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ABSTRACT

Was Brexit Caused by the Unhappy and the Old?*

On 23 June 2016, the United Kingdom voted to leave the European Union (so-called 'Brexit'). This paper uses newly released information, from the Understanding Society data set, to examine the characteristics of individuals who were for and against Brexit. Two key findings emerge. First, unhappy feelings contributed to Brexit. However, contrary to commonly heard views, the key channel of influence was not through general dissatisfaction with life. It was through a person's narrow feelings about his or her own financial situation. Second, despite some commentators' guesses, Brexit was not caused by old people. Only the very young were substantially pro-Remain.

JEL Classification: D72
Keywords: referendum, European Union, Brexit, voting

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"The Brexit vote and Donald Trump's surge reflect discontent." Andrew Ross Sorkin, New York Times, 29 February 2016.

"I don't think Brexit would have happened if it hadn't been for the political and economic events of the preceding 10 years. People were disillusioned. They felt badly treated. They felt squeezed." Alistair Darling, former Chancellor of the Exchequer, The Guardian, 13 September 2017

"Why did millions vote to leave? …the big gap between those over 50 and those below in support for Leave." Ben Chu, The Independent, 26 June 2016"

1. Introduction

This paper studies the 2016 UK referendum on membership of the European Union. The vote led to 'Brexit'. It is not possible to examine in a literal sense the confidential votes cast, on June 23rd 2016, in democratic voting booths across the United Kingdom. What later sections do, instead, is to investigate the patterns in citizens' views in each week within the run-up period between January and July of that year. The Understanding Society data set, based on random sampling, makes that feasible. We are able to use information on approximately 8000 citizens' views on whether they felt the UK should leave, or remain within, the European Union.

The paper is motivated by ideas that have been widely discussed in the UK media since the vote and are captured by the kinds of quotes, particularly from Alistair Darling and Ben Chu, illustrated above. These quotes (the one from Sorkin, interestingly, predates both Brexit and Trump) are meant only as iconic examples. They are used here as representative cases of issues that have been debated across the UK and Europe about why it was that Brexit occurred. Large numbers of newspaper and TV journalists have suggested that the decision to leave the EU was forced on the country by special groups (particularly old voters swamping the views of the young, and discontented citizens swamping the views of others). Early academic writings on the topic also, and rightly, emphasized the concept of a divided nation (Dorling 2016, for example). One purpose of the current paper is to try to probe the nature of the divisions.

The paper builds upon a currently small but growing literature. Important contributions, many of which are likely to be seen as seminal, have been made by scholars such as Shaw, Smith & Scully (2017), Clarke, Goodwin & Whiteley (2017), Becker, Fetzer & Novy (2017), Dorling (2016), Goodwin & Milazzo (2017), Goodwin & Heath (2016), Heath & Goodwin (2017), and Hobolt (2016). We confirm some of these articles' early conclusions, such as the likelihood of highly educated citizens favouring Remain. Our work also relates to research that has begun to explore scepticism towards European Union values (such as Hobolt & de Vries 2016) and the probable cultural and economic repercussions of Brexit (Ginsburgh, Moreno-Ternero & Weber 2017).

The majority of the early empirical studies that try to unpick the explanation for the Brexit vote have pointed to economic forces and immigration-related factors (for example, Clarke, Goodwin & Whiteley, 2017, although interestingly the work of Becker et al. 2017 argues that exposure to immigration was not particularly important but that economic forces and deprivation were powerful). Goodwin and Milazzo (2017) used interesting data from the British Election Study (BES) to explore the influence of immigration on Brexit. They found that an increase in the rate of immigration at the local level, and attitudes to perceived immigration control, were key predictors of sympathy for Brexit. Similarly, Hobolt (2016), who analysed campaign and survey data, showed that Brexit was favoured by the less-educated, the poorer and older voters, and those who expressed concerns about immigration and multi-culturalism. The analysis of Goodwin and Heath (2016) attributed Brexit more specifically to the 'left behind', as caused by poverty and a general lack of education and opportunities. The authors provided persuasive evidence that Brexit voters were consistently from among the poorest households, with incomes below £20,000 per year, the unemployed, in low-skilled and manual occupations, had worsened financial situations,

and tended to have few qualifications. Indeed, Goodwin and Heath suggested that educational inequality might have been the strongest driver behind the Leave vote.

It has also been shown that turnout was higher in Remain areas, and where there were high numbers of young people, of ethnic minorities, and of university graduates (Heath & Goodwin, 2017). However, in contrast to the tenor of some media reports that suggested voting for Brexit was more common in the North of England, Dorling (2016) pointed out that the absolute numbers of Leave voters was higher in the South.

Shaw, Smith and Scully (2017) tried to understand the result by documenting the key campaigning messages promoted by each side. They used causal-mapping methods to analyse data from nine televised Brexit debates broadcast in the 4 weeks prior to the referendum. The authors found that the Leave campaign stuck closely to a small set of themes, repeated core values, and avoided topics viewed as important to Remain voters. By contrast, the authors show, the Remain side covered a much broader set of issues, were generally less consistent in their messages, and strayed into the themes propagated by Leave.

