Tabloid media campaigns and public opinion: Quasi-experimental evidence on Euroscepticism in England

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Abstract

Whether powerful media outlets have effects on public opinion has been at the heart of theoretical and empirical discussions about the media's role in political life. Yet, the effects of media campaigns are difficult to study because citizens self-select into media consumption. Using a quasi-experiment – the 30-years boycott of the most important Eurosceptic tabloid newspaper, The Sun, in Merseyside caused by the Hillsborough soccer disaster – we identify the effects of The Sun boycott on attitudes towards leaving the EU. Difference-in-differences designs using public opinion data spanning three decades, supplemented by referendum results, show that the boycott caused EU attitudes to become more positive in treated areas. This effect is driven by cohorts socialised under the boycott, and by working class voters who stopped reading The Sun. Our findings have implications for our understanding of public opinion, media influence, and ways to counter such influence, in contemporary democracies.

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1 Introduction

Are powerful media outlets able to shape public opinion? This question is central to political science and also extensively debated in other disciplines (Bartels 1993; Lazarsfeld, Berelson, and Gaudet 1948; Mutz and Martin 2001; Zaller 1996; Horkheimer, Adorno, and Noeri 1972; McQuail 1985). The media's role in influencing public opinion is contentious, both from a normative and from an empirical point of view. While theorists have either attributed a crucial information and enlightenment role to the media (Holmes 1991), or have warned about the media's ability to spread propaganda (Lippmann 1921; Horkheimer, Adorno, and Noeri 1972), empirical political scientists have questioned the media's ability to shape public opinion. Most prominently Klapper (1960) concluded that, if anything, the media have "minimal effects", and this view has been shared by other important scholars (Lazarsfeld, Berelson, and Gaudet 1948). At best, some have argued, media exposure should lead to the reinforcement of existing attitudes (Sherrod 1971; Shrum 2002).

However, the relationship between media exposure and public opinion is difficult to disentangle. Citizens choose which media outlets they consume, and the media not only set the agenda, but are also responsive to public opinion shifts (Kinder 1998; Baum 2002). The "minimal effects" view has been forcefully challenged (Zaller 1996). Lately, field experiments (Gerber, Karlan, and Bergan 2009; King, Schneer, and White 2017) and carefully designed observational studies (Gentzkow, Shapiro, and Sinkinson 2011; Ladd and Lenz 2009) show that exposure to newspapers can affect some electoral behaviours (Gentzkow, Shapiro, and Sinkinson 2011; Ladd and Lenz 2009; Gerber, Karlan, and Bergan 2009) and political discussion (King, Schneer, and White 2017). However, there are fewer studies providing robust evidence that the media can change opinions. Gerber, Karlan, and Bergan (2009), which was the only field experiment that aimed to test the effects of randomly assigned newspaper subscriptions on stated opinions, report null effects. However, the time frame of their study is limited and it is difficult to speak of "the media" and "media effects" as if we were studying a homogeneous actor. Some TV stations and newspapers, for instance the BBC or the Washington Post, attempt to report news in a neutral or factual manner, while other outlets explicitly aim to "create opinion" (Arceneaux and Johnson 2013): Consistent with this idea, quasi-random exposure to campaigning outlets such as Fox News led to an increase in Republican vote shares (Martin and Yurukoglu 2017; Dellavigna and Kaplan 2007) and populist cable news in Italy affected perceptions of crime rates

(Mastrorocco and Minale 2018).

In this study we show that a campaigning tabloid newspaper was able to shape public opinion in the long-run, with potentially important policy consequences. For causal identification, our study relies on a specific historical event, the Hillsborough disaster, a human crush at Hillsborough soccer stadium in Sheffield, England in 1989, in which 96 Liverpool F.C. supporters lost their lives. The biased and slanderous reporting by the UK's most popular tabloid newspaper, The Sun, on the disaster and its victims led to an unexpected and sudden boycott of The Sun in the region of Merseyside (UK) covering Liverpool. Importantly, for the purposes of this study, The Sun also happens to be the most widely-read Eurosceptic newspaper in the UK, and the second most widely-read newspapers in Europe (Campaign Magazine 2002). Since the boycott was not triggered by the Eurosceptic slant of The Sun, but by its extremely biased reporting on the UK's most deadly sporting disaster, the boycott was not a function of EU attitudes in Merseyside.

We believe that our study makes several important contributions to the literature on media effects, public opinion, and the rise of Euroscepticism, and has broader implications for how we understand the role of the media in contemporary democracies. The fact that this large-scale boycott of the nation's most widely read newspaper has endured until the present day is a sufficiently large and important event to allow us to estimate the effects of a powerful medium on Euroscepticism, addressing the concern that the effects of important causes are usually extremely difficult to identify. Following individual attitudes in Merseyside and other Northern English counties for more than 30 years, we provide evidence of the long-term impact of sustained media campaigns on public opinion. Using a difference-in-differences design based on yearly British Social Attitudes data from 1983 to 2004, we show that The Sun boycott caused a sharp drop in Sun readership in Merseyside. We also find that respondents' attitudes towards the EU got significantly more positive in Merseyside after the onset of the boycott, compared to attitudes of respondents in other Northern English areas, and in other areas of England as a whole. We substantiate these findings by providing empirical evidence consistent with the explanation that this decline in Euroscepticism in Merseyside was driven by the boycott: The decline in Euroscepticism was most pronounced among cohorts that came of age during the boycott, and among working class voters who were most likely to read The Sun before the boycott. Moreover, we show that the long-lasting "Sun" boycott negatively affected the "Leave" vote

in Merseyside during the 2016 EU referendum. We hence provide evidence that long-term attitudes towards the EU were influenced by media reports, and that the unfolding disintegration crisis of the EU is to some extent a function of media campaigns that started more than 30 years ago. While this might not be surprising to EU scholars, estimating the causal long-term effect of a Eurosceptic media campaign in a quasi-experimental setting is a novel contribution. After all, the British Brexit vote has been one of the most consequential public policy decisions taken by referendum in the past decades.

2 Media Campaigns and Euroscepticism

When theorists worry about the persuasive power of the media, they usually refer to sustained one-sided campaigns by a medium or multiple media outlets, meant to explicitly influence public opinion in a specific direction (Horkheimer, Adorno, and Noeri 1972; Lippmann 1921). Media outlets can act as “political actors” (Page 1985) and "issue entrepreneurs" (Hobolt and de Vries 2016; de Vries and Hobolt 2020), raising the salience of a specific political issue, while at the same time providing a strong frame that citizens rely on to interpret the issue (Leeper and Slothuus 2020). As Page (1985: 20) writes, we should understand certain media outlets as political actors who “try and change the beliefs and policy preferences of mass and/or elite audiences, which would presumably affect subsequent policy decisions”. This assumes that these media outlets or their owners act purposefully to influence public opinion and that citizens can be receptive to such influences.

The latest experimental (Broockman and Kalla 2016; Arceneaux and Kolodny 2009; Arceneaux and Johnson 2013) and quasi-experimental (Jäger 2019) literature on issue-based campaigns and framing effects suggests that persuasion effects can materialise under favourable scope conditions: When audiences are not self-selecting into receiving political messages, but receiving them as a by-product (Arceneaux and Johnson 2013), when campaigns target emerging rather than highly salient or polarised issues (Arceneaux and Kolodny 2009), and when messaging is one-sided or loop-sided (Jäger 2019). As Zaller (1992) has shown, messages should be more effective at influencing opinions if the audience is not highly politically interested or engaged. This leads to the apparent paradox that those most likely to accept persuasive messages are least likely to receive them (Zaller 1992). Building on these insights, Arceneaux and Johnson (2013) have argued that audiences that consume a medium for entertainment purposes should be more likely to change their opinion if they receive

political news via that medium than audiences that consume the medium because they intend to consume political news.

Arceneaux and Kolodny (2009) show that voters changed their minds when exposed to messages on birth control, but not on the highly salient issue of abortion. On highly salient issues, citizens will already hold crystallized attitudes that are difficult to move. This is consistent with findings by Gerber, Karlan, and Bergan (2009) who report null effects of subscribing to either the Washington Post or the Washington Times on opinions towards the Iraq War in 2005. Clearly, Iraq was a highly salient issue in the United States in 2005. Moreover, the framing literature suggests that one-sided messaging is particularly effective (Chong and Druckman 2007). We should hence expect media effects to materialize in political environments characterized by one-sided messaging on emerging issues. We therefore deduct that if exposure to strong frames happens in the absence of effective counter frames, the media should be able to shape strong attitudes in relation to an issue. As Chong and Druckman (2013: 13) write, once "strong attitudes are accessible, counter-frames are rejected and may even serve to reinforce the original attitude". Strong attitudes are then difficult to change going forward and will be less likely to decay.

One of the key remaining challenges in the study of media effects is hence to identify the consequences of sustained exposure to media content, so-called "media campaigns", on specific issues of policy importance. A prime example of such a media campaign is the one-sided negative coverage that the European Union (EU) was subject to over three decades in the British tabloid press (Hobolt and Tilley 2014; Jackson, Thorsen, and Wring 2016). While the EU issue in the 2010s had become highly salient and during the EU referendum campaign reporting was balanced, English voters had been exposed to Eurosceptic content for decades (Levy, Aslan, and Bironzo 2016; Jackson, Thorsen, and Wring 2016). One remarkable aspect of this exposure is that a lot of it happened inadvertently while consuming tabloid media for their celebrity or sports coverage (Rooney 2000).

Eurosceptic media outlets and the reporters associated with them had consistently portrayed European integration as a threat to sovereignty, and the EU as an inflexible and irrational bureaucracy imposing layers of red tape on member states (Jackson, Thorsen, and Wring 2016). While many researchers (Hooghe and Marks 2007; de Vreese 2007) and columnists (Martinson 2016; Bennhold 2017) have wondered whether the tabloid press have contributed to the rise of Euroscepticism –

the (qualified) rejection of European integration (Vasilopoulou 2013; de Vries 2018), across Britain and other European countries – testing this claim is difficult. Researchers have mostly relied on cross-sectional surveys (Carey and Burton 2004), or panel studies to control for time-invariant confounders (De Vreese and Boomgaarden 2006). Survey-experimental studies suggest that there can be immediate effects of Eurosceptic media frames on public attitudes, for instance towards EU enlargement (De Vreese, Boomgaarden, and Semetko 2011). Thus, while there is evidence that media slant is correlated with public attitudes, and experiments show that Eurosceptic frames and primes can have immediate effects in the direction of the information, it remains unclear whether sustained Eurosceptic media campaigns are able to consequentially influence public opinion in the long run.

3 The Case: Hillsborough and the Merseyside "Sun" boycott

To study such sustained media effects in a real world setting, we need to observe substantial and relatively sudden change in media landscapes. Yet, media landscapes are normally relatively stable and change slowly; on rare occasions media outlets enter or exit existing media markets, offering opportunities to study the effects of newspapers or TV channels on political outcomes (Gentzkow, Shapiro, and Sinkinson 2011; Dellavigna and Kaplan 2007). However, the decision to enter or exit a media market can be endogenous to political or economic considerations such as consumer demand or the lack thereof (Gentzkow, Shapiro, and Sinkinson 2011). Normally, media boycotts also follow a political logic. We overcome this endogeneity concern by relying on the case of the long-lasting "Merseyside Sun boycott", which was caused by an exogeneous event, the Hillsborough sporting disaster involving Liverpool F.C. and the ensuing slanderous media coverage in The Sun tabloid, which led to a geographically restricted boycott of the paper.

On 15 April 1989 Liverpool F.C. played Nottingham Forest in the semi-finals of the British Football Association (FA) Cup in the Hillsborough stadium. Due to overcrowding and an ensuing mass panic, ninety-six Liverpool supporters lost their lives, hundreds were injured and thousands traumatized (Scration 2004; Wright 1993; Wright, Gaskell, and O'Muircheartaigh 1998).[1] As pictured in Figure 1, The

[1]Originally the match was scheduled to start at 3 pm. Yet, approximately at 2.30 pm large crowds – predominantly Liverpool F.C. supporters – started gathering in front of the stadium. Police officers then decided to open the exit gates in order to ensure that the masses could enter the stadium on time and enjoy the soccer match. This uncontrolled in-streaming of ever more people led to a overcrowding of the stadium, specifically of the side pens (Jemphrey and Berrington 2000).

Sun's sensationalist coverage of the disaster was particularly one-sided and falsely claimed that "the truth" about the disaster was that Liverpool supporters were responsible for the chaotic escalation, and ultimately, for their own death.

Figure 1: The Sun's Hillsborough and EU coverage

Source: British Newspaper Archive (British Library)

Based partly on false information by a South Yorkshire police inspector, The Sun claimed that Liverpool supporters had stolen from the dead as the disaster unfolded. According to The Sun's source, one of the victims had "numerous wallets" on him, and was likely "one of the Liverpool pickpockets". Despite what would turn into a commercial disaster for the paper, The Sun remained unapologetic. This stubbornness led to a boycott of The Sun in the Merseyside area. Soccer is very important to Liverpudlians' identities and to the city of Liverpool (Alrababah et al. 2019). While initially, The Sun boycott was initiated by football supporters and their family and friends stopping to purchase the tabloid in protest of The Sun's coverage, soon the boycott was coordinated by the Hillsborough justice campaign (BBC 2012). The boycott has not only been supported by fans of Liverpool F.C., the most popular soccer club in Merseyside, but even supporters of Premier League rival Everton F.C. showed their solidarity with Liverpool supporters and the Hillsborough 96, and vouched never to buy The Sun again. Until today, this boycott is ongoing. In 2017 after speaking to several victims of the Hillsborough disaster, the club owners and the manager Jürgen Klopp decided to ban all "Sun" journalists from entering their stadium at Anfield Road and their training grounds (Conn 2017).

The Sun's version of the Hillsborough disaster was comprehensively contradicted by multiple reports released by the official Hillsborough Independent Panel, which pointed to the catastrophic mishandling of the situation by the police (House of Commons 2012). The Guardian estimates that in the wake of the Hillsborough disaster, The Sun's circulation fell from 55'000 copies to just around 12'000 copies in Merseyside, although this figures cannot be independently verified (Brook 2005).

Thus, to achieve valid and reliable information about the extent of the boycott in Merseyside, we conducted a telephone survey. More precisely, in January and February 2021 we surveyed the entire population of newsagents and cornershops located in Merseyside and two directly adjacent counties, Lancashire and Cheshire, listed on Yelp where a functioning telephone number could be located either on Yelp or Google Maps.[2] Newsagents were interviewed about newspaper sales, with no reference to Hillsborough or The Sun boycott. The results clearly confirm that The Sun boycott in Merseyside is wide-spread. Overall, 62% of newsagents' in Merseyside reported not selling The Sun. This figure increases to 86% in the city of Liverpool. The survey also shows that the boycott is clearly

[2]The response rate to the telephone survey was 25% for an overall sample of N=165. More details on the newsagents telephone survey can be found in Appendix A.1.

geographically limited: 90% of newsagents in Lancashire and 88% of newsagents in Cheshire report selling The Sun. Asked about the number of copies of The Sun the newsagent sold on an average weekday, 34% of newsagents who did not sell The Sun mentioned the boycott unprompted. One newsagent went on to explain:

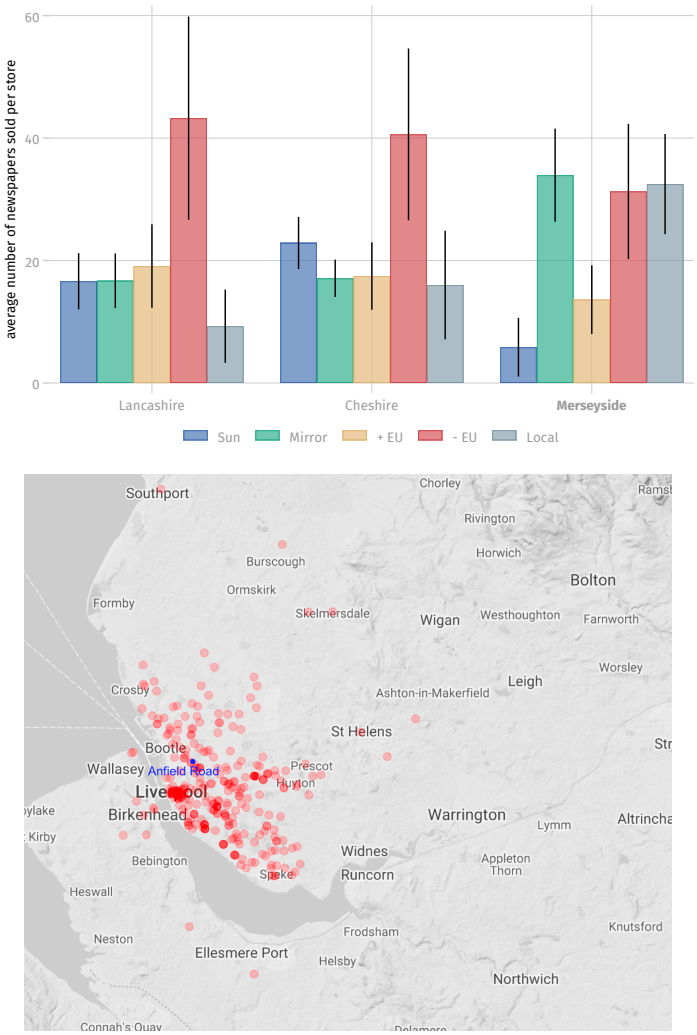
> "You're in Liverpool mate, not sure if you're a football fan, but no Scouser would dare read it. You might get the odd one or two in the city, maybe the odd tourist, but that's about it. Ever since Hillsborough, nobody in this city touches it."

"It's Liverpool, innit?" was a common theme when interviewing newsagents' about how many copies of The Sun they sold. The top panel in Figure 2 displays the estimated number of newspaper sales on an average weekday per newsagent in Merseyside compared to adjacent counties. With an estimated 6 copies sold per newsagent per day, sales in Merseyside are only around 1/3 of the sales compared to Cheshire and 1/4 of the sales compared to Lancashire.

The bottom panel of Figure 2 then reports shops boycotting The Sun in Merseyside according to a webpage associated with the "Total Eclipse of the S*n"-campaign. Both independent data sources provide complementary information on the extent of the boycott and show that the boycott is strong across Merseyside – strongest in its core –, and does not significantly extent to areas outside of Merseyside.

Even after The Sun's unreserved apology in 2012 under the headline "Hillsborough: The real truth", which admitted that their reporting on Hillsborough was the "gravest error" in the tabloid's history and acknowledged that "the people of Liverpool may never forgive us for the injustice we did to them" (Moriarty, Veevers, and Dunn 2012), the boycott is ongoing to this day (Conn 2017). In fact, a strong social norm of boycotting The Sun developed in Merseyside. The norm not only extends to boycotting the newspaper itself, but also to interviews by public figures such as Merseyside MPs and celebrities who are publicly sanctioned when breaking the norm (Thorp 2018; The Liverpool Echo 2011). Due to the UK's reliance on newsagents for newspaper sales, before the advent of the internet in the 2000s, norm violations were easy to police, and the initial boycott easier to enforce. Three newsagents interviewed mentioned unprompted that they were not selling the paper because they were worried about customers' reactions: "We stopped selling The Sun because we don't want any trouble - people were coming in and complaining". One newsagent reported that last time they tried

Figure 2: Extent of the boycott in Merseyside and adjacent counties



Source: Top: Original telephone survey (N=165 shops). Whiskers report 95% confidence intervals.
Bottom: retrieved from: https://totaleclipseofthesun.org/shops.

selling The Sun, people were “throwing things”. There is also evidence that the boycott led to habit formation which lasted into the internet age. To get a better understanding of how often people in Liverpool access The Sun online, we report Googletrends data (more information: Appendix A.1), which is available at the city level in England from 2004 until today.

