Ballots, Budgets and Bricks: Brexit and the Polarisation of Individual Economic Behaviours

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Abstract

Does political polarisation influence actual economic behaviours? Using British nationally representative surveys and administrative data, we document how the Brexit referendum triggered stark divergences in individual micro and macro expectations between Leave and Remain supporters. Compared to existing research, we show how these polarising effects were driven by a specific policy issue and mostly unrelated to traditional partisan identities. We also demonstrate how these diverging beliefs influenced major real financial decisions. Leavers became more likely to purchase durable goods and engage in housing transactions, and areas with higher proportions of Leave voters experienced increased housing transaction volumes and rising prices.

Keywords: Political Polarisation, Brexit, Expectations, Spending Intentions, Housing Transactions

JEL Classification: D84, E66, P16, R21

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I Introduction

Expectations play a central role in shaping economic behaviour (e.g., Barsky and Sims, 2012; Angeletos and La'O, 2013; Adam, Kuang and Marcet, 2012; Binder, 2020; Binder and Makridis, 2022; Galashin, Kanz and Perez-Truglia, 2020; Cavallo, Cruces and Perez-Truglia, 2017). Understanding how individuals and households subjectively collect and process information is increasingly acknowledged as crucial to understanding their economic behaviour (Alesina, Miano and Stantcheva, 2020; D'Acunto and Weber, 2024; Fuster et al., 2022; Cruces, Perez-Truglia and Tetaz, 2013; Bottan and Perez-Truglia, 2025).

Existing work shows that partisan bias is widespread in survey-based measures of economic expectations (e.g., Mian, Sufi and Khoshkhou, 2021; McGrath, 2016; Gerber and Huber, 2010). As documented in studies on American and Australian elections, voters tend to rate the economy more favourably when they support the party in office (e.g., Gerber and Huber, 2009; Gillitzer and Prasad, 2018; Benhabib and Spiegel, 2019; Bartels, 2002; Coibion, Gorodnichenko and Weber, 2020).

However, it is debated whether subjective polarisation in economic expectations also influences *actual* economic behaviour. For example, "partisan cheerleading" can lead voters to feel very happy when their "team", i.e. their supported party, wins the elections and to respond overly optimistically to surveys, but not seriously alter their actual behaviour (Mian, Sufi and Khoshkhou, 2021). Moreover, existing studies on the political polarisation of economic beliefs and behaviours mainly focus on partisanship. But does the polarisation of beliefs arise beyond partisanship? If the vote is a once-in-a-lifetime political event focused on a specific issue, will individuals and households be more cautious and less influenced by "cognitive bias" in their assessment of the economy and their actual behaviour?

In this paper, we address these open issues. We study the impacts of political polarisation on economic beliefs and behaviour in the context of the "Brexit" referendum, arguably one of the most prominent events in European politics over the past three decades. On 23 June 2016, the United

Kingdom (UK) voted to leave the European Union (EU) by 52% vs 48%. The UK subsequently invoked Article 50 of the Treaty on the European Union and began the withdrawal process on 29 March 2017. The UK formally exited the EU on 31 January 2020.

Using British nationally representative surveys and administrative data and a Difference-in-Differences research design, we find significant polarisation between pro- ("Leavers") and anti-Brexit voters ("Remainers") after the EU referendum. We demonstrate that the divergence in economic expectations about the economy and one's individual circumstances is mirrored by changes in spending intentions and actual economic behaviour. To the best of our knowledge, this paper is the first study on the impact of the Brexit vote on households' economic beliefs and behaviour. We contribute to existing studies by: (a) uncovering how polarised households alter not only their economic expectations but also their actual behaviour. This is a novelty with respect to most studies on the economic effects of political polarisation; (b) providing evidence of belief polarisation along a specific issue rather than along traditional party lines. While existing research exclusively focuses on established partisan identities, we show how polarisation can also occur along other fault lines.

We exploit the announcement of the Brexit vote outcome as an exogenous shock to identify causal effects on the divergence in economic beliefs and actual behaviour between pro- and anti-Brexit voters. In the week before the referendum, the polls consistently found a lead for a Remain vote outcome.[1] Furthermore, the odds-implied probability of a Remain vote outcome reached close to 90% just before the vote (Broadbent, 2017).[2] Since the Leave outcome came out as a large surprise (Born et al., 2019), this shock is arguably orthogonal to contemporaneous macro and individual factors that may have affected economic beliefs and behaviour. A unique feature of our context, compared to other studies on general elections, is that there were no Brexit-related policy changes during the years immediately following the vote. Although anecdotal evidence suggests that firms

[1] See the Wikipedia page "Opinion polling for the United Kingdom European Union membership referendum".

[2] According to Marr (2017) (p. 605), most British politicians, including those on the Leave side, and journalists did not expect the outcome.

and other economic actors started reacting soon to the post-referendum world, the Brexit vote did not instantly change the relationship between the UK and the EU. The UK remained a member state of the EU Customs Union and Single Market until the end of the transition period on 31 December 2020. This feature helps us mitigate any confounding effects induced by changes in policies targeted at particular voters after the vote. We provide evidence in support of this assumption and run a comprehensive range of checks to test the robustness of our results to potential violations.

We develop our analysis in two steps. We first explore the polarising effects of Brexit on individual economic expectations. We leverage two nationally representative surveys carried out before and after the referendum. We separately pool nine waves of the British Election Study 2014–2019 (BES) and five waves of the Bank of England/NMG Household Survey (NMG) from early 2015 to late 2019 to examine households' economic expectations about the general economy and feelings toward personal economic circumstances. We apply two forms of event study specifications to examine the dynamic changes in the belief divergence that occurred in the first years after the referendum. We select Wave 8 in the BES and Wave 2015 in the NMG as reference points, both of which were the last waves conducted before the Brexit vote. We primarily focus on the period spanning from May 2015 to September 2019, that is, the period after the 2015 UK general election and before the formal withdrawal of the UK from the EU in early 2020.

We find that the Brexit vote led to a significant divergence in economic expectations between pro- and anti-Brexit voters. In the wake of the referendum, Remainers became systematically more pessimistic about the current economic situation and the general employment situation, both in comparison to Leavers and – importantly – in absolute terms, whereas the disagreement had been fairly small and insignificant beforehand. Furthermore, after the vote, Leavers began to perceive a lower risk of unemployment and became more optimistic about their future household financial position. On average, after the referendum the gap in the beliefs about the current economic situation between pro- and anti-Brexit voters increased by 0.949 standard deviations, the general employ-

ment situation by 0.758 standard deviations, the perceived likelihood of getting into unemployment by 0.105 standard deviations, and own future household financial position by 0.253 standard deviations, with pro-Brexit voters being more optimistic than anti-Brexit voters.

In a second step, we assess the extent to which changes in spending behaviour mirror the polarisation of economic expectations. Although, before the referendum, Leavers and Remainers reported similar responses, we find that the Brexit vote led to a systematic divergence in Leavers' intentions to spend on major household durable items. After the vote, the gap in spending intention on major items between pro- and anti-Brexit voters increased by 0.309 standard deviations, with Leavers having a stronger spending intention than Remainers. It is worth noting that we do not find effects on general expenditures, and that the Leavers' stronger intention to spend on durable items was not coupled with expectations of rising household income or predicted increases in the cost of living. As a matter of fact, after the referendum, Leavers had lower inflation expectations than Remainers. A belief that Brexit would bring long-term benefits (e.g., economic freedom, better trade deals) plausibly drove optimism even if individuals' short-term economic fundamentals remained unchanged.[3]

We then examine the precise relationships between household economic expectations and spending intentions. To do so, we replicate the approach of Gillitzer and Prasad (2018) and use voting intentions as an instrument for economic expectations to forecast spending intentions. The results provide robust evidence that revised economic expectations drove shifts in spending intentions on major durable goods and intentions to engage in the housing market in the post-referendum period.

Finally, to validate these survey results, we leverage administrative data for over 5.6 million housing transactions across England and Wales, replicating our event study specifications to examine the impact of the Brexit vote on transaction volume and prices. We focus on these transactions because

[3]Taken together, these findings are consistent with models and existing empirical evidence of how consumer sentiments predict durable goods expenditure more than nondurable consumption (cf. Carroll, Fuhrer and Wilcox, 1994).

homes account for a significant fraction of household assets, and buying a house often represents one of the most important economic decisions individuals face in their lives (Bottan and Perez-Truglia, 2025). While there is no evidence of pre-treatment differences, after the Brexit vote, Local Authorities with support for Leave witnessed a significant increase in the number of per capita housing transactions compared to areas with higher support for Remain. Furthermore, repeated-sales estimates show how the price of properties in Leave areas increased compared to those in Remain areas. Given the relatively low and slow residential mobility of British households (e.g., compared to the United States), we conclude that these local-level transaction patterns reflect residents' increased optimism, as reported in the surveys explored in the first part of the paper.

Although we are only able to cover the first four years after the referendum, we find that the considerable divergence in expectations and behaviours has been persistent during the period considered. Importantly, before the referendum, there were no significant differences. Such a test consolidates our underlying assumption that pro-Brexit voters' expectations and behaviour would have paralleled those of anti-Brexit voters in the absence of the vote.

We overall run an extensive set of sensitivity checks, and our results are robust when we: (a) control for pre-vote individual perceived likelihood of the referendum result; (b) address respondents' potential change of views about Brexit after the referendum. This is particularly relevant considering the attention that media and commentators have given to so called 'Bregretters' that is, people who changed their mind about Brexit after 2016; (c) control for potential peer-effects and social spillovers (cf. Makridis, 2022); (d) check the sensitivity of results to using alternative survey questions and alternative ways to classify respondents as Leavers/Remainers; (e) using a core panel of respondents from the BES survey and include individual fixed effects to account for potential unobservable individual characteristics; (f) control for area-specific time trends and pre-referendum local-level characteristics, such as exposure to EU trade, economic structure, austerity and fiscal consolidation; (g) furthermore, pro-Brexit voters tended to have a lower socioeconomic status and

lower educational attainments (Alabrese et al., 2019). We hence also test whether these individual features drove the divergence in economic expectations and behaviours we uncover, and show that controlling for voters' educational attainment, household income, and employment status does not influence our main conclusions. Moreover, we find that, within each group of voters (Leavers and Remainers), the gaps in revisions to economic expectations and spending intentions are relatively small across socioeconomic characteristics. This rules out the alternative potential explanation according to which households with different characteristics might have driven the heterogeneous responses we uncover. In contrast, the gaps in revisions to expectations and spending intentions are significantly larger between Brexit supporters and opponents within each socioeconomic characteristic. Overall, our results suggest that views towards Brexit were more important than socioeconomic characteristics in shaping economic beliefs; (e) finally, even though trade policies did not change immediately after the vote, one might be concerned that firms may have reacted quickly in their decisions regarding investments, hiring/firing and wage setting, particularly in Brexit strongholds, which were known for being more exposed to trade with the EU (Los et al., 2017). While this is likely, our results show that Brexit supporters did not express higher concerns about becoming unemployed (we find the opposite). We further distinguish between respondents inside/outside the labour market, and while we uncover a slightly more positive expectation revisions among the unemployed, we do not find differences between those in employment and those inactive.

The paper is structured as follows. Section I.A discusses the related literature. Section II describes the data sources, measurements and descriptive statistics. We present our empirical strategies and results on the divergence in economic expectations in Section III. This is followed by an investigation of stated spending intentions and actual economic behaviour in Section IV, where we explore survey spending intentions in IV.A and housing transaction data in IV.B. Finally, Section V concludes.

I.A Related Literature

Our contribution to existing research is threefold. First, we relate to the body of work on expectation formation. The literature shows that survey expectations data have significant explanatory power for economic decisions at individual, regional, and aggregate levels (e.g., Greenwood and Shleifer, 2014; Kuang et al., 2023). Expectations usually show substantial heterogeneity within and between households, firms, and experts (e.g., Coibion and Gorodnichenko, 2015; Sapienza and Zingales, 2013; Andre et al., 2022; Kuang et al., 2022). A strand of this literature examines how macroeconomic shocks and individual characteristics interact in the formation of expectations. For example, Binder and Makridis (2022) find that an increase in local gas prices causes consumers to become more pessimistic about national economic conditions. Roth and Wohlfart (2020) provide evidence of how professional macroeconomic forecasts on the likelihood of a recession shape individual expectations and spending plans. The COVID-19 pandemic also led consumers to form higher inflation expectations and more pessimistic unemployment expectations (Binder, 2020). Other studies focus on the role of socioeconomic status and individual characteristics, such as income and education, in shaping expectations (e.g., Das, Kuhnen and Nagel, 2020; Kuhnen and Miu, 2017; Souleles, 2004). To our knowledge, our paper is the first to study how the Brexit vote shock affected household economic beliefs. We find that the vote led to a sharp and lasting divergence in beliefs between pro- and anti-Brexit voters. Our results suggest that views towards Brexit dominate over socioeconomic status in shaping economic beliefs. Furthremore, our findings on actual economic behaviour are consistent with research by Carroll, Fuhrer and Wilcox (1994), Malmendier and Nagel (2016), Kamdar and Ray (2022), and Gillitzer and Prasad (2018) which argue that consumer sentiment and inflation expectations matter for household spending and exposure to liabilities.

Second, and most importantly, our paper contributes to the growing body of research on the economic effects of political polarisation (Kempf and Tsoutsoura, 2024; Mian, Sufi and Khoshkhou, 2021; Meeuwis et al., 2022) by: (a) uncovering how polarised households alter not only their eco-

nomic expectations but also their actual economic behaviour. This is a core novelty of our analysis; (b) providing evidence of belief polarisation along a specific issue rather than along traditional party lines. Recent studies report a stark polarisation among the American and British electorates (Abramowitz and Saunders, 2008; Hobolt, Leeper and Tilley, 2021; Perez-Truglia and Cruces, 2017; Allcott et al., 2020; Kaplan, Spenkuch and Sullivan, 2022). In particular, there is well-documented evidence on affective polarisation (Iyengar, Sood and Lelkes, 2012; Iyengar et al., 2019). Individuals with similar partisanship increasingly share homogeneous ideology while holding hostility towards members of the opposing political party. This line of research shows that affective polarisation may lead to disagreement in factual beliefs (Druckman et al., 2021). The recent literature further explores whether partisan identity shapes individual expectations (Mian, Sufi and Khoshkhou, 2021). However, the extent to which partisan bias in economic expectations reported in surveys accurately reflects voters' actual behaviours is contested. We address this gap by showing how partisan bias in economic expectations is mirrored by similar polarisation in spending intentions and in the extent to which households decide to buy a new home.

Relatedly, most existing research studying how partisan biases influence economic expectations and behaviours focuses on support for political parties at elections. Partisanship, however, is known to be partly linked to contextual assessments, such as the state of the economy, and partly to long-term ideological links with political parties. Research on the Brexit vote suggests that the Brexit referendum cut across established party lines, with pro- or anti-Brexit views being similarly shared by traditional Labour and Conservative voters (Hobolt, Leeper and Tilley, 2021). As the political views around Brexit were mostly orthogonal to traditional party lines, did the referendum influence individual economic expectations/behaviour in the same way as the long-term partisan identities explored in the literature? We contribute to existing studies by showing how polarisation can be triggered by political identities not strictly confined to traditional party politics.[4]

[4]Kuang, Weber and Xie (2024) examine how consumers' political affiliations, in relation to their perceptions of the Federal Reserve's political leaning, influence their behaviour in acquiring and processing information from the

Third, our findings contribute to the literature on the recent rise of populism. Several articles explore the causes behind the rise in political disenchantment, populism and, in Europe, Euroscepticism (Rodríguez-Pose, 2018; Margalit, 2019; McCann and Ortega-Argilés, 2021; Rodrik, 2021; Autor et al., 2020). We connect to this strand of work by exploring the consequences – rather than the causes – of populist events such as Brexit. In so doing, we also relate to the body of research specifically studying the economic impacts of the Brexit vote. Almost without exception, economists have shared the consensus that as a result of new economic barriers (Sampson, 2017), leaving the EU would exert an adverse influence on the UK economy with regard to trade (Dhingra et al., 2017; Steinberg, 2019), foreign direct investment (Bruno et al., 2016; Dhingra et al., 2016*b*), immigration (Portes and Forte, 2017; Wadsworth et al., 2016), household living standards (Dhingra et al., 2016*a*; Breinlich et al., 2017), and regional economic performance (Dhingra, Machin and Overman, 2017; Los et al., 2017). Nevertheless, the impact of the Brexit vote on micro-level economic decisions has not yet received much attention. We contribute to filling this gap by analysing how households reacted to the referendum.

II Data and Measurement

Our empirical analysis explores the polarising effects of the Brexit vote on household economic expectations and behaviour. We focus mainly on the period that spans from May 2015 to September 2019, that is, the period after the 2015 UK general election and before the formal withdrawal of the UK from the EU in early 2020. Such a time frame provides an ideal setting for analysing the links between political polarisation, economic expectations, and behaviour. Despite significant uncertainty about Brexit negotiations and the future of the EU-UK relationship, there were no significant Brexit-related policy changes occurring in the years following the referendum, which could other-

Fed—extending beyond traditional partisan lines. In a follow-up study, Kuang, Weber and Xie (2025) explore how the Federal Reserve can communicate more effectively to mitigate these perception biases.

wise confound our estimates. (This is a key point, and we provide a more detailed discussion in Section III.)

We combine two nationally representative surveys to measure individual economic expectations and gather detailed personal characteristics of Brexit voters, including their views toward Brexit. We also use measures of spending intentions, as elicited from the two surveys, to study individual spending behaviours. However, recognising that these survey-based spending measures may be subject to "cheerleading bias" (Mian, Sufi and Khoshkhou, 2021), we also leverage large-scale administrative records to investigate a specific major economic decision of households, namely the decision to buy a new home.[5] We now introduce our data sources and measurements.

II.A Surveys

The two nationally representative surveys used in this paper are the British Election Study 2014–2019 (BES) and the Bank of England/NMG Household Survey (NMG). The BES survey investigates British voters' political and economic attitudes around each of the general elections in the UK. Considering the study time frame and the availability of variables of interest, we leverage data combined from waves 6, 7, 8, 9, 10, 11, 14, 15, and 16 of the BES survey, with each wave encompassing a considerable

[5]We complement our survey and administrative data with a rich set of pre-vote regional characteristics at the Local Authority level obtained from Becker, Fetzer and Novy (2017). These characteristics, which are used to explain the shares of the Brexit vote between Local Authorities in their document, fall broadly into four groups: (*i*) exposure to the EU in terms of immigration, trade and structural funds; (*ii*) provision of public services and fiscal consolidation; (*iii*) demography and education; and (*iv*) economic structure, wages, and unemployment. As we show later, these characteristics enable us to rule out various distinct time trends that could potentially introduce bias into our results with respect to the role of the Brexit vote announcement in explaining subsequent housing transactions across different localities. We report summary statistics for the regional characteristics in Appendix Table C.8. For more in-depth information on definitions, sources and measurements of these characteristics, refer to Becker, Fetzer and Novy (2017).

sample size of more than 30,000 respondents.[6] We do not include BES waves 1 to 5 because they were run before the 2015 general elections, and for consistency with the NMG survey. The NMG survey, conducted annually by the Bank of England, primarily asks respondents questions about general and personal economic situations.[7] We utilise the waves of the NMG survey, conducted between 2015 and 2019, which led to approximately 6,000 individuals being surveyed each year.

The detailed timing for each wave of both the BES and NMG surveys is provided in the Appendix Table C.1. The BES waves that we focus on were carried out during the following periods: May 2015, April to May 2016, May to June 2016 (before the referendum), June to July 2016 (after the referendum), November to December 2016, April to May 2017, May 2018, March 2019, May to June 2019. As stated earlier, we exclude waves before May 2015, although robustness tests available upon request verify that including these additional waves does not affect our analysis. The pre-vote waves thus consist of waves 6, 7, and 8, while the subsequent waves are considered post-vote. The NMG survey is conventionally conducted in September each year and, therefore, we obtain only one pre-vote wave, namely Wave 2015.[8] In our main analysis, we pool survey waves and use repeated cross-sectional samples separately for each survey. However, our results are robust to using the panel structure of the data (as described in Section III.D). We apply appropriate sampling weights throughout the paper to maintain the representativeness of the samples.

The BES and NMG surveys are well suited for this study, as they provide extensive information

[6]The British Election Study (BES) holds the distinction of being the longest-running social science survey in the UK, and also one of the longest-running election studies globally. It has a history of 60 years for researchers to study Britain's electoral behaviour since the first study launched in 1964. The specific BES dataset that we use in this paper, British Election Study 2014–2019, is of high frequency and includes 16 waves in total. Detailed information on the BES project can be found at https://www.britishelectionstudy.com.

[7]The NMG survey dataset is publicly available at https://www.bankofengland.co.uk/statistics/research-datasets.

[8]We have chosen to include only one pre-vote wave of the NMG survey for two key reasons. First, this decision aligns with the primary period of interest for our study. Second, and most importantly, waves before 2015 do not have some of the key outcome variables that we focus on.

regarding individuals' Brexit identity, economic expectations, and spending intentions over time. We will now elaborate on how we measure these variables of interest in the following two subsections. For clarity, we have also included Appendix Table C.2, which presents a comprehensive summary of the survey questions, response options, and the sources from which these measures are derived.

II.B Measuring Brexit Identity

We measure respondents' "Brexit identity", i.e., whether they are classified as pro- or anti-Brexit voters, based on their actual votes, vote intentions, or attitudes towards Brexit. In the waves prior to the Brexit vote (i.e., waves 6, 7, 8), the BES asks respondents to express their voting intentions on the UK's membership of the EU. Subsequently, in Wave 9, immediately after the referendum, the survey asks what respondents had actually voted. Since Wave 10, the BES asks for vote intentions again, assuming there was another referendum on EU membership.[9] Leveraging these questions, we identify respondents as pro- or anti-Brexit voters if they respectively answer "Leave the EU" or "Remain in the EU". Using the shares of Leave voters from Wave 9, in Appendix Figure B.1 we plot the survey-measured stated vote shares against actual Leave voter shares across Local Authorities.[10] The figure shows that respondents in the BES survey are highly representative of Brexit voters, with a correlation coefficient of 0.73 between the two share measures, weighted by local electorate counts.

From Wave 2016, carried out after the Brexit referendum, the NMG survey asks respondents about their attitudes towards the UK voting to leave the EU in the referendum. We identify respondents as pro-Brexit voters if they have "somewhat positive" or "very positive" attitudes, and

[9]The BES survey also includes a profile variable that records the actual vote of individuals in the EU referendum. We use this variable for robustness checks and to investigate changes in expectations among voters who changed their views about Brexit since 2016. See more details in Section III.D.