The paper also builds on another literature within quantitative social science (including Di Tella & MacCulloch 2005 and Liberini et al. 2017) that uses 'happiness' kinds of data to try to understand political decisions. A general introduction to the modern social science of happiness can be found in sources such as Powdthavee (2010).

By drawing upon the Understanding Society data set, the analysis produces two results that may not currently be widely understood. First, somewhat in support of a version of Sorokin's and Darling's opinions, there is evidence that unhappy feelings contributed to Brexit. However, the key channel of influence was not through general dissatisfaction with life. It was through a person's narrow feelings about his or her own financial situation. Second, despite what some

commentators have believed, on our estimates the Brexit decision was not caused by the old. The Understanding Society data set suggests that only the very youngest UK citizens -- particularly those under the age of 25 -- were substantially pro-Remain. Between the end of their 20s and their 70s, people who live in the UK apparently have almost the same views on the desirability of EU membership.

2. Analytical Approach

How can 'discontent' be incorporated into a statistical study? In the later analysis, we focus especially on the following two questions that are asked of respondents in the Understanding Society survey. An overall life-satisfaction question[1] appears on page 523 of the Understanding Society questionnaire Wave 8 Consultation v02, 2016.

Question wording

On a scale of 1 to 7 where 1 = 'Completely Dissatisfied' and 7 = 'Completely Satisfied', please tell me the number which you feel best describes how dissatisfied or satisfied you are with the following aspects of your current situation.

Satisfaction with life on a 7 point scale (with the means in the data set)

Completely dissatisfied (2.2%)
Mostly dissatisfied (5.1%)
Somewhat dissatisfied (7.4%)
Neither satisfied nor dissatisfied (9.7%)
Somewhat satisfied (17.0%)
Mostly satisfied (45.5%)
Completely satisfied. (12.9%)

[1] Such data have been widely used in other settings in quantitative social science (surveyed in Powdthavee 2010, for instance). There have also been a number of attempts to validate life-satisfaction data. Work by Oswald and Wu (2010), for example, provides evidence, using compensating-differentials theory and data on approximately 1 million US citizens, that there is a match between life-satisfaction scores and objective quality of life.

A question about people's feelings about their financial situation is asked on page 486 of the Understanding Society questionnaire Wave 8 Consultation v02, 2016. The wording is

Question wording

How well would you say you yourself are managing financially these days? Would you say you are...

Subjective financial situation on a 5 point scale (with the means in the data set)

Living comfortably (35.0%)

Doing alright (39.7%)

Just about getting by (19.0%)

Finding it quite difficult (4.7%)

Finding it very difficult (1.6%)

Both of these measure people's feelings – about, respectively, the quality of their life and how they are doing in an economic sense.

As a dependent variable in later regression equations, we will use the Leave/Remain answers from the question asked on page 524 of the Understanding Society questionnaire Wave 8 Consultation v02, 2016. The wording of that question is

Question Wording

Should the United Kingdom remain a member of the European Union or leave the European Union?

Options

1 Remain a member of the European Union

2 Leave the European Union

For the regression equations, a variety of other variables will be included as independent controls. These are of the type normal in quantitative social science. They will include people's age, gender, ethnic group, marital status, working status, region, and so on.

Table 1 sets out the means and standard deviations for a number of the key variables used. Noticeably, the proportion 'voting' Brexit here is only 37.5% of those in the survey. This number is surprisingly low (as a narrow majority in the actual vote favoured Brexit). One reason is that the percentage in favour of leaving the EU increased as the deadline vote day in June became closer. However, that is not enough to account for the apparent discrepancy. We must therefore draw the conclusion that it is likely a number of anti-Brexit voters declined to take part in the Understanding Society sampling.

The rest of Table 1 provides information about life satisfaction (its mean is 5.22 on a scale from 1 to 7) and feelings of financial difficulty (mean of 1.982 on a scale from 1 to 4). Standard demographic and personal variables are also reported in Table 1.

Table 2 gives the age distribution on the respondents in the sample. Here we group individuals into 5-year bands, except for those over 70 years of age, who are combined into a single category. Approximately 17% of citizens in this sample are aged above 70.

3. Regression-equation results

Table 3 gives regression-equation results for a form of 'pro-Brexit' equation. We use a simple zero/one dependent variable to represent individuals' views in favour of either the Anti or Pro case for the European Union. Non-responders are excluded. The regression equations in Table 3 are of an elementary Ordinary Least Squares kind. This has drawbacks, but more complicated kinds of estimators give the same results, so for simplicity we report here the OLS form. Estimates using probit or logistic regression are available from the authors on request.

Is general dissatisfaction predictive of a pro-Brexit position? Table 3 offers only limited evidence for such a view. Column 1 of Table 3 gives results (to the best of our knowledge they are the first of their kind) on whether Brexit might be linked to discontent as measured in this way by overall satisfaction with life. The base category for the life-satisfaction variable in this Column 1 regression is 'completely dissatisfied'. That extreme answer is given by only 2% of the UK population. Table 3 demonstrates that these individuals are, indeed, more favourable to Brexit than any other citizens, ceteris paribus.

