

Online Appendix

“Did Austerity Cause Brexit?”

For Online Publication

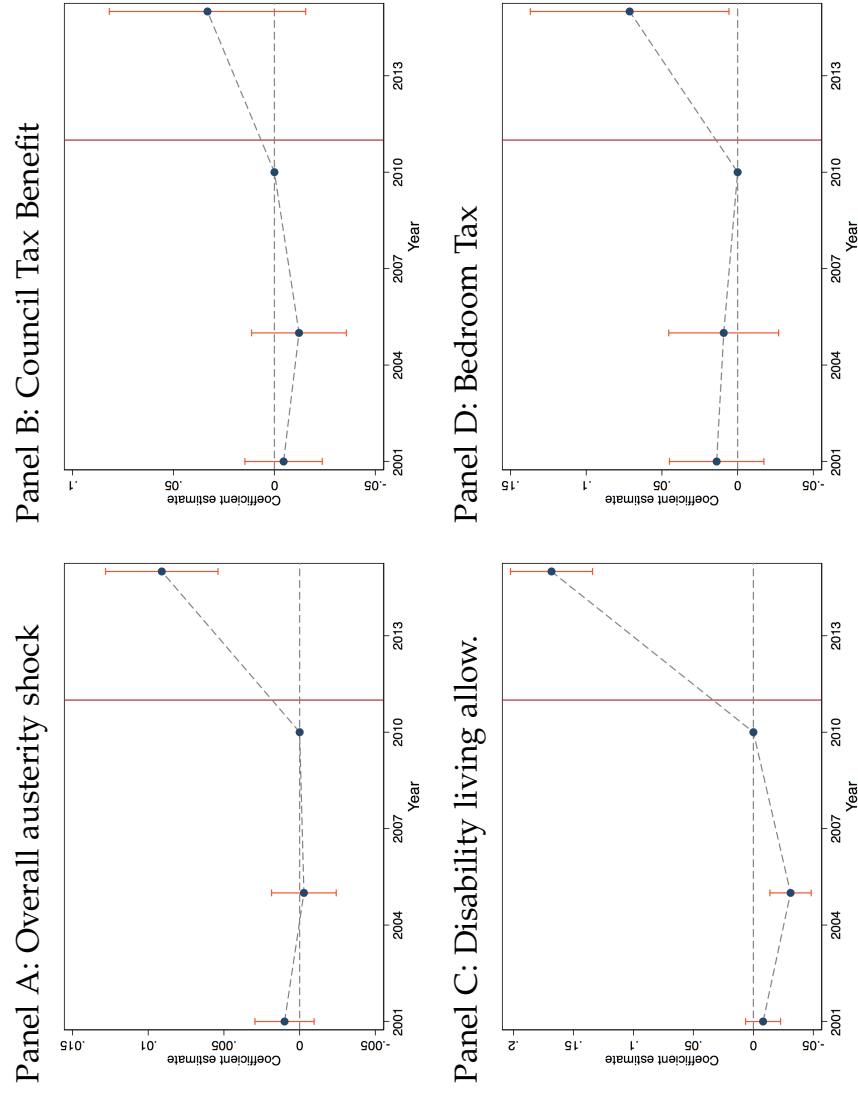
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July 22, 2018

This appendix is subdivided into three sections. Section **A** presents further robustness checks and additional results as figures or tables that were omitted from the main paper due to space constraints. These results are directly referred to in the main text and discussed in the main body or in footnotes. Section **B** presents further descriptions of the underlying data as well as additional background materials. The relevant sections are referred to in the main text. Section **C** presents a set of auxiliary results only indirectly referred to in the main text, they are discussed in detail in this appendix section.

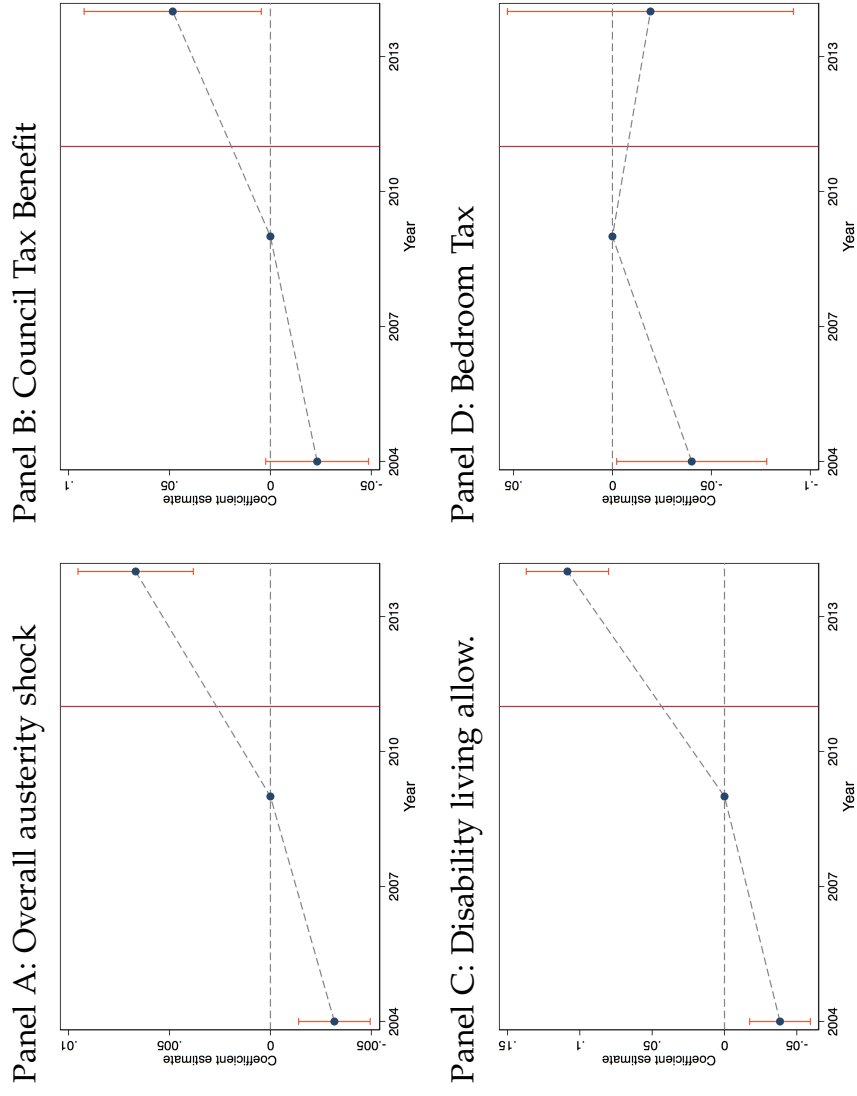
A Further Robustness Checks and Additional Results

Figure A1: Non-parametric effect of austerity on support for UKIP overall and by individual measures studying *Westminster elections*.



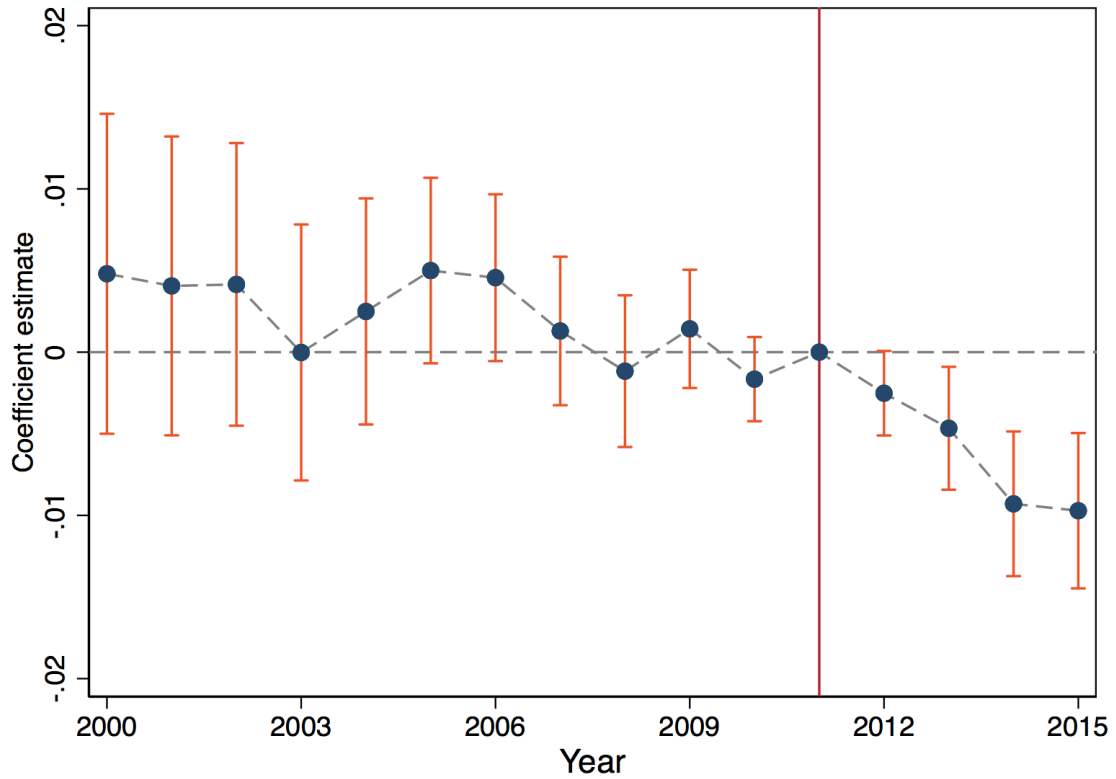
Notes: The dependent variable is the percentage of votes for UKIP in Westminster elections across the 570 harmonized constituencies in the 2001, 2005, 2010 and 2015 Westminster elections. The graph plots point estimates of the interaction between the simulated incidence of the austerity measures and a set of year fixed effects with 2010 as omitted year. All regression include constituency fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the constituency level with 90% confidence bands indicated.

Figure A2: Non-parametric effect of austerity on support for UKIP overall and by individual measures studying *European elections*.