[10]The associated actual Brexit vote results are obtained from London Datastore with the following link: https://data.london.gov.uk/dataset/eu-referendum-results.

anti-Brexit if they hold "somewhat negative" or "very negative" views. However, the attitudes of the respondents are not available in the preceding-vote wave, Wave 2015. To address the issue of missing values, since some NMG survey respondents are traced across different waves, we successively utilise their attitudes revealed in waves 2016, 2017, 2018, and 2019 to fill in the missing values in Wave 2015. Through this approach, we can determine the Brexit identity of approximately 39.9% of the respondents in Wave 2015. Despite sample attrition, our filled sample remains highly representative (see Appendix Table C.3).[11]

One major concern with this imputation approach is that it may be subject to measurement errors, as respondents could alter their Brexit attitudes over time, especially after the Brexit vote outcome was declared. This is because the announcement had promptly changed interest rates and other economic circumstances, which might in turn alter individual Brexit attitudes. To assess the extent to which this concern may bias our results, we first examine respondents' attitudes towards Brexit over time. In so doing, we calculate the proportions of respondents who express unchanged or changed attitudes toward Brexit across any two particular waves within each survey. In Appendix Table C.4 and C.5, results suggest that the attitude of respondents toward Brexit remains relatively stable during both the pre- and post-referendum periods up to 2019.[12] In other words, voters who

[11] In Appendix Table C.3, we present summary statistics for the original sample of Wave 2015 of the NMG survey and for its filled sample. Comparing columns (1) and (3), we find that the sample with missing attitudes imputed does not significantly twist the demographic compositions of the original sample.

[12] In Appendix Table C.4, we limit respondents to those who participate in the NMG survey for any two particular years from 2016 to 2019, and present the percentages of respondents who report unchanged or changed attitudes towards Brexit. Specifically, we calculate the shares of four types of voters: (*i*) voters expressing pro-Brexit attitudes in both years, (*ii*) voters expressing anti-Brexit attitudes in both years, (*iii*) voters expressing pro-Brexit attitudes in the former year but changing to anti-Brexit attitudes in the latter year, (*iv*) voters expressing anti-Brexit attitudes in the former year but changing to pro-Brexit attitudes in the latter year. Hence, the voters who changed (or do not change) attitudes are the latter (or the first) two types. For instance, the percentage of respondents who do not change attitudes between waves 2016 and 2017 is 92.6%. Although the percentage of respondents with unchanged attitudes slightly decreases over time,

changed Brexit attitudes – e.g., *"Bregretters"*– only account for a small proportion of the overall sample, which is thus unlikely to drive our main conclusion. In Section III.D, we provide further evidence examining view revisions for *"Bregret"* voters across the referendum.[13]

Demographic Compositions of Brexit Voters. We report the demographic compositions of the voters in the BES and NMG samples in Table 1. Confirming the literature identifying the "politically disenchanted median voter", the table shows that anti-Brexit voters are more likely to hold a college degree than pro-Brexit voters (53.8% vs. 32.4% in the BES survey, 53.0% vs. 37.3% in the NMG survey). Anti-Brexit voters are also more represented among the high-income group (24.2% vs. 14.1% in the BES survey, 20.1% vs. 18.5% in the NMG survey) and, by contrast, less represented in the low-income group (18.3% vs. 25.0% in the BES survey, 20.1% vs. 25.5% in the NMG survey).[14] Anti-Brexit voters are also more likely to be employed (61.0% vs. 50.9% in the BES survey, 61.6% vs. 55.8% in the NMG survey) and less likely to be inactive (36.2% vs. 46.7% in the BES survey, 35.4% vs. 42.1% in the NMG survey). The share of those unemployed is relatively balanced among pro- and anti-Brexit voters (2.9% vs. 2.5% in the BES survey, 3.0% vs. 2.2% in the NMG survey). In columns (5) and (6), we test the null hypotheses that average anti- and pro-Brexit voters are not different in characteristics by regressing each demographic variable on a dummy indicating if voters are

it still reaches 83.4% between waves 2016 and 2019. Appendix Table C.5 provides another examination using the BES survey, which makes it possible to compare the waves before the vote and the waves afterwards. It suggests that the percentages of respondents with unchanged attitudes between a wave before the vote and another afterwards all exceed 80%.

[13]It is also worth stressing that opinion polls suggest how the biggest changes in attitudes towards Brexit occurred after 2020. See: https://www.theguardian.com/politics/ng-interactive/2023/jan/30/changing-attitudes-to-brexit-three-years-on, accessed on 4 April 2025. A plausible explanation for this can be attributed to the absence of significant policy changes related to Brexit before January 2020. In the absence of tangible policy shifts, and subsequent notable changes in economic circumstances, individuals may have been less inclined to reconsider their positions on Brexit.

[14]Low income refers to households below the 25th percentile in the distribution of annual gross income, high income refers to those above the 75th percentile, and middle income refers to those between the 25th and 75th percentiles.

pro-Brexit or not. We find that all null hypotheses are rejected at the 1% significance level. Taken together, these descriptive results suggest that anti-Brexit voters have higher educational levels and higher socioeconomic status.

II.C Measuring Economic Expectations

Our primary measures of economic expectations are derived from survey questions that elicit respondents' beliefs about the general UK economy (macro expectations) and personal economic circumstances (micro expectations). By considering both aspects, we can obtain a more comprehensive and nuanced understanding of individuals' overall economic outlook.

We include two questions to measure macro expectations. Taken out from the BES survey, the first one is designed to gauge individuals' perceptions on the economy; it asks respondents whether they believe the economy is getting better, getting worse, or staying about the same. Within this question, participants are allowed to report on a scale from 1 (getting a lot worse) to 5 (getting a lot better). We refer to this question as about the "Current Economic Situation". The second question comes from the NMG survey and captures individuals' beliefs regarding the general employment situation in the UK. Specifically, respondents are asked to assess how they believe the number of unemployed people in the country will change over the following 12 months. Responses range from 1 (increase sharply) to 5 (fall sharply).[15] We refer to this question as the "General Employment Situation" question.[16]

Similarly, we focus on two questions capturing micro expectations. The first one, which we refer to as "Personal Unemployment Risk", is sourced from the BES survey. It asks respondents

[15]Higher values are associated with more optimism about the general employment situation in the UK.

[16]For robustness checks, we also obtain an additional variable based on a question from the NMG survey that asks respondents to assess the general economic situation over the next 12 months on a scale from 1 (get a lot worse) to 5 (get a lot better). This variable is a complement to our primary measure of respondents' beliefs on the current economic situation from the BES survey.

about their beliefs on the personal likelihood of being unemployed in the subsequent 12 months. The answers range from 1 (very unlikely) to 5 (very likely). In the second question, sourced from the NMG survey and referred to as "Household Financial Position", respondents are asked to provide their perceptions about how their household financial positions may change over the following 12 months. Answers range from 1 (financial position will get a lot worse) to 5 (it will be a lot better).[17] For ease of interpretation, we standardise all the variables to have a mean of zero and a standard deviation of one.

II.D Measuring Economic Behaviour in Survey Data

We first follow the approach of the existing literature that uses survey-based measurements of spending intentions to understand spending behaviours (e.g., Gillitzer and Prasad, 2018; Bachmann, Berg and Sims, 2015; Shapiro and Slemrod, 2003). Using spending intentions allows us to study the immediate response of individuals to the Brexit vote and to the induced changes in economic expectations.

One survey question measures people's willingness to purchase major household items. The question is taken from the BES survey and is referred to as "Good Time to Purchase Major Items". It asks respondents to report whether it is currently a good or bad time to buy major household items (e.g., furniture, kitchen appliances, and televisions).[18] We code the answers as 1 for bad, 2 for neither

[17] We also obtain a variable pertaining to personal financial situations from the BES survey, which is measured by a question asking for respondents' perceived risks of getting into poverty. The question reads as follows: "During the next 12 months, how likely or unlikely is it that there will be times when you do not have enough money to cover your day-to-day living costs?" Its scale is the same as our measure of individual perceptions of unemployment risks. However, we recognise that for the majority of respondents in developed economies, the issue of a lack of money to cover daily living costs may not be a significant concern. As a result, we have downgraded the importance of this variable to a secondary role in our analysis.

[18] We cross-validate this question by a similar one from the NMG survey, which asks: "compared to the last 12 months, do you expect to spend more or less money on major purchases (such as a car, furniture or electrical goods) over the

good nor bad, and 3 for good. In addition to examining spending intentions on major items, it is also interesting to examine general spending. Therefore, we include another question from the NMG survey, referred to as "Household General Spending", in which respondents are asked to anticipate how their household general spending will change over the following 12 months. There are five response options, ranging from 1 (decrease significantly) to 5 (increase significantly). As above, we standardise both variables for ease of interpretation.

Our second set of questions on household economic behaviour appears only in Wave 2016 of the NMG survey. These questions focus on respondents' intentions to participate in housing transactions. Specifically, they ask respondents their views on how the Brexit vote affected mortgage accessibility and the likelihood of purchasing a new residential home. Regarding mortgage accessibility, respondents are asked to report if they agree with the following two statements: (*i*) mortgages have become more *difficult* for people to obtain since the UK voted to leave the EU; (*ii*) mortgages have become *easier* for people to obtain since the UK voted to leave the EU. We create two indicators based on these statements, assigning a value of one if respondents agree with the corresponding statements. We refer to these indicators as "Difficult to Obtain Mortgages" and "Easier to Obtain Mortgages" in our analysis.

Furthermore, we draw on a question that more directly addresses the impact of the Brexit vote on individuals' likelihood of purchasing a new main residential home within the following 12 months. Based on the responses to this question, we similarly create a dummy variable to indicate whether respondents state that the Leave vote has made them a lot more likely or a little more likely to buy a new main residential home, compared to a scenario where the UK voted to remain in the EU. We refer to this dummy variable as "More Likely to Buy a House".

It should be noted that individuals who are buying a new home may also sell their old property. As such, we employ a similar question that asks about the influence of the Leave vote on the likeli-

next year?" Respondents state their intentions on a scale from 1 (much less) to 5 (much more).

hood of selling their primary residential properties over the following 12 months. We analogously create a dummy variable, referred to as "More Likely to Sell a House". This question enables us to capture a more comprehensive picture of household behaviour in the housing market.

II.E Administrative Data on Housing Transactions

Despite the inclusion of comprehensive survey questions to capture households' economic decisions, stated preferences may not accurately reflect actual behaviour in the presence of "cheerleading bias" (Mian, Sufi and Khoshkhou, 2021). This bias may arise if respondents feel overly optimistic/pessimistic after their supported party wins/loses a vote, influencing their survey response. Therefore, we complement our analysis with administrative data on housing transactions. It is important to stress that, for many households, a house is an important asset and buying a property is one of the major economic decisions individuals face in their lives.

We use Price Paid Data from the HM Land Registry to access administrative records on housing transactions. This dataset contains detailed information on transaction dates, prices, postcodes, and characteristics of all property sales in England and Wales. Since we intend to use a relatively wide window of time to examine the impact of the Brexit vote on actual housing transactions, we extend our window to include housing transactions completed between 1 June 2014 and 31 December 2019. This extension allows us to have a longer period preceding the referendum. During this time period, we observe a total of 5.663 million housing transaction records. Considering the potentially slower response of housing transactions to the vote and motivated by their temporal patterns, we aggregate housing transactions at a semiannual frequency.

Appendix Figure B.2 presents the temporal and spatial patterns of our housing transaction data. Panel A suggests that the average daily number of housing transactions is approximately 3,000. In addition, we observe seasonal cycles in the volume of transactions, with the first half of each year generally having lower volumes than the second half. Using the postcode information for each

property, we can map each transaction to the relevant Local Authority, the lowest administrative tier in England and Wales.[19] In Panel B, we present the overall aggregated volume of housing transactions per capita in the Local Authority districts. We find hotspots with higher levels of housing transaction volume per capita scattered across England, while lower levels are clustered in Wales.

III The Polarisation of Households' Economic Expectations

III.A Descriptive Results

We begin by investigating the impact of the Brexit referendum on voters' economic expectations. Specifically, we examine how pro- and anti-Brexit voters updated their expectations regarding both the general economic situation and personal circumstances after the results were declared. We first provide descriptive evidence showing the means (estimated with marginal predicted values) of pro-Brexit vs. anti-Brexit voters' standardised economic expectations across each survey wave, conditional on a rich set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. These estimates, presented graphically in Figure 1, are interesting because they show the divergence in absolute levels, as opposed to the relative effects that we will uncover in our event study specifications.

The graphs in the top panel show means of optimism towards the current economic situation and general employment prospects across pro- and anti-Brexit voters, both before and after the Brexit vote. One can see that within survey waves prior to the referendum, the mean levels of optimism towards the current economy and employment situation are greater among Remainers, although differences in the means between pro- and anti-Brexit voters are relatively modest. Following the referendum, however, we observe a clear and long-lasting divergence: Leavers report, on average, a

[19] This cross-walk procedure is completed relying on a dataset of postcode directory provided by the Office for National Statistics, which can found at the following link: https://geoportal.statistics.gov.uk/datasets/ons::ons-postcode-directory-may-2021-1/about.

remarkable increase in economic optimism, while anti-Brexit voters exhibited a substantial decline in their economic outlook.

The bottom panel focuses on expectations about the risk of personal unemployment and the financial position of the household. By comparing BES waves 8 and 9, which were conducted right before and after the referendum, we can observe how anti-Brexit voters demonstrated a sharp increase in perceived unemployment risk in Wave 9, while pro-Brexit voters reported a significant decline. Although perceptions of personal unemployment risks among Remainers marginally decreased after Wave 9, their post-referendum levels remain higher than both their pre-referendum levels and the levels of Leavers. Similarly, in the aftermath of the vote, Remainers became much more pessimistic about their future household financial prospects. Once again, before the referendum, there were minimal differences between pro- and anti-Brexit voters in both perceived unemployment risks and expectations about household financial positions.

III.B Econometric Models

We next examine these patterns through a regression framework based on two event study specifications. In so doing, we exploit the Brexit vote shocks and compare changes in expectations between anti- and pro-Brexit voters across the referendum, conditional on a full set of controls. Our first event study specification is a flexible model designed to estimate the dynamic effects across survey waves, as follows:

$$Y_{ict} = \lambda \cdot ProBrexit_{ict} + \sum \eta_t \cdot Wave_t + \sum \rho_t \cdot Wave_t \cdot ProBrexit_{ict} + \mu_{ct} + \eta X'_{ict} + \epsilon_{ict}, \qquad (1)$$

where Y_{ict} is a specific macro or microeconomic expectation variable from either the BES or the NMG survey (i denotes the voter, c their area of residence – defined as the Local Authority in the BES survey and, due to different spatial resolution provided, the postcode area in the NMG survey –

and t the survey wave).[20] $ProBrexit_{ict}$ represents each voter's Brexit identity, taking a value of one for pro-Brexit voters and zero otherwise. $Wave_t$ is a full set of indicator variables for each survey wave. In the event studies, we treat Wave 8 of the BES survey and Wave 2015 of the NMG survey as the omitted reference categories and compare them to all remaining pre-referendum survey waves (none for the NGM survey due to data availability) and the waves conducted after the referendum. ϵ_{ict} is the error term and we cluster standard errors at the area by wave level.

We control for key demographic factors, X'_{ict}, which are known to shape economic expectations. These factors include gender, age, educational attainment, annual gross household income, and employment status (e.g., Malmendier and Nagel, 2016; Das, Kuhnen and Nagel, 2020).

In addition, it is important to consider the potential impact of changes in the economic fundamentals of constituencies following the Brexit vote. This concern is particularly relevant in the context of general elections, where political candidates may direct more resources and government revenues to areas they favour once in office (e.g., Hodler and Raschky, 2014; Luca, 2021).[21] In our context, this concern is attenuated because the UK-EU relationship remained provisionally unchanged, with no immediate shifts in actual Brexit-related policies following the vote until the end of 2020 – after the period covered by our analysis. Nevertheless, it might be expected that firms and sectors have already started reacting to Brexit, trying to anticipate some of the potential economic impacts. Although we do not have data on individual firms, we include area × wave-level fixed-effects, μ_{ct}, to address any possible confounding factors.

[20] The UK postcode, maintained by Royal Mail, consists of five to seven alphanumeric characters that identify postal delivery areas. The initial characters of these postcodes define geographical units known as postcode areas. As of January 2023, there were 124 postcode areas in the UK. We obtain information on these areas from the postcodes provided by respondents in the NMG survey.

[21] For further discussions on this potential confounder, see two closely related papers that examine changes in voters' expectations across general elections in the US (Mian, Sufi and Khoshkhou, 2021), and Australia (Gillitzer and Prasad, 2018).

Second, we estimate a more parsimonious Difference-in-Differences model to capture the average effects before/after Brexit,

$$Y_{ict} = \theta \cdot ProBrexit_{ict} + \sum \delta_t \cdot Period_t + \sum \beta_t \cdot Period_t \cdot ProBrexit_{ict} + \mu_{ct} + \eta X'_{ict} + \epsilon_{ict}, \quad (2)$$

where Y_{ict}, $ProBrexit_{ict}$, μ_{ct}, X'_{ict}, and ϵ_{ict} are defined as above. Replacing $Wave_t$, $Period_t$ consists of two dummy variables that indicate whether the survey wave t was conducted before or after the Brexit referendum. In the BES survey, we subsume waves 6 and 7 into the pre-referendum period, and waves 9, 10, 11, 14, 15 and 16 into the post-vote period. In the NMG survey, we subsume waves 2016 to 2019 into the post-vote period, with no pre-referendum period classified in this case. As before, the omitted reference categories are Wave 8 for the BES survey and Wave 2015 for the NMG survey. Standard errors are clustered at the Local Authority or postcode area by wave level.

The explanatory variables of our interest are the interactions between $Wave_t$ (or $Period_t$) and $ProBrexit_{it}$. Their coefficient estimates, ρ_t or β_t, capture the changes in the divergence of economic expectations between pro- and anti-Brexit voters relative to the reference time points. These estimates allow us to assess whether expectation divergences changed even before the Brexit vote (which would challenge our identification) and to verify if there was a sharp increase in polarisation immediately after the vote.

In addition to the baseline specifications, we also estimate additional specifications where: (*i*) we disaggregate the average effects of the Brexit referendum by voters' socioeconomic status, to understand the relative importance of Brexit identity in shaping voters' economic expectations; (*ii*) we include controls for voter types, to examine whether particular groups of voters drive our main estimates; (*iii*) we use a limited survey sample and include a full set of individual fixed effects; and (*v*) we examine supplementary expectation variables from both BES and NMG surveys.

III.C Baseline Regression Estimates

We begin by estimating our event study models in equation (1), progressively introducing individual controls and area × wave fixed effects. For each of our outcomes of interest, in Figure 2 we visualise the coefficient estimates and 95 percent confidence intervals on the key interaction terms between time indicators and the Brexit identity indicator. The interactions between $Wave_t$ and $ProBrexit_{it}$ are presented as dots, with 95 percent confidence intervals indicated by vertical lines. In the same graphs, we also plot the coefficients for the interactions between $Period_t$ and $ProBrexit_{it}$ from equation (2) using horizontal lines, with 95 percent confidence intervals shown as boxes. (Detailed regression coefficients are presented in Appendix Table C.9.)

In the graphs showing households' perceptions of the broader economy and employment (macro expectations), one can see clear, significant, and persistent divergence right after the referendum, with greater optimism among pro-Brexit voters and increased pessimism among anti-Brexit voters. As shown by the horizontal lines, the attitude gap between pro- and anti-Brexit voters increased, on average, by 0.949 standard deviations on views about the current economic situation and by 0.758 standard deviations on perceptions about overall employment conditions. The results in Figure 2 – those based on BES data – also show no evidence of significant pre-treatment trends.[22] Comparing the plots in the middle and right panels to those on the left, we also observe that results remain both qualitatively and quantitatively similar when controlling for individual covariates and area × wave fixed effects.

Turning to micro-expectations, we can also observe a consistent and lasting divergence on perceived personal unemployment risk and assessments of respondents' household financial positions. As before, results are robust to controlling for individual covariates and area-by-wave fixed effects. Relative to the reference period, the Brexit vote led to an average increase of 0.105 standard de-

[22] The question about the current economic situation is not available in BES Wave 6, and this is the reason why we only report two waves pre-treatment.

viations in the gap about perceptions of personal unemployment risk. This shift reflects a lower perceived risk of job loss among pro-Brexit voters and a higher perceived risk among anti-Brexit voters. Again, we find no statistically significant evidence of pre-trends. Our findings for views about household financial positions mirror those for the general employment situation. Over the years following the vote, the attitude gap increased by an average of 0.253 standard deviations.

Next, we restrict the analysis to the parsimonious event study model of equation (2) and test the heterogeneity of results between voter groups with different socioeconomic characteristics. More precisely, we estimate equation (2) using subsamples separately stratified as follows: (*i*) voters with/without a college degree; (*ii*) voters divided by income categories (low income, below the 25th percentile; middle income, 25th to 75th percentile; and high income, above the 75th percentile); and (*iii*) voters classified by employment status (employed, unemployed, inactive e.g., retired individuals).[23]

In Figure 3, we plot the coefficient estimates as dots, with 95 percent confidence intervals represented by vertical lines. In the case of graphs based on BES variables, black circles mark the reference period, while "Before" and "After" indicate the pre-/post-Brexit $Period_t$ dummies. In case of outcome variables from the NMG data, we can only estimate the post-Brexit period, and "Before" now indicates the reference. In nearly all of the stratifications, we continue finding that the Brexit referendum led to a significant divergence in economic expectations between pro- and anti-Brexit voters, both concerning views about the macroeconomy and perceptions of their personal circumstances.

Importantly, we find relatively small differences between sub-groups, suggesting that socioeconomic characteristics, as opposed to Brexit identity, have relatively lower explanatory power in accounting for the observed divergence in attitudes. There are two exceptions. First, compared to respondents in employment or those who are inactive, those who are unemployed reported a more

[23]We hence have eight separate groups. We control for the full set of covariates, including area × wave fixed effects, but excluding the covariate by which the voters are stratified.

substantial divergence in their views about the general employment situation and their own household's financial position. Second, the divergence in expectations about the financial position of the household was higher among those with high incomes than among low-income respondents.