Googletrends displays the relative amount of searches for a respective term; meaning that we can not know how many people in Liverpool searched for The Sun on Google but only the relative number in relation to the region where most people searched (Wolverhampton=100%). In Liverpool we find by far the lowest search amount in any British city, with a 30% search share. Even in urban, cosmopolitan areas such as London, Oxford or Cambridge the search amount is still around 50%.

Overall, this suggests we have little reason to question that people from Merseyside bypass the boycott of The Sun or seek access to The Sun via the internet, even today.

The occurrence of the Hillsborough disaster, thus, gives us the rare opportunity to identify the causal effect of a sustained media boycott on attitudes towards the EU because the circulation of the most important Eurosceptic tabloid was significantly reduced due to a sporting disaster, which was unrelated to the tabloid's EU coverage. Readers did not choose to stop reading The Sun due to its EU coverage, but they did so due to a clear cause, which is *exogenous* to The Sun's anti-EU campaign. Thus, our research design addresses the methodological issues of *selection* and *reverse causation* discussed above.

4 The Sun's EU coverage

The Australian-born media mogul Rupert Murdoch bought the British newspaper The Sun in 1969 and turned it into a "red top" tabloid paper (Rooney 2000), directly competing for readers with the Daily Mirror, a title which dominated the tabloid market in the UK in the 1960s and 1970s. The British newspaper market can broadly be divided into two sections: "Quality papers", often referred to as "broadsheets" such as The Guardian and The Times and "tabloids", which are defined by their sensationalist coverage and eye-catching title pages. By the end of the 1970s, The Sun had overtaken The Mirror as the most widely read tabloid in the UK (Johansson 2007). In 1992, The Sun had a daily circulation of around 3.6 million and was read by around 10 million individuals (Rooney 2000). At the end of the 1980s, The Sun and The Mirror combined sold more copies than all other English newspapers taken together (Johansson 2007).

However, in contrast to its main competitor, The Mirror, The Sun took a strong negative editorial stance on the European Union during the 1990s and 2000s (see Figure A.4 and Figures A.5 in the Appendix for the number of articles and proportion of editorials that contain EU-specific search terms). As Nigel Farage commented in a recent BBC interview, "I think Murdoch helped to create an environment in which Brexit could happen with the Sun's pretty constant Eurosceptic criticism" (Roberts 2020).

In Table 1 we display a comprehensive content analysis of a random sample of editorials published

in The Sun and The Mirror which contained search terms associated with the "European Union".[3] Between 1996 and 2016, the time period for which editorials are available in the Factiva database, 92% of The Sun's editorials displayed a negative tone towards European integration and 80% were classified as "Eurosceptic", based on the definition by Vasilopoulou (2013) provided to coders (see Appendix A.3.1). This overwhelmingly negative slant of The Sun compares to the relatively neutral to positive slant which is visible in The Daily Mirror throughout the same period. Only 10% of The Mirror's editorials were classified as "negative" in tone towards European integration by coders and only 6% could be classified as "Eurosceptic".[4]

Table 1: Editorial slant of The Sun and The Mirror, 1996 - 2016

	The Sun	The Mirror	% agreement	Kappa	Pearson's r
% EU	56.9	49.4	83.6	0.67	
N	610	352	481	481	
% negative	91.6	10.3	92.3	0.83	
0-100 negativity scale	62.0	41.3			0.75
% Eurosceptic	80.1	6.3	76.9	0.55	
N	347	174	221	221	200

While The Sun's Online Archive only starts in 1996, in Appendix Figure A.8 we present qualitative evidence that The Sun's Eurosceptic coverage was pronounced around the time of the Hillsborough disaster in the early 1990s when the paper opposed then Commission President Jacques Delors in his feud with British Prime Minister Margaret Thatcher about further European integration, British participation in monetary union and British contributions to the EC budget. Now famous articles and editorials from 1989 and 1990, the period directly following the Hillsborough disaster, are shown in Figure 1 and A.8 in the Appendix.

Moreover, The Sun became famous for inventing and spreading so-called "Euro-myths", some of the most famous being that Brussels was trying to ban "bendy bananas" and regulate the shape of cucumbers (see Figure A.9 in the Appendix for a famous Sun story). All stories portray EU bureaucrats as out-of-touch and trying to impose unnecessary red tape on Britain. The persistence of Euro-myths

[3]The search terms we used were: "EU", "European Union", "European Community", "Brussels" and "Europe", excluding all terms associated with sports competitions.

[4]A detailed discussion of the methodology applied, the inter-coder reliability of the measures, and instructions given to coders can be found in Appendix A.3.1. Due to national lockdown restrictions because of COVID-19, we were unable to extend the content analysis to the years from 1983-1995. The Sun's online archive is only available from 1996 onwards and the British Library, which has archived all editions of The Sun on micro-film in London, was closed during two national lockdowns in England that coincided with the R&R period.

among the British public was a problem important enough that the European Commission dedicated an entire website to debunking these myths during the 2016 EU referendum campaign (Hobolt and Tilley 2014). While there are other Eurosceptic papers in the UK, notably the Daily Mail and the Daily Telegraph, The Sun has by far the highest circulation numbers. As Figure A.2 in the Appendix shows, in 1992, The Sun had around 3.6 million readers compared to the Mail's 1.7 million readers and the Telegraph's 1 million readers. Moreover, the class appeal of Eurosceptic papers in the UK is markedly different. The Sun's readership is significantly more working class than the readership of other papers (Ladd and Lenz 2009; Rooney 2000; see also Figure A.16 in the Appendix). During most of the period we study, The Sun supported the Conservative party under Margaret Thatcher (PM from 1979-1990), and John Major (PM from 1990-1997). While the tabloid switched support to New Labour under Tony Blair and Gordon Brown from 1997 until the 2010 General Election, it remained steadfast in its Eurosceptic slant and anti-EU coverage throughout UK Labour's last period in office (Ladd and Lenz 2009; Roberts 2020).

The Sun was a major media player in the EU referendum campaign of 2016 when it forcefully advocated for a "Leave" vote (see Figure A.10). A comprehensive analysis of EU referendum media coverage shows that The Sun was classified as one of only two papers in the UK (the other being the Daily Mail) that was both Eurosceptic in its positioning and had a large reach and volume, meaning it was read by a large proportion of the electorate (Levy, Aslan, and Bironzo 2016: 17). Importantly, The Sun published more than twice as many articles on the referendum than the second most important tabloid, the Mirror, which took a pro-EU stance (Levy, Aslan, and Bironzo 2016: 12). Emphasizing the papers' perceived contribution to Brexit, the editor of The Sun, Tony Gallagher, texted the Guardian Newsroom on the morning after the referendum with the words "So much for the waning power of the print media" (Martinson 2016).

5 Research Design

The unexpected occurrence of the Hillsborough disaster allows us to estimate the causal effect of a wide-spread, but geographically restricted, boycott of the most important Eurosceptic tabloid newspaper in the UK, caused by a plausibly exogenous event, on attitudes towards leaving the EU. In our framework, all parliamentary constituencies that happen to be located within Merseyside county

would be assigned to treatment, the tabloid boycott. Our main analyses are therefore "Intent-to-Treat" analyses. We conceptualise the boycott as a large number of shops refusing to sell the paper and a majority of citizens refusing to read The Sun. Both dynamics are strongly and positively correlated: In our data we do not observe evidence consistent with a displacement mechanism: Shops in Merseyside that continue to sell The Sun do not sell more copies than shops in places where the boycott is not operational. In auxiliary analyses we therefore measure the extent of today's boycott via two distinct but complementary proxies: the number of stores that participate in the boycott according to a list provided on the "Total Eclispe of the S*n" campaign website that we scraped from the internet and geo-located within parliamentary constituencies[5] and based on the proportion of shops boycotting The Sun as recorded in our newsagents survey.

Given the strong anti-EU stance of The Sun, we expect that due to the boycott induced by the Hillsborough disaster, Euroscepticism should decrease in Merseyside, compared to a counterfactual where Hillsborough would not have happened. To construct this credible counterfactual, we rely on a difference-in-differences design (DiD) (Angrist and Pischke 2009; Dunning 2012), assuming that Euroscepticism in Merseyside would have continued on a similar trend to the rest of Northern England, were it not for The Sun boycott directly induced by the newspaper's libellous reporting on the Hillsborough disaster.

5.1 Estimation

To estimate the DiD we allocate respondents to the treatment group if they reside in parliamentary constituencies within Merseyside, and to the control group if they reside in the remaining Northern English parliamentary constituencies. The key reason for why we define other Northern English constituencies as the control in our main specification is that they were subject to similar macro-economic and socio-economic trends over period that we study (Wilks-Heeg 2003; Harding, Wilks-Heeg, and Perry 2001). Regions such as London and the South of England had seen faster economic growth in the 1980s and 1990s than the North of England. Note, however, that our findings are robust to including all of England as a control group (Appendix A.7).

[5] According to the website, there are a few shops that participate in the boycott and are not located in Merseyside. We also geo-locate these shops in their corresponding parliamentary constituencies. We use this measure as an alternative specification of the treatment in our DiD framework (see Appendix Table A.15) and as the endogeneous variable in a 2-stage least squares regression reported in Appendix Table A.16.

We apply a two-way fixed effects specification which allows us to adjust for any time constant differences across constituencies:

$$\text{leaving EU}_{i,c,t} = \alpha_c + \gamma_t + \delta_{\text{DID}} T_{c,t} + \epsilon_{i,c,t} \tag{1}$$

where *Leaving EU*$_{i,c,t}$ is respondent *i*'s support for leaving the EU in constituency$_c$ at year$_t$; α_c is a constituency fixed effect that rules out omitted variable bias from unobserved constituency characteristics that are invariant over our study period; γ_t are time fixed effects (year, quarter) which control for common factors changing across time; $T_{i,c,t}$ is our binary treatment indicator, Merseyside after the Hillsborough disaster, and $\epsilon_{i,c,t}$ is the error term. δ_{DID} is the estimand of interest which identifies the effect of Hillsborough on Euroscepticism in Merseyside. Since the sampling frame of the survey is stratified by constituency, we cluster our standard errors at the constituency level.[6]

As a robustness test we use constituency-specific linear time trends instead of the simpler constituency and time fixed effects specification, outlined above. The model we estimate is as follows:

$$\text{leaving EU}_{i,c,t} = \alpha_c + \gamma_t + \alpha_c \times \gamma_t + \delta_{\text{DID}} T_{c,t} + \epsilon_{i,c,t} \tag{2}$$

This allows treatment and control constituencies to follow different trends (Angrist and Pischke 2009: 238). Furthermore, we conduct subsample analyses (Appendices A.6 & A.7), investigate potential spillover effects to adjacent constituencies (Appendix A.8), conduct placebo tests (Appendix A.9), use matching techniques (Appendix A.10), and provide additional information and data that helps us appreciate the exclusion restriction to further substantiate the robustness of our empirical findings.

Our attitudinal analyses are based on the long-running and high-quality British Social Attitudes

[6] Clustering can follow two types of logic: Sampling or assignment (Abadie et al. 2017): The BSA followed a two stage sampling process where in the first stage, a subset of constituencies was randomly sampled from the population of all constituencies, and in the second stage, respondents were sampled randomly from the sampled constituencies. Hence, there are constituencies in the population that we do not see in the sample and we should therefore cluster at the constituency level. Clustering can also be driven by design considerations: One might argue that the treatment is assigned at the county-level and that we should therefore cluster our standard errors at that level. We do so in Appendix A.11. Our conclusions remain unaffected by this decision. Since we have fewer than 50 counties in our data, standard errors are biased downwards when clustering at the county level. We address this issue by applying a wild bootstrap (Esarey and Menger 2019).

(BSA) Survey – an annual, cross-sectional survey of public opinion towards social and political issues in Britain (National Centre for Social Research 2004). We rely on the BSA Survey since it is the only survey in the UK that covers a sufficiently long time-period before and after the Hillsborough disaster, as well as providing information about the location of the interview at the constituency level. We cover the years from 1983 to 2004, the last year in which parliamentary constituency identifiers are included in the BSA, allowing us to match respondents to the area in which they live. From 2005 onwards, the BSA does no longer include any location identifiers smaller than the sub-region.[7] 908 of the 35,204 BSA respondents live in one of the 15 parliamentary constituencies within Merseyside and were directly exposed to the "Sun" boycott.[8] We measure Euroscepticism by relying on the question asking respondents if "Britain should continue its EEC/EU membership". Our dependent variable Leaving EU is then coded '1' if respondents answered that Britain should withdraw from the EEC/EU, and '0' otherwise.[9] As we use the BSA Euroscepticism measurement instrument over a 30-years time-period, concerns over measurement error linger. In Appendix A.4 we validate the measurement instrument by reporting a strong correlation between national trends in Euroscepticism as recorded in the BSA and the most frequently used measure based on Eurobarometer data.

Since we are dealing with repeated cross-sectional data, we control for respondents' gender, age, education, ethnicity, self-reported social class and party identification. As the BSA reports the interview dates for each respondent, we can directly identify which respondents were interviewed before and after the 19^{th} of April 1989 – the day The Sun published its first of several slanderous front-pages on the Hillsborough Disaster.

[7] We also considered using Eurobarometer data (EB), the British Household Panel Study (BHPS) and the British Election Study (BES). While providing excellent information on Euroscepticism, the EB does not provide any geo-locations prior to 1990, and the BHPS only started in 1991. The BES 1987-1992 panel study would allow us to investigate two years, 1987 and 1992, but there are only 46 respondents interviewed in Merseyside post-Hillsborough. All of these shortcomings make it either impossible to use these data sources (EB, BHPS) or less useful than the BSA (BES).

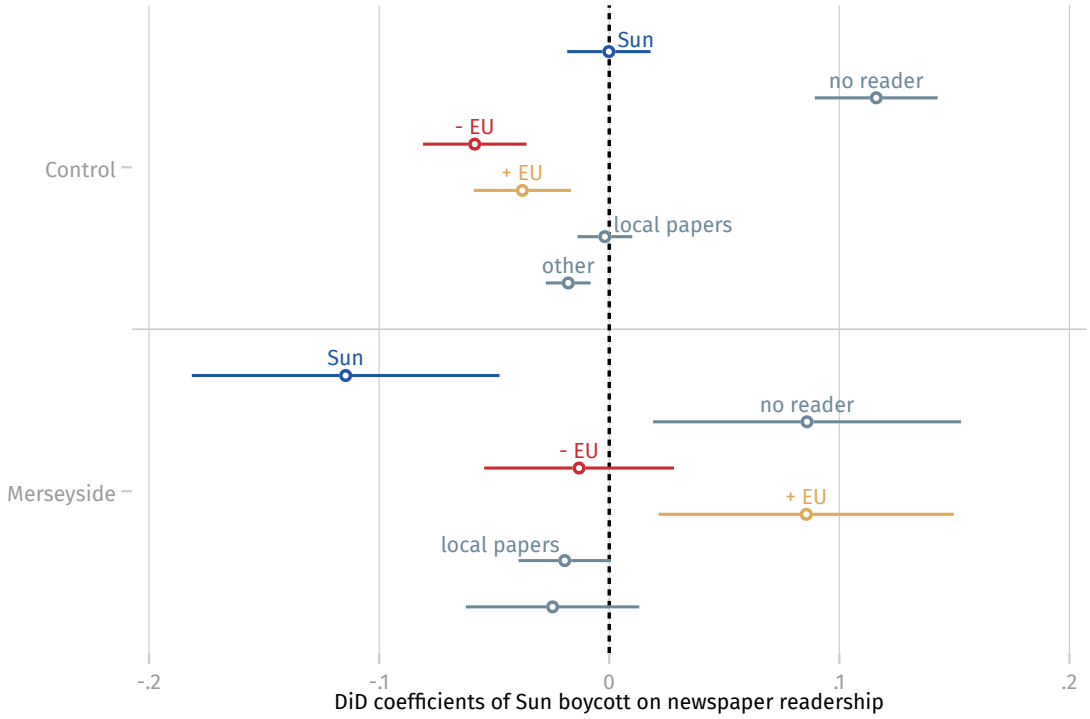
[8] Several variables report missing values for respondents. We mean impute all missing values in the analyses reported below; our findings are robust to excluding all missing observations (Appendix section A.5).

[9] From 1993 onwards the BSA introduced six answer categories to the same question: "uk leave ec", "stay+reduce ec power", "leave as is", "stay+incr.ec power", "single ec govt", and "don't know". However, since this change in the measurement instrument does not coincide with the treatment, it should not bias our results. All results are robust to excluding the 1993-2004 period.

6 Results

Figure 3 shows the results of the manipulation check, the effect of Hillsborough on self-reported print media consumption among respondents sampled in parliamentary constituencies located within Merseyside, compared to respondents sampled from the remaining parliamentary constituencies located in the North of England. The Sun does not release circulation data at the county level or below, and we are therefore unable to estimate the effects of the Hillsborough disaster on actual "Sun" readership in Merseyside. While self-reports can be a function of social desirability bias, in this case this would confirm the existence of a strong social norm against reading The Sun in Merseyside.

Figure 3: Effects of Hillsborough on 'Sun' readership and media substitution



Note: Predictions of multinomial logistic diff-in-diffs surrounded by 95 % confidence intervals.

Figure 3 compares change in self-reported newspaper readership in Merseyside post vs pre-Hillsborough (row B) to change in readership in other Northern English counties (row A). The changes in predicted probabilities derived from a multinomial logistic model plotted in Figure 3 can directly be interpreted in percentage-points, meaning that post-Hillsborough, "Sun" readership in Merseyside declined by 11 percentage-points compared to no change (a precisely estimated 0 percentage-points) in other Northern English counties. To be precise, self-reported Sun readership among respondents

living in parliamentary constituencies within Merseyside decreased from 18 to 7 percent.

Note also that Figure 3 shows a substitution effect of "Sun" readership to pro-EU papers, coded as Daily Mirror, Independent, Guardian, the Financial Times and The Times.[10] instead of substitution to anti-EU newspapers (Daily Mail, Daily Telegraph, Daily Star and Daily Express). Crucially, The Daily Mirror becomes by far the most popular national paper in Merseyside post-Hillsborough. This is both reflected in the self-reported readership data and the newsagents survey. Based on the BSA, among newspaper readers, 26% report reading The Mirror. Readership of all other pro-EU papers combined is only 6%. Moreover, based on the newsagents survey we estimate that the Mirror sells an average of 34 copies per newsagent daily in Merseyside, while the number is half that figure in the adjacent counties of Cheshire and Lancashire. Substitution from The Sun to The Mirror is plausible because many readers consume The Sun based on its cultural appeal and sports coverage which is most closely reflected by The Mirror, not The Daily Mail or The Daily Telegraph (Johansson 2007; Rooney 2000). As Rooney (2000: 107) writes The Sun and The Mirror "both thought the same readership, they both eschewed the serious in favor of the nonserious. Central to their editorial agendas was the pursuit of the sensational". While The Sun's and The Mirror's readership bases are mostly working class, the Mail's and the Telegraph's bases are (lower) middle class. While the DiD analyses that follow will not allow us to empirically distinguish between the effects of non-readership of Eurosceptic material in The Sun and potential substitution with pro-EU material in The Mirror, during the 1990s and early 2000s, which is the period covered by the public opinion data, in contrast to The Sun, The Mirror only published very few editorials pertaining to European integration (Figure A.4 in the Appendix). In fact, The Mirror published 1 editorial that included keywords relating to European integration in the years between 1996-2000, compared to The Sun that published 62 editorials over the same period of time. 92% of these "Sun" editorials showed a negative slant towards the EU. We therefore think that it is highly unlikely that the drop in Euroscepticism that we observe as a function of the boycott was in large part due to the Mirror's pro-EU coverage as opposed to the absence of The Sun's Eurosceptic content.

