

# Local Newspaper Decline and Political Polarization\*

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January 26, 2021

## Abstract

Does consolidation in the market for local news affect electoral polarization? A growing literature recognizes that political polarization partially stems from changes in the media landscape. While declines in the number and readership of local news outlets have been prevalent for decades, there is little work that studies how local news exits affect polarization. To examine this relationship, we draw on a novel panel data set of the coverage areas of all German newspapers between 1979 and 2009. Using a difference-in-differences design, we demonstrate that newspaper exits increase electoral polarization. We argue that the most likely explanation for this finding is a shift from news about relatively consensual local politics to national news. As individuals are increasingly exposed to national politics, stronger partisan cues may activate partisanship and induce ideological extremity. Consistent with this argument, we find that local news exits lead to increases in the consumption of national news and induce affected individuals to report higher degrees of partisan identification.

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\*We thank Gary King, Heike Kluever, Michael Olson, Pia Raffler, Anna Wilke, Stephane Wolton, and audiences at APSA, Harvard, and HU Berlin for helpful comments. We thank Inga Brentel and Joerg Hagenah for their invaluable help in accessing and cleaning the media consumption data. Please send correspondence to [hhilbig@g.harvard.edu](mailto:hhilbig@g.harvard.edu).

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# 1 Introduction

How does the decline of traditional news outlets affect political polarization? Political polarization has become a core challenge for established democracies. Over time, political polarization has led to the emergence of a number of negative consequences. These include legislative gridlock (Jones 2001) as well as de-legitimization and animosity towards political opponents (Mason 2018; McCoy and Somer 2019), which ultimately spills over into nonpolitical realms (Iyengar et al. 2018; McConnell et al. 2018). At the same time, social scientists have recognized how changes in the media environment are partially responsible for increasing polarization (see e.g. Iyengar and Hahn 2009; Prior 2013; Levendusky 2013a; Martin and McCrain 2019). Research on the relationship between media and polarization has largely focused on television, the internet, and national news media in general. In this paper, we use a novel German data set to study the relationship between electoral polarization and the decline of local newspapers, which has received comparably little attention.

The relationship between newspaper exits and electoral polarization is theoretically ambiguous. In the context of national news media, prior research has shown that greater choice in the market for news may exacerbate polarization (Prior 2007; Aelst et al. 2017; DellaVigna and Kaplan 2007). This happens when different outlets correspond to distinct ideological viewpoints, and consumers select into outlets based on their own political priors (Gentzkow, Shapiro and Sinkinson 2014). However, local news is often much less ideological. In the German context, partisan local reporting was common before World War II, but has since given way to a more neutral reporting style (Blotevogel 1984). What is more, local politics is often perceived as more consensual and less politicized, with a smaller emphasis on partisan differences (Holtkamp 2017). Local news exits may therefore increase polarization if consumers switch from local to national news outlets that cover more politicized and adversarial national politics.

To estimate the effects of newspaper exits on electoral polarization, we link a novel panel of all German newspapers between 1979 and 2009 with county-level electoral results in local and national elections. We stress that we assess the effect on electoral polarization at the county level, as measured by the vote share weighted average distance from the ideological center. To partial out time-invariant confounders, we use a difference-in-differences approach that compares counties that experience exits to those that do not. We find that exits have a positive effect on the average ideological dispersion in a county. Accordingly, we also show that exits increase vote shares for parties that are further from the ideological center, both for federal and municipal elections. In a series of additional checks, we confirm that outcome and covariate trends do not differ between counties that eventually experience exit and those that do not. What is more, the results are robust to a number of different functional forms. Taken together, our findings suggest that the decline of local news has spurred electoral polarization.

We propose that greater exposure to more politicized national news outlets is the most likely explanation that underlies our findings. Using two supplementary data, we present two pieces of evidence that are consistent with this argument. First, we utilize a large-scale consumption survey to demonstrate that national news consumption increases both in relative and absolute terms after a local outlet exists. Second, we employ a panel survey to show that exits heighten the salience of partisanship among affected individuals. We find that respondents become more likely to identify with a party, report higher intensity identification, and are slightly more involved in politics.