Even though policies did not change immediately after the vote, one concern is that UK firms may have reacted quickly in their decisions regarding hiring, firing, and wage setting. If this were true, an alternative hypothesis to explain the observed polarisation in economic expectations could be that people's experience at their place of work may have shaped economic expectations, rather than any general view about Brexit. If this were correct, we would expect a different effect between those within and outside the labour force. However, our results do not reveal any difference between those who are inactive and those who are employed.[24]

III.D Robustness checks

Next, we conduct a series of supplementary tests to verify the robustness of our results. Although our baseline specifications allow us to address a series of empirical concerns, this section further rules out several major alternative explanations and empirical challenges that might threaten our baseline findings.

First, because the Brexit vote outcome was a significant surprise to most people, a key concern in our analysis is that voters who were most surprised by the result may have played a dominant role in updating their economic expectations – whether regarding the broader economy or their personal financial situations – through a Bayesian belief updating process. As a check that Brexit identity, rather than voters' level of surprise about the outcome of the vote, played a crucial role in the updating of beliefs after the referendum, we use a question from waves 7 and 8 of the BES, in which respondents were asked about their perceived likelihood that the UK would ultimately vote to

[24]Exploring in more depth the interaction effects between Brexit identity and socioeconomic status on economic view revisions, and unpacking the underlying cognitive mechanisms leading to these differential revisions, is an interesting avenue for further research.

leave the EU. The response scale ranges from 0 (low likelihood) to 100 (extreme likelihood). Thus, arguably, the further the reported perceived likelihood is from 100, the more surprising the final outcome of Brexit would have been for a voter.[25]

Since this question was only asked in waves 7 and 8, we use a core panel from the BES survey that tracks respondents from waves 7, 8 through to Wave 9, that is, a panel specifically designed to study the Brexit vote campaign. We calculate each individual's mean perceived likelihood of the UK leaving the EU by averaging their responses from waves 7 and 8. We subsequently estimate the first event study model, equation (1), incorporating the full set of demographic controls and area-by-wave fixed effects while importantly controlling for voters' mean perceived likelihood of the UK leaving the EU. The coefficient estimates on the interaction terms between the survey wave dummies and the Brexit identity indicator, along with their 95 percent confidence intervals, are presented in Appendix Figure B.4 as red circles with vertical lines. For ease of comparison, the baseline results from subsection III.C – including only demographic controls and area-by-wave fixed effects – are also plotted (in gray). One can see that controlling for prior expectations (or surprise level) about the referendum outcome does not significantly alter our findings.[26]

Another potential concern is that our baseline estimates, derived from repeated cross-sectional

[25] Appendix Figure B.3 depicts the distributions of perceived likelihood of voting to leave, stratified by Brexit identity and survey wave. The distributions appear broadly normal, with higher proportions of anti-Brexit voters concentrated on the lower end of the scale and higher proportions of pro-Brexit voters on the higher end. On average, anti-Brexit voters estimated a 40 percent chance that the UK would vote to leave, while pro-Brexit voters estimated 59 percent. Notably, very few anti-Brexit voters were fully convinced that the UK would leave. Among pro-Brexit voters, around six percent were completely certain of a Leave outcome, whereas this number was close to zero for remain voters. These distributions suggest that within both pro- and anti-Brexit voters, individuals had experienced differing levels of surprise following the referendum result.

[26] As this core panel only covers waves 7, 8, and 9, readers need to be cautious in generalising these findings and concluding that, when accounting for the concern as stated, the widening expectation divergence would still persist until 2019.

data, could be influenced by unobserved individual-level factors. For instance, one might worry that respondents' post-Brexit views were predetermined and adjusted in response to the vote outcome, or that respondents were differentially selected into the survey before vs. after the vote. It is worth noting that, conditional on Brexit identity, our baseline specifications enable us to capture individual-level time-invariant factors that are shared within the groups of either pro-Brexit or anti-Brexit voters, such as common stable preferences for Brexit policies. For any factors to confound our estimates, they would need to have differential effects on voters across the Brexit vote, depending on their voting status – such as time-varying and differential selection into the survey between pro- or anti-Brexit voters. To examine the possibility, we thus draw on the aforementioned BES core panel and include individual fixed effects in our regression equation (1), which helps address these issues. In the same Appendix Figure B.4 (results are presented in navy), one can see that when controlling for individual fixed effects, the estimates are quantitatively more precise and remain qualitatively unchanged.

More generally, one might be concerned that individuals who voted for/against Brexit may have changed their views over time, and that this may be correlated to their economic expectations (and, possibly, their revision). Thus, we examine whether our results are affected by voters who, after 2016, changed their views toward Brexit. To do so, we generate a dummy variable indicating whether a voter changed their view on Brexit by comparing our baseline Brexit identity measure (which is based on questions asking attitudes to Brexit across each wave) to a profile variable provided by the BES that records voters' *actual* vote in the 2016 referendum. We then include this dummy as an additional control in our baseline event study models, using only BES outcomes. A lack of robustness with the inclusion of this dummy variable would reflect the possibility that there may be important omitted time-varying factors that influence our results. However, lending little support to this possibility, the associated results presented in Appendix Figure B.5 are very similar to the baseline results.

A further question is whether voters' economic expectations may be shaped not only by individual characteristics and stance towards Brexit, but also by contextual influence from peers, neighbours, and others living in the same local area. There is an established body of literature that spans the social sciences exploring how context and social interactions shape individual perceptions and behaviour (e.g., McNeil, Lee and Luca, 2023; Nathan and Sands, 2023; Makridis, 2022; Perez-Truglia and Cruces, 2017; Fang, Heuser and Stötzer, 2025). Consider, for example, the case of Remain supporters living in an area with a higher share of Leavers. They may be influenced by their pro-Brexit neighbours and become more optimistic than Remainers living elsewhere, or, conversely, they may polarise further, becoming more pessimistic about the economy than Remain voters elsewhere. We examine this concern by testing whether voters' expectation revisions are influenced by the proportion of Leave voters in their local areas. We draw on separate subsamples for pro- or anti-Brexit voters, and regress economic expectation variables on interaction terms between our $Period_t$ dummies and the share of Leave voters at the area level, while controlling for area fixed effects, survey wave fixed effects, and a full set of demographic characteristics.[27] Coefficient estimates on the interaction terms thus capture the effects of the area Leave voter shares on voters' expectation revisions, relative to the reference survey waves, among either pro- or anti-Brexit voters. Broadly, we find nearly no statistically significant results indicating that Leave voter shares have moderating effects on voters' view revisions, reinforcing our interpretation that individual views about Brexit, rather than local social or peer effects, drive the divergence in economic expectations observed after the referendum (see Appendix Table C.10).

Finally, we examine the robustness of our findings by varying some key outcomes and indepen-

[27]The share of Leave voters is defined at the Local Authority level for the BES survey and at the postcode area level for the NMG survey. In the BES, the Leave voter shares are calculated using data from Wave 9, where respondents' actual vote choices were recorded. For the NMG survey, the Leave voter shares are based on data from Wave 2016, which was conducted shortly after the Brexit vote. In our regressions, we cluster standard errors at the level of area — Local Authority for the BES and postcode area for the NMG — by survey wave.

dent variables. In Appendix Figure B.6, we additionally examine two outcome variables related to how voters assessed: (*i*) the general economic situation (from the NMG), and (*ii*) personal risks of getting into poverty (from the BES).[28] Note that the first variable is similar to one of our primary economic expectation variables (the variable regarding optimism about the current economic situation, from the BES). Since this variable comes from the NMG rather than the BES survey, it can be used to cross-validate our baseline findings. Consistent with our main analysis, using this alternative outcome shows a similar expectation divergence between pro- and anti-Brexit voters after the referendum. We find similar results when considering the perceived personal risk of getting into poverty as the outcome. Next, we replace our Brexit identity measure with a profile variable that records the actual vote of respondents in the 2016 referendum and estimate the baseline event study models with the BES data. The results are presented in the Appendix Figure B.7. As expected (partly due to a limited number of voters who changed their minds up to 2019, as mentioned in Section II), it can be seen that the estimated effects of changing our key independent variables (Brexit identity and its interaction terms with time dummies) are almost identical to the baseline estimates.

IV Divergence in Household Economic Behaviours

We now turn to the question of whether the long-lasting divergence in economic expectations between pro- and anti-Brexit voters triggered changes in actual economic behaviours. Specifically, we use survey and administrative data to analyse household economic decisions, focusing on purchases of general goods, major items, and residential housing market transactions.

IV.A Evidence from Survey Data

Intentions to Spend on Major Household Items vs. General Expenditure. Household economic behaviour, as elicited in survey data, allows us to understand consumers' immediate responses

[28] The corresponding survey questions and response options are reported in Appendix Table C.2.

to the Brexit vote and its associated effects on changes in economic expectations. Figure 4 examines household spending intentions on major items – e.g., furniture, kitchen appliances, and televisions – as well as on general spending over the 12 months following the survey interviews, replicating our empirical exercises from equations (1) and (2). One can see that, while there was no difference before the referendum, voters' beliefs about whether it was good to buy major household items experienced a sharp divergence after the Brexit results were announced. The effect is particularly pronounced in the very first survey wave after June 2016 (Wave 9) and then decreases slightly, but remaining high and significant throughout the entire post-vote period analysed.[29]

In contrast, we find little evidence that the Brexit vote had a significant effect on the divergence in plans for general routine spending. Interestingly, we also do not find any effect on household expectations regarding income changes (see Appendix Figure B.9). Taken together, these findings suggest that the observed increase in divergence in spending intentions on major items was not driven by household expectations of income changes (nor by other economic fundamentals, as we control for area × wave fixed effects).

Robustness Checks. We next analyse how the Brexit vote's impact on the divergence in spending intentions varies by voters' socioeconomic status, replicating the empirical exercises presented earlier in Figure 3. As shown in Figure 5, our findings indicate relatively low heterogeneity in the effects on spending intentions, whether for major household purchases or general expenditures, although we find that the unemployed tended to experience slightly more positive expectation revisions compared to those in employment and inactive (note that the coefficients for unemployed groups are less precisely estimated due to relatively small sample sizes). However, in general, we do not find strong heterogeneity in spending intention divergence across different educational attainment levels and

[29]Such widening disagreement in spending intentions on household major items is also observed when we cross-validate the results using a similar variable from the NMG survey, as shown in the bottom panel of Appendix Figure B.6.

income groups.

Finally, we check for the robustness of our findings, and our results remain consistent if we instead: (*i*) control for voters' perceptions of the likelihood that the UK would vote to leave the EU (see the right panel of Appendix Figure B.4); (*ii*) use a core panel of respondents from the BES survey and include individual fixed effects (see the right panel of Appendix Figure B.4); (*iii*) incorporate a control variable indicating whether a respondent is a voter who changed their mind about Brexit (see the bottom panel of Appendix Figure B.5); (*iv*) replace our Brexit identity measure with a profile variable capturing actual votes in the 2016 referendum (see the bottom panel of Appendix Figure B.7); and (*v*) account for potential contextual or peer effects by assessing how revisions in spending intentions depend on the local shares of Leave voters in the area where a respondent lives (see Appendix Table C.10).

Taken together, we conclude that the Brexit vote amplified the divergence in spending intentions between pro- and anti-Brexit voters for major household items, but had no significant impact on general expenditures. These findings are consistent with models and existing empirical evidence of how consumer sentiments predict durable goods expenditure more than non-durable consumption (Carroll, Fuhrer and Wilcox, 1994). A belief that Brexit would bring long-term benefits (e.g., economic freedom, better trade deals) may have driven optimism even if short-term economic fundamentals remained unchanged, and since they are postponable and discretionary, durable goods are more likely to reflect long-term expectations.

Expectations about Inflation. Since changes in views on household spending can result from changes in quantities or changes in prices (i.e., real spending vs. nominal spending), an important question is whether expectations about inflation influenced the diverging patterns discussed above. We address this point by leveraging two questions. One is from the BES survey and measures household views on how the current cost of living is changing, while the other is from the NMG survey and measures household expectations on how general shop prices will change over the following 12

months.[30] As before, we standardise these two variables and use them as our outcomes in the two event study specifications.

We report the results in Appendix Figure B.8. In both measures of inflation expectations, we observe a remarkable increase in the divergence between pro- and anti-Brexit voters. Interestingly, however, we find that Brexiteers became more optimistic and less concerned about potential inflation. Economic theory suggests that, when individuals expect an increase in inflation but stable real income (or if nominal income expectations move one-to-one with inflation expectations), they increase their spending, as a way to maximise their real-term purchasing power. However, our results show an opposing pattern: after the referendum, pro-Brexit voters had stronger intentions to spend on major household items, despite showing lower inflation expectations than anti-Brexit voters. Thus, one can infer that, in real terms, the divergence in spending intentions was, in fact, even greater than the nominal term divergence observed in Figure 4.

Predicting Spending Intentions via Economic Expectations. So far, we have demonstrated a divergence between pro- and anti-Brexit supporters on both economic expectations and spending intentions on major household items. A natural question arising from these patterns is whether household economic expectations are driving spending intentions. To examine this link, we follow the approach of Gillitzer and Prasad (2018), using voting intentions as instruments for economic expectations to forecast spending intentions (with a particular focus on major items).

[30] As listed in Appendix Table C.2, the first survey question reads: "Do you think that the cost of living is getting higher, getting lower or staying about the same?" The response options include: "1 = Getting a lot lower", "2 = Getting a little lower", "3 = Staying the same", "4 = Getting a little higher", "5 = Getting a lot higher". A higher value implies more pessimism about inflation. The second question reads: "How much would you expect prices in the shops generally to change over the next twelve months?" There are eight scales for the response options: "1 = Go down", "2 = Not change", "3 = Go up by 1% or less", "4 = Go up by 1% but less than 2%", "5 = Go up by 2% but less than 3%", "6 = Go up by 3% but less than 4%", "7 = Go up by 4% but less than 5%", "8 = Go up by 5% or more". A higher value with this variable implies a larger expected increase in prices.

This identification strategy allows us to address a range of empirical concerns. First, as discussed by Gillitzer and Prasad (2018), a major threat to the exclusion restriction assumption underlying the use of voting intentions as a valid instrument is the possibility that winning parties may target specific groups with partial policies after taking office. However, in our Brexit context, this concern is less relevant since no actual changes in current economic policies occurred in the aftermath of the vote. Second, and most importantly, one might worry about alternative channels through which voting intentions could influence behaviour. For example, voters may experience heightened psychological excitement after seeing the party they support win the vote, potentially leading to impulsive consumption regardless of economic expectations. However, our analysis spans a three-year period after the vote, making it unlikely that such psychological factors could persist long enough to significantly affect our results. Finally, for major economic events – such as sharp changes in inflation or exchange rates coinciding with the Brexit vote – to invalidate our instrument, they would need to have differential effects on the spending intentions of pro- and anti-Brexit voters. To the best of our knowledge, economic theories have not yet identified any strong or plausible reasons why such an effect would occur. It is also important to remember that this identification strategy relies on the conditional exogeneity of the instrument, i.e. conditional on our full set of controls and area-by-wave fixed effects.

We therefore estimate the following Two-Stage Least Squares (2SLS) regression, using voting intentions as the instrument for each of our four economic expectation variables:

$$Spend_{ict} = \phi \cdot \widehat{Expect_{ict}} + \eta_0 X'_{ict} + \mu_{ct} + \epsilon_{ict}, \tag{3}$$

$$Expect_{ict} = \theta \cdot ProBrexit_{ict} + \eta_1 X'_{ict} + \mu_{ct} + \varepsilon_{ict}, \tag{4}$$

where $Spend_{ict}$ represents the reported spending intentions for major household items, derived from the BES or NMG surveys, and $Expect_{ict}$ denotes one of the four standardised economic ex-

pectations variables analysed earlier. ε_{ict} is the error term in the first stage. All other variables and fixed effects are defined as before. Since our primary interest lies in understanding how economic expectations, driven by the Brexit vote, influenced changes in spending intentions on major items, we restricted our BES and NMG samples to respondents interviewed after the referendum.

The 2SLS results and, for comparison, the OLS outputs, are reported in the Appendix Table C.6. First, focusing on columns (1) and (2) of Panel A, which examine BES data using OLS, we observe that higher levels of optimism about the current economic situation and a lower perceived risk of losing personal jobs are associated with a greater belief that it is a good time to purchase major items. Similarly, in columns (3) and (4), which analyse NMG data, respondents who express greater satisfaction with the general employment situation and their household financial position are more likely to expect increases in major household purchases over the following year, although the coefficient estimate for views on the general employment situation is merely significant at the 90 percent level. Turning to the instrumental variable results in Panel B (reduced form) and Panel C (2SLS estimates), we observe that all coefficient estimates retain their signs, remain significant at the 99 percent level, and exhibit substantially larger magnitudes. Moreover, the first-stage Kleibergen-Paap F-statistic exceeds 90 in each regression, comfortably exceeding the standard thresholds for instrument relevance (additional details on the first-stage results are provided in the Appendix Table C.11). Taken together, these results provide robust evidence that revised economic expectations drove shifts in spending intentions on major items in the post-referendum period.

Intentions to Engage in the Housing Market. We next examine whether economic expectations influence household participation in the housing market, a critical economic decision typically guided by prudent considerations rather than temporary psychological influences. To this end, we begin by analysing the NMG survey, specifically Wave 2016, which asks respondents to assess whether the Brexit vote has made it more difficult or easier to obtain mortgages and whether it has made them more likely to buy or sell a home. From these responses, we create four dummy

variables: one indicating whether respondents believe it is more difficult to obtain a mortgage, another for those who find it easier, a third for those who feel more likely to buy a home, and a fourth for those who consider themselves more likely to sell. We then use expectations about either the general unemployment situation or changes in the financial position of the household to predict each of these four dummy variables.

Appendix Table C.7 replicates the empirical analysis presented above, showing both the OLS and 2SLS results using the Brexit identity as the instrumental variable. Following the Brexit vote, respondents who were optimistic about the general employment situation were less likely to perceive an increase in difficulty in obtaining mortgages, but conversely, they felt it had become much easier. The instrumental variable approach significantly amplifies the magnitude of the coefficient estimates and enhances their statistical significance. Furthermore, while OLS results are less definitive, our 2SLS results reveal that greater satisfaction with either the general employment situation or household financial position positively influences households' intentions to participate in the housing market, whether through buying or selling properties. Overall, these findings underscore the importance of economic expectations in shaping household decisions to engage in the housing market.

IV.B Evidence from Administrative Data on Housing Transactions

Our subsequent analysis focuses on actual housing transactions in England and Wales.[31] Specifically, we examine whether the housing transaction volume and prices differ across Local Authorities with higher/lower shares of Leave voters before/after the referendum.

Transaction volume. To measure transaction volumes, we aggregate our administrative data on housing transactions at the Local Authority level and, to account for time lags reflecting the process and duration required to initiate and complete a housing deal, aggregate transactions at a semi-year

[31]We focus on England and Wales because of data availability as mentioned in Section II.

frequency. We then estimate, as before, a dynamic event study model and a generalised difference-in-differences model to measure the polarising effects of the Brexit vote on housing transactions. Our housing transaction dynamic event study model is as follows:

$$ln(Transactions)_{ct} = \sum_{t \neq 2016h1} \rho_t \cdot SemiYear_t \cdot LeaveShare_c + \delta_t + \gamma_c + \omega_t^{Leave} + \epsilon_{ct}, \quad (5)$$

where $ln(Transactions)_{ct}$ denotes the log of the number of housing transactions per capita completed in Local Authority c in the semi-year t. The explanatory variables of interest are a set of interactions between half-yearly dummy variables, $SemiYear_t$, and Leave voter shares, $LeaveShare_c$.[32] The interaction with the first half of 2016 is omitted as the reference group. ρ_t therefore captures the dynamic time-varying effects of Leave voter shares (which capture intensity of Brexit vote shocks) on per capita housing transactions before/after the referendum, relative to the reference period.

We control for a full set of semi-year fixed effects, δ_t, to absorb all variations in outcomes that vary over time but are common across Local Authorities, such as seasonality. We also include Local Authority fixed effects, γ_c, to capture all time-invariant characteristics specific to each area, such as geographic location, baseline economic conditions and demographic composition. To allow for differential time trends in housing transactions between Leave and Remain Local Authorities, we additionally include a linear time trend interacted with a Leave-Local-Authority indicator, ω_t^{Leave}. ϵ_{ct} is the disturbance term and standard errors are clustered at the Local Authority level. Regressions are weighted by the size of the local electorate.

In the left panel of Figure 6, we present the coefficient estimates of our parameter of interest, ρ_t, with their 95 percent confidence intervals. One can see that, while there is no evidence of pretreatment differences, in the wake of the Brexit vote, Local Authorities with higher levels of Leave voter shares witnessed a relative increase in the number of per capita housing transactions compared to areas with lower levels of Leave voter shares. Interestingly, the new equilibrium was reached

[32] Data on Brexit voting outcomes across Local Authorities are sourced from Becker, Fetzer and Novy (2017).

quickly, with effects becoming clear as early as the first half of the year after the vote. These effects remained relatively consistent throughout the subsequent post-Brexit period, aligning with our previous findings regarding economic expectations and spending intentions on major household items. Although we discuss in detail below possible temporal trends that could threaten identification, the absence of pre-vote differences (relative to the reference period) suggests a causal effect of the Brexit vote shock.

In the right panel, we test whether our results are sensitive to the Modifiable Areal Unit Problem (MAUP), that is, the possibility that aggregating data into different spatial units might lead to varying outcomes. We do so by aggregating housing transaction data at the postcode instead of the Local Authority level. Specifically, we replicate equation (5), but replace the housing transactions per capita variable with one measured at the postcode area level and compute Leave voter shares at the same level using data from Wave 2016 of the NMG survey.[33] While the parameters are slightly less precisely estimated (yet still significant at the 95 percent level), changing the level of aggregation and using alternative data sources to compute Leave voter shares have a minimal effect on the coefficient estimates.

British party politics has been historically dominated by two major parties, the Conservative and Labour Parties, alongside several smaller parties, with the UK Independence Party (UKIP) standing out for its pro-Brexit stance. Founded in 1993, UKIP's primary objective was to advocate for the UK's withdrawal from the EU and has long been associated with Euroscepticism. Despite their formal positions, in the lead-up to the referendum, both the Conservatives and Labour were internally divided, with both parties effectively allowing their respective MPs to publicly campaign for either side of the vote. UKIP, in contrast, played a pivotal role in promoting the "Vote Leave" campaign. Building on this institutional context, we conduct placebo tests by replacing the dummy

[33]In the same vein, we control for postcode area fixed effects and include differential time trends in housing transactions between Leave and Remain postcode areas, where Leave and Remain areas are defined using the 50 percent threshold. Standard errors are clustered at the postcode level and so are regressions weighted by local population size.

for areas with above-average Leave voter shares with new dummies constructed using voter shares for the Conservative Party, the Labour Party, and UKIP in the 2014 European Parliament election, respectively.[34] The results, presented in Figure 7, show almost statistically insignificant coefficient estimates for the vote shares of both the Conservative and Labour parties. In contrast, using shares of UKIP votes leads to a clear and significant increase in per capita housing transactions following the vote; these effects are qualitatively similar to our baseline estimates based on Leave voter shares, further solidifying our interpretation that the Brexit vote shocks causally contributed to variations in housing transactions across localities.