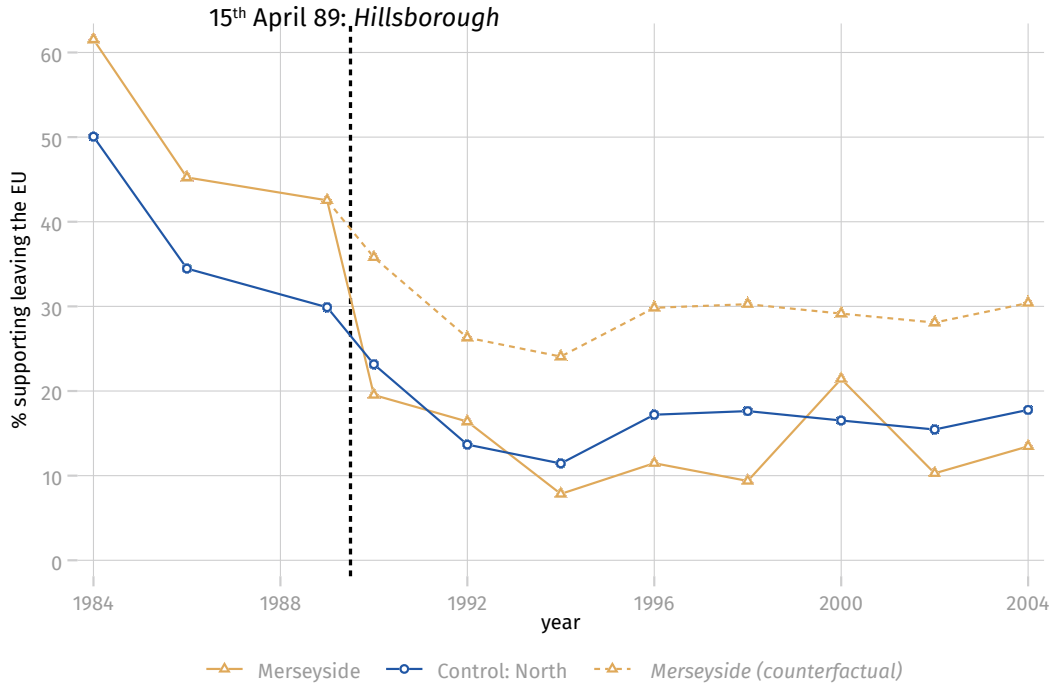
Figure 4 plots the percentage of respondents who support leaving the EEC/EU sampled from parliamentary constituencies within Merseyside and the control group consisting of respondents

[10] There is only some ambiguity about The Times' position. The Times endorsed "Remain" in the 2016 Brexit referendum. Re-classifying The Times to be a Eurosceptic papers does not change the results.

living in all remaining constituencies in the North of England along with a dashed line projecting counterfactual trends in Merseyside. We estimate this counterfactual by relying on the trends in the control group to extrapolate the trends for Merseyside. Since sample sizes are small for some individual years, we always pool two successive years in this figure. Before the Hillsborough disaster, respondents' opinions sampled within Merseyside constituencies followed parallel trends on Euroscepticism to opinions of respondents sampled in other Northern parliamentary constituencies. These parallel pre-trends give credibility to the assumption that in the absence of the Hillsborough disaster, respondents in Merseyside would have followed similar opinion patterns in Euroscepticism as the rest of Northern England. There are many similarities between Merseyside and the remaining North of England (e.g. voting patterns).[11] While we estimate that Merseyside was more Eurosceptic before Hillsborough, during the boycott we estimate that attitudes to EU membership in the early 1990s became significantly more positive in Merseyside compared to the counterfactual, and stayed more positive throughout the entire post-treatment period.

Table 2 reports the main findings of the formal Difference-in-Differences models. All models use

Figure 4: DiD Graph: Trends in Euroscepticism in Merseyside and control counties before and after Hillsborough



[11] In Appendix A.7 we specify all remaining English constituencies as the control group. Although the pre-trends diverge slightly between 1983 and 1984 in this specification, our findings remain entirely robust to this alternative specification.

the DiD strategy outlined above. The first model reports a simple bivariate comparison, the following two models add fixed effects for constituencies, year (2) and months (3) respectively. Model (4) then adds all control variables listed above. Models (5) and (6) then introduce interactive fixed effects.[12]

Table 2: DiD, Effect of Hillsborough on Euroscepticism (1985-2004)

	(1)	(2)	(3)	(4)	(5)	(6)
	support leaving the EU (0,1)					
δ DiD	-0.070	-0.172	-0.170	-0.166	-0.120	-0.114
	(0.016)	(0.047)	(0.049)	(0.044)	(0.032)	(0.033)
Constant	0.212	0.219	0.219	0.231	0.215	0.220
	(0.007)	(0.003)	(0.003)	(0.028)	(0.002)	(0.029)
Constituency FE		✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓	✓
Quarter FE			✓	✓	✓	✓
Constituency FE × Year					✓	✓
Constituency FE × Quarter					✓	✓
Controls				✓		✓
Obs	10384	10384	10384	10384	10384	10384
N $_{constituencies}$	172	172	172	172	172	172
adj.R^2	0.00	0.05	0.05	0.08	0.05	0.08
adj.R^2 (within)	0.00	0.00	0.00	0.03	0.00	0.03
RMSE	0.41	0.40	0.40	0.39	0.39	0.39

Note: Clustered standard errors by constituency. Controls (1985-2004): age, gender, education, religion, social class, party-ID. Constituency & time fixed effects omitted from table.

Throughout all models in Table 2 we estimate a theoretically meaningful, large effect of Hillsborough on respondents' attitudes towards leaving the EEC/EU in Merseyside. Depending on the models we estimate, the effects range from a 7 to 17 percentage-points decrease in Euroscepticism. Our preferred model, model 6, reports a 11 percentage-point decrease in Euroscepticism. Thus, we find a statistically significant and substantially meaningful decline in Euroscepticism due to The Sun boycott following Hillsborough. Note that effect sizes and significance levels are comparable across models 2-6 once we add more fixed effects, covariates and constituency-specific time trends. It is important to note that most of the decline in Euroscepticism occurs between 1989 and 1994, exactly at the time when The Sun made its first big stand on European integration vehemently opposing, ridiculing and deriding then Commission President Jacques Delors and Britain's adaption of the ECU, the predecessor of the EURO. Articles and editorials from the crucial 1989 and 1990 period are displayed in Appendix A.3.2.

[12] Since some covariates are not recorded in the years before 1985 (e.g. education) the main findings are based on the years 1985-2004. Our findings are entirely robust to the inclusion of the entire time span (Appendix A.6).

The analyses presented here do not yet incorporate the extent of the boycott. To do so, we rely on the web-scraped information on boycotting shops along with our telephone survey of newsagents to estimate the extent of the boycott across English constituencies and counties. In Appendix A.14 we use these measures to re-estimate our DiD model, first using the extent of the boycott as measured by the logged number of boycotting shops per constituency scraped from the "Eclispe of the S*un" website, and, second, based on an instrumental variable approach. We use the number of boycotting shops per county as the endogenous variable and location within Merseyside post Hillsborough as the exogenous instrument, and second we use the proportion of boycotting shops per county as estimated based on the newsagents survey as the endogeneous variable. In both instances we distinguish between the city of Liverpool and other places in Merseyside to account for the essential geographical variation in the strength of the boycott.[13] Our findings are robust to both 2SLS specifications.

We also report further tests in the Appendix. First, we report the results using respondents sampled in all remaining English parliamentary constituencies as the control group. Re-estimating the DiD models does not change our findings (Appendix A.7). Second, we investigate whether there are spillover effects into counties adjacent to Merseyside. Spillover effects could imply that we underestimate the effect of reading The Sun on Euroscepticism since in the models reported in Table 2 these constituencies are part of the control group. However, we do not find a pattern of effects that would be consistent with large spillover into adjacent areas (Appendix A.8). This is consistent with the results from our newsagents survey, which show that the boycott is geographically limited to Merseyside. Third, the decrease of Euroscepticism might not be unique to Merseyside, but subject to a more general pattern across English constituencies. Hence, we randomly re-assigned the treatment into other parliamentary constituencies in England using a (*permutation test*) and find that the drop of Euroscepticism in parliamentary constituencies located within Merseyside is statistically distinct from the simulated sample of estimates (Appendix A.9). Fourth, we used matching on observables to address issues of comparability between treatment and control group across space and time. Again

[13] Since we are unable to go back in time, we only hold information about the extent of the boycott as of today. For our 2SLS specification, we need to make the assumption that the boycott began in 1989 and that the geographic variation of the boycott (between Liverpool and other places in Merseyside, and between Merseyside and other counties) was stable over time. While this corresponds to an approximation, we think that the relative strength of the boycott across counties is unlikely to have differed systematically.

our findings remain robust (Appendix A.10). Fifth, we re-estimate the DiD clustering at the county-level and including county-level fixed effects. The results remain consistent (Appendix A.11).

6.1 Excludability

For our results to be valid, we need to assume that Hillsborough in April 1989 did not coincide with any other significant event or phenomenon of similar importance that differentially applied to Merseyside compared to other Northern English counties and could (to a large extent) explain the large decline in Euroscepticism in Merseyside that we observe compared to control areas. This assumption is often summed up as the "no compound treatment assumption". There are three alternative developments, an increase in Labour Party support under Tony Blair during the 1990s and 2000s, an increase in EU structural funds to Merseyside, and de-industrialisation due to globalisation, that could potentially provide threats to inference. In what follows, we provide evidence that we think helps us appreciate the validity of the excludability assumption.

First, during the mid 1990s and early 2000s, the UK saw a decline in Conservative party support and a shift to the Labour Party, first lead by Neil Kinnock, then by the late John Smith, and from 1994 on-wards, by Tony Blair. Thanks to its industrial heritage and radical political tradition (including the Militant tendency), by the late 1980s Merseyside was a bastion of the UK Labour Party. Importantly, by 1983, the beginning of our time series data, the Labour Party had decisively abandoned its Euroscepticism under its socialist leader Michael Foot (1979 - 1983), and both the pre-treatment 1987 and the post-treatment 1992 Labour Party manifestos authored under Neil Kinnock's leadership consistently committed Labour to staying in the EEC. Recall that for the DiD to be valid, trends need to be parallel, not levels. Consistent with the excludability assumption, a study of Merseyside politics by Wilks-Heeg (2018) finds that an increase in Labour Party support occurred in the 1980s, and then again after 2010. Beyond this qualitative illustration, we try to address any remaining concerns empirically in our matching approach in Appendix A.10, where we match respondents in treatment and control on party identification. We show that our results are robust to including party identification (which is plausibly endogeneous) as one of the variables we match on.

Second, during the 1990s Merseyside was named a priority region for the receipt of EU structural funds (Objective 1 spending) by the UK government lead by Conservative Prime Minister John Major.

An increase in EU structural funds over and above what other Northern counties received could hence potentially provide an alternative explanation for our findings. However, Merseyside was only dedicated a priority region for EU structural funds from 1994 on-wards, for the 1994-1999 funding round (Di Cataldo 2016). Before that, for the crucial 1988-1993 funding round which directly coincides with Hillsborough, Merseyside benefited from structural funds equally with other Northern counties. Figure 4 clearly shows that the largest drop in Euroscepticism in Merseyside occurs in the early 1990s, not in the mid 1990s, which would have pointed to some influence of EU structural funds. This assumption is also consistent with a recent paper using a RDD to identify the effects of EU structural funds on Euroscepticism, which reports null effects (Schüssler 2019).

Third, previous scholarship contends that globalization shocks contribute to explaining the recent success of challenger parties (Autor, Dorn, and Hanson 2013) and the rise in Eurosceptic attitudes (Colantone and Stanig 2018). If Merseyside was affected differently by globalization at the exact time as The Sun boycott occurred, this might explain the decline of Euroscepticism. In this context it is important to note that Liverpool was worst hit by deindustrialisation in the 1970s and the early 1980s (Wilks-Heeg 2003) and that the economic revival of the region did not start in the early 1990s. Liverpool's population continued to decline (albeit at a lower pace) until 2001 and economic growth only returned in the 2000s (Harding, Wilks-Heeg, and Perry 2001). Moreover, in Appendix A.13 we merge the BSA data with information about the "offshorability" of respondents' jobs – a valid approximation for individuals' economic affectedness by globalization (see: Mahutga, Curran, and Roberts 2018) –, control for "offshorability" and our findings remain unaffected.

6.2 Mechanisms

To further understand which sub-populations drive our global finding, we rely on a set of Difference-in-Difference-in-Differences (DiDiD) designs. Doing so allows us to better understand which mechanisms could potentially explain the main findings reported above.

First, we investigate how the boycott of The Sun affected generations that were socialized into politics while the boycott was ongoing. Research on political socialization posits that political identities tend to develop in younger age and frequently remain fairly stable across the life cycle (Dinas 2013). These "formative years" are described as a laboratory in which ideas are exchanged,

challenged, dropped and renewed. Applied to our case at hand, this might mean that people going through their formative years during the boycott a) might be more likely to support the boycott and, thus, b) be more supportive of the EU due to the absence of The Sun's Eurosceptic slant. In contrast, both effects should be weaker for people which are past their formative years when the boycott started.

To test this idea we coded all respondents as 'experiencing their formative years during the Sun boycott' if they were born after 1972. The reason for choosing this year as our cut-off is that these respondents were 16 or younger at the time the Merseyside region decided to boycott The Sun. We then use this dummy and interact it with the Merseyside indicator, such that our treatment group are respondents born after 1972 in Merseyside. Table 3 reports our findings for "Sun" readership and

Table 3: DiDiD, Effect of Hillsborough during formative years (1985-2004)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sun readership (0,1)				support leaving the EU (0,1)			
Merseyside × born after 1972	-0.094	-0.080	-0.082	-0.085	-0.066	-0.065	-0.061	-0.060
	(0.021)	(0.024)	(0.025)	(0.026)	(0.033)	(0.030)	(0.030)	(0.029)
Constant	0.124	0.126	0.125	0.180	0.215	0.207	0.207	0.310
	(0.005)	(0.005)	(0.005)	(0.022)	(0.007)	(0.006)	(0.005)	(0.027)
Birth year FE		✓	✓	✓		✓	✓	✓
Study year FE			✓	✓			✓	✓
Controls				✓				✓
Obs	10225	10223	10223	10223	10350	10348	10348	10348
N $_{constituencies}$	172	172	172	172	172	172	172	172
adj.R^2	0.00	0.00	0.00	0.04	0.00	0.02	0.05	0.07
adj.R^2 (within)	0.00	0.00	0.00	0.04	0.00	-0.00	-0.00	0.02
RMSE	0.33	0.33	0.33	0.32	0.40	0.40	0.40	0.39

Note: Standard errors clustered by constituency in parentheses. Controls (1985-2004): gender, education, religion, social class, party-ID. Fixed effects omitted from table.

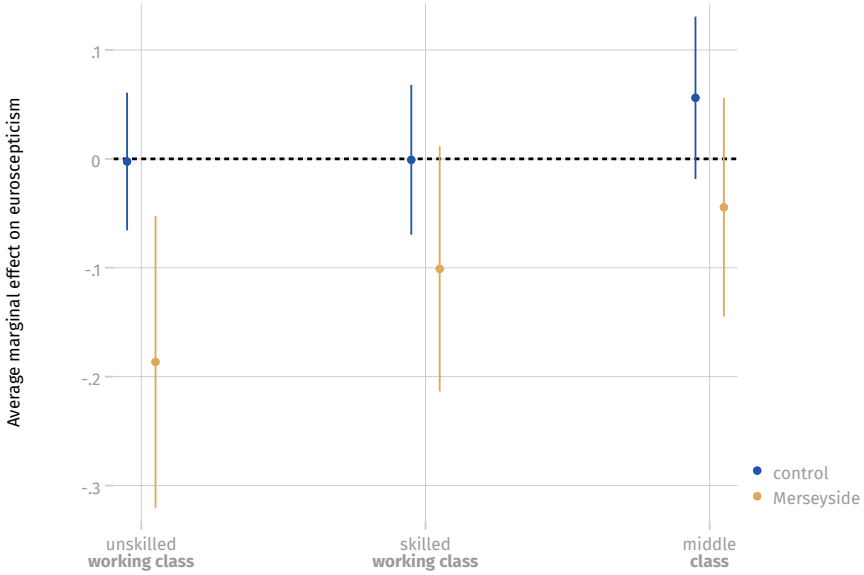
support for leaving the EU. Indeed, for the models we estimate, we find a stronger effect during the formative years. Respondents experiencing their formative years during the boycott are significantly less likely to read The Sun and to be Eurosceptic. This finding is even more telling if we keep in mind that according to our data, respondents born after 1972 are overall more likely to read The Sun and to be Eurosceptic outside of the Merseyside region. This further underpins our previous findings and adds the perspective that the boycott indeed might shape political attitudes in Merseyside, particularly for younger cohorts born after the boycott.

Second, social class is an important predictor of whether a respondent reads The Sun. Hence, the effects of the successful "Sun" boycott should be more pronounced among working class respondents, with middle class respondents who were unlikely to read The Sun in the first place, acting as an

additional control group within Merseyside.

We report our procedure in detail in Appendix A.16. We find that unskilled and partly-skilled workers were much more likely to read The Sun than skilled workers, intermediate occupations or professionals, before the Hillsborough disaster. We should therefore expect that the effect of The Sun boycott should be most pronounced among unskilled and semi-skilled workers. Figure 5 reports the marginal effects of the three-way interaction between the DiD estimand and social class. We use three class indicators in our analysis: low (unemployed, unskilled, semi-skilled), medium (skilled) and high (intermediate and professional).[14] The results of the DiDiD model vary as expected across

Figure 5: Difference-in-Difference-in-Differences results for social classes



Note: Reported are the CATEs stemming from a difference-in-difference-in-differences model interacting the standard DiD estimand with self-reported social class (unskilled working class (baseline): *"never had job", unskilled*; skilled working class: *partly skilled, skilled*, middle: *intermediate, professionals*) of BSA respondents. Plotted are point estimates (scatter) surrounded by 95 % confidence intervals (whiskers).