Using qualitative and quantitative evidence, we further discuss and then reject two alternative explanations for our findings. First, newspaper exits may be caused by population declines or economic downturns, which could, in turn, induce voting for parties further from the center. While initially plausible, we find no evidence that counties where exits occur are on different economic or demographic trajectories than counties where exits do not occur. Moreover, our results are robust to the inclusion of relevant covariates. Second, exits may

lower the ideological congruence between consumers and news outlets if consumers select into newspapers based on newspaper slant. However, prior qualitative work strongly suggests that German local newspapers do not slant their reporting. As a result, it appears unlikely that exits affect polarization through changes in reader-outlet congruence.

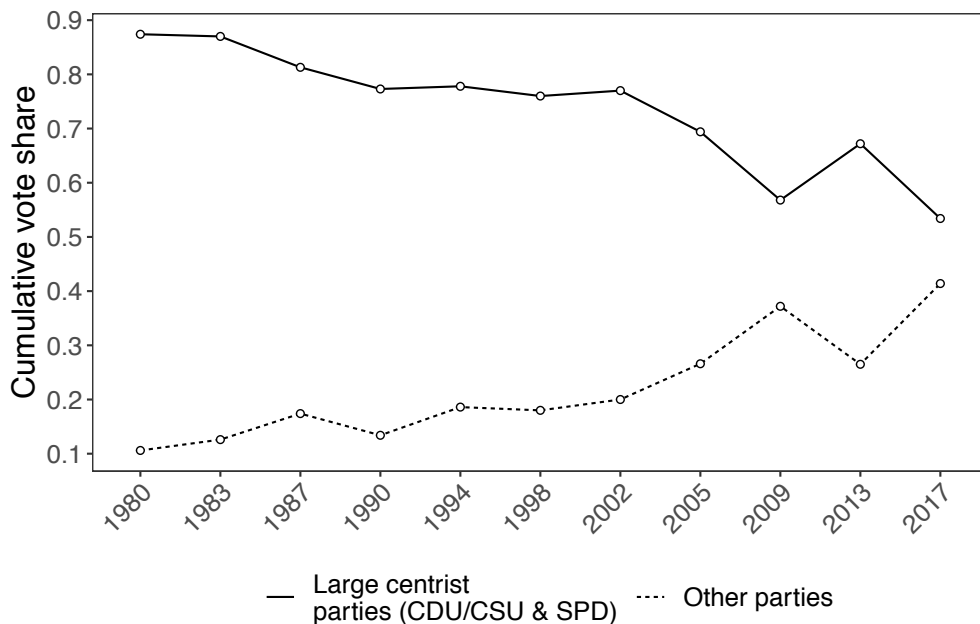
Our research contributes to a number of related literatures. Most directly, we add to previous research that analyzes how changes in the market for news affect political preferences (DellaVigna and Kaplan 2007; Gentzkow, Shapiro and Sinkinson 2011). To our knowledge, this study is the first to present extensive panel evidence on newspaper exits in the German context. In fact, only a handful of studies have analyzed the effects of newspaper exits outside of the American context (major examples are Drago, Nannicini and Sobbrío 2014 and Cagé 2019). Second, we contribute evidence on a previously understudied effect of the decline of local news: political polarization. While the decline of local news has been linked to lower political accountability (Ramsay and Moore 2016; Gao, Lee and Murphy 2018) and political participation (Hayes and Lawless 2015), prior research has paid comparatively little attention to increasing ideological extremity as a result of the decreased supply of local outlets.