Next, we estimate the following generalised difference-in-differences model:

$$ln(Transactions)_{ct} = \sum_{t \neq 2016h1} \beta_t \cdot Period_t \cdot LeaveShare_c + \delta_t + \gamma_c + \omega_t^{Leave} + \epsilon_{ct}, \tag{6}$$

where $ln(Transactions)_{ct}$, $LeaveShare_c$, δ_t, γ_c, ω_t^{Leave}, and ϵ_{ct} are defined as above. Instead of using semi-year dummy variables, we interact $LeaveShare_c$ with two time dummy variables: one indicates housing transactions completed before the Brexit vote ($Period_1$) and another indicates transactions completed after the vote ($Period_3$). The first half of 2016 is set as the reference period, omitted from our regressions. In addition to differential time trends specific to Leave and Remain Local Authorities, we augment our baseline specification by incorporating alternative linear time trends specific to local characteristics, as discussed in more depth below. Again, standard errors are clustered at the Local Authority level, and so are regressions weighted by local electorate size.

Appendix Table C.12 reports the coefficient estimates of β_t, which capture the average pre- or post-vote effects of Leave voter shares on housing transactions per capita, relative to the reference period. We present the baseline estimates in column (1), controlling for Local Authority and time-period fixed effects, along with time trends specific to Leave and Remain Local Authorities. A one percentage point increase in Leave vote shares is associated with an average 0.4 percent increase in

[34]Data comes from Becker, Fetzer and Novy (2017).

housing transactions per capita after the vote, while no statistically significant effects are observed before the referendum. This pattern, as demonstrated in the previous section, reflects a combination of both demand- and supply-side dynamics, as evidenced by the greater willingness of Leave voters to both buy and sell houses after the Brexit vote. Furthermore, our analysis of actual transaction data reveals that the divergence in economic expectations and spending intentions identified earlier is unlikely to reflect merely a "cheerleading effect", at least as manifested in housing transaction behaviour.

While the economic relationship between the UK and the EU remained largely unchanged during the study period 2015–2019, other area-specific, time-varying factors influencing local Brexit vote outcomes, which were not captured by our baseline specification, could still potentially bias our estimates. To assess the robustness of our findings to these unobservables, we consider a range of potential determinants of local Brexit vote outcomes (Becker, Fetzer and Novy, 2017), broadly falling into four themes: (a) local economic exposure to the EU; (b) public service provision and fiscal consolidation; (c) demographic structure and educational attainment; (d) and economic structure, wages, and unemployment (cf. Feng et al., 2023). (All variables are observed pre-vote; refer to Appendix Table C.8 for specific variables under each category). These factors are often discussed in theoretical narratives underlying Euroscepticism. In Appendix Table C.12, we then separately control for linear time trends interacted with each set of pre-vote local economic characteristics, reporting the results in columns (2) to (5) and, finally, including all time trends in column (6). While the magnitude of beta estimates decreases when including these additional trends, their direction and significance are unchanged.

Prices. We then replicate the approach of Equation (5), replacing housing transactions with prices. Here, we do not aggregate transactions to the Local Authority level but, instead, follow a repeated-sale approach. Hence, the outcome $ln(Prices)_{ict}$ measures the log of the inflation-adjusted price of each of the approximately 1.37 million individual properties that we observe in nearly 5.66 million

transactions. Relying on these repeated transactions, we include property fixed-effects λ_i to control for observable and unobservable property characteristics:

$$ln(Prices)_{ict} = \sum_{t \neq 2016h1} \rho_t \cdot SemiYear_t \cdot LeaveShare_c + \delta_t + \lambda_i + \omega_t^{Leave} + \epsilon_{ict}. \quad (7)$$

We report the results in Figure 8 (results using nominal prices are reported in Appendix Figure B.10). The results show how average house prices experienced a notable increase in pro-Brexit areas. A 1 percentage point increase in Brexit votes at the Local Authority level is associated with a rise of up to 0.5 percent in house prices by the second half of 2019. Overall, these results confirm our previous findings about transaction volume and align with "normal, procyclical" dynamics in real estate markets, where trading volume and prices tend to move together (van Dijk, Geltner and van de Minne, 2022).

In December 2014, the UK Government reformed the Stamp Duty, effectively lowering the property tax rate for houses at the low price end. This disproportionately benefited cheaper housing markets and areas outside of London and the Southeast, that is, the very areas that tended to vote Leave. However, it is unlikely that the property tax reform drives our results. If this were the case, we would expect to see an increase in housing transactions and average prices already in 2015. Similarly, in December 2015, the UK Government announced another set of changes to the Stamp Duty, which became effective in April 2016. These changes increase the tax rate for purchases of second homes. Such changes led to a peak in housing transactions in Q1 of 2016 ahead of stamp duty changes, which is inconsistent with our results, where we only find an effect after the Brexit referendum, from Q3/Q4 of 2016. We conclude that the transaction volume and price trends we uncover are driven by Brexit rather than other policy changes.

IV.C Brief Discussion: Polarised Beliefs and the UK Economy

This section provides a brief and informal discussion on experts' forecasts of the economic consequences of a Brexit vote and the implications of political polarisation about Brexit for the UK economy. In contrast to the significant disagreement among households, economic experts had a nearly unanimous view that Brexit would have negative short- and long-term economic consequences.[35] For instance, on June 7, 2016 (shortly before the referendum), the Centre for Macroeconomics (CFM) survey asked a panel of economists about the consequences of a Brexit vote on the British economy, financial sector and asset prices. Nobody thought that the a Leave outcome would be beneficial for the UK economy. Private and public economic institutions shared a similar view, including investment banks, the Bank of England, and the IMF.[36]

Correctly estimating the impacts of Brexit on the British economy is difficult. In their latest October 2024 forecasts, the Office for Budget Responsibility (OBR) calculates that, in the long run, the post-Brexit trading relationship with the EU will reduce the UK's productivity by 4 percent, and exports and imports by around 15 percent.[37] These calculations remain highly uncertain due to a wide range of factors, not least the current volatile international environment and how different micro and macro effects will offset each other in the medium to long term (e.g., Bloom et al., 2018; Terry, 2023). Furthermore, isolating the causal impact of Brexit is challenging because the commencement of the new trading relationship between the EU and the UK post-2020 coincided with a series of other major shocks, including the unprecedented COVID-19 pandemic and, soon after, the Russian invasion of Ukraine. Importantly, part of the effects of Brexit on the British economy will also de-

[35] The literature has documented large disagreement about a wide range of economic and policy issues between ordinary households and economic experts, such as Sapienza and Zingales (2013).

[36] Appendix A provides a detailed discussion of these views expressed by economic experts before the referendum.

[37] https://obr.uk/forecasts-in-depth/the-economy-forecast/brexit-analysis/future, accessed 4 April 2025. The OBR is a public organisation in charge of producing the economic forecasts that accompany the UK Government's budgets, evaluating the government's plans, providing balance sheet analysis and scrutinising tax and welfare policy costing.

pend on how firms and households respond to the referendum outcomes. Our analysis contributes to addressing this point by understanding households' post-Brexit short-term behaviours.

In general, the view of experts is based on one or several of the following economic channels. First and foremost, Brexit has altered trade between Britain and its primary trading partner, the European Union. Recent empirical assessments do indeed uncover significant negative trade impacts (Dhingra et al., 2018; de Lucio et al., 2024; Kren and Lawless, 2024; Du, Satoglu and Shepotylo, 2023). For instance, the post-Brexit TCA which came into force in early 2021, increased non-tariff barriers, while some of the negative impact had already occurred by the time the new agreement came into force because of high uncertainty during the negotiation phase. Second, a less open UK economy may be less attractive for external foreign direct investment and international firms, driving down productivity and household incomes in the long term. Anticipating this, households would cut their spending, and businesses would cut jobs or scale back or postpone investment plans.[38] Third, spending decisions would be put off by uncertainty about the UK's relationship with the EU, especially considering the high levels of uncertainty about the negotiation of post-Brexit agreements. Fourth, the above two effects would lead to rising financial market volatility, falling asset prices, and increasing borrowing rates for households and businesses. The worsening financial conditions would amplify the previous two effects.

The economics profession has been criticised for being pessimistic in its predictions (e.g., Johnson and Mitchell, 2017). Our empirical findings highlight the heterogeneous response of households, as we find that the referendum has led to significant polarisation of economic expectations, intention to spend on major items, and housing market transactions between pro- and anti-Brexit voters. In summary, the optimism displayed by pro-Brexit households may have counteracted some of the other negative economic channels and helped cushion some of the negative impacts of Brexit.

[38]Related to this channel, Kuang and Mitra (2016) develops a learning model which suggests an important role for shifting long-run growth expectations in business cycle fluctuations.

It is important to stress that, despite the results we uncover, one should not necessarily expect to see an overall increase in economic activity in Brexit-supporting areas vis-à-vis Remain areas. For example, the positive impact exerted by pro-Brexit households might have been countered by other effects running in the opposite direction, e.g., if national and international firms responded more negatively than households. While it is beyond the scope of this paper, future work should complement our work with an analysis of firms' behaviours. Similarly, future work could also develop a general equilibrium framework to estimate the overall economic effects of the levels of polarisation in household economic behaviour that we uncover.

V Conclusion

This paper provides new evidence on the role of political polarisation in shaping economic expectations and behaviour by studying the impact of the Brexit referendum on households. Our findings highlight the strong divergence in economic beliefs and spending intentions between pro- and anti-Brexit voters following the vote, even in the absence of immediate policy changes. Overall, our study highlights the broader impact of exogenous shocks and political events on economic expectations and decisions.

By demonstrating the lasting effects of the Brexit vote on household economic behaviour, the evidence we present contributes to several strands of the literature. First, it contributes to research on expectation formation by demonstrating that political identities can influence economic perceptions independently of socioeconomic characteristics. Importantly, while most existing studies in this subfield detect effects of political polarisation on economic expectations, few studies explore if expectations in turn influence decisions and actual behaviour.

Second, this study deepens our understanding of political polarisation and its economic effects by looking at belief polarisation along a specific issue rather than along traditional party lines.

Third, the paper extends the literature on the economic consequences of Brexit by providing new

insights into how households responded to the significant political event. Relatedly, it informs the broader discourse on populism by illustrating how landmark political events can influence economic actions in ways that persist beyond the immediate aftermath of the event.

Given the persistent divergence in belief and its impact on economic behaviour, policymakers should consider the role of political sentiment in shaping consumer confidence and economic activity. Interventions aimed at mitigating uncertainty, such as clear and transparent economic policies, may help to stabilise expectations and reduce the extent to which political shocks translate into economic fluctuations. Additionally, future research should explore whether similar patterns of belief-driven economic behaviour emerge in other politically polarising events, both within the UK and internationally.

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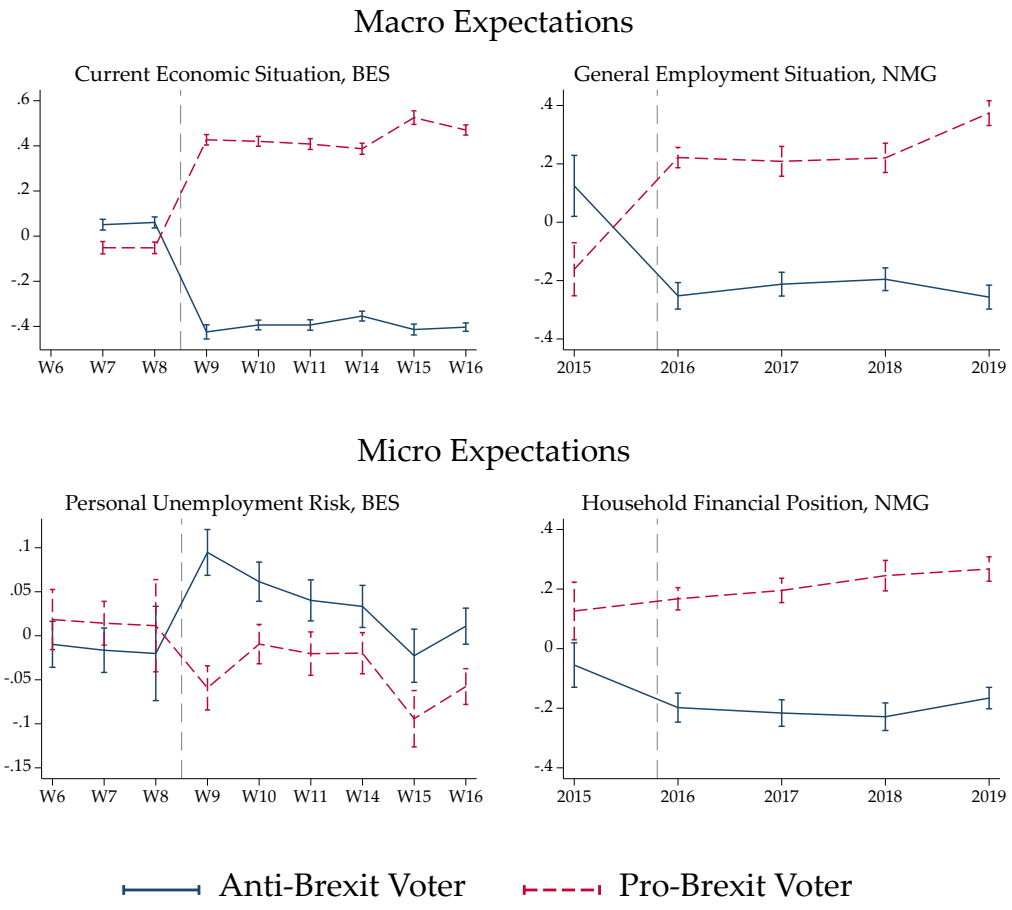
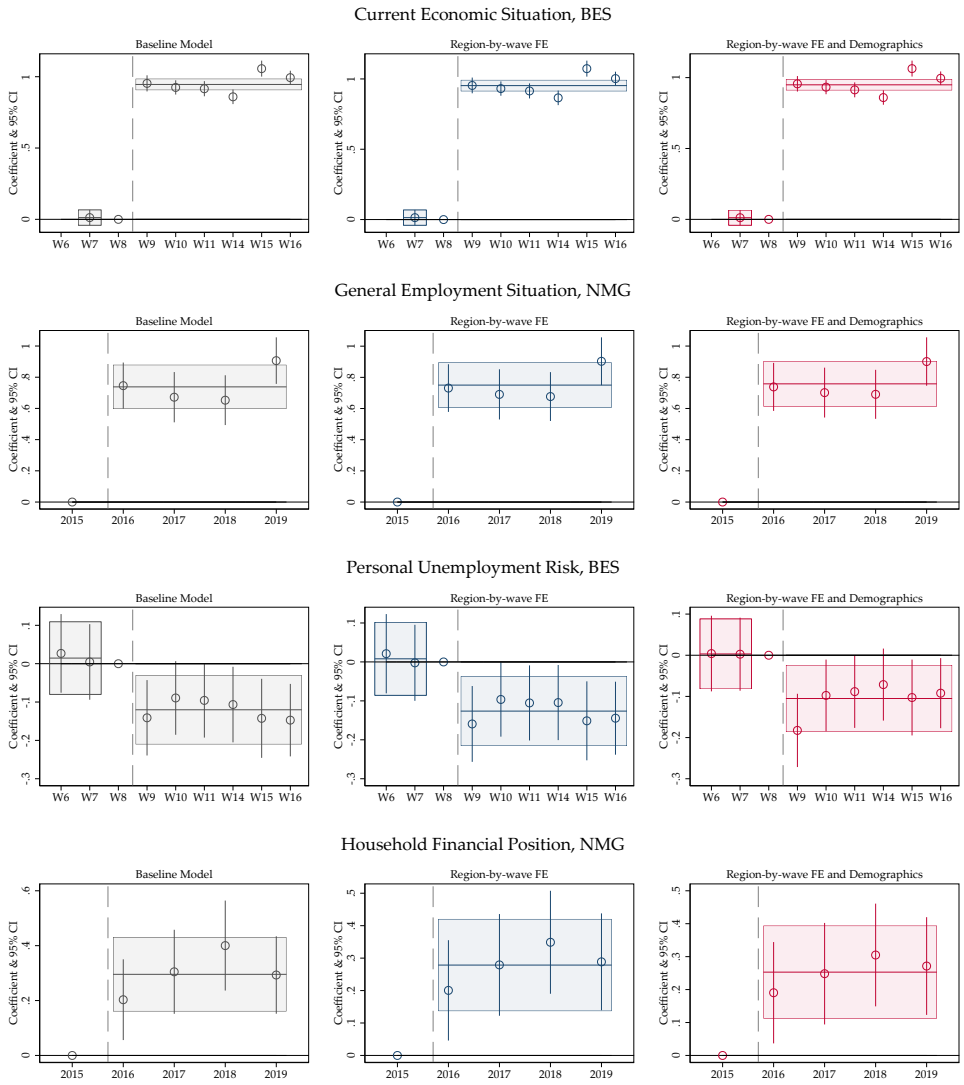
Main Figures

FIGURE 1: Economic Expectations across the Brexit Referendum



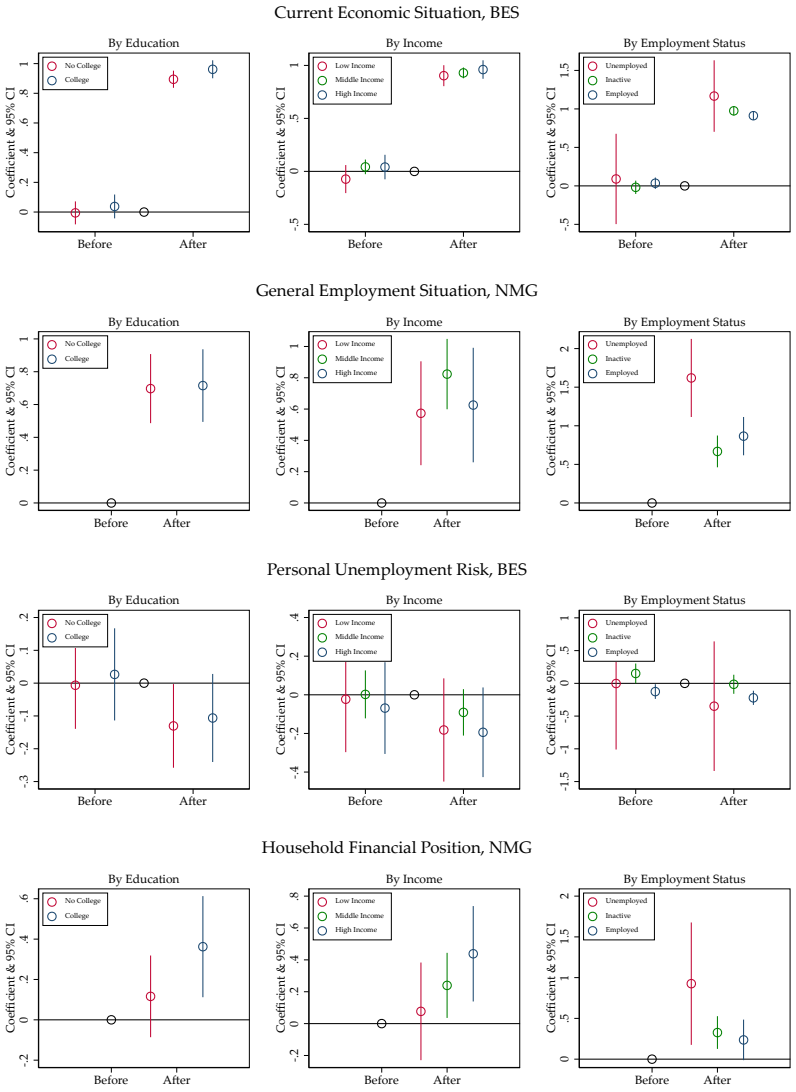
Notes: Figure plots marginal predicted values of economic expectations on Brexit identity by wave. Outcome variables measure Brexit voters' macro expectations and micro expectations. We standardize the variables to be mean zero and standard deviation one. Brexit identity is a binary variable, which takes the value of one if the respondent supports leaving the EU (pro-Brexit voters), or zero if against leaving the EU (anti-Brexit voters). The estimates are conditional on a rich set of demographic characteristics, including age, gender, educational attainment (an indicator for holding a college degree), working status (three indicators for employed, unemployed, and inactive), and household annual gross income (three indicators for low income – lower than 25th percentile, middle income – 25th percentile to 75th percentile, and high income – greater than 75th percentile). 95 percent confidence intervals based on standard errors clustered at the level of local authority (BES), or postcode area (NMG) are also shown.