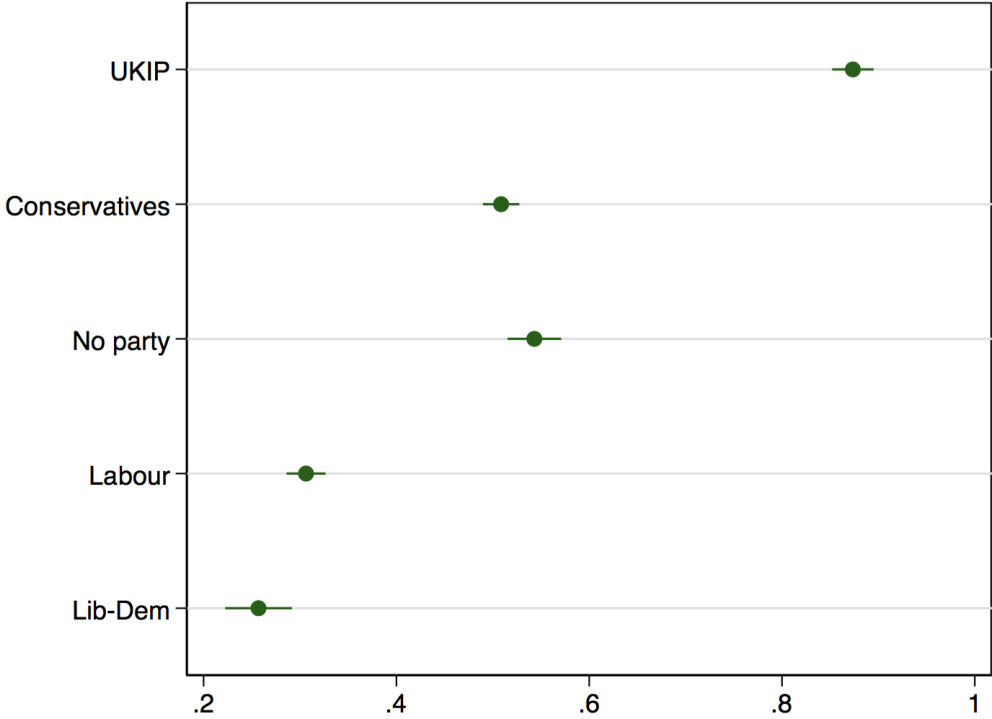
Notes: The dependent variable is the percentage of votes for UKIP in European Parliamentary elections of 2004, 2009 and 2014 at the district level. The graph plots point estimates of the interaction between the simulated incidence of the austerity measures and a set of year fixed effects with 2009 being the omitted year. All regression include district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure A3: Effect of Austerity on Local Area Gross Value Added per capita



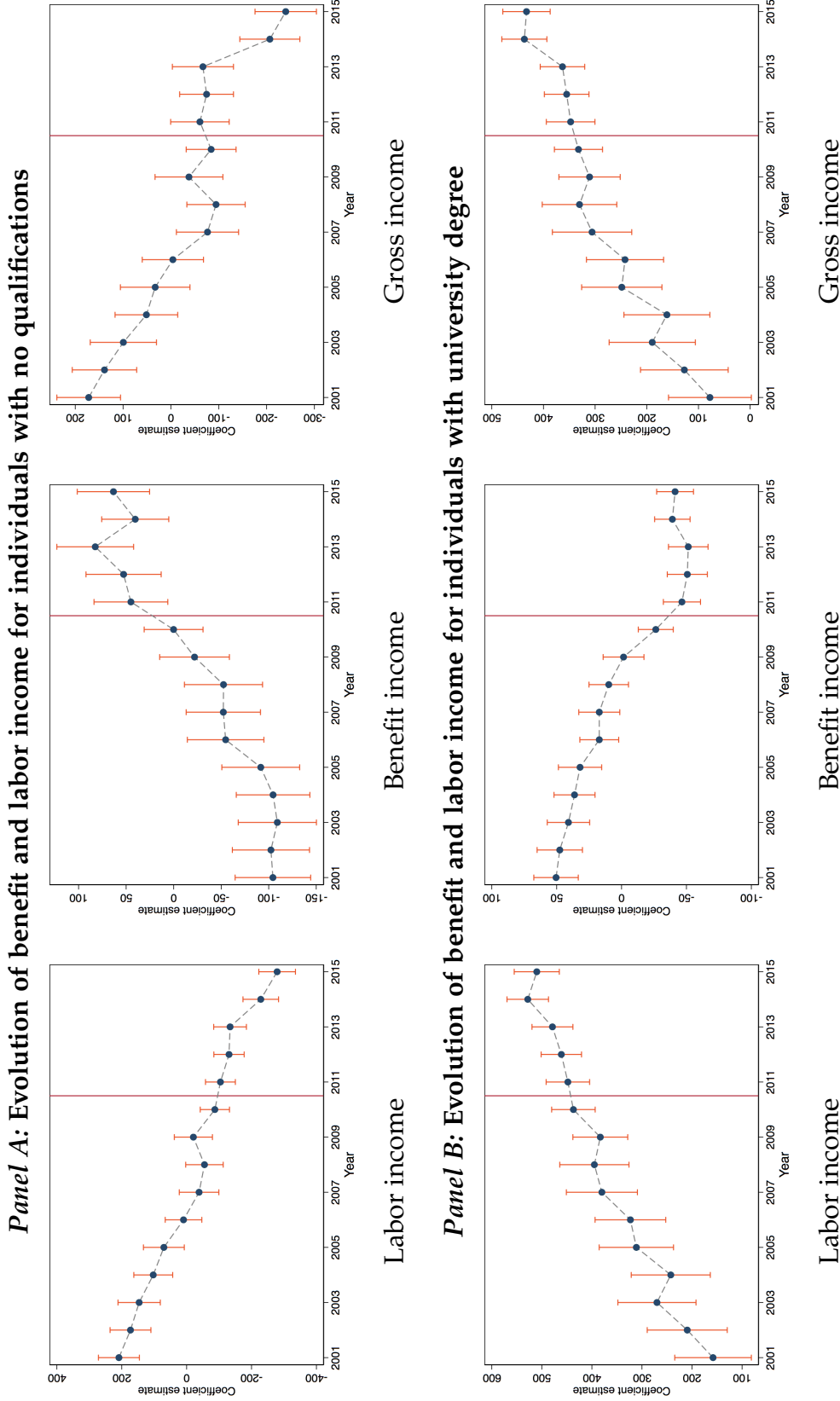
Notes: The dependent variable is the log value of the gross value added per working age adult in a local authority area between 2000 to 2015. The graph plots point estimates of the interaction between the overall simulated local authority area austerity incidence and a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure A4: Support for Leave in EU referendum by respondent's political party preference



Notes: The plot presents sample averages of Leave support in Wave 8 of the USOC survey by the respondents expressed political support for UKIP, the Conservatives, Labour or the Liberal Democrats.

Figure A5: Excluding individuals ever having worked in manufacturing, mining or agriculture: Non-parametric estimates capturing the evolution of labor and benefit income *within individuals* over time for respondents with low- and high levels of human capital



Notes: The dependent variable is the monthly gross labor income on the left, and the monthly benefit income on the right. The population is restricted to the sample of BHPS and USOC respondents that are not retired and that have never worked in manufacturing, mining or agriculture. The BHPS survey waves 11-18 start in 2001 and end in 2009, while the larger USOC survey starts in 2009 and includes some, but not all of the former BHPS from Wave 2 onwards. The graph plots point estimates of the interaction between the qualification status of respondents (having no qualifications in top row, versus having a university degree in bottom row) on monthly labor or benefit income. All regression include individual respondent fixed effects and local authority by time fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Table A1: Robustness of the Impact of different austerity measures on support for UKIP across Local, European and Westminster elections: Adding district specific linear time trends

	(1)	(2)	(3)	(4)	(5)	(6)
	Overall	TC	CB	CTB	DLA	BTX
<i>Panel A: Local</i>						
$\mathbb{1}(\text{Year}>2010) \times \text{Austerity}$	0.005* (0.002)	0.036*** (0.012)	0.094** (0.038)	0.051 (0.034)	0.052* (0.027)	0.040 (0.069)
Mean of DV	4.49	4.49	4.49	4.49	4.49	4.49
Local authority districts	345	346	346	346	346	346
Observations	3260	3263	3263	3263	3263	3263
<i>Panel B: European</i>						
$\mathbb{1}(\text{Year}>2010) \times \text{Austerity}$	0.004 (0.003)	0.030** (0.014)	0.015 (0.035)	0.025 (0.038)	0.070*** (0.027)	-0.059 (0.057)
Mean of DV	21.1	21.1	21.1	21.1	21.1	21.1
Local authority districts	378	379	379	379	379	379
Observations	1134	1137	1137	1137	1137	1137
<i>Panel C: Westminster</i>						
$\mathbb{1}(\text{Year}>2010) \times \text{Austerity}$	0.010*** (0.002)	0.081*** (0.010)	-0.016 (0.031)	0.073** (0.035)	0.164*** (0.024)	0.118** (0.051)
Mean of DV	6.03	6.03	6.03	6.03	6.03	6.03
Harmonized Constituencies	566	566	566	566	566	566
Observations	2047	2047	2047	2047	2047	2047
Avg Loss per working age adult Affected HH. in 1000s	447.1	87.97 4507	71.52 7601	7.21 2436	36.57 499	10.81 660
<i>Correlation with...</i>						
No qualification share		.75	.17	.51	.77	.58
Routine job share		.6	.12	.27	.62	.43
Retail sector share		.35	.28	.02	.21	.08
Manufacturing sector share		.3	.11	-.03	.37	.24

Notes: Table reports results from a panel OLS regressions with local authority area and region by year fixed effects. The dependent variable is UKIP's vote share in the Local Elections from 2000 to 2015. Standard errors clustered at the Local Government Authority District Level are presented in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A2: Effect of austerity on political preferences: Studying the original political preferences of supporters of different political parties

	(1)	(2)	(3)	(4)	(5)
	UKIP	Conservatives	Labour	Lib Dems	No party
<i>Initial party preference...</i>					
Conservatives × Post × Any	0.047*** (0.013)	-0.080*** (0.016)	0.029** (0.013)	0.008 (0.007)	0.002 (0.012)
Labour × Post × Any	0.007 (0.006)	-0.026*** (0.005)	0.021** (0.010)	-0.001 (0.003)	0.000 (0.008)
Lib Dems × Post × Any	0.045** (0.018)	-0.061*** (0.012)	-0.002 (0.020)	0.006 (0.019)	0.013 (0.018)
None × Post × Any	0.003 (0.009)	-0.039*** (0.007)	0.022* (0.012)	-0.006 (0.005)	0.027** (0.014)
UKIP × Post × Any	0.006 (0.037)	-0.020 (0.020)	0.007 (0.022)	0.006 (0.010)	-0.000 (0.029)
Other × Post × Any	0.057*** (0.020)	-0.014 (0.011)	-0.022 (0.020)	-0.013 (0.010)	0.020 (0.019)
Mean of DV	.0479	.263	.351	.082	.187
Local authority districts	378	378	378	378	378
Observations	231887	231887	231887	231887	231887
Individual FE	x	x	x	x	x
District × Region × Time FE	x	x	x	x	x

Notes: Table reports results from a panel OLS. The dependent variable is a dummy variable taking the value 1 in case a respondent expresses support for the party provided in the column head (either stating they are a supporter, feel close or would vote for the party if there was a general election tomorrow). The underlying regression interacts the individual level exposure to welfare reforms studied in Table 3 with a baseline measure of an individual's stated political party preference recorded the first time the respondents contribute to the USOC study. Standard errors clustered at the Local Government Authority District Level are presented in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A3: Effect of exposure to welfare cuts on like/ or dislike of the established political parties: included only in Wave 2, 3 and 6 in USOC study

	(1)	(2)	(3)
<i>Panel A: Like or dislike Conservatives</i>			
Post × Benefit cut	-0.178*** (0.055)	-0.221*** (0.059)	-0.173* (0.100)
Mean of DV	3.53	3.53	3.53
Local election districts	378	378	378
Observations	75077	75077	75077
<i>Panel B: Like or dislike Labour</i>			
Post × Benefit cut	-0.020 (0.061)	-0.041 (0.066)	-0.045 (0.103)
Mean of DV	4.09	4.09	4.09
Local election districts	378	378	378
Observations	75193	75193	75193
<i>Panel C: Like or dislike Liberal Democrats</i>			
Post × Benefit cut	0.090* (0.050)	0.032 (0.053)	-0.015 (0.097)
Mean of DV	3.07	3.07	3.07
Local election districts	378	378	378
Observations	73783	73783	73783
District FE	×		
Region x Wave x Time FE	×		
District x Wave x Time FE		×	×
Individual FE			×