## 2 Local news and polarization

Political polarization has become a widespread phenomenon among established democracies. In the US, prior work documents an increasing relevance of partisan identities and growing ideological divisions between political elites (Baldassarri and Gelman 2008; Hetherington and Weiler 2009; Druckman, Peterson and Slothuus 2013). In Europe, polarization has created new lines of political conflict, pertaining especially issues such as climate change or migration (Kriesi et al. 2012). At the same time, Europe has experienced the formation of a set of radical parties (Kitschelt and McGann 1997). In Figure 1, we visualize the trend towards non-centrist parties in Germany. Since the 1970s, the centrist Christian Democrats

(CDU/CSU) and Social Democrats (SPD) have steadily lost voters to parties further from the political center. Commonly cited causes for polarization are voter sorting and realignment (Abramowitz and Saunders 1998, 2008), an increasing overlap of individual party affiliation and other types of salient social identities (Mason 2018), and the emergence of radical candidates or parties that 'pull' voters from the political center (Woon 2018; Banda and Cluverius 2018; Bischof and Wagner 2019). Most relevant to our argument, the emergence of partisan media outlets and ideologically one-sided news exposure, especially online, have been named as potential drivers of political polarization (Prior 2013; Levendusky 2013a)

Figure 1: Fractionalization of the vote in German federal elections



*Note:* The figure shows the vote share of the two large centrist German parties, the Christian Democrats (CDU/CSU, center-right) and the Social Democrats (SPD, center-left) in comparison to all other parties in all federal elections since 1980. Parties other than Christian Democrats and the Social Democrats generally hold more ideologically extreme positions.

Rather than studying highly partisan media exposure, we link polarization to the decline of local news outlets. The continuing decline of local news has attracted attention in both the public and scholarly discourse. In the United States, the circulation of paid daily newspapers has decreased by more than 50% since 1990, from more than 60 million units to less than 30 million units today. A similar trend can be observed in Germany, where the total circulation

of daily newspapers has dropped from more than 25 million copies in 1990 to about 15 million today (see figure 2). In virtually all Western democracies, newspaper sales and advertising revenues have dropped substantially, as we show in figure A.1 in the appendix. This ‘death of local news’ has raised concerns about repercussions for political accountability (Hayes and Lawless 2015; Ramsay and Moore 2016; Gao, Lee and Murphy 2018), ideological diversity in the market for news (Gentzkow, Shapiro and Sinkinson 2014), and political participation (Gentzkow, Shapiro and Sinkinson 2011; Hayes and Lawless 2015; Cagé 2019).

Figure 2: Newspaper circulation in Germany and the United States



*Note:* The figure shows the circulation of paid daily newspapers per capita in the United States and Germany over time. Data for the US was collected by *Pew Research Center*. Data for Germany was originally published by the *Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern*. We retrieved the data from [statista.com](https://www.statista.com).

Why might local newspaper exits affect political behavior, particularly political polarization? On the most basic level, exits change patterns of news consumption for individuals who are affected by the exit. The resulting shift in consumption behavior can take four forms: affected readers may i) switch to a different local outlet, if there is one; they can ii) substitute with a national newspaper, iii) increase consumption of other news sources (e.g. radio or television), or (iv) consumers may not substitute at all and therefore consume less news in general.

Among the four reactions described above, the latter three will induce an increase in the relative share of national news that individuals consume. This is most apparent when voters react to exits by subscribing to a national newspaper. Increased consumption of other news sources after exit (e.g. television) would likewise imply greater exposure to national news.<sup>1</sup> In cases where individuals do not shift to other outlets, the share of national news in their media diet increases. The majority of people consume national news on a regular basis, most commonly in the form of national newspapers or television.<sup>2</sup> When individuals in this group continue consuming national news after local news exit, their media diet becomes relatively more nationalized. Taken together, local news exits likely induce some individuals to consume (relatively) more national news.

How do political preferences react to such shifts from local to national news exposure? First and foremost, a shift to national news consumption will heighten the relative salience of national politics. While local newspapers in Germany devote some space to coverage of national issues, local politics constitutes a large share of their reporting (we discuss local news coverage in more detail in section 2.1). In contrast, domestic reporting in national outlets focuses almost exclusively on national politics. The connection between exits and polarization may therefore run through a key difference between local and national politics: the salience of ideological differences and political conflict.