FIGURE 2: Divergence in Economic Expectations between Pro- and Anti-Brexit Voters



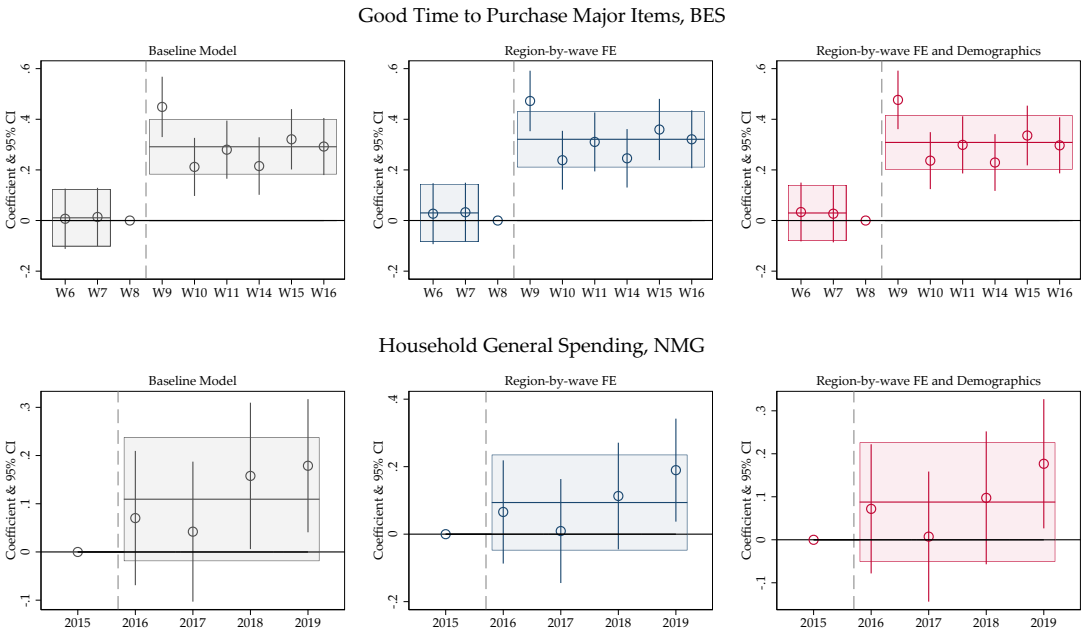
Notes: Figure presents regression estimates of the effects of the Brexit vote on expectation divergence between pro- and anti-Brexit voters. The top two panels display the divergence in views on the macroeconomy, while the bottom panels show the divergence in perceptions of personal or household economic situations at the micro level. In the dynamic event study model, the coefficients of interest correspond to interactions between a Brexit identity indicator and survey wave fixed effects, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). In the parsimonious, aggregate event study specification, the coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave. Coefficient estimates on the survey wave interactions are plotted as dots, with their 95 percent confidence intervals represented by vertical lines. Coefficient estimates from the aggregate interactions are depicted as horizontal lines, with their 95 percent confidence intervals shown as boxes (coefficient estimates are also reported in Appendix Table C.9). We progressively include controls for region-by-wave fixed effects (regions are local authorities in the BES survey and postcode areas in the NMG survey), as well as a comprehensive set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the region by wave level.

FIGURE 3: Expectation Divergence by Voters' Socioeconomic Status



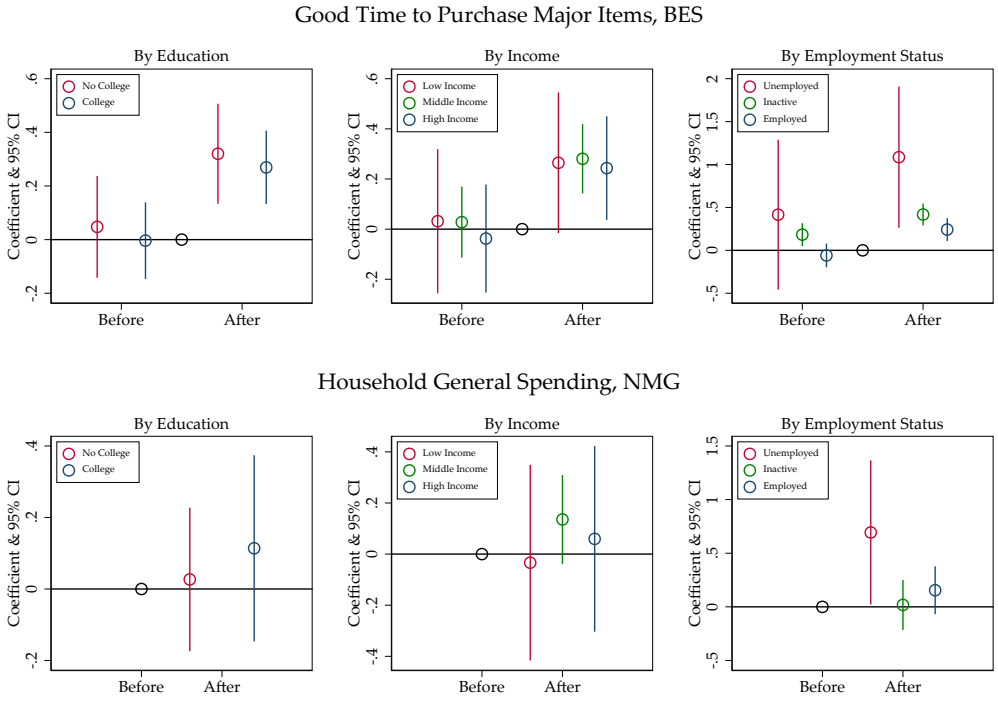
Notes: Figure presents regression estimates of the effects of the Brexit vote on expectation divergence between pro- and anti-Brexit voters, stratified by socioeconomic status. Socioeconomic status is measured by educational attainment (whether the respondent holds a college degree), household annual gross income (low income: lower than 25th percentile; middle income: 25th percentile to 75th percentile; high income: greater than 75th percentile), and employment status (employed, unemployed, or inactive). For each socioeconomic subgroup, we estimate our parsimonious, aggregate event study specification. The coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). Coefficient estimates on these interactions are plotted as dots: those for the pre-vote period appear above "Before" (except in the NMG, where dots above "Before" denote the reference wave), and those for the post-vote period appear above "After". Vertical lines represent 95 percent confidence intervals. All regressions control for age, gender, and region-by-wave fixed effects (regions are local authorities in the BES survey and postcode areas in the NMG survey). Standard errors are clustered at the region-by-wave level.

FIGURE 4: Divergence in Consumers' Spending Intentions



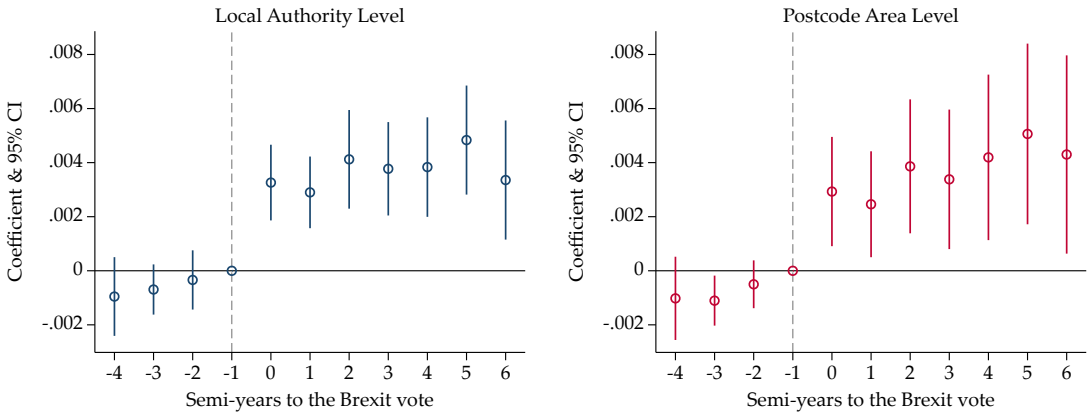
Notes: Figure presents regression estimates of the effects of the Brexit vote on divergence in spending intentions between pro- and anti-Brexit voters. The top panel displays the divergence in views on the major expenditure, while the bottom panel shows the divergence general spending. In the dynamic event study model, the coefficients of interest correspond to interactions between a Brexit identity indicator and survey wave fixed effects, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). In the parsimonious, aggregate event study specification, the coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave. Coefficient estimates on the survey wave interactions are plotted as dots, with their 95 percent confidence intervals represented by vertical lines. Coefficient estimates from the aggregate interactions are depicted as horizontal lines, with their 95 percent confidence intervals shown as boxes (coefficient estimates are also reported in Appendix Table C.9). We progressively include controls for region-by-wave fixed effects (regions are local authorities in the BES survey and postcode areas in the NMG survey), as well as a comprehensive set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the region by wave level.

FIGURE 5: Spending Intention Divergence by Socioeconomic Status



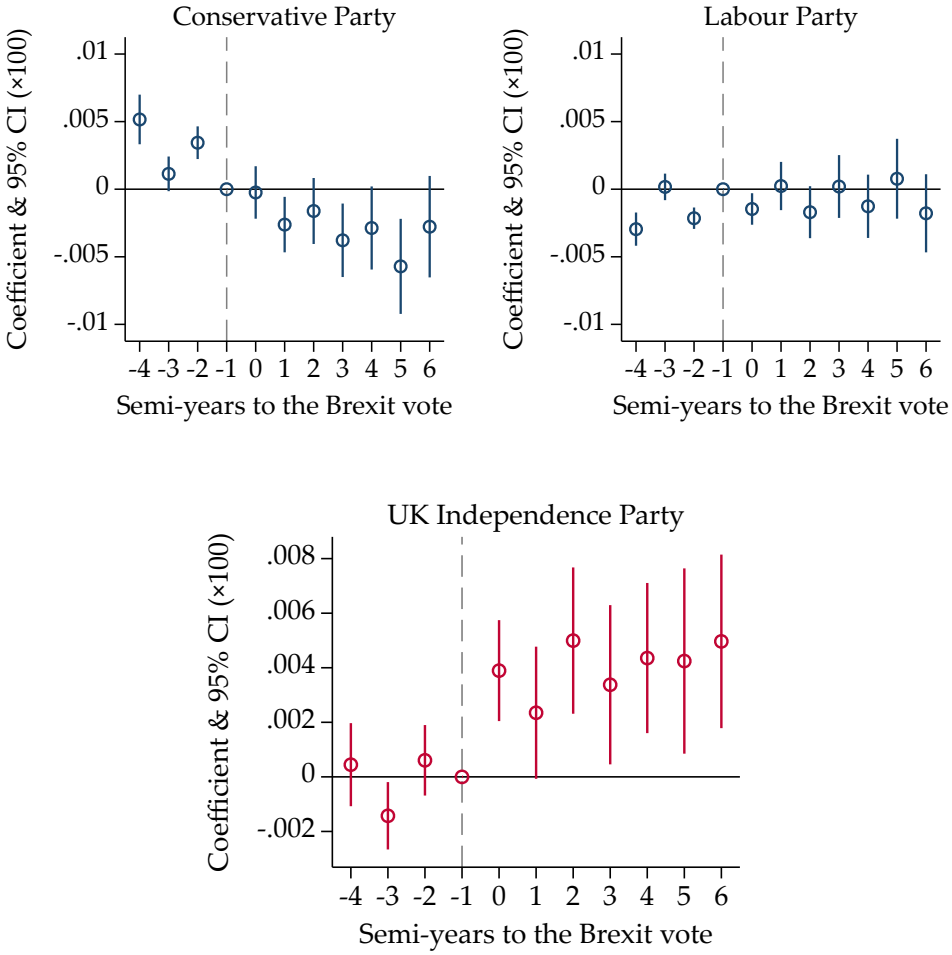
Notes: Figure presents regression estimates of the effects of the Brexit vote on divergence in spending intentions between pro- and anti-Brexit voters, stratified by socioeconomic status. Socioeconomic status is measured by educational attainment (whether the respondent holds a college degree), household annual gross income (low income: lower than 25th percentile; middle income: 25th percentile to 75th percentile; high income: greater than 75th percentile), and employment status (employed, unemployed, or inactive). For each socioeconomic subgroup, we estimate our parsimonious, aggregate event study specification. The coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). Coefficient estimates on these interactions are plotted as dots: those for the pre-vote period appear above "Before" (except in the NMG, where dots above "Before" denote the reference wave), and those for the post-vote period appear above "After". Vertical lines represent 95 percent confidence intervals. All regressions control for age, gender, and region-by-wave fixed effects (regions are local authorities in the BES survey and postcode areas in the NMG survey). Standard errors are clustered at the region-by-wave level.

FIGURE 6: Dynamic Effects of the Brexit Vote on the Volume of Housing Transactions



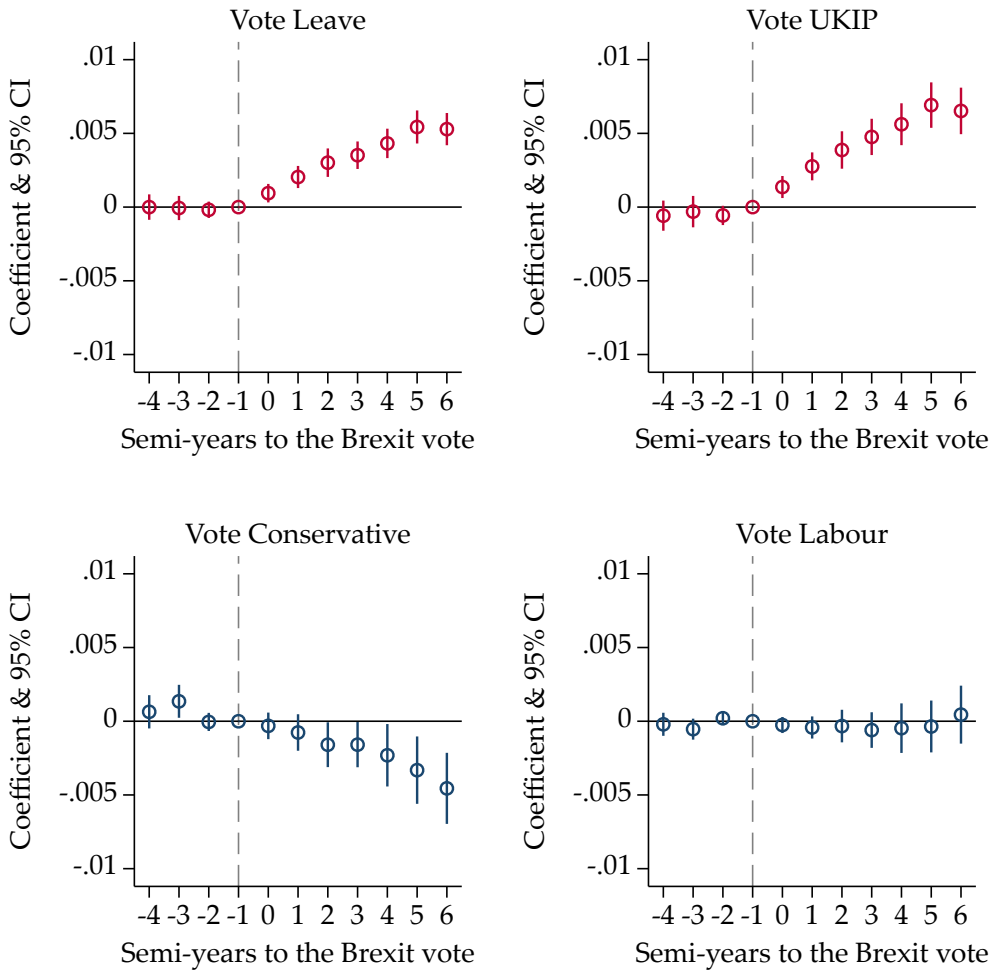
Notes: Figure presents dynamic effects of the Brexit vote on housing transaction volume per capita. We aggregate housing transactions separately at the local authority and postcode area levels, with both aggregations performed at a half-yearly frequency. The left panel presents effects estimated at the local authority level. The right panel presents effects estimated at the postcode area level. We plot the coefficient estimates as dots with their 95% confidence intervals indicated by vertical lines. In the left panel, we measure Leave voter shares with actual shares at the local authority level. We do not have actual vote shares at the postcode area level. We therefore use Wave 2016 of the NMG survey for the measure of Leave voter shares at the postcode area level. All regressions control for time period fixed effects and region (local authority or postcode area) fixed effects, and time trends specific to Leave (Leave voter shares greater than 50%) or Remain (Leave voter shares less than or equal to 50%) areas. Regressions are weighted by regional electorate counts (for local authority level analysis) or population (for postcode area level analysis). Robust standard errors are clustered at the region level.

FIGURE 7: Placebo Test, Using EP Election Vote Shares in 2014



Notes: Figure presents the results of placebo tests to examine the dynamic effects of partisan voting patterns on housing transactions across the time of the EU referendum. We replace Leave voter shares with voter shares for a specific party in the 2014 European Parliament election, and estimate the specification. We plot the coefficient estimates as dots with their 95% confidence intervals indicated by vertical lines. We use voter shares for the Conservative Party in the top left panel, the Labour Party in the top right panel, and the UK Independence Party (UKIP) in the bottom panel. All units of analysis are at the local authority level. All regressions control for time period fixed effects, and local authority fixed effects, and time trends specific to areas where the respective partisan voter shares are either above or below the mean. Regressions are weighted by regional electorate counts from the EU referendum. Robust standard errors are clustered at the local authority level.

FIGURE 8: Dynamic Effects of the Brexit Vote on Housing Price (Real), Conditional on Property Fixed Effects



Notes: Figure illustrates the dynamic effects of the Brexit vote on housing prices. Coefficients are estimated using transaction-level regressions, conditional on property fixed effects, where the dependent variable is the logarithm of real housing prices. Coefficient estimates are represented by dots, with 95% confidence intervals shown as vertical lines. The top-left panel employs interactions between Leave voter shares and a series of semi-annual dummy variables as the key explanatory variables. In the remaining panels, Leave voter shares are replaced with vote shares for specific parties in the 2014 European Parliament election, and the same specification is estimated. All regressions include time fixed effects and time trends specific to areas where the respective partisan voter shares are either above or below the mean (in the top-left panel, we use time trends specific to Leave (Leave voter shares greater than 50%) or Remain (Leave voter shares less than or equal to 50%) areas). Robust standard errors are clustered at the local authority level.

Main Tables

Table 1: Demographic Compositions of Voters, BES and NMG

	All		Anti-Brexit	Pro-Brexit	Anti-Brexit vs. Pro-Brexit	
	Mean	Std. Err.	Mean	Mean	Diff.	p-value
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	PANEL A: Pooled British Election Study Survey					
Male	0.485	0.001	0.485	0.511	-0.026	0.000
Age	44.958	0.044	41.296	50.461	-9.165	0.000
College	0.422	0.001	0.538	0.324	0.214	0.000
Low income	0.227	0.001	0.183	0.250	-0.067	0.000
Middle income	0.589	0.001	0.574	0.610	-0.036	0.000
High income	0.185	0.001	0.242	0.141	0.101	0.000
Employed	0.567	0.001	0.610	0.509	0.101	0.000
Unemployed	0.030	0.001	0.029	0.025	0.004	0.000
Inactive	0.404	0.001	0.362	0.467	-0.105	0.000
Pro-Brexit	0.479	0.001	0.000	1.000	-	-
	PANEL B: Filled and Pooled NMG Household Survey					
Male	0.489	0.003	0.468	0.568	-0.100	0.000
Age	47.756	0.104	46.705	51.750	-5.045	0.000
College	0.438	0.003	0.530	0.373	0.157	0.000
Low income	0.234	0.003	0.201	0.255	-0.054	0.000
Middle income	0.576	0.003	0.598	0.560	0.038	0.000
High income	0.190	0.003	0.201	0.185	0.016	0.005
Employed	0.604	0.003	0.616	0.558	0.058	0.000
Unemployed	0.028	0.001	0.030	0.022	0.008	0.000
Inactive	0.368	0.003	0.354	0.421	-0.067	0.000
Pro-Brexit	0.482	0.003	0.000	1.000	-	-

Notes: Table provides an overview of demographic compositions of voters in the British Election Study (BES) and the Bank of England/NMG Household Survey (NMG). The BES sample is a pooled combination of waves W6, W7, W8, W9, W10, W11, W14, W15, W16. The NMG sample combines waves W2016 through W2019, along with a sub-sample from W2015 comprised of respondents whose Brexit identity is filled using information from subsequent waves. Low income refers to households below the 25th percentile in the distribution of annual gross income, high income refers to those above the 75th percentile, and middle income refers to those between the 25th and 75th percentiles. All variables except age are dichotomous. Columns (5) and (6) test if average anti- and pro-Brexit voters are different regarding the particular demographics. Column (5) reports differences (column (3) minus column (4)) and column (6) reports p-values.

Appendix

Table of Contents

A Experts' Views on the Economic Consequences of Brexit

On June 7, 2016, the Centre for Macroeconomics (CFM) survey asked a panel of economists about the consequences of Brexit for the British economy, its financial sector and asset prices. For example, in the question, "what do you think will be the overall economic consequences of Brexit for the UK?", 48% of the participants answered "significantly negative", 44% "mildly negative" and 9% "neutral". Nobody thought that the overall consequences of a Leave outcome would be beneficial for the UK economy. Another question asks "what is the probability that the UK experiences such a significant disruption to financial markets and asset prices following a vote for Brexit on 23 June?". The panel members were extremely worried about the consequences of a Brexit vote for financial markets. 26% thought that the chance was higher than 70%, 29% thought this probability was between 31% and 70%, 24% thought it was between 11% and 30%, and 18% thought that it was less than 10%.

Table A.1: UK Quarter-on-Quarter GDP Growth (%): Forecast

	16 Q3	16 Q4	17 Q1	17 Q2	17 Q3	17 Q4	18 Q1	18 Q2
Treasury (scenario 1)	-0.1	-0.1	-0.1	-0.1	0.2	0.2	0.2	0.2
Treasury (scenario 2)	-1.0	-0.4	-0.4	-0.4	0.0	0.0	0.1	0.1

Notes: The table reports forecasts of real GDP growth rate for the UK made by HM Treasury, conditional on the assumption of a vote to leave the EU (HM Treasury, 2016*a*). Two scenarios are analysed: a "shock scenario" (scenario 1) and a more pessimistic "severe shock scenario" (scenario 2).

