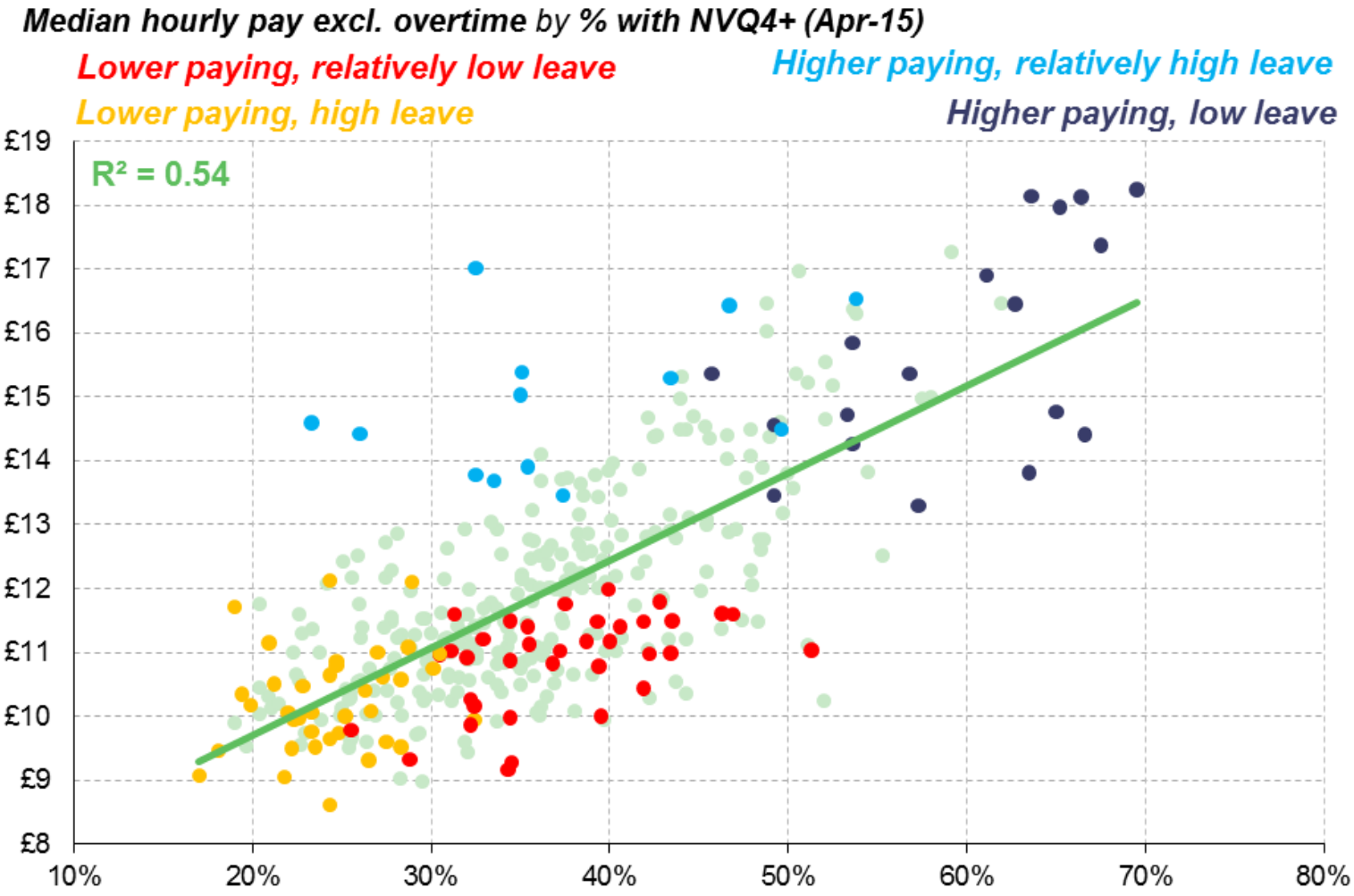


Source: ONS, NOMIS

Similar strength of correlation between education and level of migrant population in the local authority

Higher-skilled, higher-migrant, low-leave areas include ***Westminster, Hammersmith & Fulham and Camden***

With education showing correlation with culture, demographics and economics – *pay levels*



Source: ONS, NOMIS

Especially strong relationship between education and pay

Lower-skilled, high-pay, higher-leave areas include ***Havering, Brentwood and Bromley***

4 THE KEY DRIVERS

Regression results

Regression analysis isolates the impact of each variable when holding all others constant

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- The simple correlations set out above depict those factors that are related to the strength of the leave vote in each local authority
- These factors are shown to be important in a number of regression models. We isolate the explanatory value of each different factor, holding all other factors constant
- Technically, we use a clustered standard errors approach
- Due to data availability, most of our findings relate to England only, but we run separate models with fewer variables to identify the Scottish and Welsh 'effects'