Notes: Table reports results from a OLS regressions. The dependent variable capture the extent to which respondents like or dislike one of the three main political parties. They are measured on a 10 point Likert scale ranging from strong dislike to strongly like. Standard errors clustered at the Local Government Authority District Level are presented in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A4: Alternative broader outcome measures and support for Leave across different control variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
My vote doesnt matter	0.001 (0.010)	0.009 (0.009)	0.014 (0.009)	0.014 (0.009)	0.014 (0.009)	0.014 (0.011)	0.012 (0.012)	0.014 (0.015)
Public officials dont care	0.052*** (0.006)	0.041*** (0.006)	0.037*** (0.006)	0.037*** (0.006)	0.035*** (0.006)	0.036*** (0.007)	0.028*** (0.007)	0.034*** (0.009)
Dont have a say in what govt does	0.043*** (0.005)	0.032*** (0.005)	0.032*** (0.005)	0.032*** (0.005)	0.031*** (0.005)	0.027*** (0.006)	0.027*** (0.006)	0.029*** (0.008)
Mean of DV	.438	.438	.438	.438	.438	.403	.388	.386
Local authority districts	374	374	374	374	374	373	369	344
Observations	12709	12674	12670	12667	12667	9276	7232	4495
District FE	x	x	x	x	x	x	x	x
Qualifications FE		x	x	x	x	x	x	x
Age FE			x	x	x	x	x	x
Employment Status FE				x	x	x	x	x
Income Decile FE					x	x	x	x
Industry of Employment FE						x	x	x
Socio-economic status group FE							x	x
Health conditions								x

Notes: Table reports results from a cross-sectional OLS regressions. The dependent variable is a dummy indicating whether respondents stated that they support Leaving the EU. The sample gets successively smaller as more control variables get added that are not available across the full sample. In case a variable is not reported on in a specific wave, the most recent time a control variable is observed for an individual in the panel is used. Standard errors clustered at the Local Government Authority District Level are presented in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

B Data and Additional Background Material

B.1 Validating the use of UKIP vote shares to capture anti-EU sentiment

One might be worried that UKIP vote shares in EP elections are not measuring anti-EU sentiments but potentially other dimensions of political preferences. Micro data from the British Election Study (BES) me to see whether support for UKIP is strongly associated with support for Leave.

The BES surveys are carried out with prospective voters from sampled wards across a (changing) sample of roughly 200 Westminster parliamentary constituencies. The sampling is not representative at the local authority district level and it is not guaranteed that the same constituencies or the same wards are sampled across different rounds, which makes it econometrically less appealing to work with this data. The survey is usually carried out reliably around British general elections.

Appendix Table B1 shows that self-reported individual (planned) voting for UKIP in the British general elections in 2005, 2010 and 2015 is a meaningful indicator for anti-EU and anti-immigration preferences across a range of these cross sections. In particular, the analysis suggests that UKIP voters are more likely to support the view that the EU is responsible for the UK's debt levels, that the EU is a threat to British sovereignty, that Britain let in too many immigrants into the country and that immigration increases crime, is bad for the economy and for job prospects of natives.

B.2 Council elections

The data for district elections in Great Britain is taken from The Elections Centre. It contains comprehensive data on local government elections since 1973. Since 1999, there have been several changes in local government structure, and these have been accounted for in constructing the panel.

The current local government structure includes both two-tier and single-tier components. In England, there are 27 upper-tier county councils with 201 lower-tier district councils. Additionally, there are 32 London Boroughs, the City of Lon-

Table B1: Validation of UKIP vote as measure of anti-EU and anti immigration sentiment

	(1)	(2)	(3)
<i>Panel A: (Strongly) disapprove of British EU membership [2005, 2010, 2015]</i>			
(Will) vote for UKIP	0.450*** (0.030)	0.457*** (0.031)	0.460*** (0.033)
Mean of DV	.331	.345	.352
LGA Districts	270	226	198
Respondents	7295	4958	4440
<i>Panel B: (Strongly) agree EU is responsible for UK debt [2015]</i>			
(Will) vote for UKIP	0.138*** (0.034)	0.142*** (0.036)	0.158*** (0.037)
Mean of DV	.265	.276	.286
LGA Districts	209	181	155
Respondents	2019	1718	1519
<i>Panel C: (Strongly) disagree that EU threat to British sovereignty is exaggerated [2005]</i>			
(Will) vote for UKIP	0.324*** (0.080)	0.312*** (0.101)	0.253** (0.117)
Mean of DV	.31	.327	.326
LGA Districts	104	69	59
Respondents	4296	2454	2204
<i>Panel C: Immigration is not good for economy [2005, 2010]</i>			
(Will) vote for UKIP	0.396*** (0.147)	0.356** (0.172)	0.355* (0.184)
Mean of DV	3.03	3.04	3.07
LGA Districts	191	147	128
Respondents	4702	2975	2689
<i>Panel C: Immigrants take jobs from natives [2005, 2010]</i>			
(Will) vote for UKIP	0.447*** (0.151)	0.453** (0.189)	0.382** (0.175)
Mean of DV	3.03	3.06	3.08
LGA Districts	190	146	127
Respondents	5096	3104	2795
<i>Panel D: Yes, too many immigrants have been let into this country [2015]</i>			
(Will) vote for UKIP	0.255*** (0.016)	0.258*** (0.016)	0.254*** (0.015)
Mean of DV	.73	.731	.751
LGA Districts	209	181	155
Respondents	2019	1718	1519
<i>Panel E: (Strongly) agree immigrants increase crime rates [2005, 2010]</i>			
(Will) vote for UKIP	0.293*** (0.061)	0.275*** (0.071)	0.260*** (0.075)
Mean of DV	.44	.462	.468
LGA Districts	191	147	128
Respondents	4690	2963	2677
Sample	All	England	Not London
Respondent controls	Yes	Yes	Yes
Region x Year FE	Yes	Yes	Yes

Notes: Table reports results from a OLS regressions on variables obtained from the 2005, 2010 and 2015 British Election Study. The years in which data is available for respective question is presented in parenthesis. All regressions control for respondent age, gender, an indicator of whether the respondent has no formal qualifications, a quadratic in age and an interaction with the education indicator and age. Standard errors clustered at the Local Government Authority District Level are presented in parentheses, stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

don, 36 metropolitan boroughs (or districts), and 55 unitary authorities (UA), all of which operate on a single-tier basis. Since 1994, there are 22 unitary authorities in Wales and 32 unitary authorities in Scotland. While most responsibilities are split between counties and districts in two-tier authorities, single-tier authorities must provide all the services. In constructing the sample, this paper includes all election results at the district council and single-tier authority level between 2000 and 2015.

Elections are organized by subdivisions of local authorities called electoral wards or electoral divisions. Each ward is represented by one or more elected councilors. Although in all cases councilors serve 4 year terms, there are three distinct systems of elections. First, elections may happen every four years for all councilors. Second, elections may happen for a third of the councilors every year, with no election in the fourth year. In this case, the fourth year is used for county council elections. Third, half of the councilors may be elected every two years. In terms of voting system, England and Wales use First Past the Post, while the Single Transferable Vote system is used in Scotland and Northern Ireland. In the analysis, a system of elections every four years starting in 2000 is treated separately from a system with elections every four years starting in 2004. Thus, all additional variation is taken into account with “election wave” fixed effects, which control for differences between authorities with different elections structures and sequences.

The main change in the structure of local government since 2000 was the introduction of nine new unitary authorities in England in 2009. These changes are summarized in the table below. In the first five county councils, the lower tier district councils were abolished, and all functions were undertaken by the new unitary authority of the same name. In Bedfordshire, Mid- and South Bedfordshire merged to form the Central Bedfordshire UA. Bedford attained UA status, having previously been a district. In Cheshire, the unitary authority of Cheshire West and Chester was formed from the districts of Ellesmere Port and Neston, Vale Royal, and Chester. The districts of Macclesfield, Congleton and Crewe and Nantwich merged to form Cheshire East. In order to compare the regions before and after these reforms, district-level results were merged into the current UA boundaries

between 2000 and 2008. There is no concern of overlap, as no district council was split to form the new unitary authorities.

Table B2: Changes to district councils since 2000

County Council (before 2009)	District Councils	New Unitary Authority (After 2009)
Cornwall	(Before 2009)	Cornwall
	Caradon	
	Carrick	
	Kerrier	
	North Cornwall	
	Penwith	
Durham	Restormel	Durham
	Cheshire-le-Street	
	City of Durham	
	Derwentside	
	Easington	
	Sedgefield	
	Teeside	
Northumberland	Wear Valley	Northumberland
	Alnwick	
	Berwick-upon-Tweed	
	Blyth Valley	
	Castle Morpeth	
	Tynedale	
	Wansbeck	
	Bridgnorth	
North Shropshire		
Oswestry		
Shrewsbury and Atcham		
South Shropshire		
Wiltshire	Kennet	Wiltshire
	North Wiltshire	
	Salisbury	
	West Wiltshire	
Bedfordshire	Mid Bedfordshire	Bedford
	South Bedfordshire	Central Bedfordshire
Cheshire	Chester	Cheshire West and Chester
	Congleton	Cheshire East
	Crewe and Nantwich	
	Ellesmere Port and Neston	
	Macclesfield	
	Vale Royal	

B.3 Political preferences elicited through the USOC survey

The key value added of working with individual level panel data lies in the fact that I can fully zoom in on changes in political preferences within an individual. The instrument used for each USOC survey round contains a Politics module that

elicits political preferences through a sequence of questions. These are presented in Figure B1. The enumerator asks the respondents first, whether an individual is a supporter of a political party. If the respondent says yes, they enquire which is the political party. In case respondents said that they are not a supporter of a specific party, the enumerator asks whether the respondent sees him- or herself closer to one party or another. If that is the case, the enumerator asks, which political party that is.

Only if a respondent is neither a supporter of a political party or feeling closer to one party over another one, the enumerator asks, which party would the respondent vote for in case there was an election.

In the face-to-face interviews, respondents are not directly prompted with party names from a menu, but rather respondents are asked to provide the party name, which the enumerator ticks on the survey questionnaire or, alternatively, details. In waves 1-3, the conversion of the survey questionnaires (containing the detailed party names) to digital files, did not separately code UKIP, but rather, included a broad category "Other" – the other main parties, in particular, Labour, Conservatives, Liberal Democrats, Greens, Plaid Cymru, Scottish Nationalists as well as Sinn Fein for Northern Ireland are always consistently coded.

Conversations with the UK Data Service handling the USOC data confirms that most of the Other-coded responses prior to wave 3 were supporters of UKIP or the British Nationalist Party (BNP). From Wave 4 onwards, UKIP is separately coded and the pool of respondents in the maintained "Other" category collapses once UKIP is separately coded. To be consistent throughout, I include the Other category into the count of UKIP supporters from Wave 4 onwards as well, which likely adds some noise to the dependent variable.