Table A.2: Forecasts on Immediate Effects of a Brexit Vote on the Level of GDP (%)

PwC/CBI	-3.1 to -5.5 (over 5 years)
Citi	-4.0 (over 3 years)
Credit Suisse	-1.0 to -2.0 (over 2 years)
Deutsche Bank	-3.0 (over 3 years)
HSBC	-1.0 to -1.5 (over 1 year)
JP Morgan	-1.0 (over 1 year)
Morgan Stanley	-1.5 to -2.5 (over 2 years)
Normura	-4.0 (over 1 year)
Societe Generale	-4.0 to -8.0 (over 5 years)

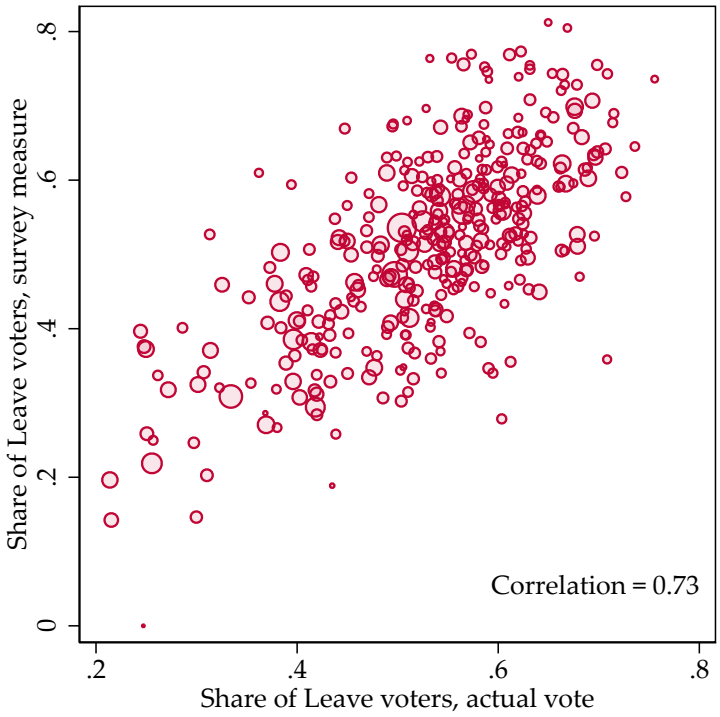
Public and private economic institutions shared a similar pessimistic view. Table A.1 displays forecasts of real GDP growth rate for the UK made by HM Treasury (HM Treasury, 2016*a*). Two sce-

narios are analysed: a "shock scenario" (scenario 1) and a more pessimistic "severe shock scenario" (scenario 2).[39] Under both scenarios, HM Treasury predicted that a vote to leave would immediately push the UK economy into recession with four quarters of negative growth. In May 2016, Mark Carney, the then-governor of the Bank of England, described the Brexit vote as "the most immediate and significant risk" for the UK's economic outlook and warned that a Leave vote "could possibly include a technical recession" (Guardian, 2017). The published minutes of the Monetary Policy Committee meeting in May 2016 warned that a leave vote could increase unemployment and prompt households and businesses to delay spending (MPC, 2016). Christine Lagarde, the managing director of the IMF, noted that she shared the Bank of England's view that a leave vote "could lead to a recession" (IMF, 2016). Table A.2 reports the forecasts of the immediate effect of Brexit on GDP levels (relative to remaining in the EU) made by a number of financial institutions shortly before the referendum. The forecasts are reproduced from Box 3.D of HM Treasury (2016*b*) and the sources of the forecasts are provided there.

[39] The exact explanations of the two scenarios can be seen from HM Treasury (2016*a*).

B Appendix Figures

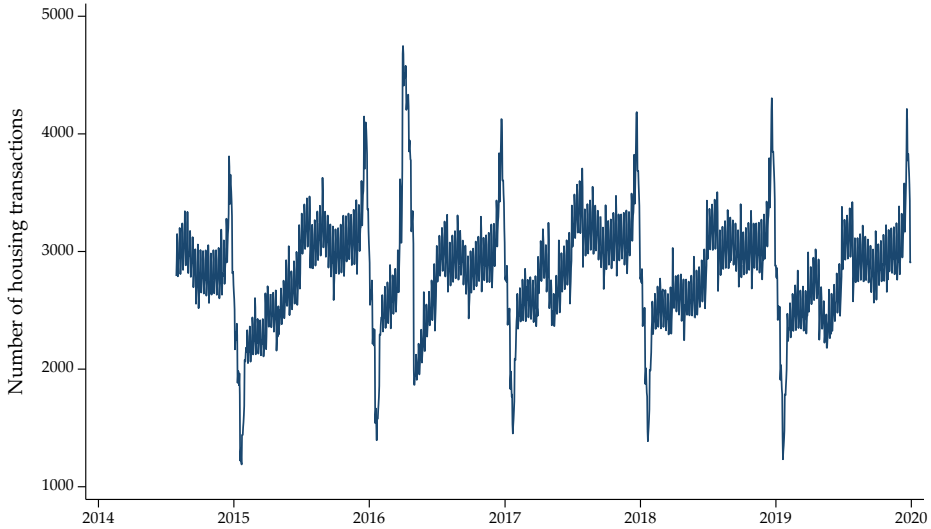
FIGURE B.1: Leave Voter Shares: Survey Measure vs. Actual Vote



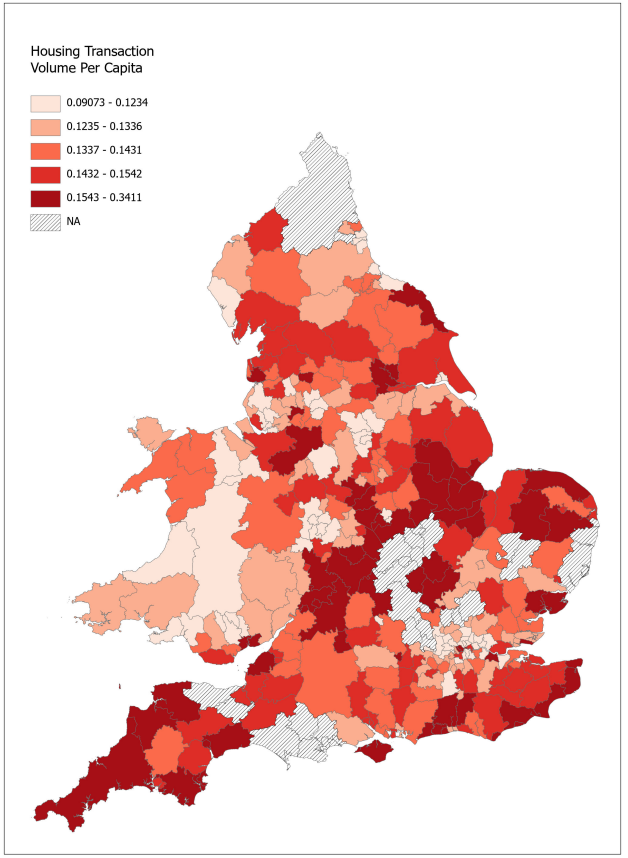
Notes: Figure compares survey-based Leave voter shares to the actual shares across local authorities. Each bubble denotes a local authority. The number of local authorities that are successfully matched between the two share measures is 378. Actual Leave voter shares are obtained from London Datastore, an open data-sharing portal administered by Greater London Authority. To measure the survey-based shares, we use Wave 9 of the BES that asks respondents' actual vote choices in the EU referendum to calculate the shares of voting Leave. Bubble sizes are proportional to electorate counts (also come from London Datastore) across local authorities. The correlation coefficient between survey-based and actual shares is weighted by electorate counts.

FIGURE B.2: Temporal and Spatial Patterns of Housing Transactions

PANEL A: Temporal Trend

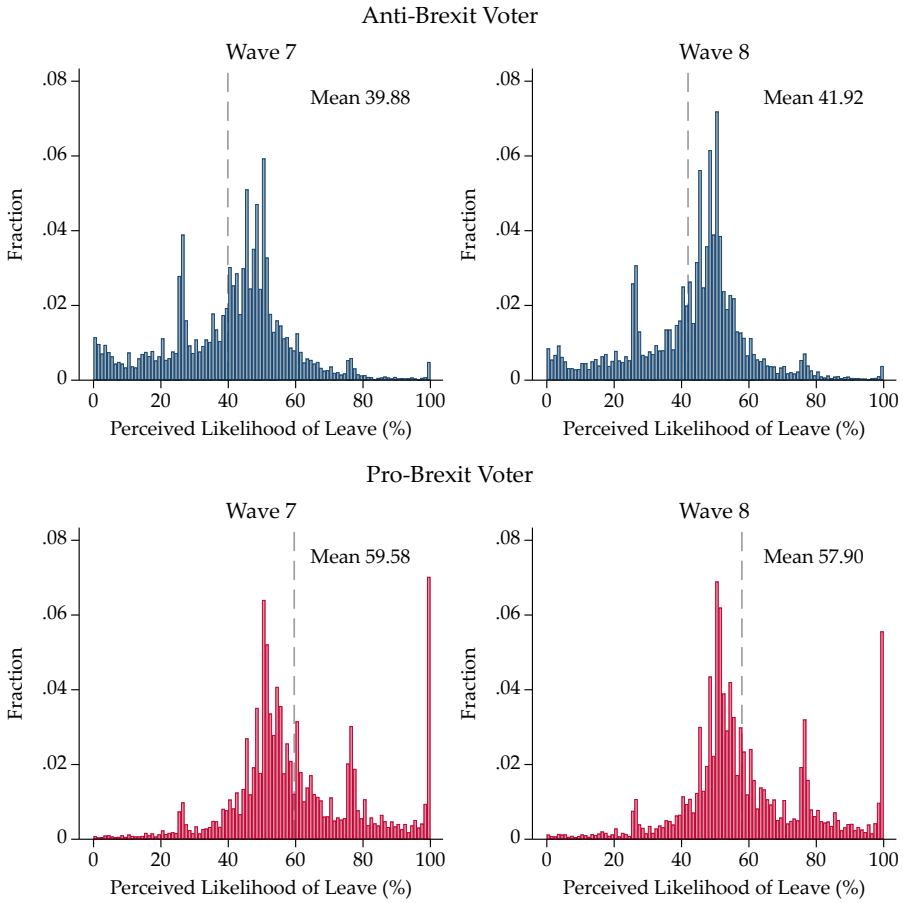


PANEL B: Spatial Distribution



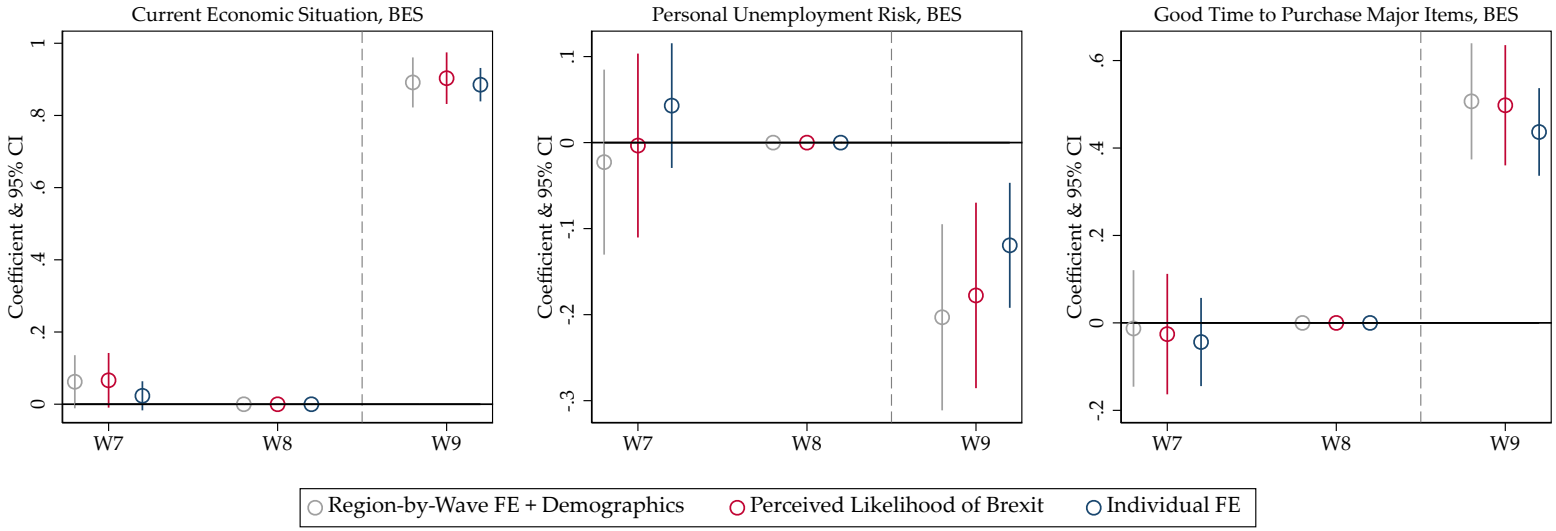
Notes: Figure illustrates the temporal and spatial patterns of housing transactions in England and Wales from the second half of 2014 to the end of 2019. Panel A showcases the overall daily number of housing transactions in England and Wales, with the time-series smoothed using a 30-day rolling average. Panel B aggregates housing transactions and displays the volume of housing transactions per capita across local authority districts. Statistics are ranked in magnitude and classified into five groups; darker colors correspond to higher values.

FIGURE B.3: Perceived Likelihood of A "Leave" Outcome



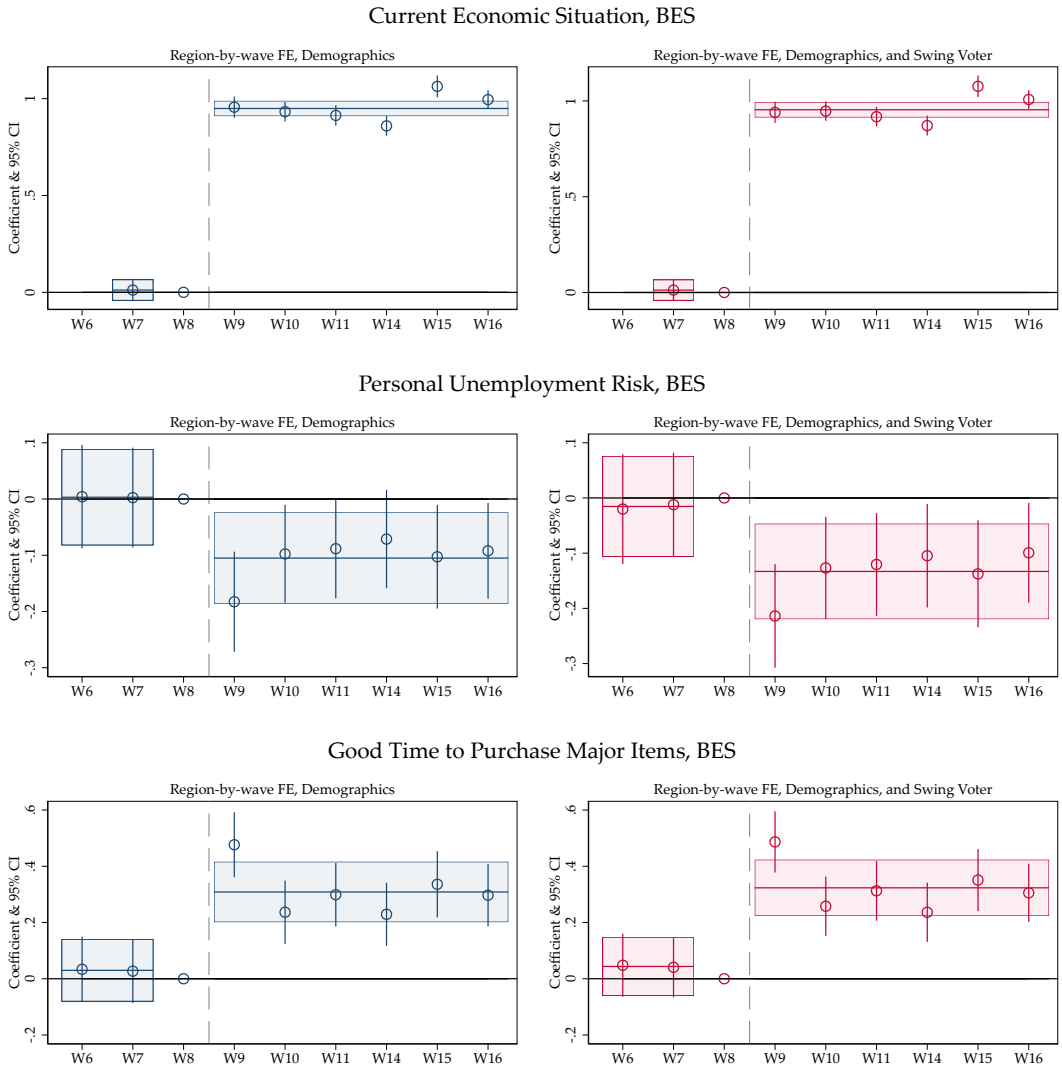
Notes: This figure presents the distributions of perceived likelihood of a "Leave" outcome in the EU referendum for anti-Brexit and pro-Brexit voters. To construct this figure, we employ a variable available in Wave 7 and 8 of the BES that asked respondents' perceived likelihood that the UK would finally vote to leave the EU in the referendum. This variable measures the perceived likelihood with a scale ranging from 0 to 100. The value of "100" implies completely believing that the UK would leave.

Figure B.4: Robustness Checks Using the Panel Structure



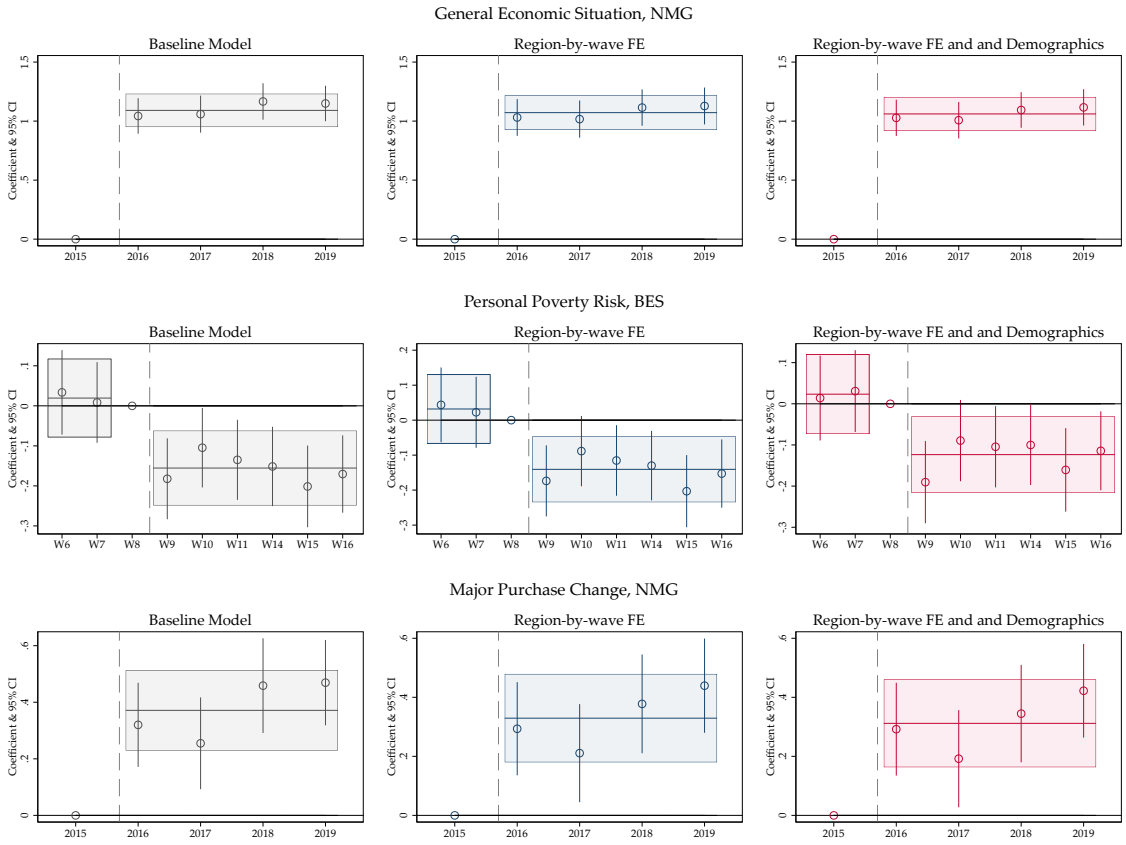
Notes: Figure presents regression estimates of the effects of the Brexit vote on view divergence between pro- and anti-Brexit voters in economic expectations and spending intentions, using a panel dataset from the BES. We focus on a limited sample from the BES survey consisting of respondents who participated in all three waves of W7, W8, and W9. We estimate our dynamic event study model, and plot coefficient estimates of interest — interactions between a Brexit identity dummy variable and survey wave fixed effects — as dots and plot 95 percent confidence intervals with vertical lines. Wave 8 is set as the omitted reference category. We control for (*i*) local authority-by-wave fixed effects, as well as individual demographic characteristics: age, gender, educational attainment, working status, and household annual gross income (in gray); (*ii*) local authority-by-wave fixed effects, demographic factors, along with an additional variable reflecting voters' perceived likelihood of the UK voting to leave the EU (in red); and (*iii*) individual fixed effects in place of demographic characteristics and area-by-wave fixed effects (in navy). In all regressions, we apply a weight factor provided by the survey to maintain representativeness of the panel. Standard errors are clustered at the local authority by wave level.

Figure B.5: Robustness Checks Considering Swing Voters



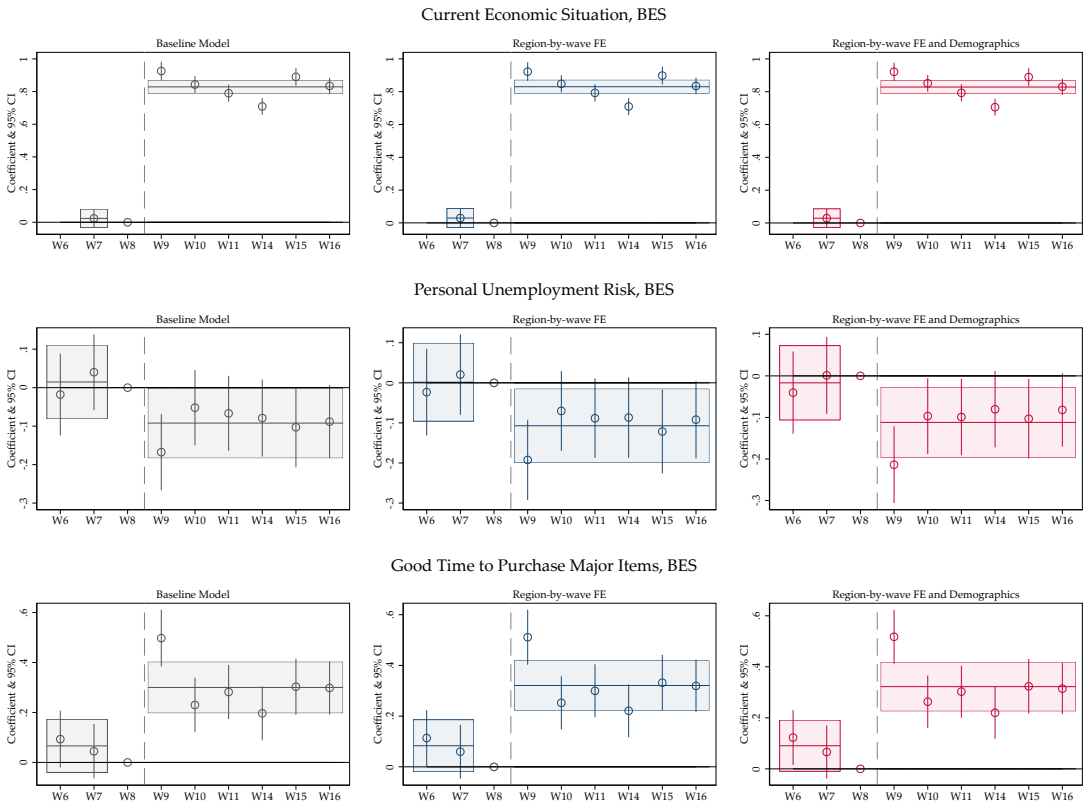
Notes: Figure presents regression estimates of the effects of the Brexit vote on view divergence between pro- and anti-Brexit voters regarding economic expectations (the top and middle panels) and spending intentions (the bottom panel). In the dynamic event study model, the coefficients of interest correspond to interactions between a Brexit identity indicator and survey wave fixed effects, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). In the parsimonious, aggregate event study specification, the coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave. Coefficient estimates on the survey wave interactions are plotted as dots, with their 95 percent confidence intervals represented by vertical lines. Coefficient estimates from the aggregate interactions are depicted as horizontal lines, with their 95 percent confidence intervals shown as boxes. We first, in the left panels, include controls for area-by-wave fixed effects (areas are local authorities in the BES survey and postcode in the NMG survey), as well as a comprehensive set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. In the right panels, we additionally include a variable reflecting whether a voter is a swing voter as a further control. Standard errors are clustered at the area by wave level.