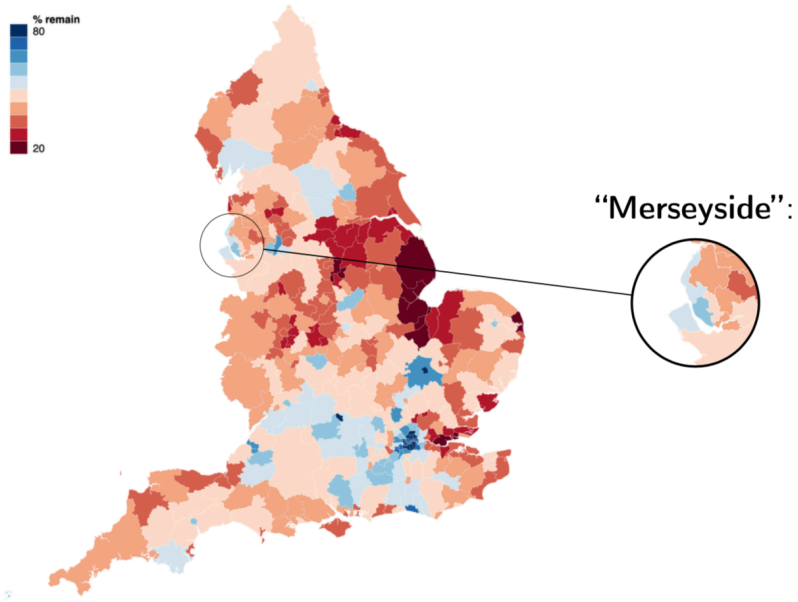
social classes – we observe a very large and significant decrease of Euroscepticism for unskilled and semi-skilled working class respondents, while we estimate smaller effects for skilled workers and middle class respondents that were far less likely to report reading The Sun before Hillsborough. Thus, the decrease of Euroscepticism in Merseyside after the Hillsborough disaster reported in the first part of our analyses, appears to be driven by working class respondents.

[14] To ease interpretation of these findings, we here rely on a simpler DiD strategy. We interact a Merseyside dummy with a post Hillsborough indicator and the social class identifier, instead of relying on a two-way fixed effects estimation on the constituency level as outlined above. This way we can plot the pre-post estimates separately for Merseyside and the rest of the country. The interpretation of the findings remain unaffected by this simpler strategy.

6.3 2016 referendum

As outlined in our case description, The Sun played an important role during the 2016 Brexit referendum campaign. Thus, in this section we look at the long-term effects of Hillsborough on the 2016 EU referendum. Figure 6 plots remain vote shares in the "Brexit" referendum across England.

Figure 6: Remain vote share in the 2016 EU-referendum



As shown in Figure 6, the city of Liverpool voted significantly more "Remain" than the rest of England. In Table 4 we use the same DiD identification strategy as in the previous analyses. We rely on a counting area level dataset of referendum vote shares in the 1975 EEC accession referendum and the 2016 Brexit referendum, which also includes time-invariant and time-variant socio-economic and political control variables (Becker and Novy 2017). As in all previous analyses, we use other Northern English counting areas as the control group. We code 2016 as the post-Hillsborough period, and 1975 as the pre-Hillsborough period, and again interact this variable with the Merseyside treatment area indicator. We estimate the following fixed effects model:

$$\text{Leave 2016}_{i,t} = \alpha_i + \gamma_t + \delta_{DID} T_{i,t} + \zeta' X_i + \epsilon_{i,t} \tag{3}$$

where *Leave 2016*$_{i,t}$ is the share of the "Leave" (2016) or "No" (1975) vote in the EU referendums in

counting area i in year t, α_i is a region or counting area fixed effect (depending on specification) that rules out omitted variable bias from unobserved region/counting area characteristics that are invariant over our study period, γ_t is a fixed effect which accounts for common factors that change between 1975 and 2016, X is a matrix of time-variant counting area covariates collected in 2001 and 2011 by Becker and Novy (2017), $T_{i,t}$ is our binary treatment indicator, Merseyside in 2016 after the Hillsborough disaster, and $\epsilon_{i,t}$ is the error term. δ_{DID} is the estimand of interest which identifies the effect of Hillsborough on the Eurosceptic vote share in Merseyside. We cluster our standard errors at the counting-area level. All details about the data, and statistical analysis can be found in the Materials and Methods section in Appendix A.17.

Table 4 shows that counting areas located in Merseyside are consistently estimated to be around 8-9 percentage points less "Leave" voting in the 2016 EU referendum than other Northern English counting areas, compared to the 1975 referendum. This effect is robust to the inclusion of time-variant control variables related to EU/Non-EU migration, as well as economic and socio-demographic variables such as age and educational composition that are strongly correlated with Brexit vote shares (Table 4, columns 4-5, and Table A.17 in the Appendix). These results indicate that the consistently more pro-European attitudes in Merseyside as a result of The Sun boycott also translated into higher "Remain" vote shares in the Brexit referendum.

Table 4: DiD: Effect of Hillsborough on 2016 Leave vote share

	(1)	(2)	(3)	(4)	(5)
	leave vote share				
δ DiD	-0.082	-0.083	-0.082	-0.087	-0.087
	(0.031)	(0.032)	(0.031)	(0.023)	(0.024)
Constant	0.453	0.453	0.453	0.569	0.423
	(0.005)	(0.005)	(0.002)	(0.049)	(0.047)
Merseyside FE	✓	✓		✓	✓
region FE	✓			✓	✓
year FE	✓		✓	✓	✓
counting area FE			✓		
region × year FE		✓			
Controls				✓	✓
Obs	102	102	102	102	102
adj.R^2	0.862	0.860	0.838	0.924	0.924
adj.R^2 (within)	0.064	0.062	0.102	0.485	
RMSE	0.048	0.049	0.052	0.036	0.036

Note: Standard errors in parentheses; model (5) uses bootstrapped standard errors. Omitted controls: share of EU migrants, share of A10 migrants, share of non-EU migrants, share of financial sector employment, share of manufacturing sector employment, share of residents > 60, share of tertiary education.

7 Discussion and Conclusion

Evidence from an exogenously induced boycott of the most important Eurosceptic newspaper - The Sun - in Merseyside as a consequence of the paper's reporting on the Hillsborough sporting disaster - caused a decrease of Euroscepticism in Merseyside. Consistent with our hypothesis that the decline in Euroscepticism in Merseyside post-1989 was driven by The Sun boycott, treatment effects are stronger among generations that came politically of age during the boycott, and among unskilled and semi-skilled workers, the social group that was most likely to read The Sun before Hillsborough. The effects we identify can neither be explained by differential trends in party preferences between Merseyside and other Northern English counties, nor are they likely to have resulted from differential access to EU structural funds, or differential effects of globalisation on offshorability.

Our study therefore makes an important contribution to our understanding of the long-term effects of sustained media campaigns on public opinion. The study of over-time processes and temporal dynamics in media persuasion research is "in need of considerably more theoretical and empirical attention" (Leeper and Slothuus 2020), and instances that allow for such study are rare. Besides our contribution to the over-time study of media effects, we also address another, related challenge of research on the media and public opinion - namely that most studies can only look at the effects of a specific article or news story, rather than the effects of an entire media campaign over an extended period of time. As former Conservative Chancellor Michael Heseltine said in a recent BBC interview speaking about the Sun's anti-EU campaign, "That drip drip drip of European poison decade after decade had a most unfortunate effect on British public opinion" (Roberts 2020). No matter where one stands on the normative question, it is not inconceivable that as a discipline we perceive media effects to be small because we usually study small, one-off, interventions.

To what extent are the results generalizable to other contexts beyond the Hillsborough case, given that our estimates are local to Merseyside and the North of England? While generalizability must ultimately remain an empirical question, in this paper we clearly outline the scope conditions that we think need to hold for media campaigns to result in large and lasting opinion change. In highly saturated and polarised campaign environments (Kalla and Broockman 2018), on highly salient issues, and where strong counter-frames are available (Chong and Druckman 2007), we would expect the media to have minimal, or at best, small effects. We would expect substantively large effects where

political contexts allow for sustained and one-sided media coverage on emerging issues. Moreover, we think that tabloid media outlets can be particularly influential if they decide to take a stance on politics because readers are likely to select into consumption for entertainment purposes (Arceneaux and Johnson 2013). Tabloids hence overcome the problem that those individuals who should be most likely to receive persuasive content are least likely to change their mind because they are highly attentive to politics in the first place (Zaller 1992).

One counterfactual worth considering when thinking about the generalisability of our results is whether The Sun boycott would have produced equally large effects had it happened for instance in Hampshire, in the South of England, as opposed to Merseyside in the North of England. One key question is whether former "Sun" readers would have substituted their media diets with equally Eurosceptic papers or whether they would have followed Merseyside's lead on substituting a Eurosceptic with a pro-EU tabloid. Since we think that substitution occurred based on cultural, not political preferences (Rooney 2000), we would expect that we should have seen similar effects in places that have a similar class composition of newspaper readership.

While instances that allow for the causal study of a sustained one-sided media campaign are rare (Leeper and Slothuus 2020), that does not mean that sustained one-sided media campaigns are rare per se. Besides the Murdoch-owned Eurosceptic tabloid press in the United Kingdom, important cases that immediately come to mind are the emergence of another Murdoch-owned medium, Fox News, in the United States (Dellavigna and Kaplan 2007), Berlusconi-owned TV channels in Italy (Mastrorocco and Minale 2018), and Blocher-owned newspapers in Switzerland (Spirig 2020). These outlets all push clear political agendas over a sustained period of time - they raise the salience of specific issues and provide a strong frame with which to interpret them. Whether these "issue entrepreneurs" (de Vries and Hobolt 2020) are ultimately successful, also depends on whether other actors engage in time and counter the frames provided. As George Osborne, the former chancellor, and one of the key government figures in the "Remain" campaign wrote in 2018, "We were too late in the day trying to explain some of the benefits of EU membership" (BBC 2018).

Beyond adding to our understanding of media effects on public opinion in general, what does this study tell us about the rise of Euroscepticism and the 2016 Brexit vote in particular? While our main results focus on the effects of the boycott on public opinion towards leaving the EU, official

counting area data from the 1975 and 2016 EU referendums also suggest that The Sun boycott might have decreased the "Leave" vote share in Merseyside in the 2016 EU referendum. Since this auxiliary analysis covers a longer time-period, we account for potential time-variant confounders such as changes in education levels and EU migration. Combining the analysis of the public opinion data spanning 30 years and the data on the referendum votes in 1975 and 2016 in a Difference-in-Differences framework, our study indicates that sustained media campaigns on emerging issues can have large, lasting, and ultimately, consequential effects on public opinion, and public policy.

In addition to the well-researched economic and social factors that have contributed to Eurosceptic opinion and to the Brexit vote in 2016 (de Vries 2018; Becker and Novy 2017), we show that, at least in part, public opinion and policy-relevant public decisions were endogeneous to tabloid media reporting. While this result may not be counter-intuitive or come as a big surprise to those who follow British politics, it is one thing to suspect that a causal relationship exists, and another to provide empirical evidence consistent with this assumption. Moreover, our paper also shows that the decline of Euroscepticism in Merseyside following The Sun boycott largely reflects a decrease in Euroscepticism among unskilled and semi-skilled working class voters, who made up a large share of Sun readers before the disaster. This finding is consistent with Ladd and Lenz's (2009) study of the effects of the Sun's endorsement switch from Conservatives to Labour at the 1997 General Election, where persuasive effects were also more pronounced among working class "Sun" readers. By documenting the role of the tabloid media in affecting attitude change towards European integration among working class voters, we highlight an important non-structural factor that contributed to the increase in Euroscepticism. This does not mean that EU-immigration, regional inequalities, or austerity did not matter, or that "The Sun" caused Brexit, but this study provides evidence that the tabloid press played an important role in shaping support for "Leave" among working class voters.

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A Appendix

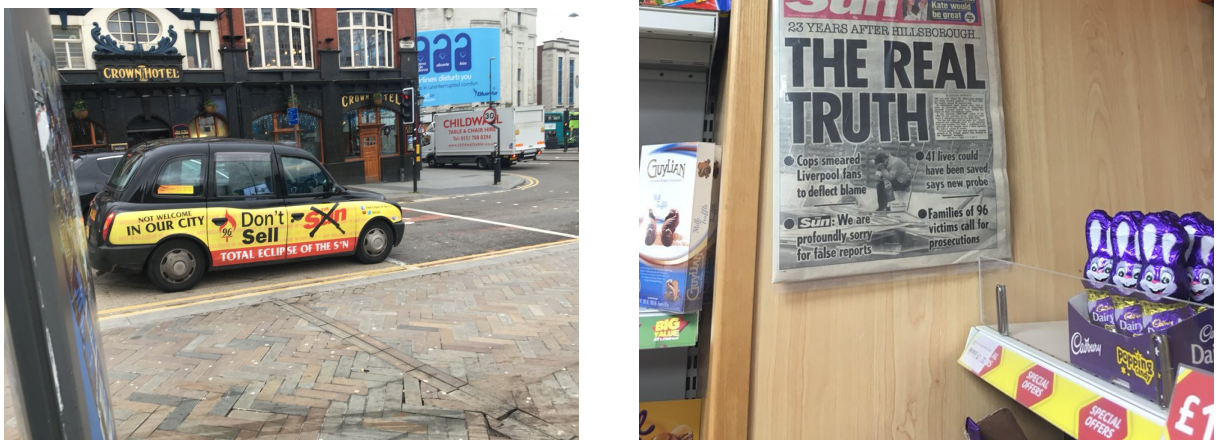
Contents

A.1 Extent of The Sun boycott

A.1.1 Internet search activity

One might suggest that even though we show a significant decrease in Sun readership in our data, that respondents in Merseyside do not share the truth about their reading behaviors. They might still access The Sun, for instance via the internet. We have no reason to assume that this is the case. As discussed, the boycott of The Sun is strong, ongoing and strongly supported by the current Liverpool manager, Klopp. To further underline the fact, we received pictures taken by Dr Stuart Wilks-Heeg (Reader in Politics at Liverpool University) picturing the boycott as of today. Figure A.1 shows two pictures we received which outline the strength of the boycott. The photo on the left shows a typical taxi cab in the county of Merseyside calling on people to not

Figure A.1: How Liverpool boycotts The Sun



Source: Photos provided by Stuart Wilks-Heeg.

read and sell The Sun. The photo on the right showcases The Sun's apology and how a shop owner in the region of Merseyside reacts to this apology, namely by not accepting it.

During the time period we study, the internet was not as relevant as it is today. In fact, throughout most of the time period under investigation, there was little commercial internet available in the UK. Even in 1998 only 9% of British households had internet access according to the OECD. 2005 was the first year in which half

of the population had access to the internet in their homes (OECD 2020). This means that at least until 2000, people form Merseyside could not rely on the internet to access The Sun.

To get a better understanding if and how often people in Liverpool might access The Sun online after the internet becomes widely available, from 2004 until today we relied on Googletrends. In the best case scenario we had access to data on how often The Sun web page has been accessed by IPs stemming from Liverpool. Since we do not have access to such data, Googletrends still allows us to understand how often people from Liverpool search for The Sun on Google – which of course they might do for various reasons. Yet, the fact that people might search for The Sun online for other reasons than reading it can be understood as providing as an upper bound of how often people seek to get information about The Sun. In Table A.1 we report the Google

Table A.1: Googletrend search volume for The Sun, 2004-2020

county	searches	county	searches	county	searches	county	searches
Wolverhampton	100	Bolton	73	Croydon	62	Brighton	53
Brentford	93	Derby	73	Bristol	62	Oxford	52
Bletchley	92	Birmingham	69	Leeds	61	Cambridge	50
Thames Ditton	88	Reading	67	Edinburgh	60	London	50
Stoke-on-Trent	85	Manchester	66	Norwich	60	**Liverpool**	**30**
Bradford	80	Nottingham	66	Sheffield	57		
Leicester	79	Northampton	66	Southampton	57		
Milton Keynes	79	Newcastle upon Tyne	65	Belfast	57		
Kingston Upon Hull	74	Coventry	64	Cardiff	56		
Glasgow	74	Portsmouth	64	Aberdeen	55		

search volume for the term "The Sun". Googletrends share the relative amount of people searching for a respective term; meaning that we cannot know how many people in Liverpool search for The Sun on Google but only the relative amount thereof in relation to the city where most people searched (Wolverhampton=100%). In Liverpool we find by far the lowest search amount in any British city with a 30% search share. Even in urban, cosmopolitan areas such as London, Oxford or Cambridge the search amount is still at 50%. Overall, this suggests that we have little reason to assume that people from Liverpool bypass the boycott of The Sun or seek access to The Sun via the internet.

A.1.2 Survey of newsagents

In Figure 2 in the manuscript we display the results of a telephone survey we conducted with newsagent and cornershop employees in three English counties, Merseyside, Lancashire and Cheshire between 12 January and 5 February 2021. The telephone survey was reviewed and approved by the university's Research Ethics Committee. We sampled the entire population of newsagents in these three counties from Yelp and determined if a functioning telephone number could be located either on Yelp or Google Maps. This procedure left us with a sample of 850 newsagents and cornershops, 428 in Merseyside, 264 in Lancashire and 163 in Cheshire. Of these, 344 answered the phone and 212 consented to participate in the survey, which corresponds to a response rate of approximately 25%. Informed consent was obtained verbally on the phone and recorded by interviewers on Qualtrics. 165 newsagents completed the survey and confirmed that they indeed sold newspapers. This is the final sample used for the analysis. Newsagents were interviewed over the phone by two male interviewers who were specifically trained for this study. Both interviewers are native speakers from the North of England. We randomly divided the list of newsagents between the two interviewers. The survey questions are listed below in section A.1.3 and did not prompt respondents to think about Hillsborough or The Sun boycott. Answers were recorded using the Qualtrics online survey software.

A.1.3 Newsagent Survey: Instructions to telephone interviewers

Read out the following text (or paraphrase in your own words conveying all the info in bold below):

Good morning/good afternoon/good evening. My names is Y and I work for University Z. We are researchers conducting an **academic study about the media and political attitudes towards Europe** and would like to **interview you about newspaper sales in your area**. The telephone survey will take approximately **3 minutes**. All information will be **fully anonymised** and neither your name, nor the name of your store will be published. We are only interested in calculating average sales of newspapers per parliamentary constituency, and since you are a newsagent you are **an expert** when it comes to that. You can stop the survey at any point and we would then delete all answers that you have given.

Would you like to participate in this survey? If you answer yes, this indicates that you consent to being interviewed and I will record the answers on my computer.

A. Yes, respondent would like to participate. B. No, respondent would not like to participate.

- Please give me your best guess: How many of the following newspapers would you sell on an average week-day before COVID?

A The Guardian

B A local paper

C The Times

D The Independent

E The Daily Mirror

F The Daily Mail

G The Sun

H The Telegraph

I Refused to answer

- Follow-up: The agent told you that they are selling 0 copies of paper X. Ask the agent: Is this because nobody buys paper X or because they are not selling it?

  A Nobody is buying it

  B Not selling it

  C Both

  D Other

  E Refused to answer

- Follow-up: Ask the agent: Do you remember which year you stopped selling paper X?

- DO NOT READ: Follow up about agents not selling The Sun. Did the agent mention Hillsborough or the boycott unprompted?