Table 3's first column uses the life-satisfaction scores as a full set of dummy variables. It shows that the coefficient on 'mostly dissatisfied' is not markedly different from that on 'completely satisfied', at -0.0873 compared to -0.0659. Taken literally, and arguably paradoxically, the completely-satisfied people are fractionally more likely to vote for Brexit (by just 2 % points, which is not statistically significant here) than the mostly-dissatisfied ones. It might be thought that a strange finding is that of the coefficient of -0.0153 for people 'neither satisfied nor dissatisfied' with their lives. However, this coefficient has a large standard error, and the natural interpretation of these dummy variables appears to be that it is only the (small number of) completely-dissatisfied citizens who wish disproportionately, in a statistically significant way, to leave the European Union.

Table 3 also enters a set of dummy variables for age. Was it the old who forced the UK out of the European Union? To examine that, the age pattern across the full set of coefficeints in Table 3 is of central interest. Here, in column 1 of Table 3, the base category is young adults who are aged under 20 years old. Relative to them, the coefficient on the 20-24 age category is 0.0530 with a large standard error. Hence those in their early twenties appear to be slightly more in favour of Brexit than those under 20, but it is not possible to reject the null hypothesis, at 95% confidence, that their views are the same.

From this point on in the age distribution, the results are striking. The age dummy-variable coefficients are much flatter than many commentators have believed. The coefficients run from 0.208 for ages 25-29; 0.244 for ages 30-34; …0.254 for ages 50-54; and eventually 0.263 for 70 years and above. Figure 1 illustrates this. On the vertical axis is a measure of support for Brexit. It can be seen that by the time people are in their 30s there is steady support for a pro-Brexit position (all relative, it should be emphasized, to the views of the young adult citizens who are under 20 years old in the Understanding Society data set). The natural conclusion from Figure 1 seems to be that support for the Leave side of the EU referendum follows a kind of step function. It jumps up abruptly, and then runs almost horizontally.

What this implies is that the young are highly pro-Europe. However, the word 'young' here does mean very young. Once UK citizens reach the late 20s, they are apparently behaving essentially the same way as UK citizens in their 70s. The data suggest that Brexit was not, in a general sense, caused by old people.

Table 3 reveals a powerful pattern in the independent variable that captures respondents' feelings about their finances.[2] Coefficients are reported for 'doing alright', 'just about getting by', 'finding it quite difficult', and 'finding it very difficult'. Unlike in the pattern for the life-satisfaction scores, here a marked incline in the coefficients is noticeable. In the fullest specification, that of column 3 of Table 3, the four coefficients on financial feelings are, respectively, 0.0289, 0.0740, 0.0844, and 0.128. These can be treated as approximate percentage amounts. Thus, for example, UK citizens who feel things are very difficult financially are approximately 13% points more likely (than those who feel their finances are comfortable) to be in favour of leaving the European Union.

[2] Data on people's actual incomes are not available (our understanding is that the income data will be released later).

Figure 2 illustrates this graphically. Moving rightwards across the diagram, people feel steadily less happy with their financial situation, and then are progressively more likely to favour the Leave position. The implied sizes are fairly substantial. Overall, our statistical analysis suggests that financial feelings are amongst the strongest correlates with citizens' views on the desirability of Brexit.

Table 3 allows a number of other hypotheses to be tested. A profound association is found between having high qualifications and favouring Remain. The coefficient on having a degree is approximately -0.16. People with children are statistically indifferent to the EU. Women are more favourable to the EU, by approximately 7% points. There is also evidence of an ethnic influence. Those who classify themselves in the survey as 'white British', who from Table 1 are around three quarters of those answering the survey, are somewhat more likely to vote for Brexit. The coefficient, in the columns of Table 3, varies from approximately 0.05 to 0.06.

The other listed variables do not have statistically significant effects. In the full specification of Table 3, being 'in work' does enter negatively, with a small coefficient of -0.0252, but the standard error is 0.0163. It might be thought (for example, from the careful analysis of district data by Becker et al. 2017), that unemployment per se was crucial. However, perhaps surprisingly, a dummy variable for being unemployed into the regressions has a small coefficient that is never statistically significantly different from zero. Being married has no detectable effect on people's views about Brexit. Finally, and perhaps against some commentators' intuitions, living in a rural area has no discernible consequences.

Table 3 includes a number of variables whose coefficients are not reported. These are regional dummies (for the 12 regions) and week-of-interview dummies (for 25 consecutive weeks) from January 2016 to June 2016. The former pattern is depicted in Figure 3; the latter is given in Figure 4. Scotland is the most pro-EU region. Although there is a positive time trend in Figure 4,

meaning that support for Leave rose through the six months from early January to early June, the trend is a shallow one. It thus remains a puzzle, if we use only these data, how the UK came to vote for Brexit.