FIGURE B.6: Additional Examinations on Economic Expectations and Spending Intentions



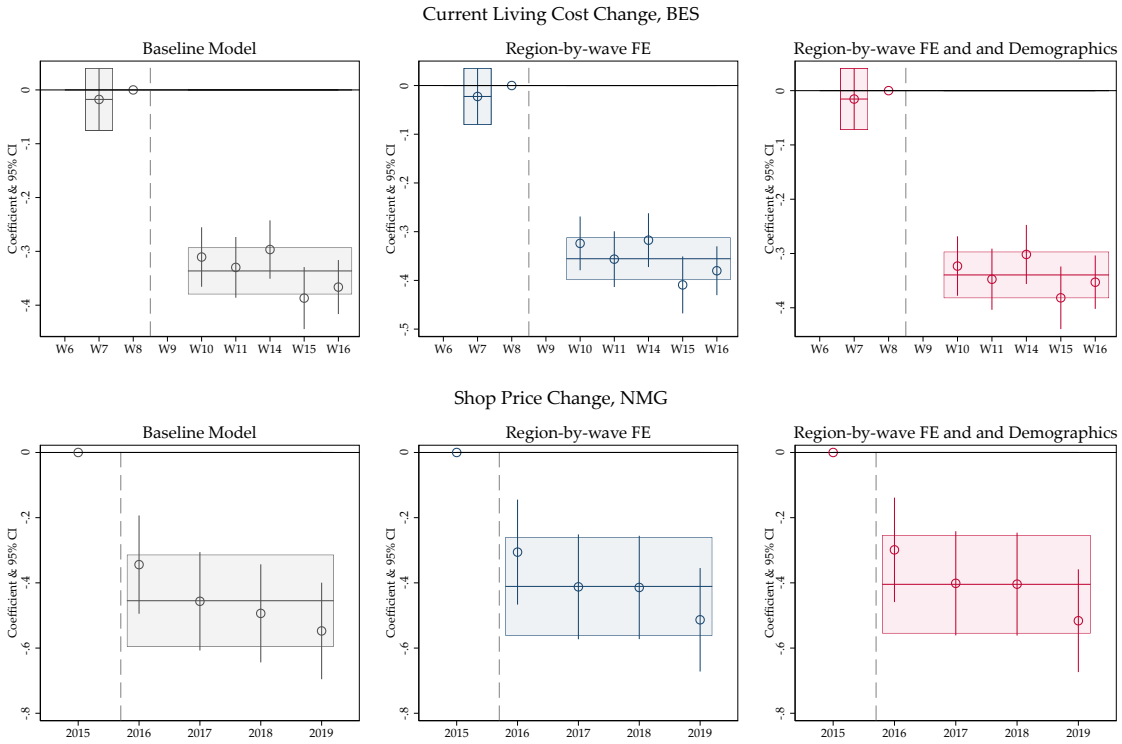
Notes: Figure presents regression estimates of the effects of the Brexit vote on view divergence between pro- and anti-Brexit voters regarding economic expectations and spending intentions (supplementary variables). In the dynamic event study model, the coefficients of interest correspond to interactions between a Brexit identity indicator and survey wave fixed effects, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). In the parsimonious, aggregate event study specification, the coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave. Coefficient estimates on the survey wave interactions are plotted as dots, with their 95 percent confidence intervals represented by vertical lines. Coefficient estimates from the aggregate interactions are depicted as horizontal lines, with their 95 percent confidence intervals shown as boxes. We progressively include controls for area-by-wave fixed effects (areas are local authorities in the BES survey and postcode in the NMG survey), as well as a comprehensive set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the area by wave level.

FIGURE B.7: Robustness Checks Using the Profile Variable of Brexit Identity



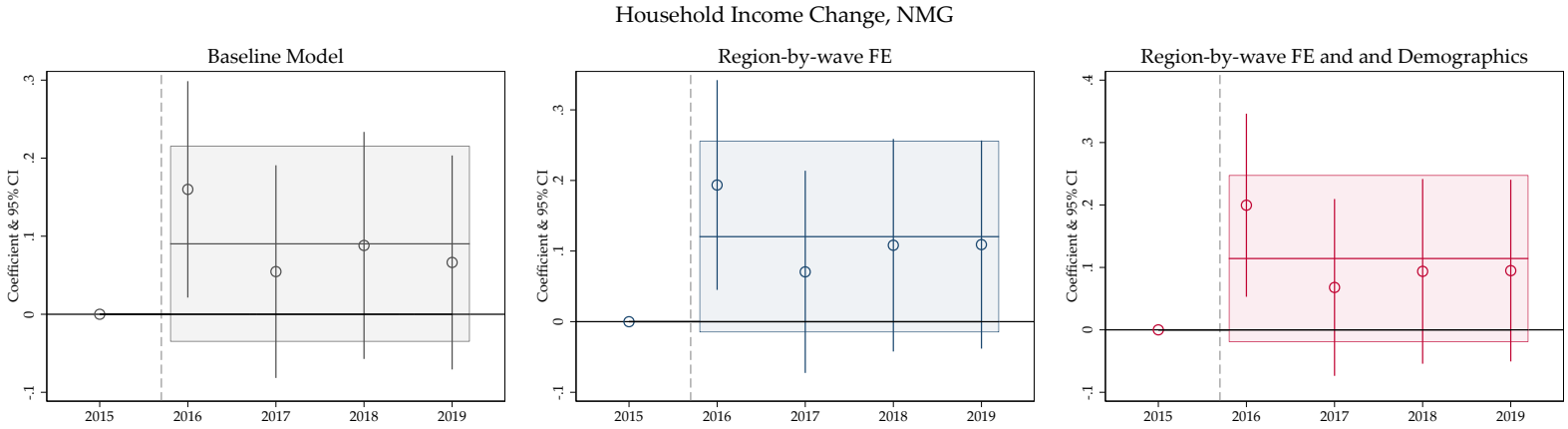
Notes: Figure presents regression estimates of the effects of the Brexit vote on view divergence between pro- and anti-Brexit voters regarding economic expectations and spending intentions, using the BES survey data and the profile variable of Brexit identity. In the dynamic event study model, the coefficients of interest correspond to interactions between a Brexit identity indicator and survey wave fixed effects, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). In the parsimonious, aggregate event study specification, the coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave. Coefficient estimates on the survey wave interactions are plotted as dots, with their 95 percent confidence intervals represented by vertical lines. Coefficient estimates from the aggregate interactions are depicted as horizontal lines, with their 95 percent confidence intervals shown as boxes. We progressively include controls for area-by-wave fixed effects (areas are local authorities in the BES survey and postcodes in the NMG survey), as well as a comprehensive set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the area by wave level.

FIGURE B.8: Beliefs on the Cost of Living and Shop Price Change



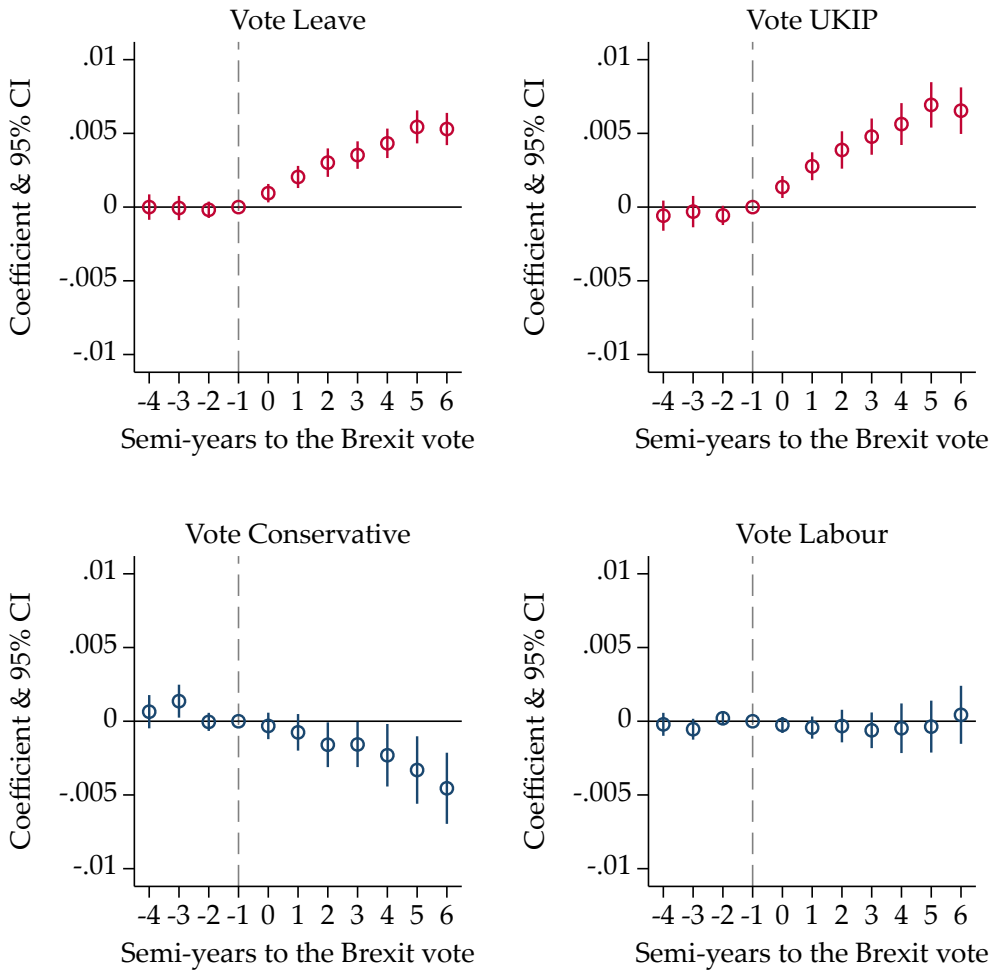
Notes: Figure presents regression estimates of the effects of the Brexit vote on divergence in beliefs on current living cost change and on shop price change between pro- and anti-Brexit voters. In the dynamic event study model, the coefficients of interest correspond to interactions between a Brexit identity indicator and survey wave fixed effects, estimated relative to the omitted interaction with the reference survey wave (Wave 8 for the BES or Wave 2015 for the NMG survey). In the parsimonious, aggregate event study specification, the coefficients of interest are interactions between a Brexit identity dummy variable and a pre-vote period dummy (not included in using the NMG data), as well as between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave. Coefficient estimates on the survey wave interactions are plotted as dots, with their 95 percent confidence intervals represented by vertical lines. Coefficient estimates from the aggregate interactions are depicted as horizontal lines, with their 95 percent confidence intervals shown as boxes. We progressively include controls for area-by-wave fixed effects (areas are local authorities in the BES survey and postcodes in the NMG survey), as well as a comprehensive set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the area by wave level.

Figure B.9: Divergence in the Expectation on Income Change



Notes: Figure presents regression estimates of the effects of the Brexit vote on divergence in expectations on income change between pro- and anti-Brexit voters. In the dynamic event study model, the coefficients of interest correspond to interactions between a Brexit identity indicator and survey wave fixed effects, estimated relative to the omitted interaction with the reference survey wave (Wave 2015 for the NMG survey). In the parsimonious, aggregate event study specification, the coefficients of interest are interactions between a Brexit identity dummy variable and a post-vote period dummy, estimated relative to the omitted interaction with the reference survey wave. Coefficient estimates on the survey wave interactions are plotted as dots, with their 95 percent confidence intervals represented by vertical lines. Coefficient estimates from the aggregate interactions are depicted as horizontal lines, with their 95 percent confidence intervals shown as boxes. We progressively include controls for area-by-wave fixed effects (areas are postcodes in the NMG survey), as well as a comprehensive set of demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the area by wave level.

FIGURE B.10: Dynamic Effects of the Brexit Vote on Housing Price (Nominal), Conditional on Property Fixed Effects



Notes: Figure illustrates the dynamic effects of the Brexit vote on housing prices. Coefficients are estimated using transaction-level regressions, conditional on property fixed effects, where the dependent variable is the logarithm of nominal housing prices. Coefficient estimates are represented by dots, with 95% confidence intervals shown as vertical lines. The top-left panel employs interactions between Leave voter shares and a series of semi-annual dummy variables as the key explanatory variables. In the remaining panels, Leave voter shares are replaced with vote shares for specific parties in the 2014 European Parliament election, and the same specification is estimated. All regressions include time fixed effects and time trends specific to areas where the respective partisan voter shares are either above or below the mean (in the top-left panel, we use time trends specific to Leave (Leave voter shares greater than 50%) or Remain (Leave voter shares less than or equal to 50%) areas). Robust standard errors are clustered at the local authority level.

C Appendix Tables

Table C.1: Conducted Timeline and Sample Sizes of the BES and NMG Surveys

Wave	Survey Period	Sample Size
PANEL A: The BES		
W6	8th May 2015 – 26th May 2015	30,027
W7	14th April 2016 – 4th May 2016	30,895
W8	6th May 2016 – 22nd June 2016	33,502
W9	24th June 2016 – 4th July 2016	30,036
W10	24th November 2016 – 12th December 2016	30,319
W11	24th April 2017 – 3rd May 2017	31,014
W14	4th May 2018 – 21st May 2018	31,063
W15	11th March 2019 – 29th March 2019	30,842
W16	24th May 2019 – 18th June 2019	37,959
PANEL B: The NMG		
W2015	2–22 September 2015	6,007
W2016	31 August–19 September 2016	6,011
W2017	6–26 September 2017	6,018
W2018	5–26 September 2018	6,000
W2019	4-24 September 2019	6,051

Notes: Table reports the conducted timeline and sample sizes of the BES and NMG surveys utilized in the paper. The BES survey was carried out around each of the general elections in the UK. Wave 8 (W8) of the BES was carried out immediately before the Brexit vote which took place on 23rd June 2016, followed by Wave 9 (W9) just afterwards. The NMG survey is an annual survey administered by the Bank of England, which is conventionally conducted in the month of September every year. Across the waves that we focus on, Wave 2015 (W2015) is the only one that was carried out prior to the Brexit vote.

TABLE C.2: Main Variables from the British Election Study Survey and the Bank of England/NMG Household Survey

Row (1)	Outcome Family (2)	Outcome Name (3)	Question Wording and Coding Structure (4)	Recoded (5)	Survey (6)
1	Macro Expectations	Current Economic Situation	Do you think that the economy is getting better, getting worse or staying about the same? (1=Getting a lot worse, 2=Getting a little worse, 3=Staying the same, 4=Getting a little better, 5=Getting a lot better)	No	BES
2		General Employment Situation	How do you expect the number of unemployed people in this country will change over the next 12 months? (1=Increase sharply, 2=Increase slightly, 3=Remain the same, 4=Fall slightly, 5=Fall sharply)	No	NMG
3*		General Economic Situation	How do you expect the general economic situation in this country to develop over the next 12 months? (1=Get a lot worse, 2=Get a little worse, 3=Stay the same, 4=Get a little better, 5=Get a lot better)	Yes	NMG
4	Micro Expectations	Personal Unemployment Risk	During the next 12 months, how likely or unlikely is it that you will be out of a job and looking for work. (1=Very unlikely, 2=Fairly unlikely, 3=Neither likely nor unlikely, 4=Fairly likely, 5=Very likely)	No	BES
5		Household Financial Position	How do you expect the financial position of your household to change over the next 12 months? (1=Get a lot worse, 2=Get a little worse, 3=Stay the same, 4=Get a little better, 5=Get a lot better)	Yes	NMG
6*		Personal Poverty Risk	During the next 12 months, how likely or unlikely is it that there will be times when you do not have enough money to cover your day to day living costs? (1=Very unlikely, 2=Fairly unlikely, 3=Neither likely nor unlikely, 4=Fairly likely, 5=Very likely)	No	BES
7	Spending Intentions	Good Time to Purchase Major Items	Do you think now is a good or a bad time for people to buy major household items (furniture, kitchen appliances, televisions, and things like that)? (1=Bad, 2=Neither good nor bad, 3=Good)	Yes	BES
8		Household General Spending	How do you expect your household to change its spending over the next 12 months? Please exclude money put into savings and repayment of bank loans. (1=Decrease a lot, 2=Decrease a little, 3=About the same, 4=Increase a little, 5=Increase a lot)	Yes	NMG
9*		Major Purchase Change	Compared to the last 12 months, do you expect to spend more or less money on major purchases (such as a car, furniture or electrical goods) over the next year? (1=Much less, 2=A little less, 3=About the same, 4=A little more, 5=Much more)	Yes	NMG

Continued

TABLE C.2: Main Variables from the British Election Study Survey and the Bank of England/NMG Household Survey

Row (1)	Outcome Family (2)	Outcome Name (3)	Question Wording and Coding Structure (4)	Recoded (5)	Survey (6)
10	Beliefs on Housing Transactions	Difficult to Obtain Mortgages	Do you think the general availability of credit has changed following the UK voting to leave the EU (vote for Brexit)? Yes, I think mortgages are now more difficult for people to obtain (1=Selected, 0=Not selected)	No	NMG
11		Easier to Obtain Mortgages	Do you think the general availability of credit has changed following the UK voting to leave the EU (vote for Brexit)? Yes, I think mortgages are now easier for people to obtain (1=Selected, 0=Not selected)	No	NMG
12		More Likely to Sell House	How do you think the vote for Brexit has affected how likely you are to sell your main residential home over the next 12 months (either to buy another property to live in or move to other accommodation)? Compared to how things would have been if the UK had voted to remain in the EU, are you: (1=A lot more likely to sell + A little more likely to sell, 0=The referendum result has made no difference + A little less likely to sell + A lot less likely to sell)	Yes	NMG
13		More Likely to Buy House	How do you think the vote for Brexit has affected how likely you are to buy a new main residential home over the next 12 months (whether moving or buying for the first time)? Compared to how things would have been if the UK had voted to remain in the EU, are you: (1=A lot more likely to buy + A little more likely to buy, 0=The referendum result has made no difference + A little less likely to buy + A lot less likely to buy)	Yes	NMG
14	Other Expectation Variables	Current Living Cost Change	Do you think that the cost of living is getting higher, getting lower or staying about the same? (1=Getting a lot lower, 2=Getting a little lower, 3=Staying the same, 4=Getting a little higher, 5=Getting a lot higher)	No	BES
15		Shop Price Change	How much would you expect prices in the shops generally to change over the next twelve months? (1=Go down, 2=Not change, 3=Go up by 1% or less, 4=Go up by 1% but less than 2%, 5=Go up by 2% but less than 3%, 6=Go up by 3% but less than 4%, 7=Go up by 4% but less than 5%, 8=Go up by 5% or more)	No	NMG
16		Household Income Change	Over the next twelve months, how do you expect your household income (before anything is deducted for tax, National Insurance, pension schemes etc.) to change? (1=Decrease, 2=Stay the same, 3=Increase)	Yes	NMG

Continued

TABLE C.2: Main Variables from the British Election Study Survey and the Bank of England/NMG Household Survey

Row (1)	Outcome Family (2)	Outcome Name (3)	Question Wording and Coding Structure (4)	Recoded (5)	Survey (6)
17	Brexit Identity	Brexit Vote Intention or Actual Vote	[*Question 1*] If there was a referendum on Britain's membership of the European Union, how do you think you would vote? (W6); [*Question 2*] If you do vote in the referendum on Britain's membership of the European Union, how do you think you will vote? (W7, W8); [*Question 3*] Which way did you vote in the EU referendum? (W9); [*Question 4*] If there was another referendum on EU membership, how do you think you would vote? (W10, W11, W14, W15, W16) (0=Remain in the EU, 1=Leave the EU)	No	BES
18		Brexit Attitude	Taking everything into account, how do you currently view the UK leaving the EU (European Union) – which has become known as 'Brexit'? (1=Very positive or somewhat positive, 0=Somewhat negative or very negative)	Yes	NMG
19		Brexit Expectation	How likely do you think it is that the UK will vote to leave the EU? (Scale: 0-100)	No	BES

Notes: Table summarizes key information of our main variables, taken from the British Election Study Survey 2014–2019 (BES) and the Bank of England/NMG Household Survey 2015-2019 (NMG). Variables with the superscript "*" are used for cross-validation. Variables that are recoded by us as different from original coding structures are indicated in the column (5). We recode the variables in rows 3, 5, 7, 8, 9, 16 as described in the column (4) in order to ensure higher values represent higher levels of optimism or stronger intention to purchase. Variables in rows 10-13 come from the wave W2016 of the NMG survey; we recode variables in rows 12, 13 as dummies. We measure the Brexit identity for respondents in the BES based on four questions (asked in different waves) regarding the Brexit vote intention and actual vote, as shown in the row 17, column (4). The Brexit identity for the respondents in the NMG is dichotomized using a variable recording respondents' attitudes towards the Brexit. All variables from the BES are available in waves W6, W7, W8, W9, W10, W11, W14, W15, W16, except for variables in the row 1 (W7, W8, W9, W10, W11, W14, W15, W16), row 10 (W7, W8, W10, W11, W14, W15, W16), row 15 (W7, W8). All variables from the NMG are available in waves W2015 through W2019, except for the variables in the row 18 (W2016 - W2019), and rows 10-13 (W2016).