  A Yes

  B No

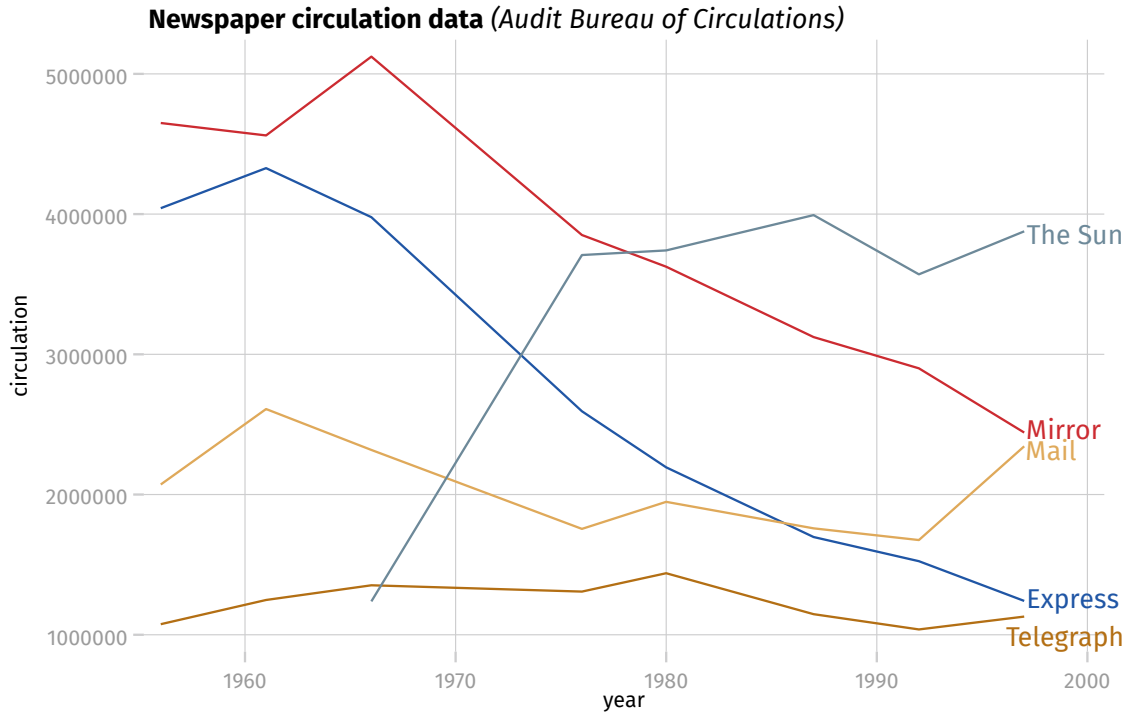
  C Can't remember

A.2 The British media landscape

A.2.1 Newspaper circulation across time

How relevant is the tabloid newspaper The Sun for the British people? Below we report newspaper circulation data for the UK since 1956 stemming from the audit bureau of circulations. As outlined in the main body of our

Figure A.2: Newspaper readership in the UK across time



paper we do not have access to circulation data at the constituency or regional level. Yet, at least for some time points (1956, 1961, 1966, 1976, 1980, 1987, 1992, 1997) we do have such information for the entire UK. Figure A.2 reports the readership figures for the most relevant newspapers across the UK. Since the 1980s The Sun is the most widely-read newspaper in terms of circulation in the UK. Next to The Mail it also appears to be the only newspaper with growing circulation at the end of the 1990s. Notice that this growing trend continued up until the mid 2000s, when circulation of The Sun slowly started to decrease.

A.2.2 EU coverage in the tabloid media

Figure A.3: Trend of different topics in Mirror

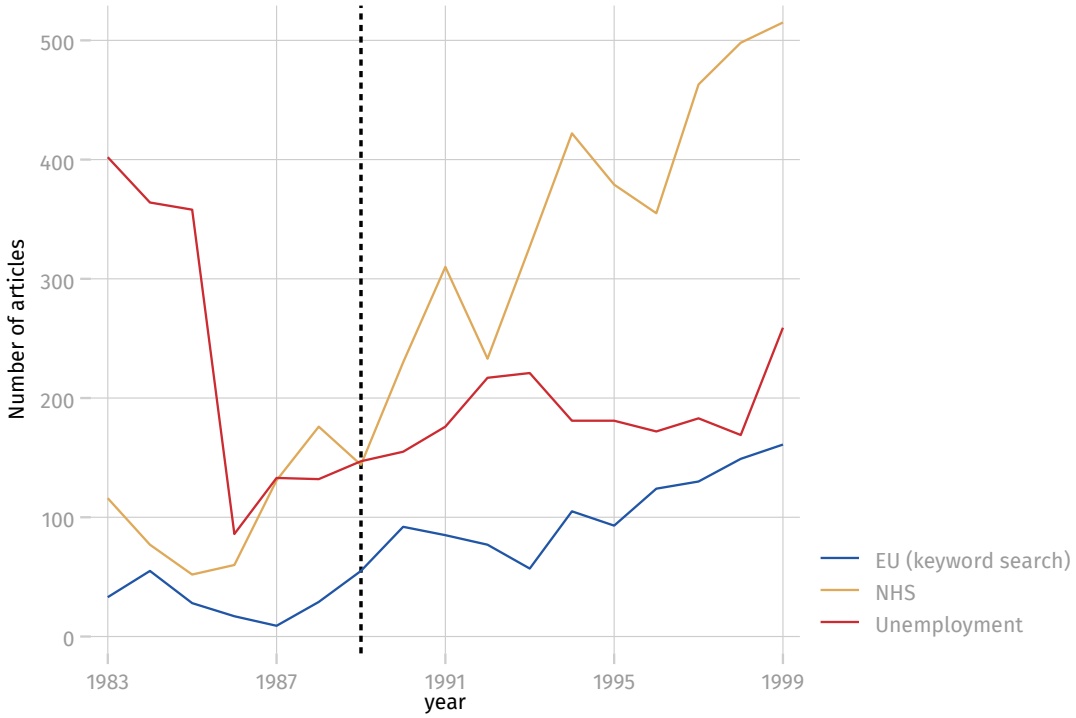


Figure A.4: Trends of EU as topic in Sun and Mirror

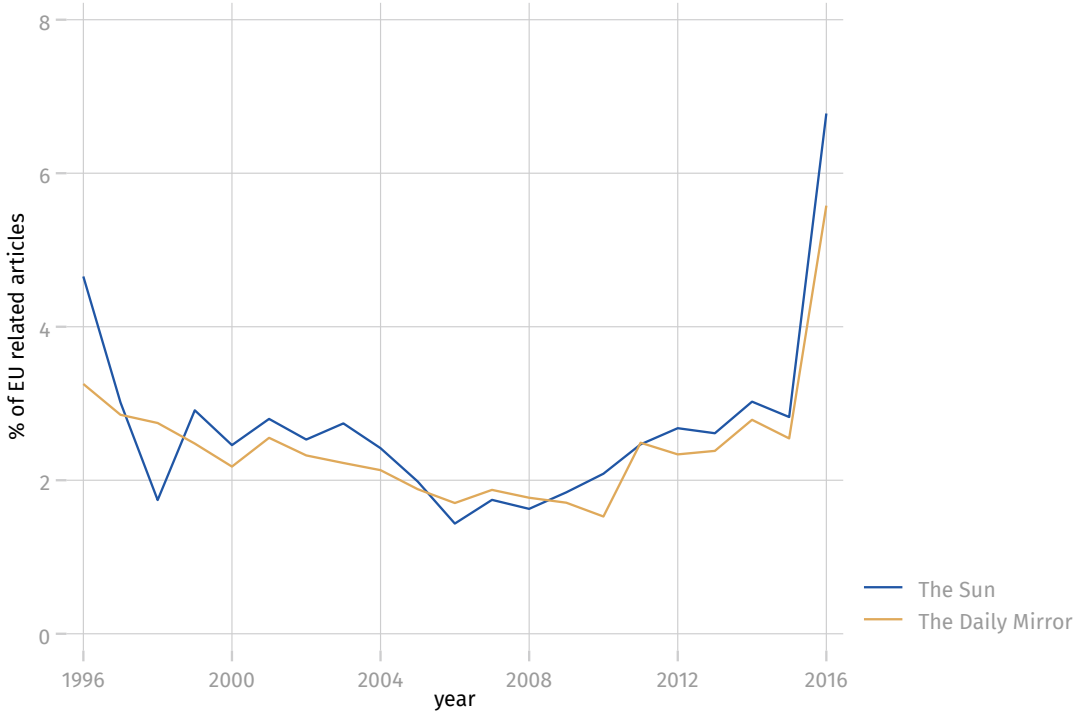


Figure A.5: Trends of EU-related editorials in Sun and Mirror

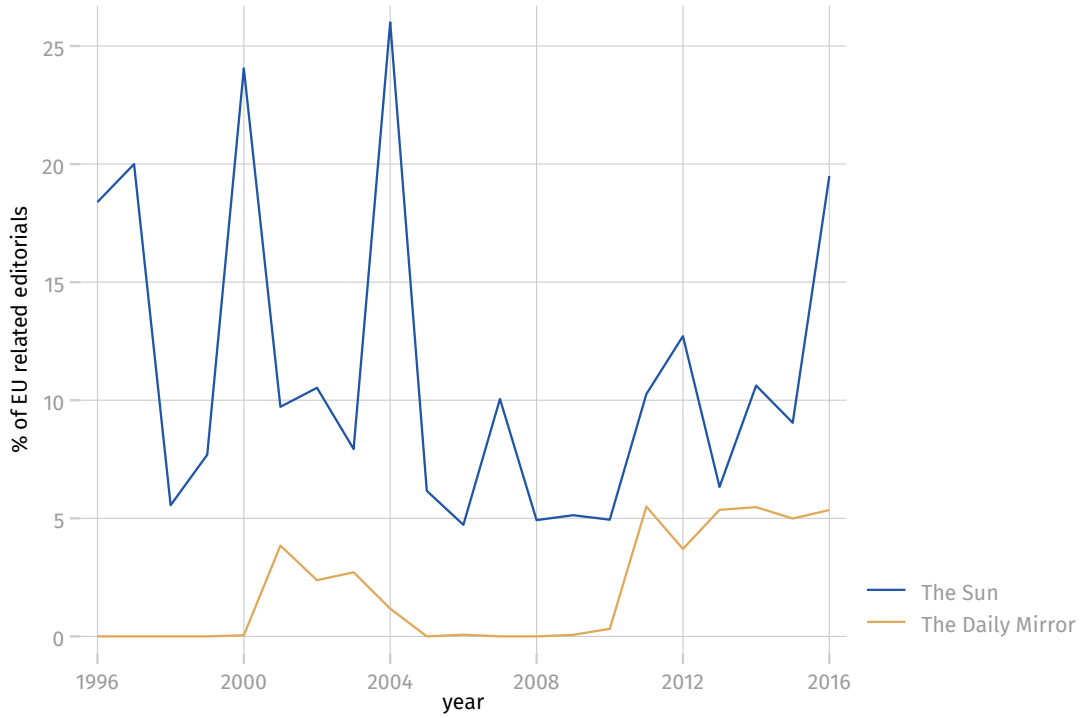
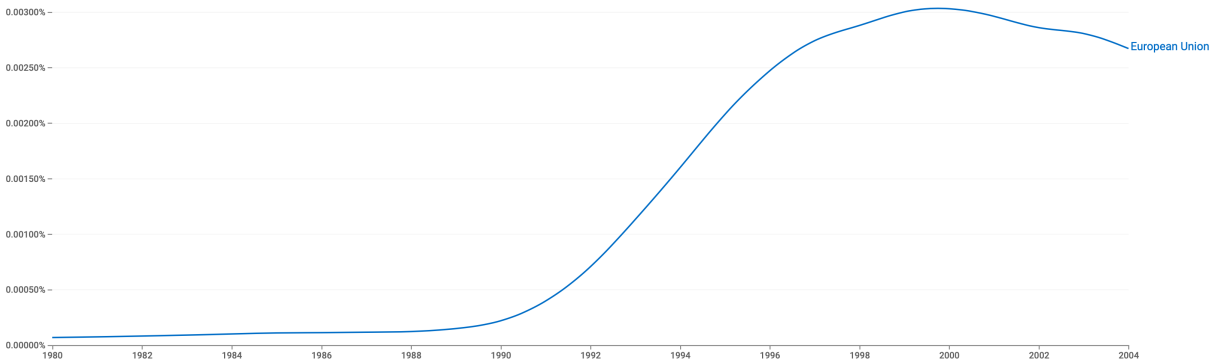
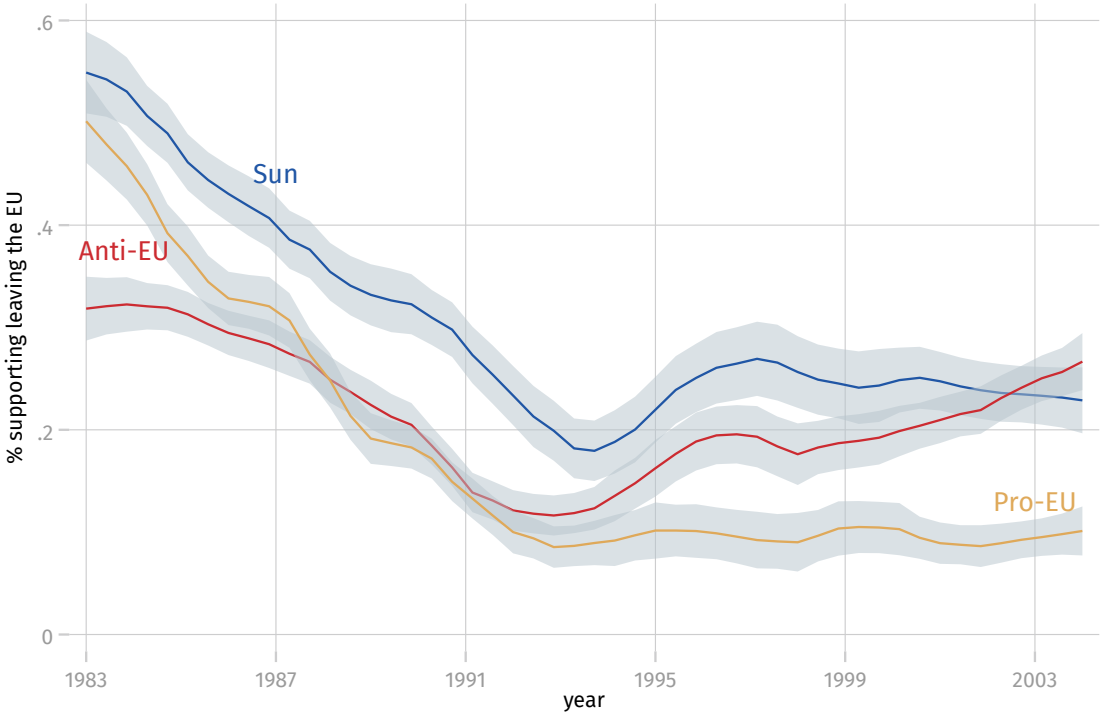


Figure A.6: Trend of EU topic in google ngrams



A.2.3 Attitude towards EU by newspaper readership

Figure A.7: Support for leaving the EU by newspaper readership



A.3 EU slant in the tabloid media

A.3.1 Content analysis of The Sun and The Mirror

Based on the Factiva online archive, we randomly sampled 50% of all "Sun" and "Mirror" editorials published between 1 January 1996 and 23 June 2016 which contained the search terms "EU" OR "European Union" OR "European Community" OR "Brussels" OR "EURO" and excluded terms associated with sports such as as football or rugby. Both samples were hand-coded independently by two research assistants to answer 1) whether the editorial addressed a question about European integration 2) what the tone of the editorial towards the EU was (positive, neutral, negative) 3) How certain the coder was about their judgement (very certain, quite certain, not so certain, not certain at all) 4) How the coder would rate the tone of the editorial on a scale from 0 (very negative) to 100 (very positive) and 5) if the editorial could be categorised as "Eurosceptic" according to the following definition: "the (qualified) rejection of European integration". Coders classified 57% of "Sun" editorials and 49% of "Mirror" editorials in the sample as about Europe. This left us with an overall sample of N=347 observations coded in The Sun and of N=174 observations coded in The Mirror. These editorials constitute the sample for our analysis displayed in Table 1 in the main body of the text.

Inter-coder reliability for the questions was relatively high with % agreement ranging from 77% for the Euroscepticism question to 92% for the question about tone. The corresponding Kappa-statistics which capture inter-coder agreement are displayed in Table 1. A Kappa statistics from 0.21-0.40 is usually considered "fair" agreement, while 0.41-0.60 is considered "moderate" agreement, 0.61-0.80 is considered "substantial" agreement and 0.81-1.0 is considered "almost perfect" agreement. With Kappas of 0.55, 0.67 and 0.83 all three measures of sentiment towards the European Union can be considered reliable.

A.3.2 Qualitative evidence

Figure A.8: The Sun's (rows 1 and 2) and The Mirror's (row 3) EU coverage in 1989/1990

Sources: British Newspaper Archive (British Library)

Figure A.9: The Sun's Euro-myths in the mid 1990s

NOW THEY'VE REALLY GONE BANANAS

THE SUN CUT OUT AND KEEP GUIDE
This is the official EU minimum size banana. Cut it out and see how yours measure up. Tell our Banana Hotline about fiddlers, whoppers or very kinky ones.

Euro bosses ban 'too bendy' ones and set minimum shop size of 5½ins

BRUSSELS bureaucrats proved yesterday what a barmy bunch they are – by outlawing curved bananas.

Sources: Evans (2016).

Figure A.10: The Sun's coverage of the 2016 EU referendum

THE Sun
Oh Roo behave
WAYNES PLEA TO ENGLAND FANS
INSIDE 8-PAGE ROYAL ASCOT GUIDE
BeLEAVE in Britain
THE Sun SAYS
VOTE TO QUIT EU ON JUNE 23

THE Sun
BeLEAVE in Britain
YOU CAN FREE UK FROM CLUTCHES OF THE EU TODAY
INDEPENDENCE DAY
THE Sun SAYS
BRITAIN'S RESURGENCE
DECISION TIME: PAGES 4 TO 11

Sources: left: Woodhouse, Cole, and Pettitt (2016); right: Sutton (2016).

A.4 Validation of BSA data

As discussed in the results section, we find a sharp decrease in Euroscepticism throughout England over time in the BSA data. This might raise concerns of data validity and reliability. In this section we address these concerns.

We use alternative data to validate the BSA measures we rely on. To do so, we downloaded the Eurobarometer trend file. This data provides us with the most widely used and validated measure of Euroscepticism. Unfortunately, as discussed in the methods section, it does not provide us with regional identifiers before 1990. Nevertheless, we can plot the time trend of Euroscepticism for the entire period covered in the EB trendfile. Figure A.11 reports the time trend for two outcomes.

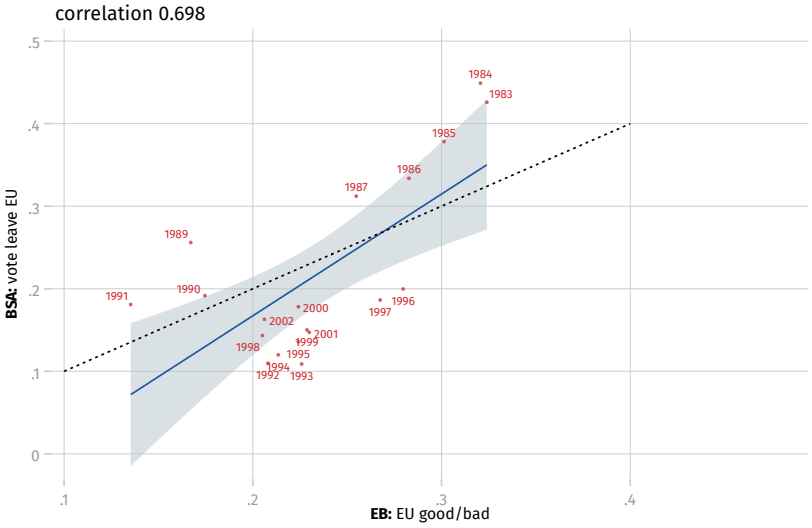
In the top panel we report the trend for the most similar question to the one we rely on in our analysis, asking respondents if they believe that their country's membership in the EU is a good/bad thing. The trends for these data are remarkably similar to the trend we report for the BSA data. As in our BSA data, public opinion towards the EU is more sceptical in the 70s and early 80s, before Euroscepticism drops to lower levels throughout the 1990s and slightly increases again by the late 90s. The bottom panel then reports the trends for a related outcome, how much respondents believe the country has benefited from EU membership. Again we find a similar pattern with strong anti EU opinions in the 80s which decrease during the 90s.