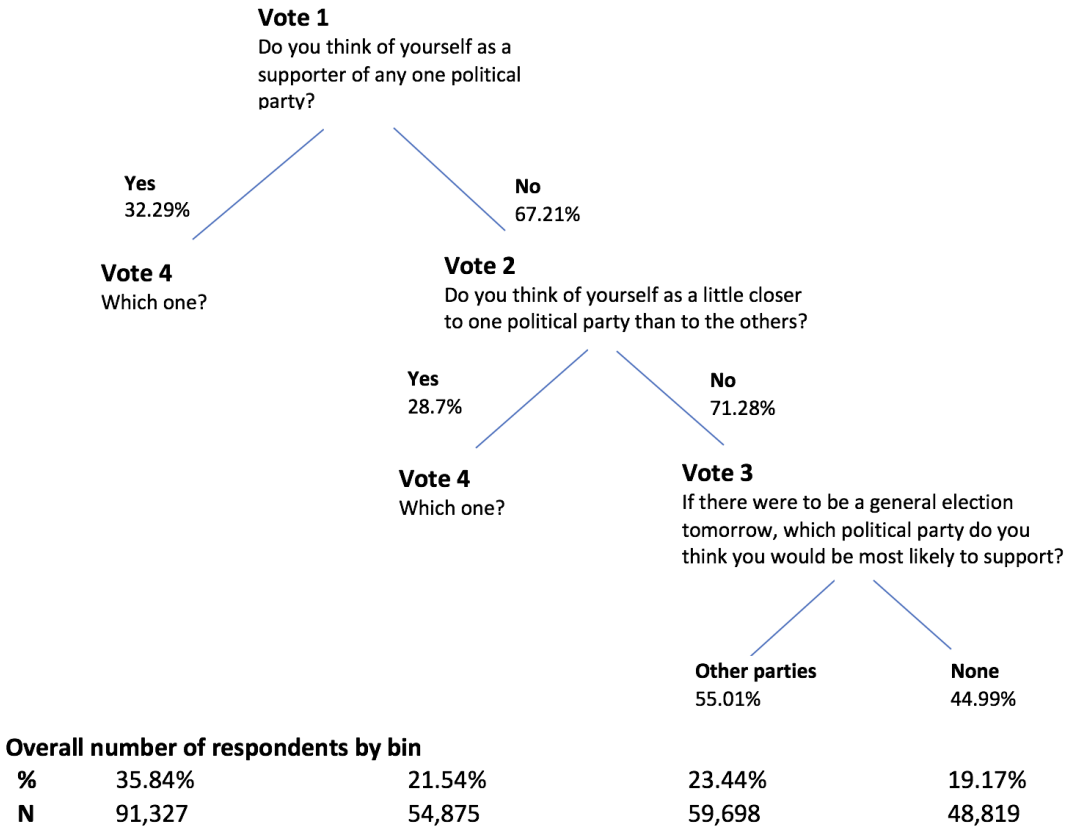
This narrow module is complemented with a more detailed *Political engagement* module in wave 2, 3 and 6. The political engagement module includes six further survey questions explored in this paper.

- "Public officials don't care" – respondents are asked to (strongly) disagree or (strongly) agree with this statement on a 5 point Likert scale.
- "I don't have a say in what the government does" – respondents are asked to

(strongly) disagree or (strongly) agree with this statement on a 5 point Likert scale.

- Perceived political influence – respondents are asked “On a scale from 0 to 10, where 0 means very unlikely and 10 means very likely, how likely is it that your vote will make a difference in terms of which party wins the election in this constituency at the next general election?” – in this paper I code respondents reporting a score weakly lower than 3 as perceiving that their vote is unlikely to make a difference.
- Party likes- and dislikes – respondents are asked for each of the three main parties (Conservative/Labour/ Liberal Democrats) “On a scale from 0 to 10, where 0 means strongly dislike and 10 means strongly like, how do you feel about the ... Party ?”

Figure B1: Schematic of USOC survey instrument eliciting political party preferences



Notes: Schematic presenting the structure of the USOC survey instrument eliciting political party preferences of individual respondent.

C Auxiliary Results

C.1 Robustness of trend changes in UKIP support

In this appendix, I present a range of robustness checks to highlight that the trends presented in Section 3 are robust.

Similar trends for EP and Westminster elections While the trends presented in the main paper focus on the local elections, due to the high frequency of election results data for local elections, the trend patterns are very similar when studying EP or Westminster elections. Appendix Figure C1 shows that the marked change in the correlation structure between UKIP support and measures of poor economic fundamentals of 2001 constituency boundaries harmonized constituencies are very similar, with UKIP support picking up markedly in areas with high shares of the local population with No Qualifications, working in Routine jobs or high shares of Retail- and Manufacturing sector employment. The same patterns appear when studying EP elections as evidenced in Figure C2. While, on average, UKIP vote shares in Local and Westminster elections are mechanically lower (as not all seats are contested), UKIPs performance in EP elections 2004, 2009 and 2014 stands out consistently realizing more than 15.6% of the vote.

Functional form The set of fixed effects included in the main specification is quite demanding. The results are very similar if I control for more or less demanding time-fixed effects. In particular, Appendix Figures C10 show the estimated coefficients, when controlling for election-wave by region and year fixed effects. This set of fixed effects is particularly suitable as it de-facto zooms in on districts that are on similar rotation schedules for the elections of councillors. Similarly, Appendix Figure C11) presents results using simple year fixed effects; throughout, the results patterns are very similar.

Sample balance UKIP does not field candidates in each of the local council elections. In the overall panel, UKIP is coded as having zero percentage of votes in case it does not field candidates. The results are however, robust to focusing on a much more balanced panel, including only districts in which UKIP fielded

candidates in at least 50% of the elections. These results are presented in Figure C9, the trends remain very similar. This, taken together with the similar trends we document for the EP (where candidates are fielded throughout the UK as they are selected based on the party's performance in regional lists) and Westminster elections renders me confident that the results are not masking selection effects.

Broader baseline categories or measures The presentation of trends in Section 3 is condensed to a small set of baseline characteristics $X_{i,baseline}$. In this section, I show that the results are robust to a much richer set of baseline characteristics. In particular, Appendix Figure C5 shows a richer set of plots for six distinct qualification groups; the increase in support for UKIP is driven by areas that have a relatively low skill composition of the local resident population, while the reverse is true for areas with a resident population with higher degrees.

Appendix Figure C6 shows a richer set of plots for the eight distinct socio-economic status groups that the UK census bureau distinguishes. The Census bureau categorizes individual occupations and job titles into these socio-economic status groups, following the Goldthorpe classification system from sociology.

Appendix Figure C7 presents a broader set of sectors, suggesting that no trend patterns emerge for areas that have a sizable Health Care or Hotel & Accommodation sector. Similar positive effects on UKIP are found for the Transportation and Construction sectors, while the opposite direction shows up for Education and Real Estate.

In particular, I use refined baseline measures focusing on the qualification profile of the UK-born resident population (as opposed to including foreign borns). This exercise serves to zoom in on the likely electorate, which is mostly drawn from the UK-born resident population, despite EU citizens being entitled to vote in local elections. These results are presented in Appendix Figure C12 and provide very similar patterns.

C.2 Where do UKIP voters come from?

The EU referendum was announced in early 2013 by the Conservative Prime Minister David Cameron, on condition of winning a majority in the 2015 election. This suggests that UKIP was particularly perceived as a threat to the Conservative

party.

Yet, the previous literature suggests that UKIP also attracted supporters from the Labour party. Similarly, it could be that UKIP was particularly successful in mobilizing voters that previously did not turn out to vote in elections.

I investigate these in turn.

Empirical specification I build on our previous analysis that documents that UKIP’s electoral ascent post 2010 is driven by places with weak economic fundamentals. I now ask whether these fundamentals, after 2010, explain distinct moves away from other parties by estimating the following specification

$$y_{irt} = \alpha_i + \beta_{rt} + \gamma \times \text{Post 2010} \times X_{i,baseline} + \epsilon_{irt} \quad (7)$$

The only difference to the previous specification is that now, we explore a range of dependent variables y_{irt} . In addition to the UKIP vote shares, we present results pertaining to turnout, the Conservative-, Labour- and Liberal Democrat party vote shares. Furthermore, due to space constraints, we present not the full sequence of non-parametric effects, but rather, focus on a pooled average post 2010 coefficient estimate γ to be presented in table form.

I perform the analysis at the level of local council elections, European Parliamentary elections as well as Westminster elections.

Results The results pertaining to the study of local elections are presented in Table C1. The results suggest that UKIP’s growth that is captured by the weak baseline socio-economic characteristics comes mostly at the expense of Conservative party vote shares as indicated by the negative coefficients in column (3) across most proxy measures for weak-socio economic fundamentals, with the exception of the share of residents working in retail.

There is no statistically discernible effect on turnout, suggesting that places with weak socio-economic fundamentals post 2010 saw no differential voter mobilization from which UKIP could have benefited. If anything, the point estimates are negative throughout.

This analysis suggests that the Conservative party, in local elections, was losing non-negligible numbers of voters to UKIP. This is not surprising, as Conservative

councillors defected to UKIP quite regularly (Webb and Bale, 2014).

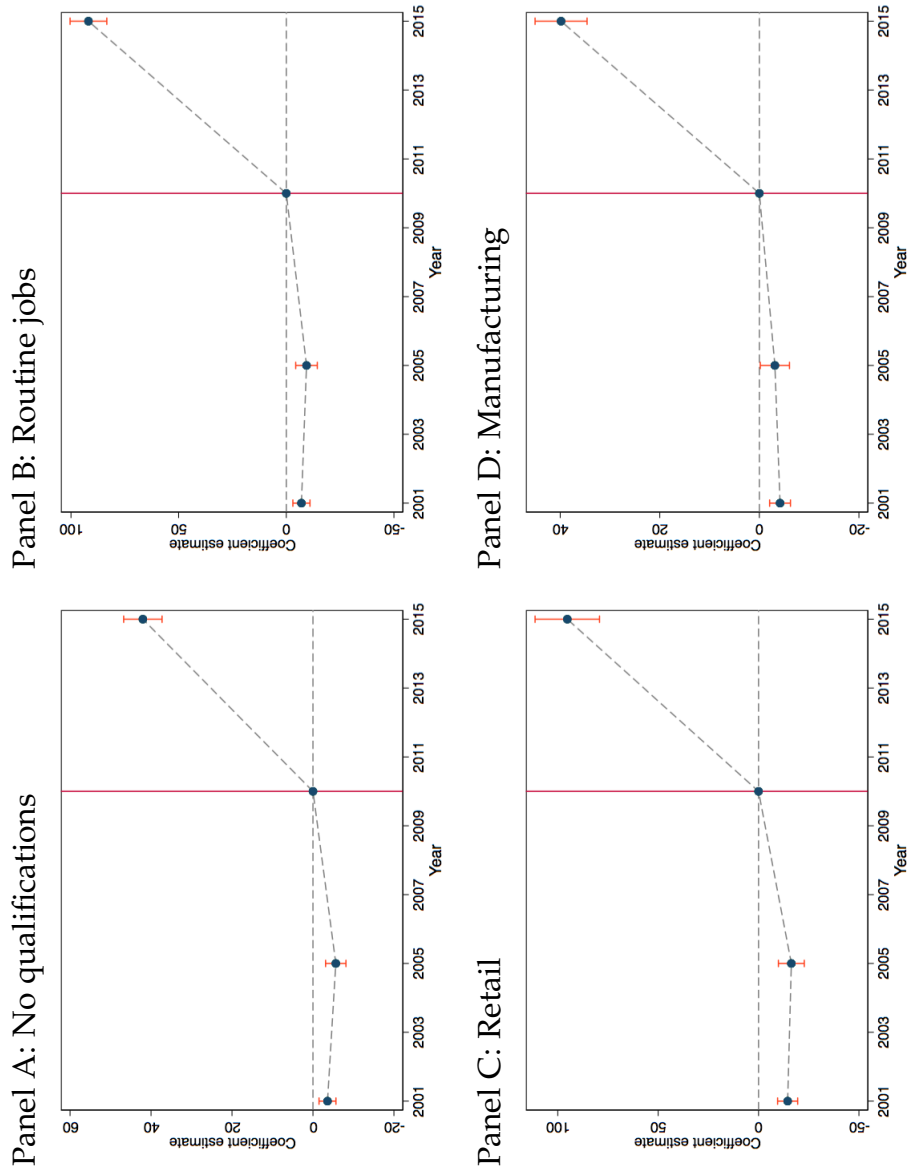
I obtain very similar results when studying the performance of UKIP and the other parties in the European Parliamentary election of 2014 (relative to the earlier rounds) and the 2015 Westminster election (relative to the 2001, 2005 and 2010 elections). These results are presented in Appendix Tables C2 and C3.