Table 4 offers a further set of estimates. In this case, the satisfaction-with-life and subjective-financial-situation variables are each compressed into a single cardinal measure. These are coded numerically (from 1 to 7, and from 1 to 4, respectively). In the fullest specification, in column 3 of Table 4, the life-satisfaction variable becomes insignificant and the financial one retains significance. Other variables are not greatly affected by a switch from Table 3 to Table 4.

4. Discussion and caveats

This paper's statistical analysis, and the Understanding Society data set itself, has a number of limitations that should be noted.

First, although the patterns discussed above may help us to understand the causes of Brexit, the analysis is necessarily a study of associations in the data. This is particularly relevant when considering the hypothesis that unhappy feelings in the UK led to the Brexit decision. While we have experimented with a number of possible instrumental-variable strategies, this paper presents only un-instrumented econometric estimates. We can perhaps legitimately say that people's financial worries, for instance, are strongly associated with favouring the Leave side of the argument, but we cannot firmly establish that financial worries caused people to favour Brexit.

Second, it could perhaps be argued that we have identified a causal effect from age, on the grounds that age is truly exogenous, and thus that it must be orthogonal to other regressors in the equation. However, individuals cannot be forced to take part in the survey; nor can they be compelled to answer particular questions within the survey form. Hence there could, in principle, remain some selection-effect biases even on the age coefficients.

Third, the low overall figure for pro-Brexit in this data set is a concern. At face value, there must be some inaccuracy in this paper's data and calculations. Even in week 25 of the year of 2016, we find, in this data set, only 40% of the population saying they want to leave the European Union. There is no clear explanation for this puzzle.

One possibility is that, on June 23rd, many of those UK citizens who favoured the EU failed to go to the polls to vote. Our data do not allow us to judge the strength of feeling, either for or against the EU, of the survey respondents. If the anti-EU individuals had, relatively, much stronger preferences than those who wished for Remain, the people who desired Brexit might have been more inclined to go to the polling stations. Abstentions by pro-EU citizens might have been influential. Table 5 reveals a fairly large number of citizens who say they do not know which way to vote.

Fourth, and relatedly, it might be that attrition within the sample is leading to difficulties in inference (Danny Dorling raised this interesting point with us), if more 'stable' people are systematically more likely to favour Remain. Again this would be a form of selection bias.

5. Conclusion

Brexit, as it has become known, is one of the important political and social events of modern European history. This paper is an attempt to understand it more fully.

In the analysis we have drawn upon new data to try to probe the motivations of UK citizens for voting Leave or Remain in the 2016 UK referendum on membership of the European Union. It is not possible -- for any social scientist -- to know the individual answers given on June 23 within the private voting booths across the United Kingdom. What the paper is able to do, however, is to examine the patterns in citizens' expressed views on the days and weeks running up to the election. The Understanding Society data set, which uses random sampling, and has the

advantage that it is not run by a political-polling company, makes that possible. In the present inquiry, the data set provides information on approximately 8000 citizens' views.

The paper has presented data on raw averages and a selection of results from regression equations. The former allows a simple description of survey answers; the latter is an analytical attempt to hold constant other influences. Neither of these is 'right' or 'wrong', because they measure different things. The analysis and discussion in the paper, however, places more emphasis on the latter method – the one based on ceteris paribus judgments. The reason is that we are interested in how being female or having a university degree, for example, influenced people's views. To do so, even imperfectly, it is necessary to control for the other characteristics of females and of degree holders. [3]

There are two principal conclusions.

The first conclusion is that feelings mattered. There is evidence that what might be described as 'unhappy feelings' do seem to have contributed to the Brexit decision. However, the channel of influence appears to have operated only marginally through a sense of dissatisfaction with life. On close examination, it was really only those who were exceptionally dissatisfied with their lives (approximately 2% of the population) who disproportionately favoured Brexit. What had a larger, and more widely found, effect operated through a person's narrow feelings about his or her own financial situation. Consider those who, respectively, described their financial situation as *living comfortably*, *doing alright*, *just about getting by*, *finding it quite difficult*, and *finding it very difficult*. The individuals giving lower answers, after adjusting for other influences, were systematically more likely to favour leaving the EU. Compared to those 'living comfortably', the

[3] It is possible, instead, to calculate in the raw data how the average woman voted, or how the average degree-holder voted. But by using a regression-equation method we can adjust for the fact that, for example, women have a higher average age in the population and degree-holders have a lower average age. If we rely only on the raw data then we conflate the effects of age and of the other influences.

other categories favoured Brexit in a steadily increasing way by, respectively, the following percentage points: 3%, 7%, 8%, and 13%.

The second conclusion is that, despite many commentators' guesses, Brexit was apparently not caused by the attitudes of old people. Only the very young were disproportionately pro-Remain. On our estimates, for example, there was little difference between being aged 35, 55 or 75. This was not what we had expected to observe in the data.

Some other patterns emerged. Having a university degree or equivalent made people more likely to vote Remain (by 16% points[4]), as did being female (by 6% points). Being white-British apparently made people more likely to vote Leave (by 6% points). There were also regional effects, and some evidence, in the run-up to the final few weeks before the vote, of a slightly rising tendency to favour Leave. There appeared to be no statistically significant influence from being unemployed, being married, having children, or living in a rural area.