Prior research suggests that ideological differences in local politics are less pronounced than in national politics (Berg, Nagelschmidt and Wollmann 1996; Holtkamp 2008, 2017). Studying opinion formation in local and national arenas, Metag (2016) remarks that “party identification as a political predisposition is more important for opinion formation at the na-

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<sup>1</sup>German television channels generally broadcast the same content nationwide and tend to report on national-level politics and other noteworthy events. Regional channels only account for about 12% of the German television market (AGF 2019).

<sup>2</sup>Between 1980 and 2005, television reached between 77% and 89% of all individuals over the age of 14, while national newspapers reached between 51% and 76%. For more data on news consumption in Germany, see Ridder (2005).

tional level [while] local politics, at least in Germany, often are perceived as less ideologically biased.” (p. 197). Accordingly, consensus across party lines is more common in local politics. As [Wehling and Kost \(2010\)](#) describe, projects such as the construction of infrastructure or public good provision are often decided in bipartisan councils. The relatively low relevance of partisan differences on the local level is reflected in the large number of candidates who run on bipartisan tickets or as independents. In the 2020 mayoral elections in North Rhine-Westphalia - Germany’s most populous state - 24% of elected mayors ran on the ticket of two or more parties, while about 12% ran as independents ([NRW 2020](#)). In Bavaria, the second-most populous state, 45% of current mayors are not affiliated with any of the large national parties ([Bayerische Landesamt für Statistik 2021](#)). This stands in stark contrast to the national parliament, where each of the 709 MPs is strictly affiliated with a single party ([Bundestag 2021](#)).

When local newspapers exit, polarization may be exacerbated through increased exposure to ideologically charged national politics. This can occur either through the activation of partisan identities or through a persuasion mechanism, where individuals move further away from the ideological center. The heightened salience of partisan positions in national news outlets may prime and strengthen partisan identities even without persuading consumers to change their opinions ([Lelkes, Sood and Iyengar 2017](#)). While individuals may spontaneously process political information through a partisan lens, they are more likely to do so when primed with a recognizable partisan position ([Zaller 1992](#)). Strikingly, this holds when cued by in-party positions as well as out-party positions that individuals reject ([Goren, Federico and Kittilson 2009](#)). Through the shift towards national news consumption, partisan priming becomes more prevalent. More and more, individuals are exposed to clearly delineated partisan cues that stem from highly visible party officials. As a result, party cues in national news outlets may push individuals to seek what [Levendusky \(2013b\)](#) terms “directional goals” – a desire to confirm their own partisan biases. In particular, these partisan cues may prime partisanship for individuals that align with non-centrist parties – newspaper content



data confirms that national outlets report on these parties markedly more often than local outlets.<sup>3</sup> Therefore, stronger partisan priming through national news consumption may increase attitudinal extremity, as individuals increasingly seek out positions that confirm their partisan preconceptions.

In addition to priming partisan identities, the information presented in national outlets may persuade consumers to become more extreme. Before going into detail, we emphasize that German national news outlets do not exhibit large degrees of partisan slant.<sup>4</sup> Rather, they present the reader with a cross-partisan set of (often competing) viewpoints. Faced with differing viewpoints, [Taber and Lodge \(2006\)](#) show that individuals not only prefer positions that are congruent with their prior attitudes, but even strengthen their own convictions when exposed to such positions (see also [Kruglanski and Webster 1996](#); [Prior 2013](#)). Since local outlets cover more consensual and often non-partisan local politics, persuasion effects may be small or non-existent. Following [Taber and Lodge \(2006\)](#), local politics can be viewed as a setting where polarization through persuasion is less probable, as ideological differences do not “arouse sufficient partisan motivation to induce much biased processing” (p. 756). The converse may be true in national politics, where partisan differences are more apparent. When consuming news about national politics, individuals might now find themselves agreeing with more extreme arguments, even if made by the same party as in the local context. Citing [Taber and Lodge \(2006\)](#), [Levendusky \(2013b\)](#) argues that even cross-cutting media, i.e. outlets that present balanced reporting, could polarize attitudes if consumers start refuting information that runs counter to their own beliefs – a process that can then push individuals to even greater ideological extremity. As a result, individuals who consume a greater share of national news tend to become more extreme in their own viewpoints. Summarizing the argument, a shift from local to national news may (i) activate