Table C.3: Demographic Compositions of Voters, NMG 2015

	All		Filled Sample					
			All Filled		Anti-Brexit	Pro-Brexit	Anti-Brexit vs. Pro-Brexit	
	Mean	Std. Err.	Mean	Std. Err.	Mean	Mean	Diff.	p-value
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male	0.488	0.007	0.605	0.010	0.558	0.648	-0.090	0.000
Age	47.424	0.223	52.040	0.337	48.997	54.831	-5.834	0.000
College	0.425	0.007	0.421	0.010	0.529	0.321	0.208	0.000
Low income	0.226	0.009	0.246	0.014	0.213	0.278	-0.065	0.020
Middle income	0.562	0.010	0.551	0.016	0.527	0.573	-0.046	0.143
High income	0.212	0.008	0.203	0.013	0.260	0.149	0.111	0.000
Employed	0.594	0.006	0.506	0.010	0.564	0.453	0.111	0.000
Unemployed	0.022	0.002	0.021	0.003	0.027	0.016	0.011	0.058
Inactive	0.384	0.006	0.473	0.010	0.409	0.532	-0.123	0.000
Pro-Brexit	-	-	0.522	0.010	0.000	1.000	-	-

Notes: Table provides an overview of demographic compositions of voters in the wave W2015 of the Bank of England/NMG Household Survey (NMG). Columns (1) and (2) report means and standard errors for the whole sample, while columns (3) through to (8) restrict the sample to a sub-sample from W2015 comprised of respondents whose Brexit identity is filled using information from subsequent waves. Low income refers to households below the 25th percentile in the distribution of annual gross income, high income refers to those above the 75th percentile, and middle income refers to those between the 25th and 75th percentiles. All variables except age are dichotomous. Columns (7) and (8) test if average anti- and pro-Brexit voters are different regarding the particular demographics. Column (7) reports differences (column (5) minus column (6)) and column (8) reports p-values. Observations for the whole sample: 6,007; observations for the filled sample: 2,398.

Table C.4: Shares of Voters with (Un)Changed Brexit Identity, NMG

		2016		2017		2018	
		Pro-Brexit	Anti-Brexit	Pro-Brexit	Anti-Brexit	Pro-Brexit	Anti-Brexit
2017	Pro-Brexit	51.67%	3.72%	.%	.%	.%	.%
	Anti-Brexit	3.72%	40.89%	.%	.%	.%	.%
2018	Pro-Brexit	42.64%	4.4%	42.63%	2.78%	.%	.%
	Anti-Brexit	9.43%	43.54%	7.52%	47.07%	.%	.%
2019	Pro-Brexit	39.53%	3.32%	37.21%	2.33%	36.67%	5.11%
	Anti-Brexit	13.29%	43.85%	12.66%	47.8%	7.72%	50.5%

Notes: Table reports percentages of voters who express unchanged/changed attitudes towards Brexit between any two particular years from 2016 to 2019 in the NMG survey. To calculate these percentages, we first limit respondents to those who were traced in two particular waves of the NMG. We then calculate the shares of four types of voters: (*i*) voters expressing pro-Brexit attitudes in both years, (*ii*) voters expressing anti-Brexit attitudes in both years, (*iii*) voters expressing pro-Brexit attitudes in the former year but changing to anti-Brexit attitudes in the latter year, (*iv*) voters expressing anti-Brexit attitudes in the former year but changing to pro-Brexit attitudes in the latter year. The voters who did not change attitudes are the first two types.

Table C.5: Shares of Voters with Unchanged Brexit Identity, BES

	W6	W7	W8	W9	W10	W11	W14	W15
W7	88.44%	.%	.%	.%	.%	.%	.%	.%
W8	87.38%	95.27%	.%	.%	.%	.%	.%	.%
W9	86.68%	92.51%	94.64%	.%	.%	.%	.%	.%
W10	85.91%	90.79%	92.14%	95.17%	.%	.%	.%	.%
W11	85.59%	90.61%	91.96%	94.43%	96.91%	.%	.%	.%
W14	85.04%	89.54%	90.58%	93.04%	95.94%	96.49%	.%	.%
W15	83.91%	87.93%	88.78%	90.96%	93.91%	94.63%	96.13%	.%
W16	83.71%	88.39%	89.37%	91.15%	94.01%	94.82%	96.07%	97.51%

Notes: Table reports percentages of voters who does not change vote intentions towards Brexit between any two particular waves in the BES survey. To calculate the percentages, we first limit respondents to those who were traced in two particular waves of the BES survey. We then calculate the shares of four types of voters: (*i*) voters expressing pro-Brexit attitudes in both years, (*ii*) voters expressing anti-Brexit attitudes in both years, (*iii*) voters expressing pro-Brexit attitudes in the former year but changing to anti-Brexit attitudes in the latter year, (*iv*) voters expressing anti-Brexit attitudes in the former year but changing to pro-Brexit attitudes in the latter year. The voters who did not change attitudes are the first two types.

TABLE C.6: Using Expectations to predict Spending Intentions

	Good Time to Purchase Major Items		Major Purchase Change	
	(1)	(2)	(3)	(4)
	PANEL A: OLS Estimates			
Current Economic Situation	0.234***			
	(0.004)			
Personal Unemployment Risk		-0.136***		
		(0.005)		
General Employment Situation			0.018*	
			(0.010)	
Household Financial Position				0.264***
				(0.011)
	PANEL B: Reduced Form			
Leave	0.262***	0.258***	0.289***	0.278***
	(0.009)	(0.009)	(0.020)	(0.019)
	PANEL C: 2SLS Estimates			
Current Economic Situation	0.320***			
	(0.011)			
Personal Unemployment Risk		-3.155***		
		(0.334)		
General Employment Situation			0.600***	
			(0.050)	
Household Financial Position				0.669***
				(0.046)
Region × Wave FE	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes
Kleibergen-Paap F-statistic	9263.480	91.408	700.117	507.269
Observations	91961	87331	15748	16450
Number of clusters	2274	2274	490	490

Notes: The table reports 2SLS estimates of the impact of economic expectations on predicting spending intentions, along with the corresponding OLS estimates. Estimates in columns (1) and (2) are based on the post-referendum samples from the BES survey. The outcome variable here is respondents' current attitudes toward purchasing major household items. Estimates in columns (3) and (4) are based on the NMG post-referendum samples. The corresponding outcome variable measures household intentions to buy major goods over the following year, compared to the previous 12 months. Economic expectation variables are described in Table C.2. The spending intention and economic expectation variables are standardised to mean zero and SD 1. In all regressions we control for area (local authority in the BES and postcode in the NMG) by wave fixed effects, and demographic characteristics, including age, gender, educational attainment (an indicator for holding a college degree), working status (three indicators for employed, unemployed, and inactive), and household annual gross income (three indicators for low income – lower than 25th percentile, middle income – 25th percentile to 75th percentile, and high income – greater than 75th percentile). Standard errors are clustered at the area by wave level. * significant at 10%, ** significant at 5%, *** significant at 1%.

TABLE C.7: Using Individual Economic Expectations to Predict Views on the Housing Markets

	Difficult to Obtain Mortgages		Easier to Obtain Mortgages		More Likely to Sell House		More Likely to Buy House	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PANEL A: OLS Estimates							
General Unemployment Situation	-0.052***		0.014***		-0.022***		-0.006	
	(0.007)		(0.004)		(0.006)		(0.004)	
Household Financial Position		-0.019***		0.006		0.015**		0.035***
		(0.007)		(0.004)		(0.006)		(0.005)
	PANEL B: Reduced Form							
Leave	-0.061***	-0.060***	0.055***	0.051***	0.059***	0.058***	0.100***	0.096***
	(0.014)	(0.013)	(0.009)	(0.008)	(0.011)	(0.011)	(0.010)	(0.009)
	PANEL C: 2SLS Estimates							
General Unemployment Situation	-0.125***		0.113***		0.107***		0.207***	
	(0.028)		(0.018)		(0.024)		(0.027)	
Household Financial Position		-0.176***		0.150***		0.168***		0.296***
		(0.042)		(0.028)		(0.036)		(0.039)
Postcode Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap F-statistic	248.893	90.353	248.893	90.353	190.199	52.748	212.594	77.682
Observations	4105	4292	4105	4292	2635	2725	3842	3970
Number of clusters	120	120	120	120	119	118	120	120

Notes: Table reports 2SLS estimates about the effects of economic expectations on housing transaction beliefs, as well as corresponding OLS estimates. The estimates are based on the sample from the wave W2016 of the NMG survey. Our outcome variables come from four questions related to how the Brexit vote had affected behaviors in the real estate market. The first two questions consist of two statements that reflect whether respondents perceived obtaining mortgages became more difficult or easier as a result of the Brexit vote (columns (1)-(4)). The variables are dummies, taking the value of 1 if the statements were selected and 0 otherwise. The latter two questions inquire about respondents' views on how the Brexit vote influenced the likelihood of selling or buying their main residential home within the next 12 months, compared to the scenario where the UK had voted to remain in the EU. The variables are also dummies, with 1 indicating a greater likelihood to sell or buy (columns (5)-(8)). Economic expectation variables are standardized to mean 0 and sd 1 and described in Table C.2. We include in all regressions controls for postcode area fixed effects, and demographic characteristics, including age, gender, educational attainment (an indicator for holding a college degree), working status (three indicators for employed, unemployed, and inactive), and household annual gross income (three indicators for low income – lower than 25th percentile, middle income – 25th percentile to 75th percentile, and high income – greater than 75th percentile). Standard errors are clustered at the postcode area level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table C.8: Summary Statistics for Area Characteristics

	All				Remain	Leave	Remain vs. Leave	
	Mean	Median	Std. Dev.	N	Mean	Mean	Diff.	p-value
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Share of Leave voters 2016	0.533	0.542	0.102	348.000	0.410	0.583	0.173	0.000
(2) Initial EU accession migrant resident share (2001)	0.002	0.001	0.002	348.000	0.004	0.001	-0.002	0.000
(3) EU accession migrant growth (2001–11)	0.019	0.013	0.018	348.000	0.028	0.015	-0.013	0.000
(4) Initial EU 15 migrant resident share (2001)	0.014	0.010	0.011	348.000	0.023	0.010	-0.013	0.000
(5) EU 15 migrant growth (2001–11)	0.004	0.001	0.007	348.000	0.009	0.002	-0.008	0.000
(6) Initial migrants from elsewhere resident share (2001)	0.062	0.034	0.072	348.000	0.124	0.037	-0.087	0.000
(7) Migrants from elsewhere growth (2001–11)	0.032	0.019	0.035	348.000	0.057	0.022	-0.035	0.000
(8) Total economy EU dependence (2010)	0.097	0.095	0.029	348.000	0.080	0.104	0.024	0.000
(9) EU structural funds per capita (2013)	43.833	15.379	78.331	339.000	35.279	47.428	12.148	0.295
(10) Share of residents commuting to London (2011)	0.023	0.001	0.054	344.000	0.064	0.007	-0.057	0.000
(11) Owned (outright + mortgage) share (2001)	0.686	0.714	0.104	348.000	0.622	0.712	0.090	0.000
(12) Owned (outright + mortgage) share growth (2001–11)	-0.045	-0.041	0.025	348.000	-0.055	-0.041	0.014	0.000
(13) Council rented share (2001)	0.130	0.113	0.080	348.000	0.143	0.125	-0.018	0.163
(14) Council rented share growth (2001–11)	-0.038	-0.026	0.035	348.000	-0.038	-0.038	0.001	0.926
(15) Total fiscal cuts (2010–15)	469.003	463.000	120.035	347.000	454.899	474.736	19.836	0.250
(16) Share of suspected cancer patient treated within 62 days (2015)	82.490	82.610	6.894	347.000	83.069	82.253	-0.816	0.392
(17) Public employment share (2009)	0.214	0.215	0.059	348.000	0.211	0.214	0.003	0.676
(18) Share of resident population no qualifications (2001)	0.360	0.366	0.069	348.000	0.303	0.384	0.081	0.000
(19) Share of resident population no qualifications growth (2001–11)	-0.042	-0.046	0.026	348.000	-0.023	-0.049	-0.026	0.000
(20) Share of resident population qualification 4 + (2001)	0.196	0.180	0.074	348.000	0.275	0.164	-0.112	0.000
(21) Share of resident population qualification 4 + growth (2001–11)	0.075	0.075	0.015	348.000	0.077	0.074	-0.003	0.250
(22) Population 60 years and older (2001)	0.209	0.208	0.036	348.000	0.188	0.218	0.030	0.000
(23) Population 60 years and older growth (2001–11)	0.159	0.162	0.105	348.000	0.103	0.182	0.079	0.000
(24) Mean life satisfaction APS well-being data (2015)	7.524	7.510	0.167	346.000	7.493	7.536	0.043	0.076
(25) CV life satisfaction APS well-being data (2015)	1.037	0.870	0.406	346.000	0.931	1.080	0.148	0.001
(26) Retail employment share (2001)	0.169	0.169	0.021	348.000	0.152	0.175	0.023	0.000
(27) Retail employment share change (2001–11)	-0.009	-0.009	0.007	348.000	-0.010	-0.008	0.002	0.024
(28) Manufacturing employment share (2001)	0.151	0.147	0.053	348.000	0.104	0.169	0.065	0.000
(29) Manufacturing employment share change (2001–11)	-0.060	-0.055	0.020	348.000	-0.048	-0.064	-0.016	0.000
(30) Construction employment share (2001)	0.068	0.068	0.014	348.000	0.056	0.073	0.017	0.000
(31) Construction employment share change (2001–11)	0.010	0.010	0.006	348.000	0.009	0.010	0.001	0.511
(32) Finance employment share (2001)	0.046	0.040	0.025	348.000	0.061	0.041	-0.020	0.000
(33) Finance employment share change (2001–11)	-0.005	-0.004	0.007	348.000	-0.004	-0.005	-0.001	0.546
(34) Median hourly pay (2005)	11.060	10.580	1.897	348.000	12.490	10.479	-2.011	0.000
(35) Median hourly pay change (2005–15)	0.223	0.224	0.077	348.000	0.212	0.227	0.015	0.113
(36) Interquartile pay range (2005)	9.897	9.150	2.852	339.000	11.899	9.073	-2.826	0.000
(37) Interquartile pay range growth (2005–15)	0.197	0.208	0.123	338.000	0.192	0.199	0.007	0.635
(38) Unemployment rate (2015)	5.527	5.200	2.173	345.000	5.464	5.552	0.089	0.765
(39) Self-employment rate (2015)	10.421	9.900	3.328	346.000	11.506	9.981	-1.525	0.001
(40) Participation rate (2015)	78.012	78.400	4.648	347.000	78.099	77.977	-0.123	0.869

Notes: Table reports summary statistics of our area level characteristics for the sample of local authorities (LAUs) in England and Wales. We access these area characteristics from Becker, Fetzer and Novy (2017) who comprehensively study the district-level factors underlying the local Brexit vote shares. These characteristics can be broadly categorized into four sets. (*i*) Characteristics on EU exposure in terms of immigration, trade, and structural funds: variables (2)-(9) . (*ii*) Characteristics on public service provision and fiscal consolidation: variables (10)-(17) (*iii*) Characteristics on demography and education: variables (18)-(25). And (*v*) characteristics on economic structure, wages and unemployment: variables (26)-(40). More detailed information about these variables can be found in Becker, Fetzer and Novy (2017). Column (7) presents differences in the area characteristics between Leave and Remain LAUs, measured by regressing the characteristics on a Leave dummy indicating LAUs' shares of Leave voters are over 50%. Column (8) presents p-values for testing the null hypotheses of no differences between Leave and Remain LAUs.

Table C.9: Regression Coefficients of Compact Event Study Models

	BES			NMG		
	Current Economic Situation	Personal Unemployment Risk	Good Time to Purchase Major Items	General Employment Situation	Household Financial Position	Household General Spending
Variable	(1)	(2)	(3)	(4)	(5)	(6)
$ProBrexit \times Period_1$	0.012	0.003	0.030			
	(0.027)	(0.043)	(0.056)			
$ProBrexit \times Period_3$	0.949***	-0.105**	0.309***	0.758***	0.253***	0.088
	(0.020)	(0.041)	(0.055)	(0.075)	(0.072)	(0.071)
Adj. R^2	0.160	0.169	0.051	0.085	0.104	0.028
Observations	140854	133533	128962	17106	17966	17915
Number of clusters	3032	3402	3402	601	601	602

Notes: Dependent variables are listed in column headings and described in Table C.2. *ProBrexit* represents each voter's Brexit identity, taking a value of one for pro-Brexit voters and zero otherwise. $Period_1$ is an indicator for surveys carried out before the Brexit vote. $Period_3$ is an indicator for surveys carried out after the vote. We include in all regressions controls for area (local authority in the BES and postcode area in the NMG) by wave fixed effects, and demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the area by wave level. * significant at 10%, ** significant at 5%, *** significant at 1%.

TABLE C.10: View Divergence and Exposure to Areas with different Leave Vote Shares

	BES			NMG		
	Current Economic Situation	Personal Unemployment Risk	Good Time to Purchase Major Items	General Employment Situation	Household Financial Position	Household General Spending
Variable	(1)	(2)	(3)	(4)	(5)	(6)
	PANEL A: Anti-Brexit Voters					
$Period_1 \times LeaveShare$	0.019	-0.342	-0.488			
	(0.133)	(0.228)	(0.334)			
$Period_3 \times LeaveShare$	0.043	-0.320	-0.479	-0.041	0.635*	0.085
	(0.096)	(0.220)	(0.330)	(0.606)	(0.369)	(0.471)
Adj. R^2	0.028	0.155	0.030	0.006	0.061	0.016
Observations	74466	72520	68448	8751	9281	9227
Number of clusters	3031	3381	3380	581	582	582
	PANEL B: Pro-Brexit Voters					
$Period_1 \times LeaveShare$	-0.228*	0.390	-0.223			
	(0.126)	(0.238)	(0.282)			
$Period_3 \times LeaveShare$	-0.115	0.256	-0.315	0.233	-0.610	-0.263
	(0.092)	(0.227)	(0.274)	(0.471)	(0.444)	(0.582)
Adj. R^2	0.049	0.169	0.030	0.066	0.102	0.037
Observations	66388	61020	60519	8357	8686	8688
Number of clusters	3025	3390	3387	602	600	602

Notes: Dependent variables are listed in column headings and described in Table C.2. $Period_1$ is an indicator for surveys carried out before the Brexit vote. $Period_3$ is an indicator for surveys carried out after the vote. *LeaveShare* denotes shares of Leave voters for each local authority in the BES, and for each postcode area in the NMG. Shares of Leave voters in the BES are calculated based on Wave 9 where respondents' actual vote choices were asked. Shares of Leave voters in the NMG are calculated based on Wave 2016, which was carried out following the Brexit vote. We include in all regressions controls for area (local authority in the BES and postcode area in the NMG) by wave fixed effects, and demographic characteristics, including age, gender, educational attainment, working status, and household annual gross income. Standard errors are clustered at the area by wave level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table C.11: First Stage Results Using Vote Intentions as the Instrument Variable

	BES		NMG	
	Current Economic Situation	Personal Unemployment Risk	General Employment Situation	Household Financial Position
	(1)	(2)	(3)	(4)
	PANEL A: Before the Brexit Vote			
Leave	-0.055***	0.039**	-0.192***	0.146**
	(0.020)	(0.016)	(0.072)	(0.070)
Region × Wave FE	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes
Kleibergen-Paap F-statistic	7.769	6.194	7.045	4.267
Observations	20058	32434	889	923
Number of clusters	749	1126	111	111
	PANEL B: After the Brexit Vote			
Leave	0.819***	-0.082***	0.483***	0.416***
	(0.009)	(0.009)	(0.018)	(0.018)
Region × Wave FE	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes
Kleibergen-Paap F-statistic	9263.480	91.408	700.117	507.269
Observations	91961	87331	15748	16450
Number of clusters	2274	2274	490	490

Notes: Table reports first-stage results using vote intentions as the instrumental variable for economic expectations. Economic expectation variables are listed in column headings and described in Table C.2. Results in Panel A and Panel B are based on pre- and post-referendum samples, respectively. We include in all regressions controls for area (local authority in the BES and postcode in the NMG) by wave fixed effects, and demographic characteristics, including age, gender, educational attainment (an indicator for holding a college degree), working status (three indicators for employed, unemployed, and inactive), and household annual gross income (three indicators for low income – lower than 25th percentile, middle income – 25th percentile to 75th percentile, and high income – greater than 75th percentile). Standard errors are clustered at the area by wave level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table C.12: The Average Effects of the Brexit Vote on the volume of Housing Transactions

	Baseline	Control for Additional Time Trends				
	(1)	(2)	(3)	(4)	(5)	(6)
$LeaveShare \times Period_1$	-0.001	0.000	0.000	0.000	0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
$LeaveShare \times Period_3$	0.004***	0.002***	0.002***	0.002**	0.002***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.814	0.846	0.855	0.854	0.851	0.875
Observations	3553	3454	3498	3531	3465	3355
Number of clusters	323	314	318	321	315	305
Local authority FE	Yes	Yes	Yes	Yes	Yes	Yes
Time period FE	Yes	Yes	Yes	Yes	Yes	Yes
Time trend × Leave area dummy	Yes	Yes	Yes	Yes	Yes	Yes
Time trends × EU exposure	No	Yes	No	No	No	Yes
Time trends × Public service provision and fiscal consolidation	No	No	Yes	No	No	Yes
Time trends × Demography and education	No	No	No	Yes	No	Yes
Time trends × Economic structure, wages and unemployment	No	No	No	No	Yes	Yes

Notes: Table reports average effects of the Brexit vote on housing transaction volume per capita. We aggregate housing transactions at the local authority level and at a half-yearly frequency. $Period_1$ is an indicator for housing transactions that were completed prior to the Brexit vote. On the other hand, $Period_3$ is an indicator for housing transactions completed after the Brexit vote. We set the first half of the year 2016 as the reference period for our analysis. *LeaveShare* denotes shares of Leave voters for each local authority. All regressions control for time period fixed effects, local authority fixed effects, and time trends specific to Leave (Leave voter shares greater than 50%) or Remain (Leave voter shares less than or equal to 50%) areas. Columns (2) to (6) add additional time trends specific to a body of pre-vote regional characteristics: (*i*) characteristics on EU exposure in terms of immigration, trade, and structural funds; (*ii*) characteristics on public service provision and fiscal consolidation; (*iii*) characteristics on demography and education; and (*v*) characteristics on economic structure, wages and unemployment. We access the four sets of regional characteristics from Becker, Fetzer and Novy (2017) who comprehensively study the district-level factors underlying the Brexit vote. All regressions are weighted by regional electorate. Robust standard errors are clustered at the local authority level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Appendix References

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