[4] The important early work by Goodwin & Heath (2016) reports a 30% point difference, but their comparison group was between university graduates and those with very low qualifications. Here we are comparing those with degrees (and equivalent) to everyone else. Our control variables also differ somewhat from those in Goodwin & Heath (2016).

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Table 1. Variable Definitions and Descriptive Statistics *(where R is the survey respondent)*

Variables	Definition	Mean**	Std. Dev
Pro-BREXIT	If R believes the UK should leave the EU and 0 otherwise	0.375	0.484
Overall life satisfaction	Overall satisfaction with life: "completed dissatisfied" =1 , "mostly dissatisfied"=2, "somewhat dissatisfied"=3, "neither satisfied nor dissatisfied=4, "somewhat satisfied"=5, "mostly satisfied"=6, "completed satisfied" =7	5.22	1.455
Subjective financial situation:	(Current) subjective financial situation: "doing all right"=1, "just about getting by"=2, "finding it quite difficult=3, "finding it very difficult"=4	1.982	0.934
University degree	=1 if R has a university degree and 0 otherwise	0.380	0.485
Children	=1 if R has children and 0 otherwise	0.153	0.360
White Brits	=1 if R 's ethnic origin is white British and 0 otherwise	0.763	0.424
Working	=1 if R is in paid occupation and 0 otherwise	0.578	0.493
Married	=1 if R is married and 0 otherwise	0.556	0.496
Rural	=1 if R lives in a rural area and 0 otherwise	0.279	0.448
Female	= if R is female and 0 otherwise	0.551	0.497
Unemployed	= if R is unemployed and zero otherwise	0.033	0.180

Observations = 8,036, from Understanding Society Panel Survey, Wave H, respondents aged 18 and above interviewed between 5th January 2016 and 22 June 2016.

**

Important notes: The full set of sampling weights in the survey have not, at the time of writing, been released. Hence these mean values should be treated cautiously.

The regression equations given later in the paper use unweighted data (as is conventional with such equations). Hence inferences from them should not be affected by data weights released subsequently.

Table 2. Distribution of the Respondents' Ages *(for the sample used in regression equations)*

Distribution of Rs' age (5 year intervals)			
intervals	Freq.	Percent	Cum.
18-19 years old*	108	1.34	1.34
20-24 years old	469	5.84	7.18
25-29 years old	455	5.66	12.84
30-34 years old	512	6.37	19.21
35-39 years old	658	8.19	27.40
40-44 years old	720	8.96	36.36
45-49 years old	804	10.00	46.37
50-54 years old	823	10.24	56.61
55-59 years old	743	9.25	65.85
60-64 years old	678	8.44	74.29
65-69 years old	682	8.49	82.78
70 years or older	1,384	17.22	100.00
Total	8,036	100.00	

Note: *Only respondents 18 years old or above are included in the regression sample; therefore those aged 15 to 17 are excluded here.

Table 3. Pro-Brexit Regression Equations (OLS Cross-Sectional Estimates with Banded Life-Satisfaction and Financial-Feelings Dummy Variables)

	Pro-BREXIT		
	(1)	(2)	(3)
Satisfaction with life: [a]	-0.0873**		-0.0840**
Mostly dissatisfied	(0.0430)		(0.0429)
Satisfaction with life:	-0.0774*		-0.0773*
Somewhat dissatisfied	(0.0414)		(0.0414)
Satisfaction with life:	-0.0153		-0.0115
Neither satisfied nor dissatisfied	(0.0406)		(0.0405)
Satisfaction with life:	-0.0836**		-0.0715*
Somewhat satisfied	(0.0387)		(0.0387)
Satisfaction with life:	-0.112***		-0.0889**
Mostly satisfied	(0.0374)		(0.0376)
Satisfaction with life:	-0.0659*		-0.0372
Completely satisfied	(0.0396)		(0.0398)
Subjective financial situation: [b]		0.0287**	0.0289**
Doing all right		(0.0129)	(0.0130)
Subjective financial situation:		0.0789***	0.0740***
Just about getting by		(0.0166)	(0.0170)
Subjective financial situation:		0.0933***	0.0844***
Finding it quite difficult		(0.0281)	(0.0286)
Subjective financial situation:		0.141***	0.128***
Finding it very difficult		(0.0485)	(0.0494)
Age Group: [c]	0.0530	0.0505	0.0467
20-24 yrs old	(0.0443)	(0.0450)	(0.0446)
Age Group:	0.208***	0.202***	0.199***
25-29 yrs old	(0.0468)	(0.0474)	(0.0471)
Age Group:	0.244***	0.237***	0.231***
30-34 yrs old	(0.0475)	(0.0481)	(0.0479)
Age Group:	0.249***	0.241***	0.238***
35-39 yrs old	(0.0463)	(0.0468)	(0.0466)
Age Group:	0.247***	0.235***	0.232***
40-44 yrs old	(0.0465)	(0.0472)	(0.0469)
Age Group:	0.265***	0.254***	0.250***
45-49 yrs old	(0.0455)	(0.0460)	(0.0458)
Age Group:	0.254***	0.243***	0.239***
50-54 yrs old	(0.0445)	(0.0451)	(0.0449)
Age Group:	0.262***	0.255***	0.252***
55-59 yrs old	(0.0451)	(0.0455)	(0.0454)
Age Group:	0.256***	0.251***	0.248***
60-64 yrs old	(0.0448)	(0.0455)	(0.0452)
Age Group:	0.272***	0.272***	0.270***
65-69 yrs old	(0.0457)	(0.0463)	(0.0459)
Age Group:	0.263***	0.266***	0.263***
Over 70 yrs old	(0.0436)	(0.0443)	(0.0439)