On the timing Since the EU referendum was already *announced* in January 2013, it becomes interesting to see whether the link between weak socio-economic fundamentals and UKIP votes is already present in the data prior to the announcement, in particular up to the 2012 local council elections that were held in May 2012.

I restrict the analysis to the two local election rounds in 2011 and 2012 and present the results in Table C4. The pattern is similar, but also suggests some distinct differences. We find the same positive link between weak socio-economic fundamentals and UKIP votes after 2010. It is statistically significant for two of the four indicators of weak socio-economic fundamentals: for the share of the resident population with low qualification and for the prevalence of retail employment.

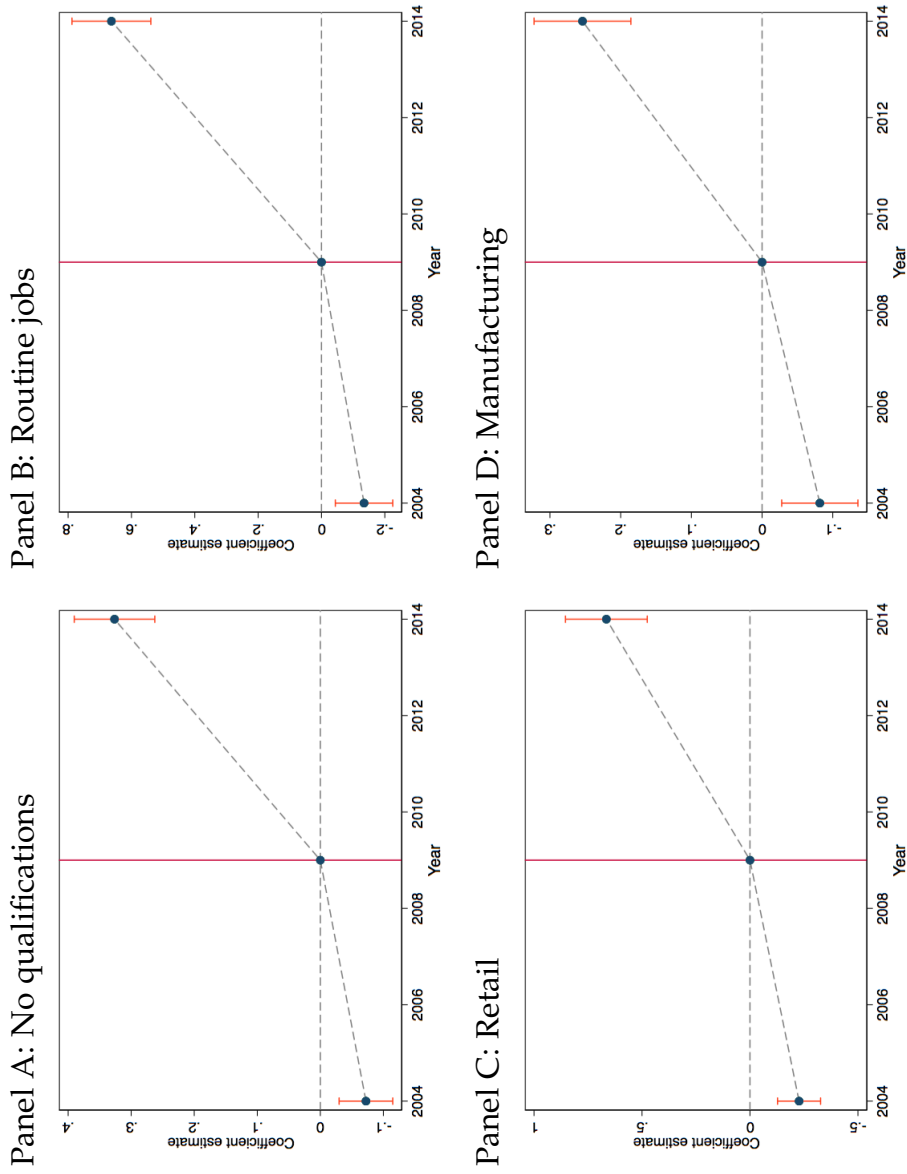
There are some differences in the effects on other parties: while the Conservative party appears to be contracting in such areas, the Labour party, along with UKIP actually stands to gain. This suggests that prior to the EU referendum announcement, in local elections, a growing support for UKIP is associated with a worse performance for the Conservatives and a better performance for Labour in areas with weak fundamentals, suggesting that the perceived threat of UKIP, increasing the risk of a shift towards Labour may have been particularly strongly perceived in the run up to the January 2013 announcement.

Figure C1: Non-parametric effect of educational qualification, socio-economic status, and sectoral employment of the resident population as of 2001 on support for UKIP in *Westminster Parliamentary elections* from 2001 - 2015 over time



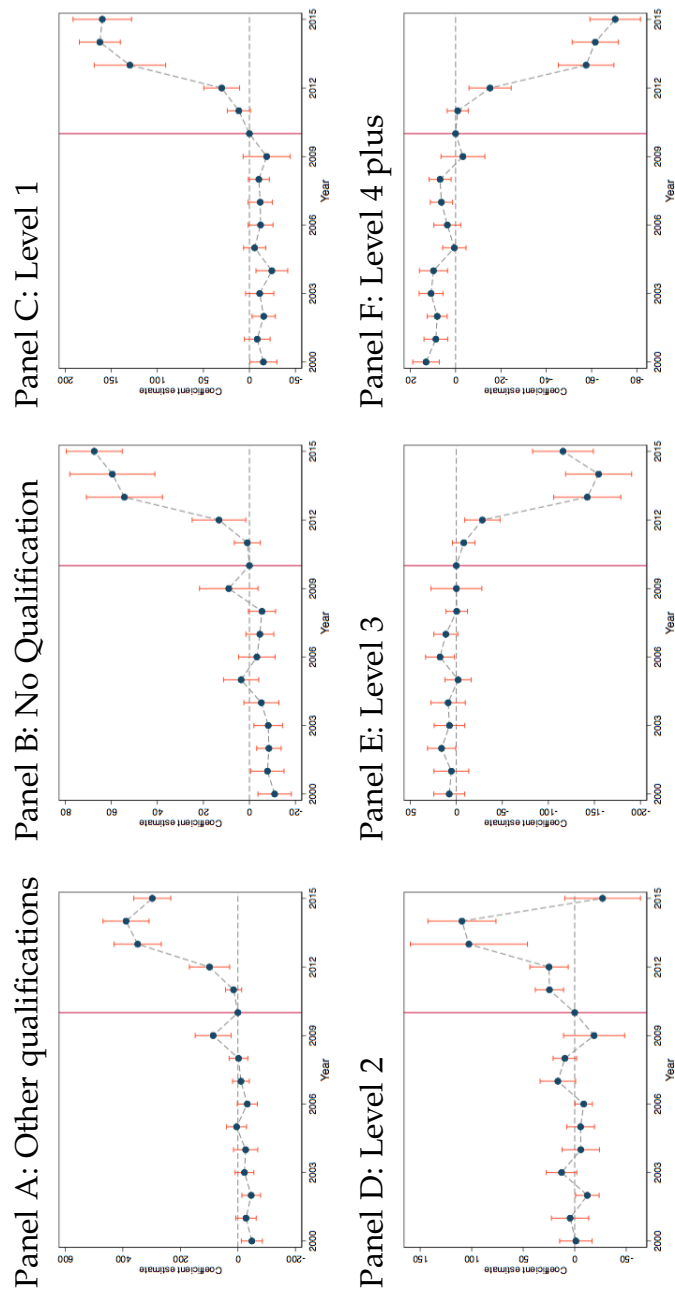
Notes: The dependent variable is the percentage of votes for UKIP in Westminster elections at the harmonized 2010 constituency level. Panel A uses the share of the resident population with no formal qualifications as of 2001. Panel B uses the share of the resident population in Routine jobs as per the National Socio-Economic Classification of Occupations as of 2001. Panel C uses the share of the resident working age population employed in the Retail sector, while panel D uses the share of the resident working age population employed in Manufacturing. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and election wave by NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C2: Non-parametric effect of educational qualification, socio-economic status, and sectoral employment of the resident population as of 2001 on support for UKIP in *European Parliamentary elections* over time



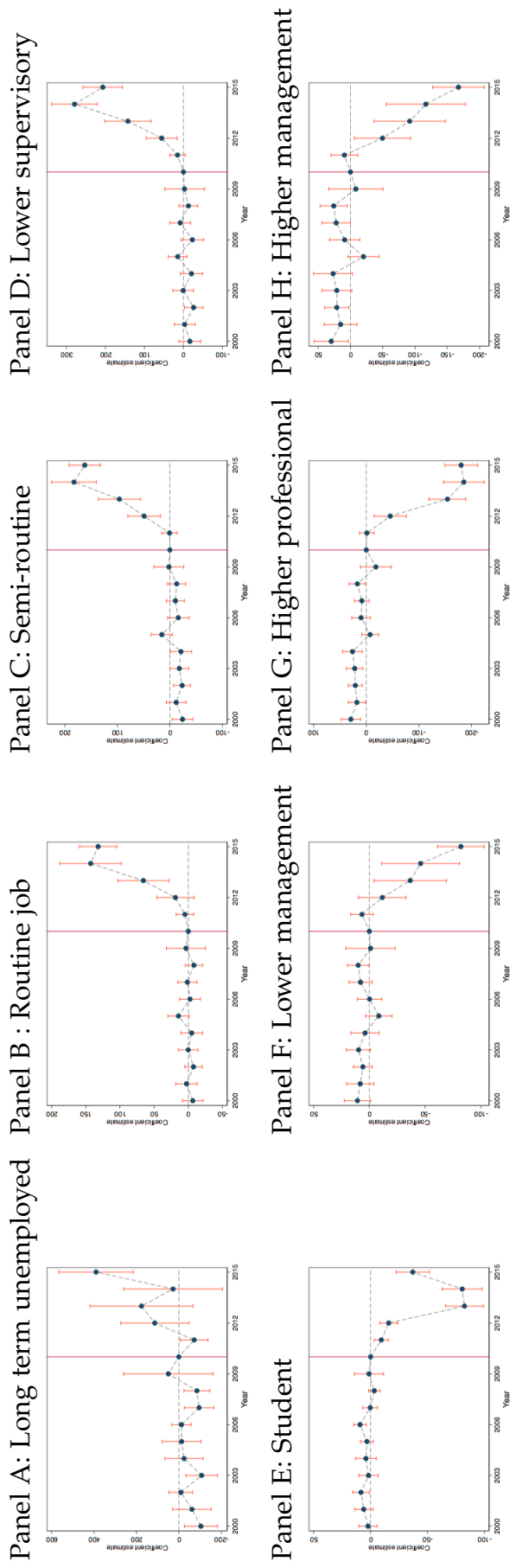
Notes: The dependent variable is the percentage of votes for UKIP in European Parliamentary elections at the local authority district level. Panel A uses the share of the resident population with no formal qualifications as of 2001. Panel B uses the share of the resident population in Routine jobs as per the National Socio-Economic Classification of Occupations as of 2001. Panel C uses the share of the resident working age population employed in the Retail sector, while panel D uses the share of the resident working age population employed in Manufacturing. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and election wave by NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C3: Non-parametric effect of educational qualification of the resident population in 2001 on support for UKIP over time