Finally, we merged the BSA data with the EB data on an annual level (annual time series). This allows us to estimate the correlation between both measures. Figure A.12 reports the correlation across years in a scatter plot. We also report the x=y line which is the benchmark for a perfect correlation between both measures; we find a very high correlation of .7 between the two measures, based on two independent sources. This speaks for the reliability of the measures we use in our study.

Figure A.11: Euroscepticism in the Eurobarometer for Great Britain, 1973-2002

Note: based on Eurobarometer Trendfile (1973-2002). Reported are local polynomials surrounded by 95% confidence intervals based on annual cross sections of almost 90,000 respondents.

Figure A.12: Correlation between Euroscepticism in the Eurobarometer and the British Social Attitudes Data, 1983-2002



Note: based on Eurobarometer Trendfile (1973-2002) and British Social Attitudes data. Both variables return % of population being Eurosceptic.

A.5 Main findings without mean imputed data

In Table A.2 below we report the main findings without mean imputation for covariates. We omit the first two models from our main findings since in these models we do not include any imputed information.

Table A.2: Effect of Hillsborough on Euroscepticism (non-imputed data)

	Support leaving the EU			
	(1)	(2)	(3)	(4)
δ DiD	-0.170	-0.145	-0.120	-0.092
	(0.049)	(0.043)	(0.032)	(0.032)
Constant	0.219	0.226	0.215	0.215
	(0.003)	(0.028)	(0.002)	(0.029)
Constituency FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Constituency FE × Year			✓	✓
Constituency FE × Quarter			✓	✓
Controls		✓		✓
Obs	10384	10026	10384	10026
N $_{constituencies}$	172	172	172	172
adj.R^2	0.05	0.08	0.05	0.08
adj.R^2 (within)	0.00	0.03	0.00	0.03
RMSE	0.40	0.39	0.39	0.39

Standard errors clustered by constituency in parentheses

A.6 Including data from 1983 & 1984

Unfortunately the BSA does not report an important covariate prior to the 1985 data, *education*. Therefore,

Table A.3: Effect of Hillsborough on Euroscepticism (1983-2004)

	Support leaving the EU					
	(1)	(2)	(3)	(4)	(5)	(6)
δ DiD	-0.083	-0.178	-0.175	-0.160	-0.106	-0.111
	(0.015)	(0.037)	(0.038)	(0.046)	(0.024)	(0.029)
Constant	0.225	0.227	0.227	0.209	0.226	0.208
	(0.004)	(0.001)	(0.001)	(0.016)	(0.000)	(0.016)
Constituency FE		✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓	✓
Quarter FE			✓	✓	✓	✓
Constituency FE × Year					✓	✓
Constituency FE × Quarter					✓	✓
Controls				✓		✓
Obs	35204	35203	35201	32314	35201	32314
N $_{constituencies}$	533	532	532	531	532	531
adj.R^2	0.00	0.06	0.06	0.07	0.07	0.08
adj.R^2 (within)	0.00	0.00	0.00	0.03	0.00	0.03
RMSE	0.42	0.40	0.40	0.39	0.40	0.39

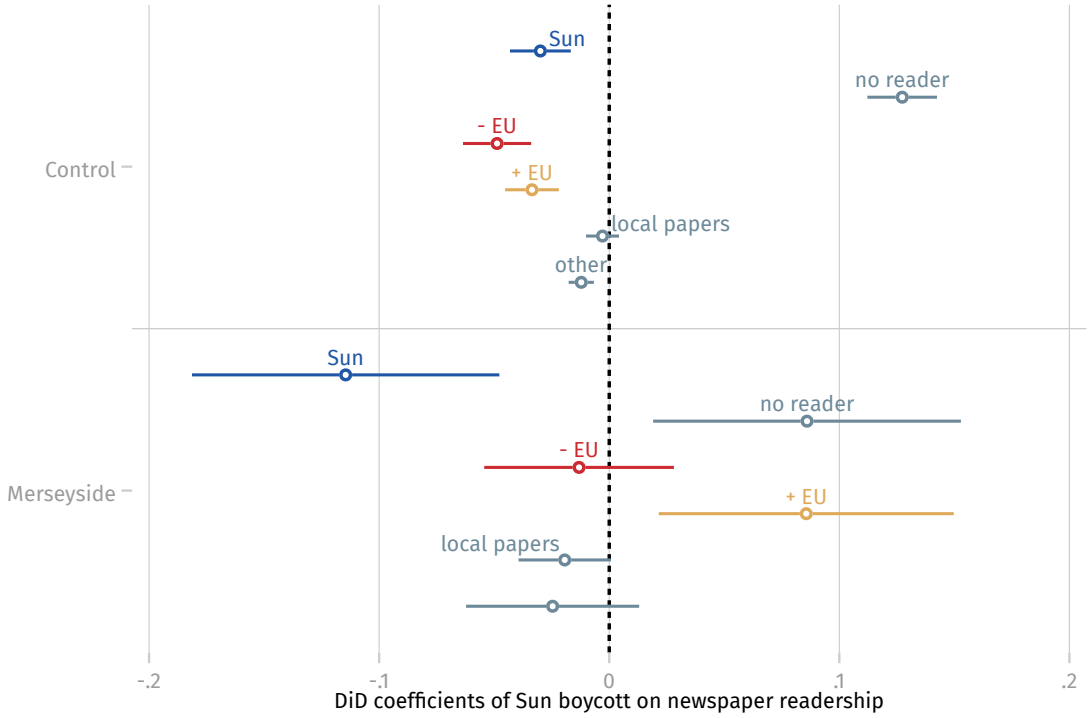
Standard errors clustered by constituency in parentheses

we include only data from 1985 on-wards in our main analysis. Table A.3 reports the same models as table 2 in the main body of the paper including all available data from the BSA. The major drop in N is due to no information about education existing for a subset of respondents. Please notice that the major findings are robust to using the entire data. If anything, the point estimate becomes larger in magnitude, suggesting an effect of around 17 percentage points.

A.7 Including respondents from all English constituencies

Below we report the same models as used in the main body of the text but using all of England as a control instead of 'the North' only.

Figure A.13: Effects of Hillsborough on 'Sun' readership and media substitution



Notice: Predictions of multinomial logistic diff-in-diffs surrounded by 95 % confidence intervals.

Figure A.14: DiD Graph: Trends in Euroscepticism in Merseyside and control before and after Hillsborough

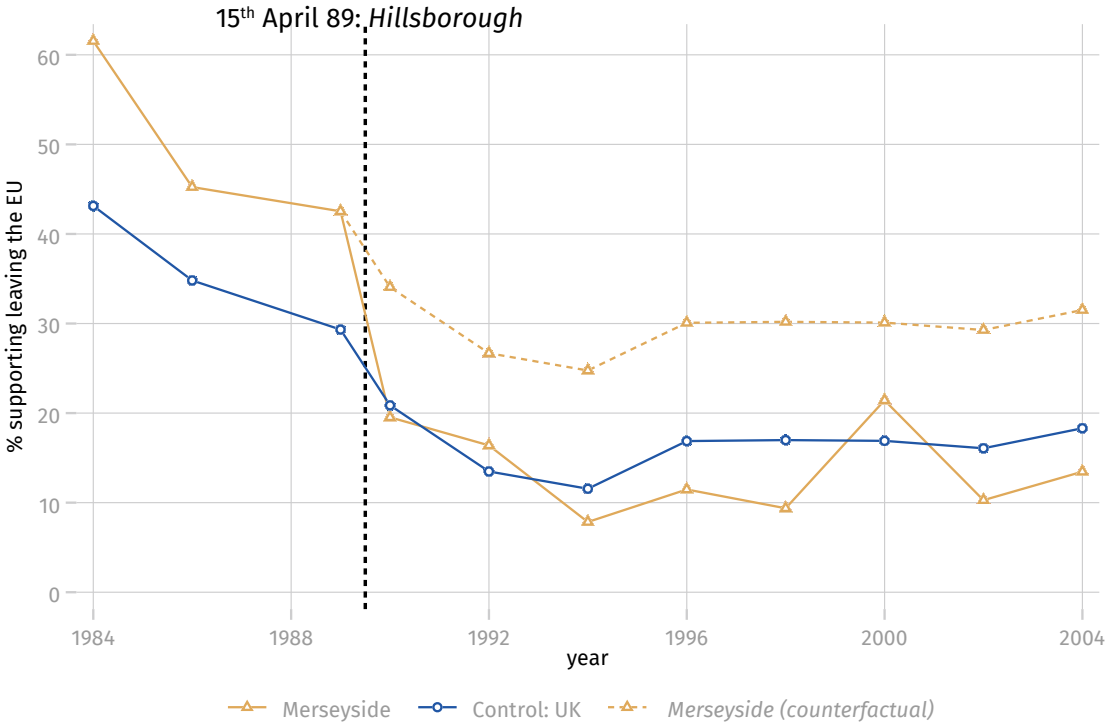
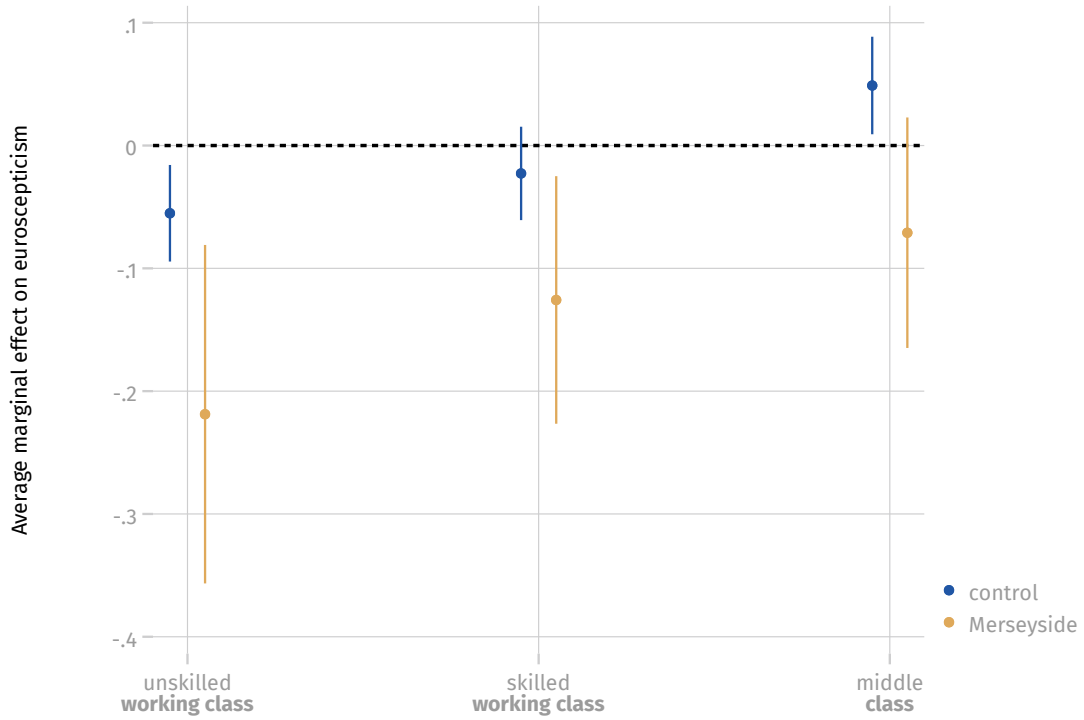


Table A.4: Effect of Hillsborough on Euroscepticism (**Entire England**)

	Support leaving the EU					
	(1)	(2)	(3)	(4)	(5)	(6)
δ DiD	-0.064	-0.159	-0.155	-0.160	-0.104	-0.111
	(0.015)	(0.049)	(0.050)	(0.046)	(0.028)	(0.029)
Constant	0.206	0.208	0.208	0.209	0.207	0.208
	(0.004)	(0.001)	(0.001)	(0.016)	(0.001)	(0.016)
Constituency FE		✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓	✓
Quarter FE			✓	✓	✓	✓
Constituency FE × Year					✓	✓
Constituency FE × Quarter					✓	✓
Controls				✓		✓
Obs	32317	32316	32314	32314	32314	32314
N $_{constituencies}$	532	531	531	531	531	531
adj.R^2	0.00	0.05	0.05	0.07	0.05	0.08
adj.R^2 (within)	0.00	0.00	0.00	0.03	0.00	0.03
RMSE	0.40	0.39	0.39	0.39	0.39	0.39

Standard errors clustered by constituency in parentheses

Figure A.15: Difference-in-Difference-in-Differences results for social classes



Note: Reported are the CATEs stemming from a difference-in-difference-in-differences model interacting the standard DiD estimand with self-reported social class (unskilled working class (baseline): *"never had job", unskilled*; skilled working class: *partly skilled, skilled*, middle: *intermediate, professionals*) of BSA respondents. Plotted are point estimates (scatter) surrounded by 95 % confidence intervals (whiskers).

A.8 Spillover

One potential caveat to our research design is that not only the county of Merseyside, but also adjacent counties might have been affected by The Sun boycott.

Yet, as outlined in the main body of the text both anecdotal and quantitative evidence based on our newsagents survey suggests that this was not the case. In Figure 2 we show that The Sun boycott is geographically limited to Merseyside and did not spill over to adjacent counties. To go beyond this, we conduct two further robustness tests to investigate if we find evidence consistent with spillover effects.

First, we re-estimate our main models by relying on Merseyside as the treatment group, and three adjacent counties (Cheshire, Lancashire and Greater Manchester) as the control group. Table A.5 reports the findings. Again, our main findings receive support across all models. This suggests that in comparison to adjacent counties – where geographical spillover is most likely – our findings remain unchanged in significance as well as size of the coefficients.

Table A.5: Effect of Hillsborough on Euroscepticism (**adjacent counties only**)

	Support leaving the EU					
	(1)	(2)	(3)	(4)	(5)	(6)
δ DiD	-0.077	-0.149	-0.143	-0.140	-0.115	-0.109
	(0.019)	(0.048)	(0.048)	(0.044)	(0.037)	(0.039)
Constant	0.219	0.231	0.230	0.174	0.226	0.167
	(0.013)	(0.008)	(0.008)	(0.040)	(0.006)	(0.042)
Constituency FE		✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓	✓
Quarter FE			✓	✓	✓	✓
Constituency FE × Year					✓	✓
Constituency FE × Quarter					✓	✓
Controls				✓		✓
Obs	3977	3977	3975	3975	3975	3975
N $_{constituencies}$	69	69	69	69	69	69
adj.R^2	0.00	0.07	0.07	0.09	0.07	0.09
adj.R^2 (within)	0.00	0.00	0.00	0.03	0.00	0.03
RMSE	0.40	0.39	0.39	0.39	0.39	0.39

Standard errors clustered by constituency in parentheses

Second, we test if in comparison to the three adjacent counties, readership of The Sun significantly declined in Merseyside. Again, we find a significant decrease of 10 percentage points in Merseyside in comparison to adjacent counties. We report these findings in Table A.6 below. Overall, these two robustness checks as well as the anecdotal evidence we discussed in the main body and the Appendix make us confident that the

boycott did not affect adjacent counties.

Table A.6: Effect of Hillsborough on Sun readership (**adjacent counties only**)

	Sun reader (0,1)	
	(1)	(2)
δ DiD	-0.072	-0.062
	(0.039)	(0.039)
Constant	0.106	0.246
	(0.006)	(0.033)
Constituency FE	✓	✓
Year FE	✓	✓
Controls		✓
Obs	3926	3926
N $_{constituencies}$	69	69
adj.R^2	0.02	0.05
adj.R^2 (within)	0.00	0.03
RMSE	0.29	0.29

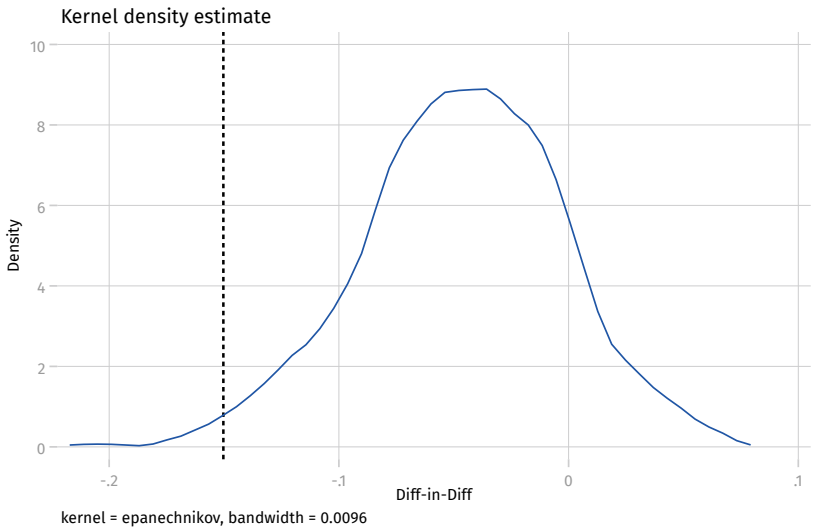
Standard errors clustered by constituency in parentheses

A.9 Permutation test

One might object that the decrease in Euroscepticism was not unique to Merseyside, but driven by a more general trend against Euroscepticism in England in the 1990s. To address this concern, we estimate a placebo test in space. More specifically, we randomly re-assigned the Hillsborough event into constituencies in England that are not located within Merseyside. The upper panel in figure A.16 reports the finding of this permutation test. The vertical line reports the effect we found for Merseyside while the density plot reports the estimated effect for all 1000 permutations we simulated. It becomes strikingly evident that the Hillsborough effect for Merseyside remains distinct and is statistically different from the distribution of placebo effects we estimated across other areas.

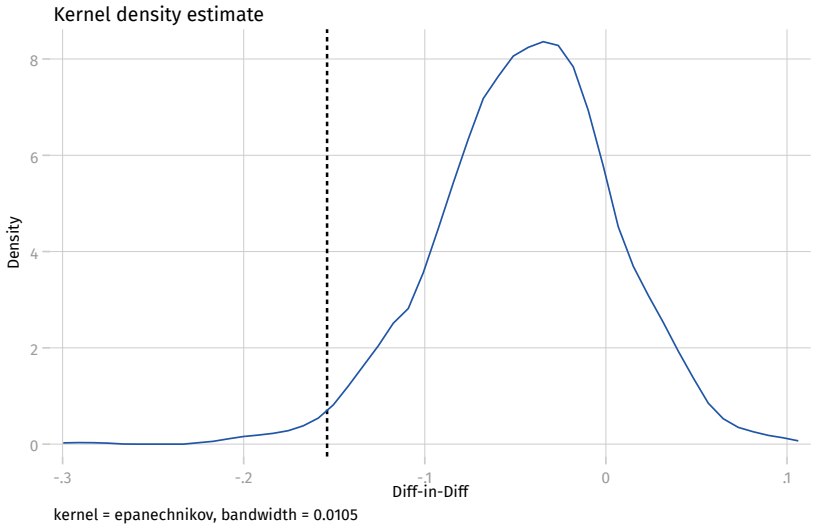
Figure A.17 reports the same permutation test for Northern English constituencies only.