University Degree	-0.165***	-0.162***	-0.158***
=1 if R has a university degree	(0.0118)	(0.0118)	(0.0118)
Female	-0.0693***	-0.0676***	-0.0678***
=1 if R is female	(0.0104)	(0.0104)	(0.0105)
Children	0.00604	-0.00128	0.000170
=1 if R has children	(0.0172)	(0.0172)	(0.0172)
White British	0.0515***	0.0570***	0.0575***
=1 if R ethnic origin is white British	(0.0141)	(0.0141)	(0.0141)
Unemployed	0.00336	-0.00174	-0.00835
=1 if R is unemployed	(0.0328)	(0.0328)	(0.0327)
Working	-0.0302*	-0.0312*	-0.0252
= 1 if R is working full time	(0.0162)	(0.0163)	(0.0163)
Married	-0.0128	-0.00826	-0.00760
=if R is married	(0.0129)	(0.0129)	(0.0129)
Rural	-0.00959	-0.00826	-0.00805
=1 if R lives in a rural area	(0.0143)	(0.0143)	(0.0143)
Number of observations	8,036	8,036	8,027
Week-of-interview dummies	yes	yes	yes
Regional dummies [(d)]	yes	yes	yes

Robust standard errors, clustered by household, in parentheses: ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

(a) Overall satisfaction with life: coded from completed dissatisfied (1) to completed dissatisfied (7). Completely dissatisfied is the baseline.

(b) Subjective financial situation: from doing all right (1) to finding it very difficult (4). Doing all right is the baseline.

(c) Age group: 5-year intervals, baseline is 18-19 years old.

(d) Regional dummies: North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East, South West, Wales, Scotland, Northern Ireland.

Table 4. Pro-Brexit Regression Equations (OLS Cross-Sectional Estimates with Continuous Life-Satisfaction and Financial-Feelings Variables)

	Pro-BREXIT		
	(1)	(2)	(3)
Satisfaction with life [a]	-0.0103***		-0.00398
	(0.00387)		(0.00401)
Subjective financial situation [b]		0.0358***	0.0338***
		(0.00648)	(0.00676)
Age Group: [c]	0.0543	0.0508	0.0486
20-24 yrs old	(0.0447)	(0.0450)	(0.0449)
Age Group:	0.210***	0.202***	0.201***
25-29 yrs old	(0.0471)	(0.0473)	(0.0474)
Age Group:	0.247***	0.238***	0.235***
30-34 yrs old	(0.0478)	(0.0481)	(0.0481)
Age Group:[c]	0.249***	0.241***	0.238***
35-39 yrs old	(0.0467)	(0.0467)	(0.0469)
Age Group:	0.247***	0.235***	0.233***
40-44 yrs old	(0.0469)	(0.0471)	(0.0472)
Age Group:	0.266***	0.255***	0.252***
45-49 yrs old	(0.0458)	(0.0459)	(0.0461)
Age Group:	0.256***	0.244***	0.241***
50-54 yrs old	(0.0448)	(0.0451)	(0.0452)
Age Group:	0.263***	0.256***	0.253***
55-59 yrs old	(0.0453)	(0.0454)	(0.0456)
Age Group:	0.257***	0.252***	0.250***
60-64 yrs old	(0.0452)	(0.0454)	(0.0455)
Age Group:	0.273***	0.273***	0.271***
65-69 yrs old	(0.0460)	(0.0462)	(0.0462)
Age Group:	0.264***	0.267***	0.266***
Over 70 yrs old	(0.0439)	(0.0442)	(0.0441)
University Degree	-0.169***	-0.162***	-0.162***
	(0.0118)	(0.0118)	(0.0118)
Female	-0.0688***	-0.0679***	-0.0677**
=1 if R is female	(0.0104)	(0.0104)	(0.0104)
Children	0.00534	-0.00102	-0.000416
=1 if R has children	(0.0172)	(0.0172)	(0.0172)
White British	0.0499***	0.0569***	0.0562***
=1 if R ethnic origin is white British	(0.0141)	(0.0141)	(0.0141)
Unemployed	0.0105	-0.00143	-0.00179
=1 if R is unemployed	(0.0329)	(0.0328)	(0.0328)
Working	-0.0349**	-0.0311*	-0.0296*
= 1 if R is doing payed work	(0.0162)	(0.0162)	(0.0163)
Married	-0.0133	-0.00838	-0.00785
=if R is married	(0.0129)	(0.0129)	(0.0129)
Rural	-0.00987	-0.00822	-0.00817
=1 if R lives in a rural area	(0.0143)	(0.0143)	(0.0143)
Number of observations	8,036	8,036	8,027
Week-of-interview dummies	yes	yes	yes