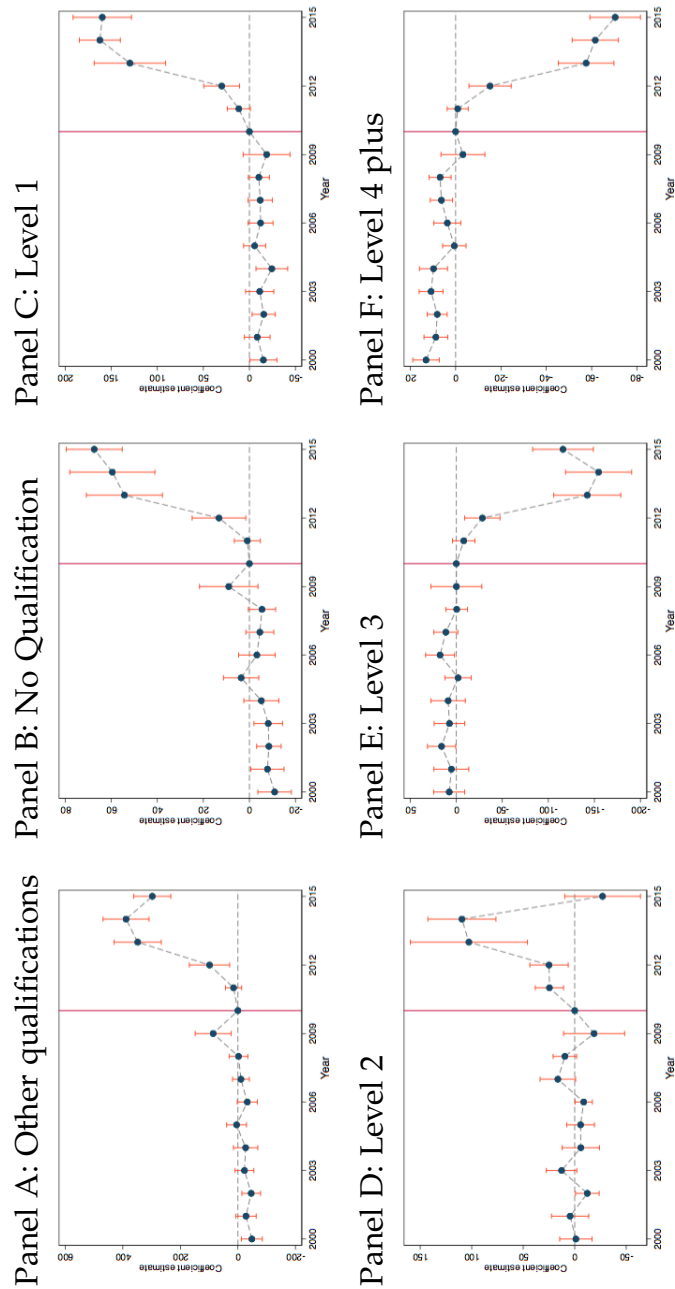
Notes: The variable is the respective share of the resident population in a local authority district that has obtained the educational qualifications following the UK classification system, whereby No qualifications means no formal qualification or school leaving certificate, Level 1 stands for having between 1-4 General Certificate of Secondary Education (GCSE) qualifications, Level 2 stands for 5 GCSEs, Level 3 means having 2 or more A-levels (university qualifying), while level 4 or above captures having a university degree. Other qualifications includes apprenticeships and foreign qualification below a university degree. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C4: Non-parametric effect of socio-economic employment status of the resident population in 2001 on support for UKIP over time



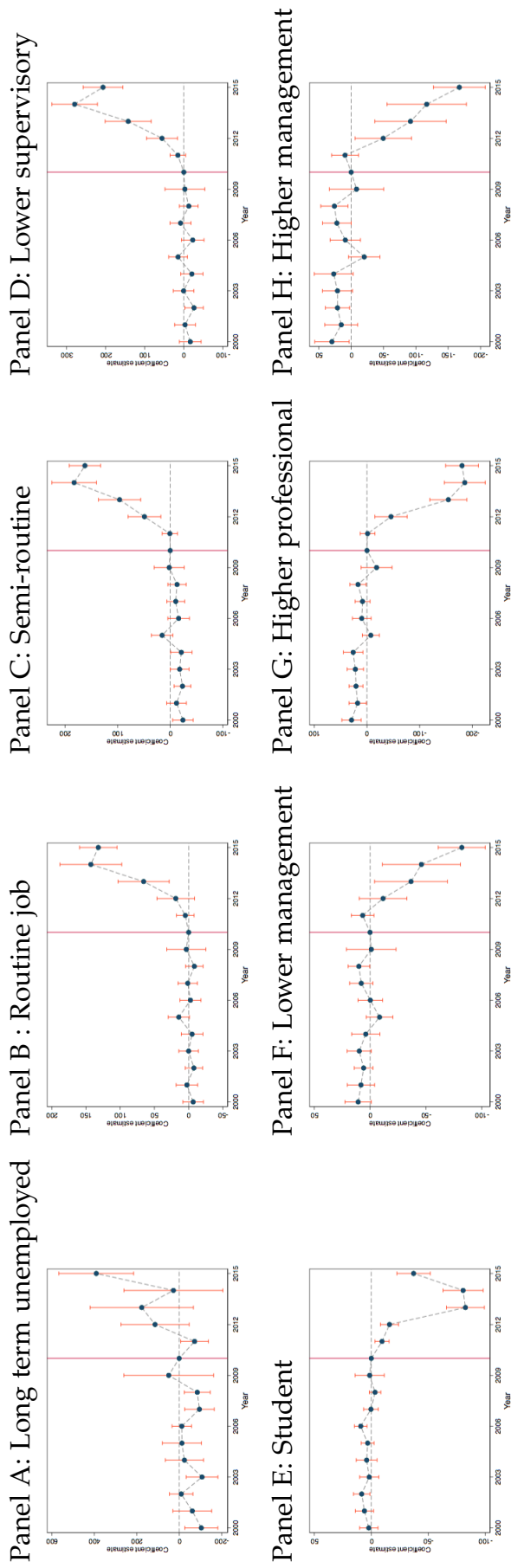
Notes: The variable is the respective share of the resident population in a district that is in either socio-economic status classification as of 2001. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C5: Non-parametric effect of educational qualification of the resident population in 2001 on support for UKIP over time



Notes: The variable is the respective share of the resident population in a local authority district that has obtained the educational qualifications following the UK classification system, whereby No qualifications means no formal qualification or school leaving certificate, Level 1 stands for having between 1-4 General Certificate of Secondary Education (GCSE) qualifications, Level 2 stands for 5 GCSEs, Level 3 means having 2 or more A-levels (university qualifying), while level 4 or above captures having a university degree. Other qualifications includes apprenticeships and foreign qualification below a university degree. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

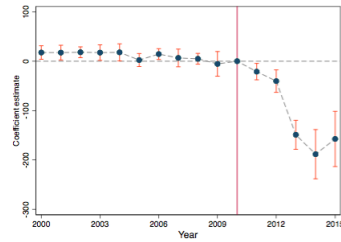
Figure C6: Non-parametric effect of socio-economic employment status of the resident population in 2001 on support for UKIP over time



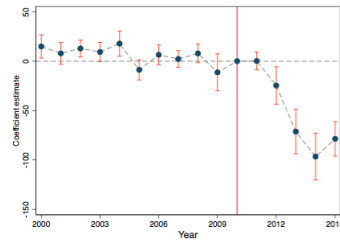
Notes: The variable is the respective share of the resident population in a district that is in either socio-economic status classification as of 2001. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C7: Non-parametric effect of the industry employment structure in 2001 on support for UKIP over time

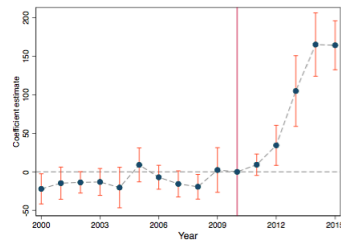
Panel A: Education



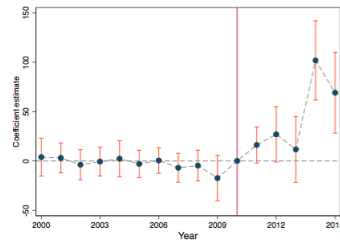
Panel B: Real Estate



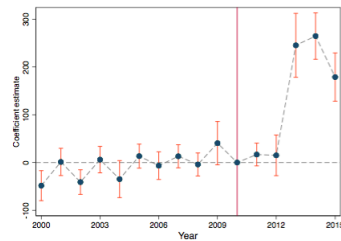
Panel C: Retail



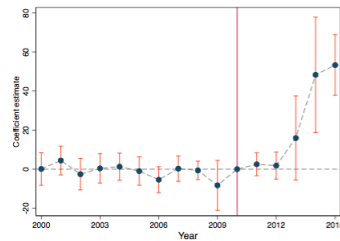
Panel D: Transport



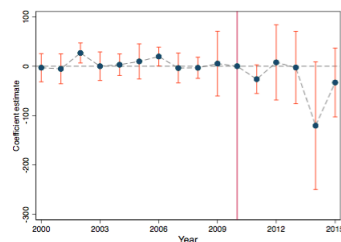
Panel E: Construction



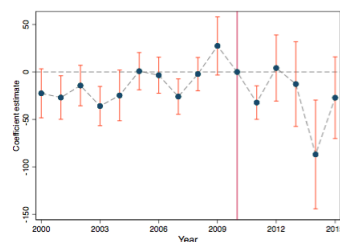
Panel F: Manufacturing



Panel G: Hotel & Accommodation



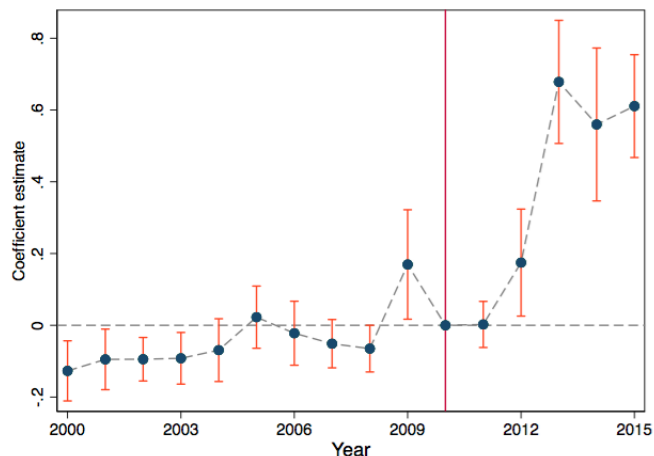
Panel H: Health care



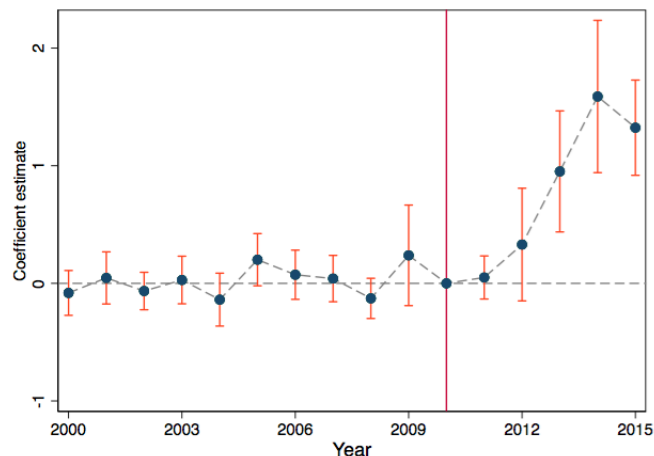
Notes: The dependent variable is the percentage of votes for UKIP in local council elections. The independent variables are the respective shares of the resident working age population in a district that is working in any of the different sectors as of 2001 interacted with a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C8: Non-linear time trend in support for UKIP *after partialing out non-linear trend in baseline manufacturing sector prevalence and import-shock*