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<sup>3</sup>For more information, see section [A.9](#) in the appendix

<sup>4</sup>Based on survey data, [Mitchell et al. \(2018\)](#) demonstrate that consumers place major German TV and print news outlet close to the center of a left-right scale

or strengthen partisan identities and (ii) persuade consumers to become more ideologically extreme.

In addition to increased exposure to national politics as a result of exit, we consider three alternative mechanisms. The first two draw on the argument that polarization is an outcome of what [Iyengar et al. \(2018\)](#) call ‘high choice media environments’. As discussed previously, consumers have been found to select into consuming news outlets that confirm their ideological priors ([Levendusky 2013b](#)). Building on this finding, local newspaper exits may affect polarization if affected consumers (i) substitute by consuming news from a highly partisan outlet or (ii) switch to a remaining local news outlet that differs in its ideological slant. The first scenario requires the existence of sufficiently partisan alternatives. While abundant today, such alternatives were rare during our sample period (1979–2009). Most commonly, highly partisan environments can be found on the internet (see e.g. [Lelkes, Sood and Iyengar 2017](#); [Boxell, Gentzkow and Shapiro 2017](#)). However, [Ridder \(2005\)](#) shows that internet use was non-existent during the majority of our time period (see also [2.1](#) for more information). Similarly, partisan cable news channels do not exist in Germany, and newspapers tend to exhibit only weakly partisan tendencies ([Blotevogel 1984](#)). As a result, we consider it less likely that local newspaper exits caused selection into partisan outlets, at least for the period that we analyze.

While the previous mechanism relates to the substitution away from local outlets, consumers may also switch from the exiting outlet to a remaining one. At the beginning of this section, we discussed how consumer may react to exits by either substituting with a national outlet or by simply consuming less news. We now address the possibility that consumers will substitute local news with local news. If local newspapers are sufficiently partisan and if consumers select into local news based on their priors, we might expect that switching to a different local outlet lowers polarization. If readers initially base their choice of news outlet based on ideological closeness, switching to a remaining local outlet would then lower ideological agreement between a reader and the outlet she reads. Crucially, this requires

that ideological variation between local newspaper is large enough to cause selection based on partisan preferences. However, the previously mentioned lack of evidence for partisan slanting in German local newspaper suggests that changes in ideological congruence between readers and local outlets due to exits are likely small. Therefore, it appears improbable that partisan differences between local newspaper would affect polarization.

Finally, the relationship between newspaper exits and polarization could be related to what [Martin and McCrain \(2019\)](#) term ‘demand’ rather than supply effects. If newspaper exits are caused by underlying demographic or economic trends, such as downturns or population declines, trends in polarization may simply reflect these underlying secular trends. Similarly, individuals might perceive the exit of local newspapers as a signal of economic decline. To punish incumbent centrist parties, voters might shift their electoral support to parties and candidates running on more extreme political platforms, leading to political polarization. While theoretically plausible, our results suggest that regions, where exits occur, do not experience significantly different economic or demographic trajectories prior to exit (see section [4.3](#)).