Regional dummies [(d)]	region	region	region

Robust standard errors, clustered by household, in parentheses : ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

(a) Overall satisfaction with life: from completed dissatisfied (1) to completed dissatisfied (7)..
(b) Subjective financial situation: from doing all right (1) to finding it very difficult (4).
(c) Age group: 5-year intervals, baseline is 18-19 years old.
(d) Regional dummies: North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East, South West, Wales, Scotland, Northern Ireland.

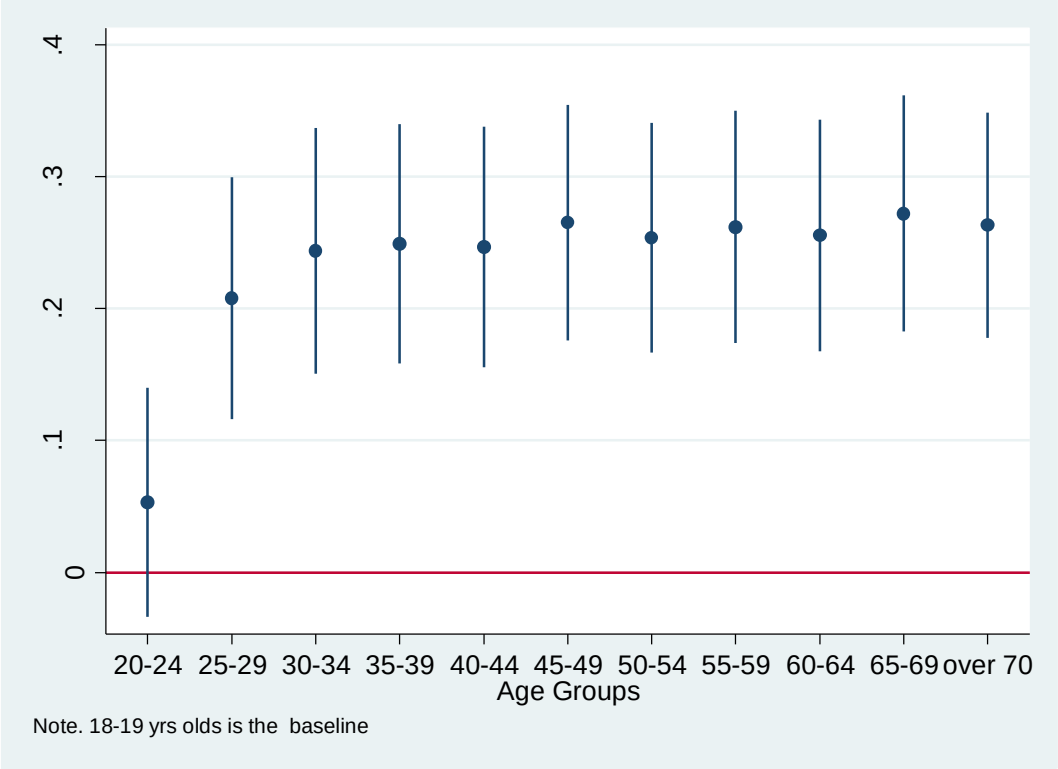
Table 5. Distribution of responses on the EU membership question

Should UK remain a member of the EU?	Freq.	Percent	Cum.
Missing	226	2.57	2.57
Refusal	139	1.58	4.16
Don't know	625	7.12	11.28
Remain a member of the European Union	4,632	52.77	64.05
Leave the European Union	3,155	35.95	100.00
Total	8,777	100.00	

Note. Subsample of respondents aged 18 and above interviewed between 5th January 2016 and 22 June 2016.

Figure 1. The Age Profile of Those Who Wanted to Leave the EU (as calculated from a Brexit equation: Column 1 of Table 3) *(95% CI shown)*

The vertical axis gives a measure of the probability of favouring Brexit.



Note. 18-19 yrs olds is the baseline

Figure 2. The Financial-Feelings Profile of Those Who Wanted to Leave the EU (as calculated from a Brexit equation: Column 2 of Table 3) *(95% CI shown)*

The vertical axis gives a measure of the probability of favouring Brexit.