Figure A.16: Placebo in space (**entire England**)



Note: Placebo in space based on 1'000 permutations, reports an ATT=-0.140 with SE(P)=0.0059 and CI: 0.025/0.049

Figure A.17: Placebo in space (**North only**)



Note: Placebo in space based on 1'000 permutations, reports an ATT=-0.130 with SE(P)=0.0057 and CI: 0.024/0.047.

A.10 Matching on observables

A.10.1 Covariate balance statistics

Below we report the distributional differences between the treatment (Merseyside after the Hillsborough disaster) and the control group. While there is no empirical evidence to support the use of any particular cut-off point on the standardized difference to define imbalance, Rubin (Rubin 2006) suggests that a standardized difference between treatment and control group of about 0.25 is strong evidence for imbalance. The last two columns of Table A.7 report the standardized difference and variance ratio (ratio of treated and control variances as a balance measure of the second moment, where balance is defined by values close to 1.0). As can be seen according to Rubin's 0.25 criterium, we find imbalances between treatment and control mainly for two variables (conservative and labour party id). All other variables appear to be balanced between treatment and control groups.

Table A.7: Covariate balance between treatment (Merseyside after Hillsborough) and control groups, BEFORE MATCHING

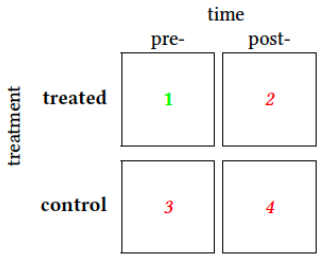
	Treated			Control			**Balance**	
	Mean	Variance	Skewness	Mean	Variance	Skewness	**Std-diff**	**Var-ratio**
age (17-98)	46.93	316.43	0.25	47.22	317.12	0.32	**-0.02**	**1.00**
female (0,1)	0.53	0.25	-0.10	0.55	0.25	-0.21	**-0.05**	**1.01**
university (0,1)	3.39	4.64	0.19	3.53	4.67	0.11	**-0.07**	**0.99**
religion (0,1)	0.68	0.22	-0.75	0.62	0.24	-0.48	**0.12**	**0.93**
social class (0-5)	3.14	1.37	-0.26	2.96	1.28	-0.17	**0.16**	**1.07**
Conservative (0,1)	0.20	0.16	1.48	0.34	0.22	0.68	**-0.31**	**0.72**
Labour (0,1)	0.56	0.25	-0.24	0.36	0.23	0.60	**0.42**	**1.08**
Libdem (0,1)	0.10	0.09	2.72	0.13	0.12	2.16	**-0.11**	**0.76**

A.10.2 Matching

Matching techniques help to address concerns of distributional observable in-balances between treatment and control groups (Rubin 1974; Rosenbaum and Rubin 1983, 1985; Dehejia and Wahba 2002; Rubin 2006; Stuart et al. 2015). Yet, few studies use matching for difference-in-differences (DiD) models. The difficulty in applying matching methods in DiD designs are twofold. First, since balance between treatment and control groups is established based on covariates which are credibly related to the outcome of interest, matching methods might introduce post-treatment biases for DiD studies based on repeated cross-sections. Given that there is no simple mathematical fix for this issue, researchers are advised to only match on variables which are plausibly not affected by an obvious issue of post-treatment bias.

Second, matching techniques usually match a *single* treated group to a *control* group. However, DiD models are essentially based on four groups. They are based on a treatment and control group, but these groups are again split by time – namely by pre- and post-treatment periods (see table 5).

Table A.8: Relevant groups for DiD models



This means that for DiD estimands two potential selection biases should be addressed by matching techniques. First, selection biases across time. To use our case as an example, our DiD model assumes that the groups we compare do not change across time. But likely they will, for instance by people moving out or into Merseyside. Second, selection biases across the treatment status groups. This means that the groups are different to begin with. Again, applied to our case, we showed in Table A.7 that there is a difference in the distribution of Labour voters between Merseyside and the control group. This second difference is not an issue for DiD studies, since constant difference across treatment and control groups do not violate the parallel trends assumption. However, if the first issue applies – differences across groups across time – the parallel trends assumption could be violated.

To address this concern we match each group onto group 1 (the pre-treated group in Table A.8). By doing so we ensure that the matching technique addresses both biases across groups, and more importantly across time:

1. We are interested in the effect of our treatment on group 1 in table 5 – namely the effect of the treatment on the respondents living in Merseyside prior to the Hillsborough disaster.
2. We then code a variable which reflects all four groups:
    - **Group 1:** if Hillsborough=0 & Merseyside=1
    - **Group 2:** if Hillsborough=1 & Merseyside=1
    - **Group 3:** if Hillsborough=0 & Merseyside=0
    - **Group 4:** if Hillsborough=1 & Merseyside=0
3. We then estimate a multinomial logit model with the group variable as our dependent variable and all covariates (X_i) included in our study (*age, gender, university, religious, social class, Conservative voter, Labour voter*) as predictors of group status. We use group 1 as our baseline category in the multinomial logit model.

4. We export the probabilities of belonging to each group based on a respondents covariate from the results of the multinomial logit model.

5. We estimate a respondent's probability of belonging to Group 1 based on the probability of the respondent belonging to her/his group. Thus, we define the probability of being in group 1 versus being in the other groups. More specifically, each respondent is assigned four probabilities, namely the probability of belonging to each of the four groups. We then use each of these four probabilities to weight them to be similar to group 1 (treatment group in pre-treatment period):

$$w_i = \frac{p_1(X_i)}{p_g(X_i)} \tag{4}$$

   where g is the subscript for a respondent i's status group. Therefore, respondents which are part of group 1 will have a weight of exactly 1. All remaining respondents receive a propensity weight which is relative to the probability of the group they are actually in.

6. Finally, we introduce this weights into the DiD models we estimated in our paper. Thus, we weight each respondent by their probability to be in the treatment group prior to treatment.

Below we report the results of our matching approach: Following the 0.25 difference criterion discussed above,

Table A.9: Covariate balance between treatment (Merseyside after Hillsborough) and control groups, AFTER MATCHING

	Treated			Control			**Balance**	
	Mean	Variance	Skewness	Mean	Variance	Skewness	**Std-diff**	**Var-ratio**
age (17-98)	46.93	316.43	0.25	47.19	318.15	0.31	**-0.02**	**0.99**
female (0,1)	0.53	0.25	-0.10	0.52	0.25	-0.08	**0.01**	**1.00**
university (0,1)	3.39	4.64	0.19	3.38	4.70	0.19	**0.01**	**0.99**
religion (0,1)	0.68	0.22	-0.75	0.69	0.21	-0.82	**-0.03**	**1.02**
social class (0-5)	3.14	1.37	-0.26	3.14	1.18	-0.32	**0.01**	**1.16**
Conservative (0,1)	0.20	0.16	1.48	0.22	0.17	1.34	**-0.05**	**0.94**
Labour (0,1)	0.56	0.25	-0.24	0.54	0.25	-0.18	**0.03**	**0.99**
Libdem (0,1)	0.10	0.09	2.72	0.10	0.09	2.70	**0.00**	**0.99**

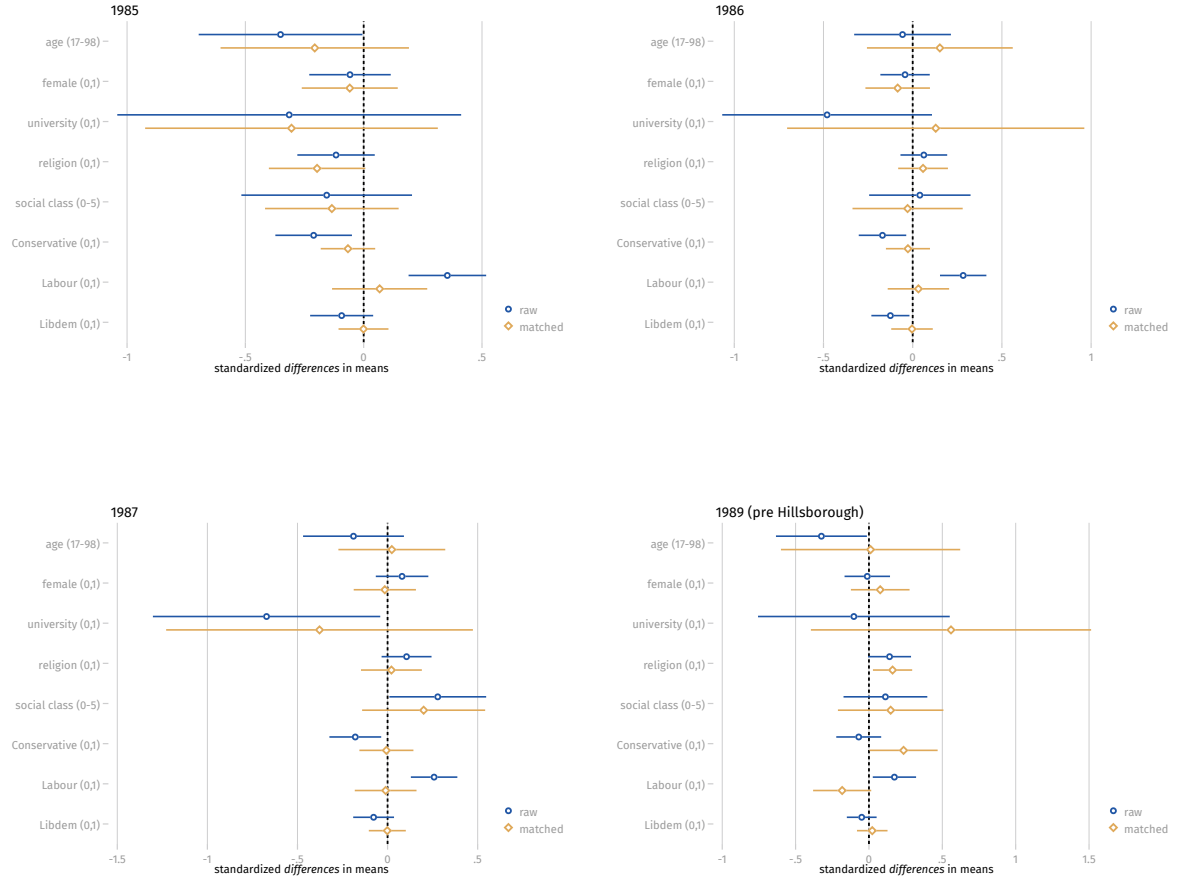
after matching we have balance for all covariates of interest.

In Figure A.18 we report the results of the matching approach for each pre-treatment year.[15] In the optimal case we would not find any differences between treatment and control in each year, meaning that the reported confidence intervals include zero. While we find some imbalances between treatment and control in the unmatched data (blue), after matching we do not observe any substantial differences in means for any covariates we matched on.

Table A.10 then reports the DiD findings from our matching results. While the ATT decreases to about 9 %

[15] As discussed beforehand: information on education is not reported before 1985. Thus, we can only report the balance test for the subsequent years.

Figure A.18: Balance per year, raw and matched data



points the effect of the Hillsborough disaster remains statistically significant and substantive in its size. We omit questions on party id in the first three models as they are plausibly affected by media exposure as (Ladd and Lenz 2009) have shown especially for the British case. Yet our findings for matching is not affected by this decision as the results of the remaining 3 models show which then also match on party IDs.

Table A.10: Did Euroscepticism decrease after Hillsborough in Merseyside (**Matching**)? Yes.

	(1)	(2)	(3)	(4)	(5)	(6)
	support leaving the EU (0,1)					
δ DiD	-0.135	-0.118	-0.090	-0.113	-0.098	-0.094
	(0.055)	(0.051)	(0.042)	(0.054)	(0.052)	(0.042)
Constant	0.291	0.287	0.280	0.292	0.288	0.287
	(0.014)	(0.013)	(0.010)	(0.014)	(0.013)	(0.011)
Constituency FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Quarter FE		✓	✓		✓	✓
Constituency FE × Quarter			✓			✓
Constituency FE × Year			✓			✓
Obs	31188	31187	31187	31188	31187	31187
N $_{constituencies}$	531	531	531	531	531	531
adj.R^2	0.08	0.09	0.11	0.10	0.10	0.13
adj.R^2 (within)	0.00	0.00	0.00	0.00	0.00	0.00
RMSE	0.42	0.42	0.41	0.42	0.42	0.41

Note: Clustered standard errors by constituency in parentheses.
Fixed effects omitted from table.

A.11 Clustering by county

Below we report the main analysis clustering at the county level instead of the constituency level. We do this only for the entire sample of England as otherwise we would rely on too few clusters (12 counties in case of Northern England only, 46 in case of Great Britain). Merseyside is one county. We also add a set of county-level controls to this analysis – logged population, gdp, employment rate, employment in several sectors (agriculture, construction, industry) – taken from Cambridge Econometrics. We then re-estimate the same models with fixed effects at the county level and cluster the standard errors at the county level.

Table A.11 reports the findings from the county-level analysis. The first 4 columns subsequently introduce fixed effects and controls. Models (5) - (8) reduce the sample to counties we observe in each and every survey year we can analyze (5 counties are not observed for some years). Model (9) then uses a wild bootstrap approach we discuss below. First, our main findings and conclusions remain unaffected by this change of

Table A.11: Re-producing main analyses clustering at the county level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	support leaving the EU (0,1)								
δ DiD	-0.154	-0.150	-0.129	-0.117	-0.153	-0.148	-0.124	-0.109	-0.154
	(0.008)	(0.009)	(0.008)	(0.012)	(0.008)	(0.009)	(0.008)	(0.012)	(0.050)
County FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quarter FE		✓	✓	✓		✓	✓	✓	
County FE × Quarter			✓	✓			✓	✓	
County FE × Year			✓	✓			✓	✓	
Controls ID				✓				✓	
Controls RE				✓				✓	
Obs	32317	32315	32315	32189	31009	31007	31007	31007	32317
N $_{counties}$	46	46	46	45	41	41	41	41	41
adj.R^2	0.04	0.04	0.04	0.07	0.04	0.04	0.04	0.07	0.04
adj.R^2 (within)	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.03	
RMSE	0.40	0.40	0.40	0.39	0.40	0.40	0.39	0.39	

Note: Clustered standard errors by county in parentheses. Controls omitted from table, individual level (1985-2004): age, gender, education, religion, social class, party-ID. Regional level: logged population, GDP, employment rate, employed in agriculture, employed in construction, employed in industry. County & time fixed effects omitted from table. Last column uses wild bootstraps, 1000 replications.

clustering and fixed effects setting. Second, the standard errors are comparable in size to the constituency-level analysis we report in the main body of our manuscript. Third, one challenge is the fact that we have too few clusters at our disposal for the analysis (below 50). This might bias our standard errors downward (see also: Bertrand, Duflo, and Mullainathan 2004). To address this issue we follow Esarey and Menger (2019) and use a wild cluster bootstrapped t-statistic (1000 replications) in the final model reported in Table A.11. Even though this increases the reported standard error significantly compared to model (1) in Table A.11, our main findings again remain unaffected by this more conservative estimation strategy.

A.12 Placebo test: UEFA cup

Below we report the findings of a placebo test. One concern might be that other salient events close to the Hillsborough disaster could drive the findings (compound treatment). One such event might be Liverpool F.C.'s UEFA Cup qualification during the 1991 football season. At the end of the season (20 May, 1991) the club qualified for the UEFA cup. At the time this was a conciliatory ending to the season – not necessarily a major success in the club's successful history. Nevertheless, this event might have influenced Liverpudlians attitudes towards the EU.

Table A.12: DiD placebo, using UEFA cup qualification

	(1)	(2)	(3)
	support leaving the EU (0,1)		
δ DiD	-0.109	-0.086	-0.095
	(0.077)	(0.073)	(0.066)
Constant	0.161	0.161	0.131
	(0.002)	(0.002)	(0.018)
Constituency FE	✓	✓	✓
Year FE		✓	✓
Quarter FE			✓
Controls			✓
Obs	20828	20828	20826
N $_{constituencies}$	521	521	521
adj.R^2	0.01	0.01	0.04
adj.R^2 (within)	0.00	0.00	0.03
RMSE	0.36	0.36	0.36

Note: Clustered standard errors by constituency in parentheses. Controls omitted from table (1989-2004): age, gender, education, religion, social class, party-ID. Constituency & time fixed effects omitted from table.

Above, we re-estimate our models using the post Hillsborough data only. We treat all interview conducted after the 1991 season's ending as treated, marking all interviews beforehand as control. Yet, we do not find any meaningful effects of the event on Liverpudlians' Euroscepticism as reported in Table A.12.

A.13 Robustness: controlling for "offshorability"

Some research indicates that Eurosceptic attitudes can be tied to one's relative level of exposure to globalization. For instance, Colantone and Stanig (2018: 201) show that "support for the Leave option in the Brexit referendum was systematically higher in regions hit harder by economic globalization". Thus, globalization might drive political attitudes differently in Merseyside than in other English regions. The reasoning being that Merseyside might be differently affected by globalization.

While we cannot fully incorporate Colantone and Stanig (2018) in our analyses due to lack of suitable data prior to the Hillsborough disaster, we can retrieve information from the British Social Attitudes Survey (BSA) on individuals' occupations. Using this data source then allows us to merge it with information on individual likelihoods of job "offshorability" for each respondent. We, thus, added information on occupation from the BSA data and merged it with available data on offshorability provided elsewhere (see: Mahutga, Curran, and Roberts 2018). These data provides us with respondents' occupational "routine task intensity" and "offshorability". Table A.13 replicates our main analyses controlling for both of these variables as well

Table A.13: DiD results, controlling for offshorability

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	support leaving the EU (0,1)							
δ DiD	-0.172	-0.165	-0.169	-0.165	-0.170	-0.165	-0.172	-0.167
	(0.058)	(0.055)	(0.058)	(0.054)	(0.059)	(0.055)	(0.058)	(0.057)
offshorability (-0.8-2.6)	-0.013	-0.011			-0.021	-0.009	-0.013	
	(0.005)	(0.005)			(0.006)	(0.006)	(0.006)	
routine task intensity (-1.5-2.4)			0.007	-0.009	0.016	-0.004		0.008
			(0.004)	(0.005)	(0.005)	(0.006)		(0.004)
δ DiD × offshorability							0.007	
							(0.012)	
δ DiD × routine task intensity								-0.010
								(0.017)
Constant	0.225	0.206	0.224	0.192	0.223	0.201	0.225	0.224
	(0.004)	(0.032)	(0.004)	(0.033)	(0.004)	(0.033)	(0.004)	(0.004)
Constituency FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		
Obs	7490	7490	7490	7490	7490	7490	7490	7490
N *constituencies*	171	171	171	171	171	171	171	171
adj.R^2	0.05	0.08	0.05	0.08	0.05	0.08	0.05	0.05
adj.R^2 (within)	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.00
RMSE	0.40	0.39	0.40	0.39	0.40	0.39	0.40	0.40

Note: Clustered standard errors by constituency in parentheses. Controls omitted from table (1985-2004): age, gender, education, religion, social class, party-ID. Constituency & time fixed effects omitted from table.

as their interaction with the DiD estimand. Throughout the models reported above we do not find any effect of including these variables on our main findings. This is evidence that globalization shocks are unlikely to explain away the effect stemming from the Hillsborough disaster.