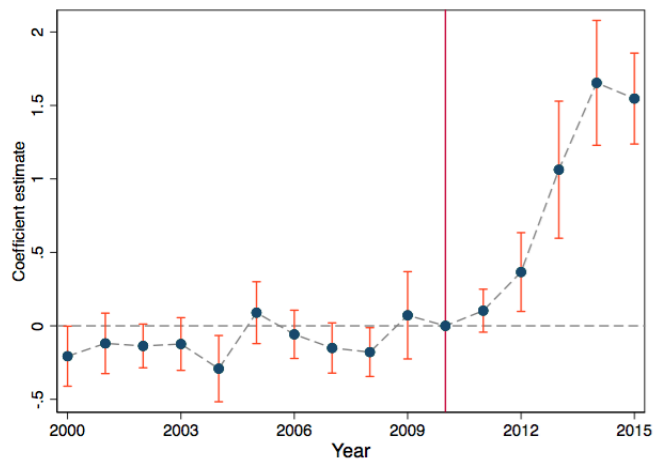
Panel A: No qualifications



Panel B: Routine jobs



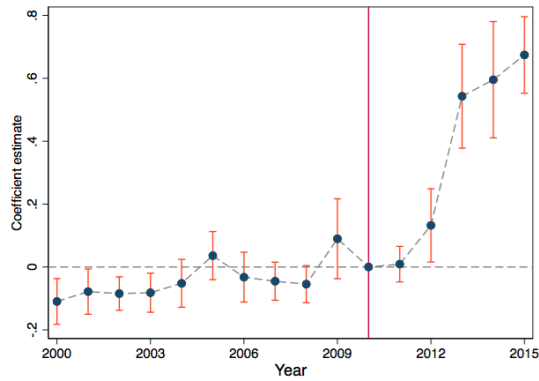
Panel C: Retail



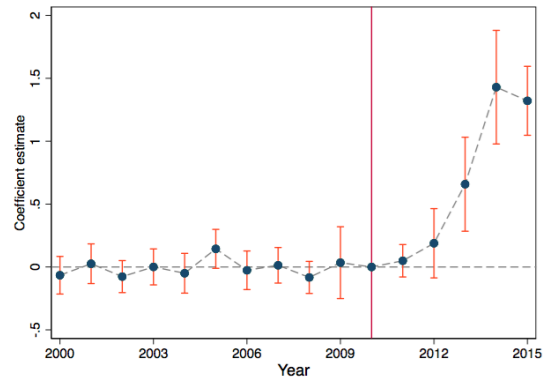
Notes: The dependent variable is the percentage of votes for UKIP in local council elections. Panel A uses the share of the resident UK born population with no formal qualifications as of 2001. Panel B uses the share of the UK born resident population in Routine jobs as per the National Socio-Economic Classification of Occupations as of 2001. The graph plots point estimates of the interaction between these two cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects, in addition to year effects interacted with the baseline size of the manufacturing sector in terms of employment as of 2001. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C9: Robustness to balanced sample of elections – Non-parametric effect of educational qualification, socio-economic status, and sectoral employment of the resident population as of 2001 on support for UKIP over time

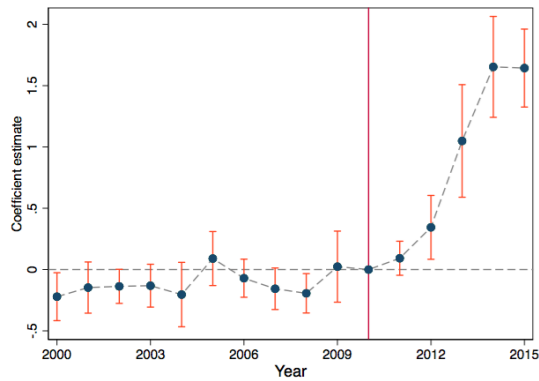
Panel A: No qualifications



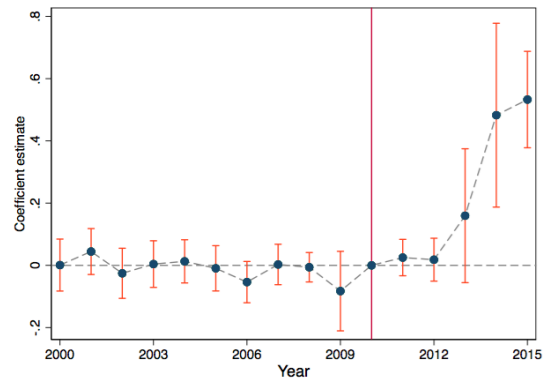
Panel B: Routine jobs



Panel C: Retail



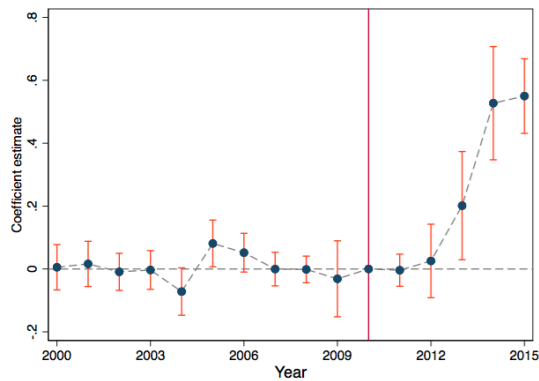
Panel D: Manufacturing



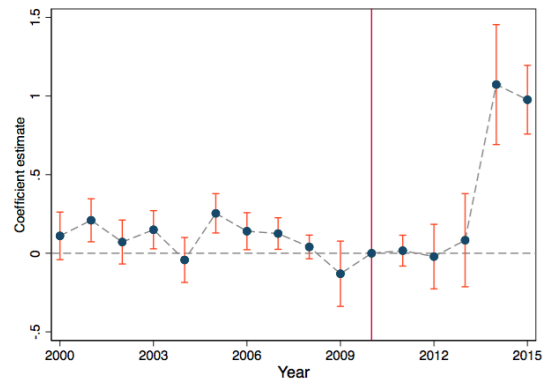
Notes: The dependent variable is the percentage of votes for UKIP in local council elections. The sample is restricted to only include elections where UKIP ran across districts in which UKIP contested at least 50% of the races. Panel A uses the share of the resident population with no formal qualifications as of 2001. Panel B uses the share of the resident population in Routine jobs as per the National Socio-Economic Classification of Occupations as of 2001. Panel C uses the share of the resident working age population employed in the Retail sector, while panel D uses the share of the resident working age population employed in Manufacturing. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and election wave by NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C10: Robustness to controlling for more demanding time effects: Election wave by Region by Year – Non-parametric effect of educational qualification, socio-economic status, and sectoral employment of the resident population as of 2001 on support for UKIP over time

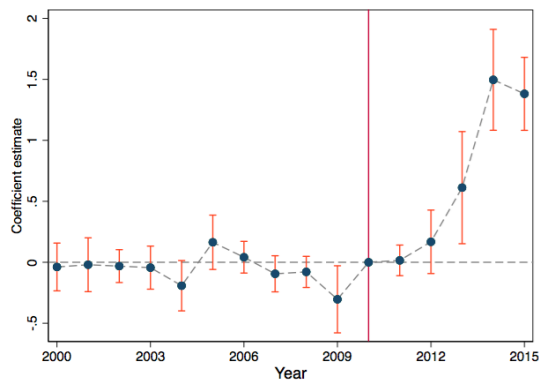
Panel A: No qualifications



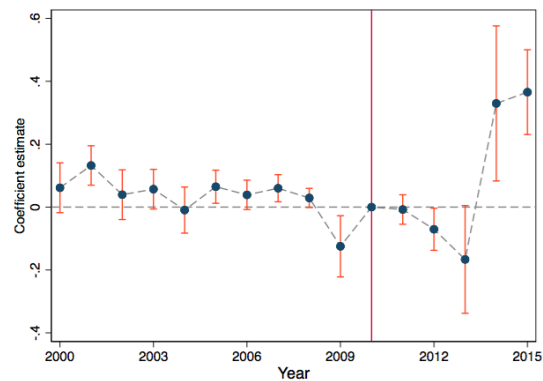
Panel B: Routine jobs



Panel C: Retail



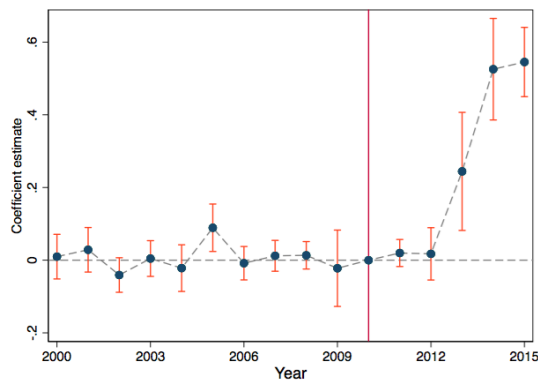
Panel D: Manufacturing



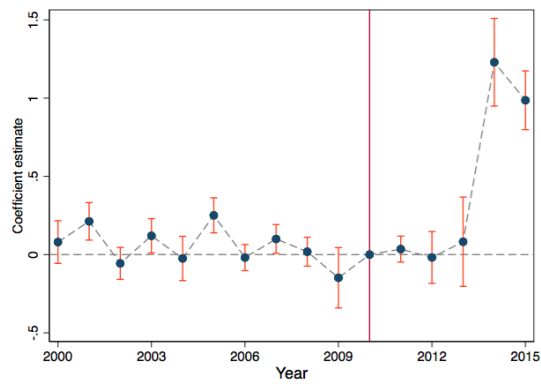
Notes: The dependent variable is the percentage of votes for UKIP in local council elections. Panel A uses the share of the resident population with no formal qualifications as of 2001. Panel B uses the share of the resident population in Routine jobs as per the National Socio-Economic Classification of Occupations as of 2001. Panel C uses the share of the resident working age population employed in the Retail sector, while panel D uses the share of the resident working age population employed in Manufacturing. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and election wave by NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C11: Robustness to controlling for less demanding time effects: Year FE – Non-parametric effect of educational qualification, socio-economic status, and sectoral employment of the resident population as of 2001 on support for UKIP over time