Significant factors include economic, demographic and cultural factors (England)

	Statistically significant variables *(2015 unless stated)*	Non-significant variables *(2015 unless stated)*
Negatively correlated *(reduces leave vote)*	Employment rate Students Degrees 'Cohesion' (2008)	Median hourly pay Change in median pay (02-15) Change in manufacturing employment ('95-'15) Non-UK born
Posititvely correlated *(increases leave vote)*	Proportion of older to younger Change in non-UK born (04-15) Home owner population (2011)	

Regression analysis controls for all other factors to highlight the explanatory value of each different factor in turn

'Significant' results are those with p values of 0.1 or lower

Significant factors include economic, demographic and cultural factors (England)

	Statistically significant variables *(2015 unless stated)*	Ppt change in leave vote assoc. w/ 10ppt increase in variable	Average across English LAs
Negatively correlated *(reduces leave vote)*	Employment rate	-1.7	75.4%
	Students	-5.0	5.4%
	Degrees	-4.5	36%
	'Cohesion' (2008)	-3.9	77%
Posititvely correlated *(increases leave vote)*	Proportion of older to younger	0.7	90.3%
	Change in non-UK born (04-15)	3.9	4.2%
	Home owner population (2011)	4.4	66%

- Results show, for example, that a 10ppt increase in the employment rate is associated with a 1.7ppt reduction in leave vote (all else constant)
- Likewise, a 10ppt increase in the share of the population with NVQ4+ qualifications is associated with a 4.5ppt reduction in the leave vote
- In contrast, a 10ppt increase in home ownership rates increases the leave vote by 4.4ppt

Relative to the South West (which voted broadly in line with the UK average), regional 'effects' are visible

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	ppt change in leave vote associated with the region
Statistically significantly different from South West vote	
Scotland	-12.02***
North West	-2.933***
Wales	-2.776***
Yorkshire and the Humber	1.614***
East Midlands	1.715***
North East	2.126**
West Midlands	3.609***
Not statistically significantly different from South West vote	
London	*1.020*
South East	*0.800*
East	*0.272*

*** p<0.01, ** p<0.05, * p<0.1

Holding constant factors such as pay, education, migration and cohesion, local authorities in Scotland recorded leave votes that were 12ppts lower than in the South West

In contrast, areas in the West Midlands recorded leave votes that were 3.6ppts higher than in the South West

Full regression results

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	England	Including Wales	Including Wales & Scotland
Median hourly pay ex. overtime (logged)	-2.479	-4.514	3.566
Change in median pay (2002-15)	-0.0294	-0.0185	-0.0621**
16-64 employment rate (2015)	-0.171*	-0.297***	-0.173*
Proportion of 50+ year-olds to 16-49 year olds (2015)	0.0749**	0.0391	0.0280
Students as proportion of population (2015)	-0.502***	-0.759***	-0.858***
Proportion of people with NVQ4 or higher (2015)	-0.452***	-0.557***	-0.633***
Change in proportion of people in employment in manufacturing (1995-15)	0.0535	0.0577	-0.0255
Proportion of population who are migrants (2015)	-0.138	-0.139*	-0.278***
Change in the proportion of population who are migrants (2004-15)	0.386***	0.463***	0.703***
Proportion of population who own home (2011)	0.440***	0.416***	
Proportion of population who believe people from different backgrounds get on well in local area (2008)	-0.387***		
Relative to South West			
East	0.598	0.588	0.272
East Midlands	1.551***	0.930**	1.715***
London	-0.105	1.379	1.020
North East	0.765	1.324	2.126**
North West	-3.943***	-3.143***	-2.933***
South East	-0.132	0.581	0.800
West Midlands	2.771***	3.412***	3.609***
Yorkshire and the Humber	-0.646	1.021**	1.614***
Wales		-3.269***	-2.776***
Scotland			-12.02***
Constant	102.0***	94.67***	85.02***
Observations	235	251	271
R-squared	0.861	0.834	0.840

All models run with standard errors clustered by region *** p<0.01, ** p<0.05, * p<0.1

5 CONCLUSION

Economics clearly matter, but by no means the only consideration

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- Evidence that the geographical distribution of living standards influenced the referendum vote, with employment having a significant effect
- But recent changes in pay appear *not* to have had a significant effect, implying that living standard issues are long-established
- Demographics also matter, with older areas voting to leave and areas with lots of students being more likely to vote remain
- Cultural and geographical factors play a key role, represented by the importance of feelings of cohesion within the local area, and by the tendency for different regions to vote differently even after controlling for all other factors
- The *level* of migration doesn't seem to matter but the pace of *change* over the past decade or so does
- The strength of the correlation with higher qualification levels in an area is particularly telling, with this variable closely associated with both economic and wider cultural factors