A.14 Exposure to boycott, replicating DiD and instrumental variable results

Our main analyses rest on the assumption that the exposure to The Sun boycott is equal within Merseyside. Yet, as we discuss in the main body of the text, the extent of the boycott varies within Merseyside. While the newsagent survey shows that some form of boycott applies to the entire county, the city center is more strict and radical in enforcing the boycott. This becomes also strikingly clear when we look at the data we retrieved from "Total Ecplise" reported in Table A.14.

Table A.14: Number of boycotting shops per constituency, first stage

1997 constituency	$\sum$ boycotting shops
Liverpool Riverside	64
Liverpool Garston	45
Liverpool Wavertree	43
Knowsley North and Seftone	31
Liverpool Walton	31
Liverpool West Derby	22
Birkenhead	21
Bootle	20
St Helens South	4
Lancashire West*	3
Ellesmereport and Neston*	2
Southport	1
Derbyshire West*	1
St Nelens North	1
remaining England	*0*

Note: * = mark consituencies outside of Merseyside.

The data on the boycotting shops allow us to not only descriptively estimate how strong the boycott is within Merseyside, but also to re-estimate our DiD models using a measure of exposure to the boycott. To do so, we log transformed the number of shops boycotting The Sun for each constituency across England.[16] We then estimate the same DiD models as in the main body of the text with the difference that we use the logged number of boycotting shops as our treatment instead of the binary Merseyside indicator.

Table A.15 reports the findings from this approach. Again we find a significant drop in Sun readers as well as a drop in Euroscepticism. As the estimator is based on a logged number, we can interpret the most conservative test (column (10)) as a 3.5% decrease in Euroscepticism due to one unit increase in boycotting shops.[17] The issue of course with this approach is that we cannot know *when* shops started boycotting. In our telephone survey it also became clear that many shops either changed ownership or opened post treatment. Thus, we should read these results with caution as we need to assume that the distribution of boycotting

[16] log shop = log(N_{shops}+1)
[17] (exp(0.034)-1)×100=3.5

Table A.15: DiD results, using exposure to boycott

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Sun reader (0,1)				support leaving the EU (0,1)					
δ DiD(SHOPS)	-0.019	-0.037	-0.037	-0.032	-0.016	-0.058	-0.058	-0.051	-0.038	-0.034
	(0.004)	(0.006)	(0.006)	(0.007)	(0.007)	(0.010)	(0.010)	(0.008)	(0.014)	(0.013)
Constant	0.125	0.127	0.127	0.127	0.210	0.217	0.216	0.228	0.214	0.218
	(0.005)	(0.001)	(0.001)	(0.001)	(0.007)	(0.001)	(0.001)	(0.028)	(0.002)	(0.028)
Constituency FE		✓	✓	✓		✓	✓	✓	✓	✓
Year FE		✓	✓	✓		✓	✓	✓	✓	✓
Quarter FE			✓	✓			✓	✓	✓	✓
Constituency FE × Year				✓					✓	✓
Constituency FE × Quarter				✓					✓	✓
Controls								✓		✓
Obs	10259	10259	10259	10259	10384	10384	10384	10384	10384	10384
N $_{constituencies}$	172	172	172	172	172	172	172	172	172	172
adj.R^2	0.00	0.02	0.02	0.02	0.00	0.05	0.05	0.08	0.05	0.08
adj.R^2 (within)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
RMSE	0.33	0.32	0.32	0.32	0.41	0.40	0.40	0.39	0.39	0.39

Note: Clustered standard errors by constituency in parentheses. Controls omitted from table (1985-2004): age, gender, education, religion, social class, party-ID. Constituency & time fixed effects omitted from table.

shops was similar in 1990 as it is today. This is also why we treat this modelling strategy as a robustness test and do not use it as our main analysis.

Furthermore, this information on the extent of the boycott allows us to estimate an instrumental variable model. In more detail we estimate models of the following form:

$$\text{leaving EU}_{i,c,t} = \alpha_r + \gamma_t + \widehat{\text{shops}_c} + \text{post Hillsborough} + (\widehat{\text{shops}_c} \times \text{post Hillsborough}) + \epsilon_c \tag{5}$$

$$\widehat{\text{shops}_c} = \psi \text{Merseyside}_c + \epsilon_{c'} \tag{6}$$

We estimate a two stage least squares instrumental variable model in which we instrument the number of shops boycotting "The Sun" with the binary treatment indicator (=Merseyside) in the first stage. We measure the extent of the boycott in two ways. First, we retrieved the number of boycotting shops from the "Total Ecplise" website presented in Table A.14. Second, we rely on our phone survey of newsagents presented in the main body of the text and discussed in section A.1.2. From this survey we extract information on the proportion of newsagents reporting that they sell 0 copies of The Sun. We again introduce time fixed effects along with county fixed effects – we can no longer use constituency-level fixed effects as they are perfectly co-linear with the treatment indicator. England in total has nine regions (North East, North West, Yorkshire and the Humber, West Midlands, East Midlands, South West, South East, East of England, Greater London). Such an instrumental variable design helps us to further address issues of omitted variable biases which might still linger in the DiD design – even though this is unlikely to be the case given the exogeneity of our treatment.

Table A.16 reports the findings from these 2SLS models. First, in order for our instrument to be valid we need a strong first stage. This means that we need to find that the Merseyside indicator is strongly predictive of the number of boycotting shops. We already established this in Table A.15 above. Furthermore, the F-Statistic of this first stage is comparatively strong (>10), as reported at the bottom of Table A.16. Second, we need to establish independence of our instrument. Transferred to our design, a violation of independence would mean that places boycotting The Sun would have been on a different trajectory in the outcome variable than places which did not boycott The Sun. As discussed throughout the main body of the text, the boycott of The Sun occurred due to an exogeneous event and does not appear to be a function of pre-boycott trends. Third, the exclusion restriction needs to be established. In our case, we have to assume that the boycott affects Euroscepticism via the number of proportion of boycotting shops *only*. This assumption could be violated if the boycott triggered other paths to the outcome other than the number of shops selling The Sun.

The instrumental variable results further underpin the findings in the main body of the text. The first stage

Table A.16: Instrumental variable results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	support leaving the EU (0,1)							
	IV=self-reported boycott				IV=survey of newsagents			
δ DiD, instrumented	-0.033	-0.033	-0.036	-0.035	-0.400	-0.405	-0.435	-0.413
	(0.013)	(0.013)	(0.013)	(0.010)	(0.157)	(0.159)	(0.155)	(0.129)
Region FE		✓	✓	✓		✓	✓	✓
Year FE			✓	✓			✓	✓
Controls				✓				✓
Obs	10384	10384	10384	10384	10384	10384	10384	10384
RMSE	0.40	0.40	0.40	0.39	0.40	0.40	0.40	0.39
F-Stat.	840.77	750.90	839.48	823.53	22.91	18.40	18.55	18.69

Note: Clustered standard errors by constituency in parentheses. F-Stat is Kleibergen-Papp. Controls omitted from table (1985-2004): age, gender, education, religion, social class, party-ID. Region & time fixed effects omitted from table.

returns a strong F-Statistics for all models. Table A.16 also reports a significant and substantial decrease in Euroscepticism due to the boycott. Since the extent of the boycott can be understood as a compliance measure, the estimated effect size will be larger than in the standard DiD model, which presents ITT estimates. Reassuringly, we find similar effect sizes for both measures of the boycott – the list of boycotting shops derived from the Total Eclipse website and the survey responses from our newsagents survey.

A.15 Parallel trends based on DiD parameter estimates

In the main body of the text we relied on the raw data to evaluate if pre-trends are parallel, giving us confidence in the parallel trends assumption underlying the DiD. Here in the Appendix we further substantiate the parallel trends assumption by instead reporting the parameter estimates of our DiD approach in the following form:

$$\text{leaving EU}_{i,c,t} = \alpha_c + \gamma_t + \gamma_{c,t} + \sum_{m=-3}^{8} \delta_{\text{DID}_m} T_{c,t-m} + \varepsilon_{it}, \tag{7}$$

In essence, we estimate the same models with constituency and year fixed effects but interact our treatment indicator with the survey years in our data. We then plot the interaction effects in Figures A.20, A.21 and A.22.

Figure A.20: Parallel trends based on parameter estimates, Northern counties

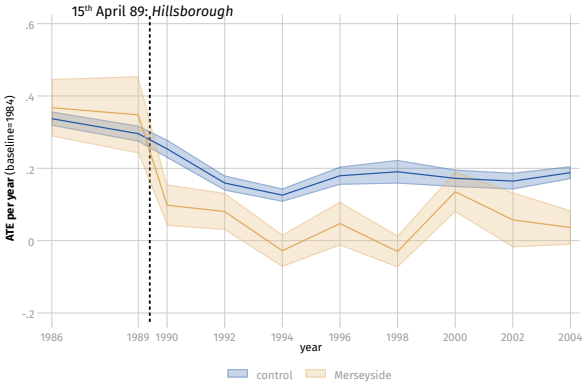
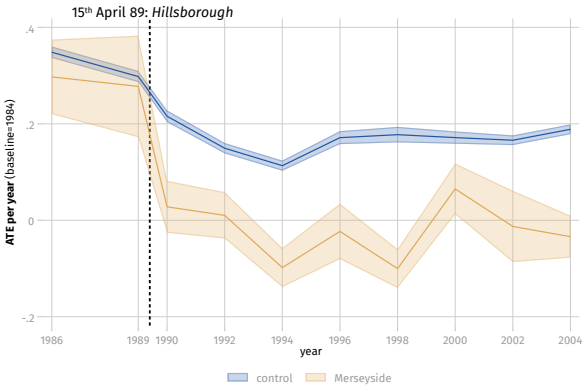
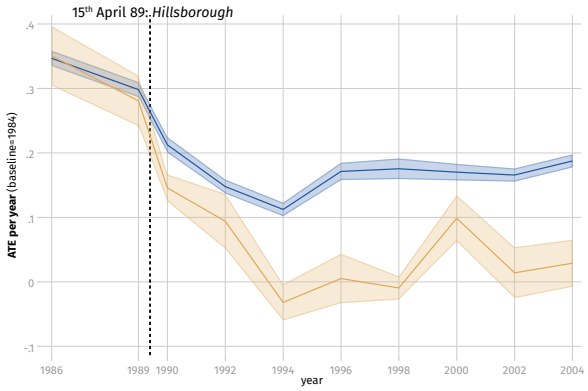


Figure A.21: Parallel trends based on parameter estimates, entire England



We do this for the Northern county sample (our preferred sample), the sample of all England counties, and for the complete sample of all boycotting shops in England that we discuss in detail in section A.1. Given the small sample sizes for some of the years in our data we have to pool two years into a single period. Otherwise we would base our treatment effect estimates in some years on only 30 respondents in Merseyside,

Figure A.22: Parallel trends based on parameter estimates, boycotting shops as treatment

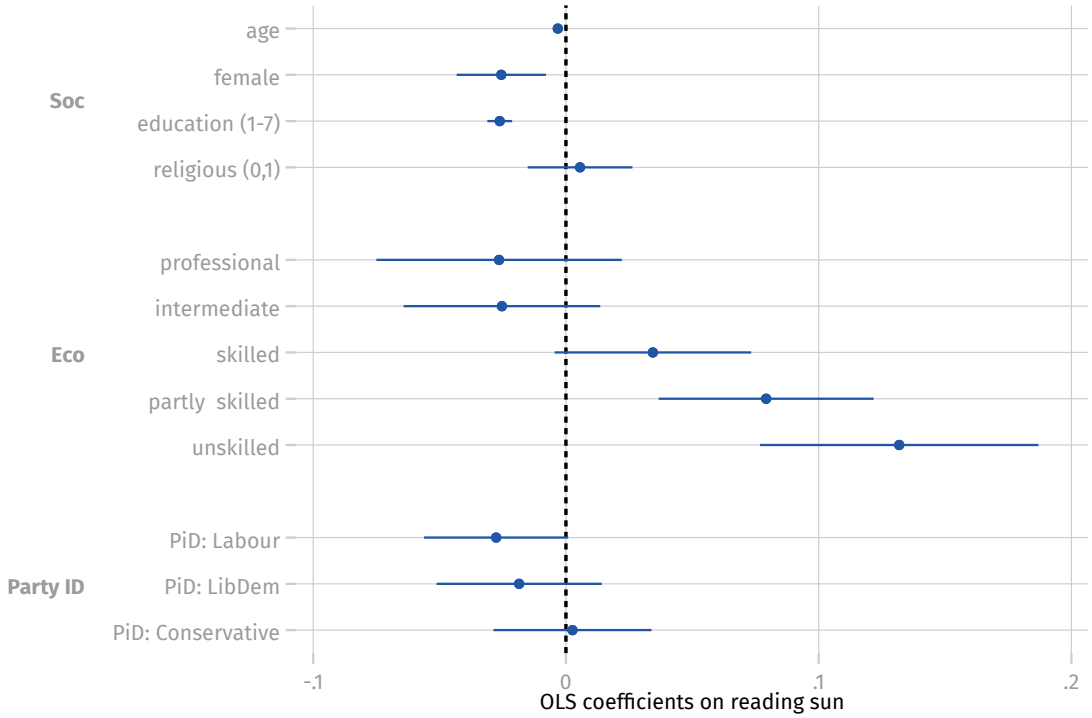


which would make them very noisy. Compared to the parallel trends plot we report in the main body of the text, we would expect that the major difference is that the fixed effects should control away the difference in levels between Merseyside and the rest of the country along with common shocks within years. And indeed we do report very similar patterns for the DiD parameters in Figures A.20, A.21 and A.22. As the shop boycott data is a continuous variable we report the effect of a one standard deviation increase in the boycott variable. Again, in all three figures, we find parallel pre-trends and a divergence in trends after the Hillsborough disaster, which continues to persist into the 2000s. Overall, this analysis again gives us confidence in the parallel trends assumption. One outlier post treatment is the year 2000 in which the BSA sampled more respondents in Southport than in any other year. From our shop data we learned that amongst constituencies in Merseyside, Southport has arguably the weakest boycott against The Sun in place. Thus, we would also expect that respondents in this constituency should be more Eurosceptic. This then explains the outlier in the post-treatment trend for the year 2000.

A.16 Who reads The Sun?

We estimated an OLS regression on which BSA respondents are most likely to read The Sun in the pre-Hillsborough data. We care about "Sun" readership because the effect of the Hillsborough disaster on Euroscepticism should be strongest for people who would have been plausible "Sun" readers before the disaster and would have continued to read The Sun in the counterfactual world in which Hillsborough would not have happened. However, given that our analyses are based on repeated cross-sections we cannot plausibly know which respondents would have read The Sun in Merseyside if the Hillsborough Disaster had never happened. We only observe respondents in Merseyside post-1989 in the presence of the disaster. Yet, we can approximate this group by relying on the strongest predictor(s) of "Sun" readership in the pre-Hillsborough data. Once we have identified this group we can run a difference-in-difference-in-differences (DiDiD) model as described in the main body of the text.

Figure A.23: Who reads The Sun?



Note: Baseline category for class is “working class”.

The OLS estimates are reported in figure A.23. It becomes clearly visible that university education and social class are the strongest predictors of "Sun" readership in the pre-Hillsborough data set. The higher respondents’ social class, the less likely they are to read The Sun. Unskilled and semi-skilled workers are most likely to read The Sun, followed by the skilled working class. Although we have no data on this question, it

appears plausible that working class respondents are also more likely to be Liverpool F.C. supporters. To help with the interpretation of our DiDiD estimates, and to include a large enough number of observations in all cells, we recoded the class variable into three categories, unskilled working class (*"never had job", unskilled workers, semi-skilled workers*), skilled working class (*skilled workers*) and middle class (*intermediate, professionals*). We then use this recoded class variable to estimate the DiDiD model. We do this by interacting the general DiD estimator (Merseyside × post Hillsborough) with the class variable discussed above.

$$\begin{aligned} leavingEU_{i,j,k,c,t,r} = \alpha + \gamma_1 Merseyside_{i,c} + \lambda_1 post\,Hillsborough_{i,t} \\ +\beta_1(Merseyside \times post\,Hillsborough_{i,c,t}) + \zeta class_j + \theta class_k + \\ \gamma_2(class \times Merseyside_{j,c}) + \lambda_2(class \times post\,Hillsborough_{k,t}) + \\ \beta_2(class \times Merseyside \times post\,Hillsborough_{j,c,t}) + \lambda_3(class \times post\,Hillsborough_{k,t}) + \\ \beta_3(class \times Merseyside \times post\,Hillsborough_{k,c,t}) + \varsigma' X_{i,j,k,c} + \tau_t + \rho_r + \epsilon_{i,j,k,c,t} \end{aligned} \tag{8}$$

where subscript $_i$ stands for unskilled working class respondent, subscript $_j$ for skilled working class respondent, and subscript $_k$ for middle class respondent.

A.17 Referendum analysis

The 2016 EU referendum counting areas officially located within Merseyside county are Liverpool, St. Helens, Knowsley, Wirral, Sefton, and Halton. They form the treatment group. The remaining 96 counting areas in North East England and North West England form the control group. The 2016 and 1975 referendums were counted under a different system. Becker and Novy (2017) match 1975 counting areas to 2016 counting areas, and we use their data. We transform the data from wide-format into long-format in order to construct a panel data set with two time periods.

Since covariates for 1975 are unavailable, we use covariate data from 2001 in time period 1. Since our most important control variables are shares of EU and A10 migrants that might have differed between Merseyside counting areas and other Northern areas, the 2001 start date makes sense because it is right before the EU-Eastern enlargement and the ensuing opening of the UK Labour market to migrants from A10 countries in 2004. We hence control for changes in EU and A10 migration at the counting area level from 2001 to 2011, the exact period that saw a large increase in Eastern European migrants to the UK. The covariates taken together add around 9% to the R^2. Table A.17 on page A19 displays the full model including the estimated coefficients and corresponding standard errors.

Table A.17: DiD: Effect of Hillsborough on 2016 Leave vote share

	(1)	(2)	(3)	(4)	(5)
	leave vote share				
δ DiD	-0.082	-0.083	-0.082	-0.087	-0.087
	(0.031)	(0.032)	(0.031)	(0.023)	(0.024)
share EU migrants				-2.955	-2.955
				(1.864)	(2.242)
share A10 migrants				-0.121	-0.121
				(2.589)	(3.001)
share non-EU migrants				0.365	0.365
				(0.242)	(0.256)
median wage				0.011	0.011
				(0.036)	(0.047)
share finance employment				0.784	0.784
				(0.337)	(0.371)
share manufacturing employment				-0.156	-0.156
				(0.100)	(0.110)
share over 60s				0.159	0.159
				(0.106)	(0.109)
share tertiary education				-0.757	-0.757
				(0.167)	(0.180)
Constant	0.453	0.453	0.453	0.569	0.423
	(0.005)	(0.005)	(0.002)	(0.049)	(0.047)
Merseyside FE	✓	✓		✓	✓
region FE	✓			✓	✓
year FE	✓		✓	✓	✓
counting area FE			✓		
region × year FE		✓			
Obs	102	102	102	102	102
adj.R^2	0.862	0.860	0.838	0.924	0.924
adj.R^2 (within)	0.064	0.062	0.102	0.485	
RMSE	0.048	0.049	0.052	0.036	0.036

Standard errors in parentheses; model (5) uses bootstrapped standard errors.

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