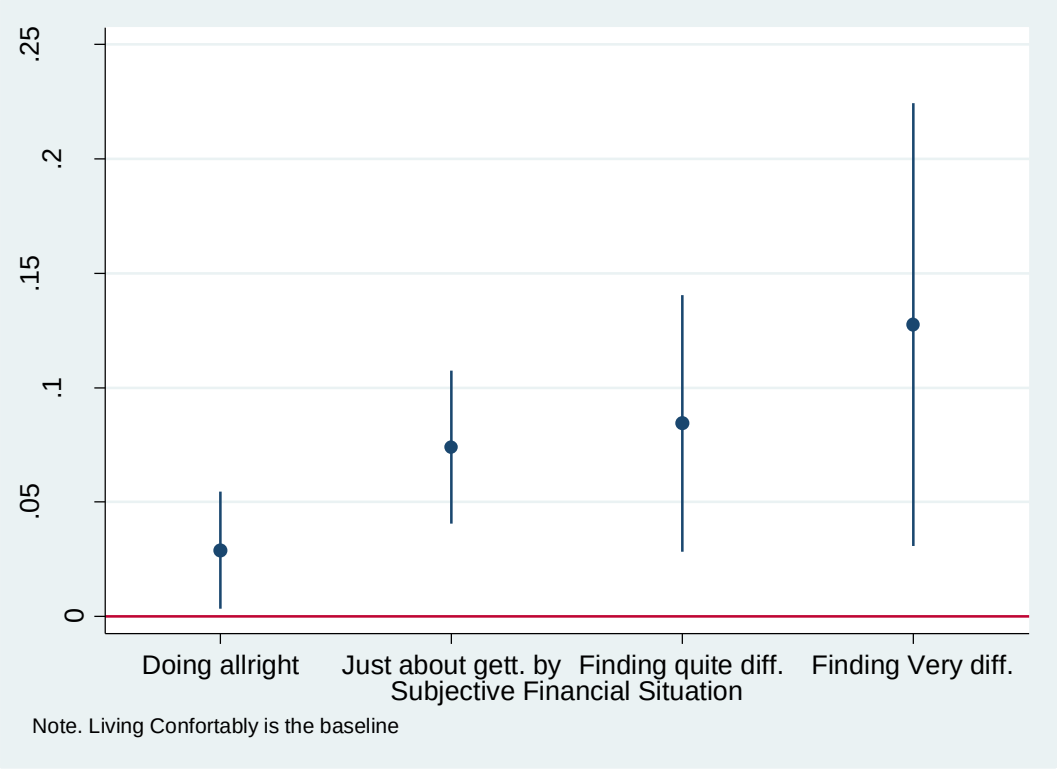
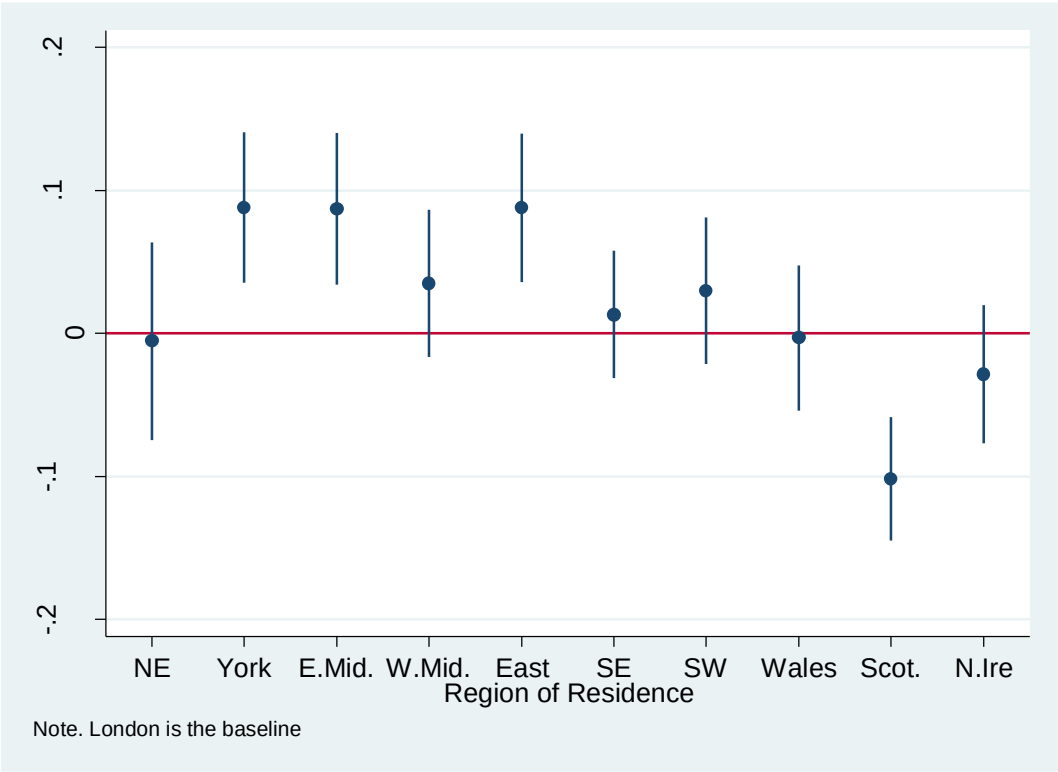


Figure 3. The Regional Distribution of Those Who Wanted to Leave the EU (as calculated from a Brexit equation: Column 2 of Table 3) *(95% CI shown)*

The vertical axis gives a measure of the probability of favouring Brexit.



Note. London is the baseline

Figure 4. The Percentage Supporting Brexit by Each Week from January 2016 to June 2016.