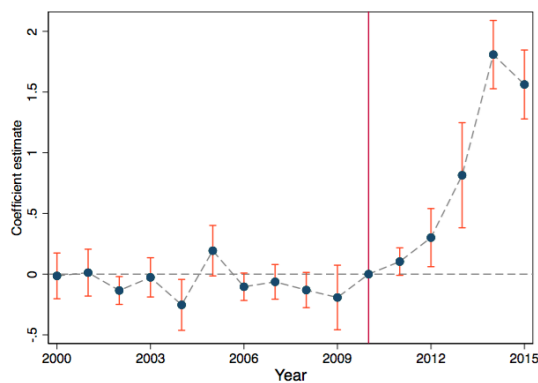
Panel A: No qualifications



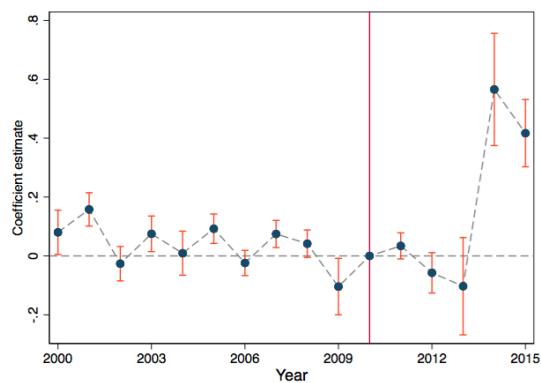
Panel B: Routine jobs



Panel C: Retail

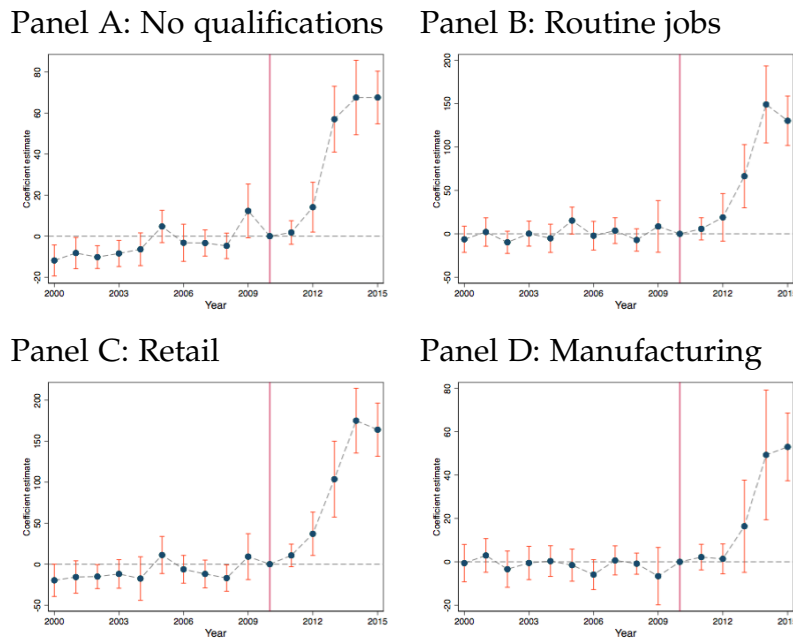


Panel D: Manufacturing



Notes: The dependent variable is the percentage of votes for UKIP in local council elections. Panel A uses the share of the resident population with no formal qualifications as of 2001. Panel B uses the share of the resident population in Routine jobs as per the National Socio-Economic Classification of Occupations as of 2001. Panel C uses the share of the resident working age population employed in the Retail sector, while panel D uses the share of the resident working age population employed in Manufacturing. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Figure C12: Robustness to measurement of baseline characteristics - Focusing on UK born population shares – Non-parametric effect of educational qualification, socio-economic status, and sectoral employment of the resident population as of 2001 on support for UKIP over time



Notes: The dependent variable is the percentage of votes for UKIP in local council elections. Panel A uses the share of the UK born resident population with no formal qualifications as of 2001. Panel B uses the share of the UK born resident population in Routine jobs as per the National Socio-Economic Classification of Occupations as of 2001. Panel C uses the share of the UK born resident working age population employed in the Retail sector, while panel D uses the share of the UK born resident working age population employed in Manufacturing. The graph plots point estimates of the interaction between these cross sectional measures and a set of year fixed effects. All regression include local authority district fixed effects and NUTS1 region by year fixed effects. Standard errors are clustered at the district level with 90% confidence bands indicated.

Table C1: Where do UKIP voters post 2010 come from? Studying local elections

	UKIP (1)	Turnout (2)	Other parties		
			Con (3)	Lab (4)	LD (5)
<i>Panel A: No qualifications</i>					
Post 2010 x Pop. share with No qualifications (2001)	42.746*** (5.257)	-2.326 (4.373)	-25.067*** (5.432)	-0.226 (6.508)	-3.668 (6.392)
Local election districts	345	345	345	345	345
Observations	3259	3258	3259	3259	3259
<i>Panel B: Routine jobs</i>					
Post 2010 x Working age Pop share working in Routine occupations (2001)	70.572*** (11.375)	-8.372 (8.452)	-37.275*** (11.182)	-15.666 (12.075)	19.746 (13.700)
Local election districts	345	345	345	345	345
Observations	3259	3258	3259	3259	3259
<i>Panel C: Retail</i>					
Post 2010 x Working age Pop share working in Retail (2001)	109.098*** (13.794)	-3.445 (8.552)	-41.989*** (11.774)	-36.801** (16.580)	25.956 (16.126)
Local election districts	345	345	345	345	345
Observations	3259	3258	3259	3259	3259
<i>Panel D: Manufacturing</i>					
Post 2010 x Working age Pop share working in Manufacturing (2001)	24.164*** (6.398)	-7.087 (5.710)	-7.246 (7.592)	-2.400 (8.012)	18.796* (9.786)
Local election districts	345	345	345	345	345
Observations	3259	3258	3259	3259	3259

Notes: All regressions control for local authority district and NUTS1 region by time fixed effects. Standard errors are adjusted clustering at the local authority district level with stars indicating *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C2: Where do UKIP voters post 2010 come from? Studying European Parliamentary elections

	UKIP (1)	Turnout (2)	Other parties		
			Con (3)	Lab (4)	LD (5)
<i>Panel A: No qualifications</i>					
Post 2010 x Pop. share with No qualifications (2001)	0.363*** (0.041)	0.167*** (0.032)	-0.166*** (0.025)	0.180*** (0.048)	0.000 (0.023)
Mean of DV	.224	.369	.282	.191	.116
Local election districts	346	346	346	346	346
Observations	1038	1038	1038	1038	1038
<i>Panel B: Routine jobs</i>					
Post 2010 x Working age Pop share working in Routine occupations (2001)	0.731*** (0.078)	0.294*** (0.062)	-0.255*** (0.051)	0.213** (0.083)	0.050 (0.043)
Mean of DV	.224	.369	.282	.191	.116
Local election districts	346	346	346	346	346
Observations	1038	1038	1038	1038	1038
<i>Panel C: Retail</i>					
Post 2010 x Working age Pop share working in Retail (2001)	0.779*** (0.116)	0.268*** (0.095)	-0.322*** (0.064)	0.067 (0.131)	0.079 (0.061)
Mean of DV	.224	.369	.282	.191	.116
Local election districts	346	346	346	346	346
Observations	1038	1038	1038	1038	1038
<i>Panel D: Manufacturing</i>					
Post 2010 x Working age Pop share working in Manufacturing (2001)	0.295*** (0.044)	0.019 (0.046)	-0.020 (0.029)	0.067 (0.055)	0.019 (0.035)
Mean of DV	.224	.369	.282	.191	.116
Local election districts	346	346	346	346	346
Observations	1038	1038	1038	1038	1038

Notes: All regressions control for state by time fixed effects and local government area (LGA) fixed effects. Standard errors are adjusted for two way clustering by time and LGA with stars indicating *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C3: Where do UKIP voters post 2010 come from? Studying Westminster Parliamentary elections

	UKIP (1)	Turnout (2)	Other parties		
			Con (3)	Lab (4)	LD (5)
<i>Panel A: No qualifications</i>					
Post 2010 x Pop. share with no qualifications	44.816*** (3.006)	-5.424** (2.129)	-28.815*** (2.974)	-8.743** (4.069)	15.998*** (3.295)
Mean of DV	6.03	62.9	35.9	35.8	18.1
Harmonized constituencies	566	573	573	573	573
Observations	2047	2285	2283	2283	2283
<i>Panel B: Routine jobs</i>					
Post 2010 x Working age pop. share working in routine occupations	96.878*** (5.396)	-29.340*** (3.607)	-27.619*** (6.600)	-58.484*** (7.960)	26.620*** (6.591)
Mean of DV	6.03	62.9	35.9	35.8	18.1
Harmonized constituencies	566	573	573	573	573
Observations	2047	2285	2283	2283	2283
<i>Panel C: Retail</i>					
Post 2010 x Working age pop. share working in Retail	105.018*** (10.381)	-35.603*** (4.952)	-15.902* (8.871)	-81.719*** (11.848)	23.520** (9.592)
Mean of DV	6.03	62.9	35.9	35.8	18.1
Harmonized constituencies	566	573	573	573	573
Observations	2047	2285	2283	2283	2283
<i>Panel D: Manufacturing</i>					
Post 2010 x Working age pop. share working in Manufacturing	42.112*** (3.323)	-20.545*** (2.020)	-1.271 (3.965)	-36.274*** (4.718)	15.915*** (3.723)
Mean of DV	6.03	62.9	35.9	35.8	18.1
Harmonized constituencies	566	573	573	573	573
Observations	2047	2285	2283	2283	2283

Notes: All regressions control for state by time fixed effects and local government area (LGA) fixed effects. Standard errors are adjusted for two way clustering by time and LGA with stars indicating *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C4: Where do UKIP voters post 2010 come from? Studying local elections *prior to 2013*

	UKIP (1)	Turnout (2)	Other parties		
			Con (3)	Lab (4)	LD (5)
<i>Panel A: No qualifications</i>					
Post 2010 x Pop. share with No qualifications (2001)	9.630** (3.802)	-6.431 (4.616)	-21.595*** (6.029)	23.928*** (7.328)	-6.244 (6.646)
Local election districts	345	345	345	345	345
Observations	2612	2612	2612	2612	2612
<i>Panel B: Routine jobs</i>					
Post 2010 x Working age Pop share working in Routine occupations (2001)	9.723 (7.610)	-15.657* (8.801)	-30.527** (12.041)	35.622*** (13.635)	9.399 (13.934)
Local election districts	345	345	345	345	345
Observations	2612	2612	2612	2612	2612
<i>Panel C: Retail</i>					
Post 2010 x Working age Pop share working in Retail (2001)	30.152*** (10.990)	-10.296 (8.616)	-17.581 (12.753)	11.671 (20.722)	17.527 (16.993)
Local election districts	345	345	345	345	345
Observations	2612	2612	2612	2612	2612
<i>Panel D: Manufacturing</i>					
Post 2010 x Working age Pop share working in Manufacturing (2001)	2.378 (3.454)	-4.348 (5.329)	0.212 (7.044)	17.115** (8.480)	12.985 (9.530)
Local election districts	345	345	345	345	345
Observations	2612	2612	2612	2612	2612

Notes: All regressions control for local authority district and NUTS1 region by time fixed effects. Standard errors are adjusted clustering at the local authority district level with stars indicating *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.