## 2.1 Local newspapers in Germany

Before describing our main analysis, we provide some background information local newspapers in the Germany. During our study period, local newspapers constituted a highly trusted source of information for a large share of the adult population in Germany. In 2011, local newspapers still reached 55.8% of all adults in Germany. Although online news sources have become more important in recent years, their relevance was still limited during the time period covered in this study (1979 – 2009). The total number of broadband internet connections in Germany has steadily increased since 2001, but was still at low overall levels before the 2009 federal election – the last election covered in our data set (see figure [A.2](#) in the appendix). In a representative survey of the German adult population in 2010, only 16%

of respondents indicated that they consumed online news. In addition, daily newspapers were deemed considerably more reputable than online sources: 43% of respondents listed them as their most trusted source of information, compared with only 6% for online news sources (Bundesverband Deutscher Zeitungsverleger 2011). In a 2008 survey, 97% of readers agreed that their local newspaper is a well-established regional institution, while 87% of respondents stated that their local newspaper acts as a “mouthpiece for the people in the region”.

In contrast to national news media, local newspapers tend to prioritize local events and politics in their reporting, providing the “informational backbone of what people know about social life in their city” (Leupold, Klinger and Jarren 2018, p.960). The style of reporting mirrors the consensual norms of decision making at the local level. Reporting tends to be factual and apolitical. While local newspapers used to be aligned with political parties before World War II, readers have since come to prefer unaligned and independent local news over partisan reporting (Blotevogel 1984). Although local newspapers do report on national politics, the relative share of editorial space dedicated to national news is much lower than in national newspapers. What is more, non-centrist parties feature more prominently in national newspapers. Using content-coded articles from the GLES survey (Roßteutscher et al. 2017), we find that the three traditionally non-centrist parties in Germany (the Greens, the FDP, and the Left party) are covered about 40% more often in national newspapers compared to local newspapers. In addition, national newspapers report more frequently on policies that are traditionally associated with national politics. They are more than twice as likely to mention terms associated with migration, law and order, or environmental issues, compared to local newspapers (see figure A.12).

### 3 Data and empirical strategy

To examine the causal effect of local newspaper exit on political polarization, we combine four different data sets. First, to measure local newspaper exits, we digitized a novel county-level data set on the entry and exit of all German local newspapers between 1979 and 2009 (Stamm and Tewes 1979). Second, we draw on county-level electoral data for federal and municipal elections to measure our primary outcome variable, electoral polarization. To shed further light on the mechanisms linking local newspaper exits to electoral polarization, we supplement our analysis with individual-level data. First, we leverage a seldomly used, large-scale annual survey on media consumption in Germany. This novel data source allows us to analyze the effect of newspaper exits on the media consumption behavior of more than 670,000 respondents between 1980 and 2008 (Hagenah, Meulemann and Akinci 2006). In addition, we analyze the effect of local newspaper exits on political attitudes and behavior using individual-level panel data from the German Socio-Economic Panel (SOEP). We now proceed to describe all data sources and how they are used in our analysis in more detail.

#### 3.1 Electoral Polarization

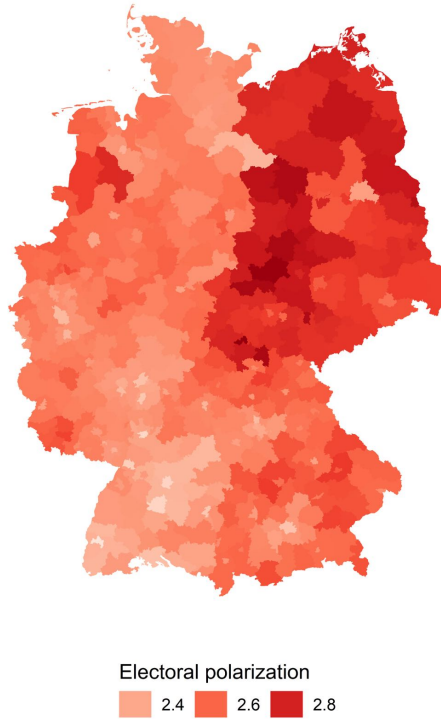
Our main outcome variable is political polarization measured on the basis of election results in federal and municipal elections between 1979 and 2009. Drawing on the polarization measure introduced by Dalton (2008), our main outcome variable  $Y_{c,t}$  is electoral polarization in county  $c$  in year  $t$  defined as:

$$Y_{c,t} = \sqrt{\sum_j \psi_{j,c,t} (\tau_{j,t} - \bar{\tau}_t)^2}$$

where  $\psi_{j,c,t}$  is the vote share of party  $j$  in county  $c$  at time  $t$ ,  $\tau_{j,t}$  is the position of party  $j$  at time-period  $t$  across the left-right political spectrum, and  $\bar{\tau}_t$  is the mean party position

in Germany at time  $t$  (weighted by the number of votes). To measure  $\tau_{j,t}$ , the ideological position of parties, we draw on the left-right RILE scores from the Manifesto project (Volgens et al. 2020). To the best of our knowledge, this is the only data source that covers party positions throughout our entire study period starting in the 1980s. We visualize the RILE scores of German political parties during our study period in figure A.3 in the appendix.

Figure 3: Electoral polarization in the 2009 federal election



*Note:* The figure shows the geographic distribution of our outcome variable, electoral polarization, based on the federal election results in 2009.

Intuitively, our measure of electoral polarization is smallest when all votes are concentrated in the center of the political spectrum, or when all parties run on the same ideological platform.<sup>5</sup> In contrast, our polarization index is maximized when the vote is split between the extremes of the political spectrum. Mathematically, our measure corresponds to the weighted standard deviation of party positions in county  $c$  at time  $t$ . The weights vary

<sup>5</sup>In the extreme,  $Y_{c,t} = 0$  when all parties run on the same platform and  $\tau_{j,t} = \bar{\tau}_{c,t} \forall j$

across counties and correspond to each party’s vote share in a given county. The party-positions on the left-right political spectrum vary over time but are constant across counties within a given election-year. We illustrate the geographic distribution of our polarization measure in figure 3. Polarization tends to be higher in East Germany, where the far-left party ‘Die Linke’ attracts a sizable number of supporters. We show similar maps for all federal elections between 1983 and 2009 in figure A.5 in the appendix.

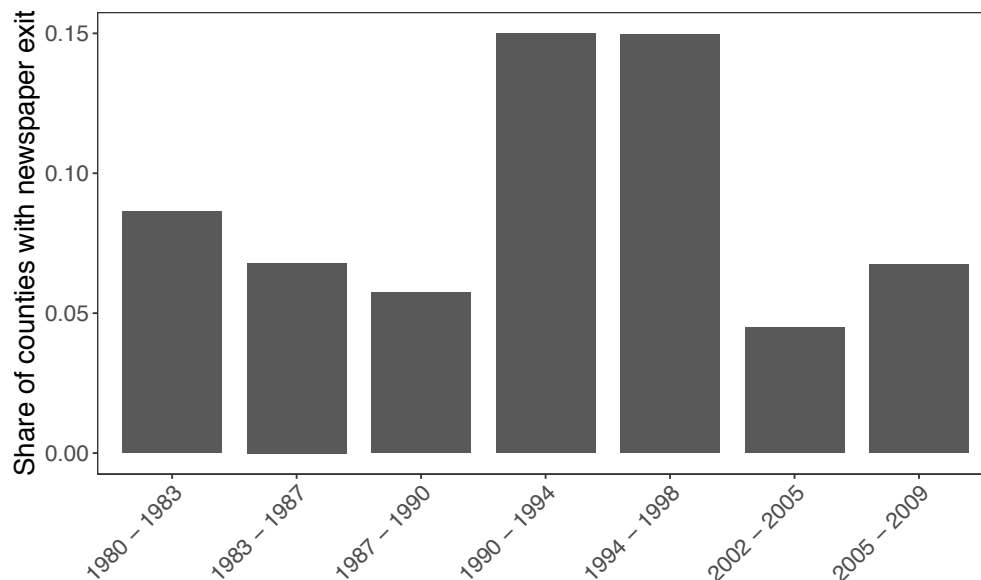
### 3.2 Local newspaper exits

We collected data on the market entry, exit, and coverage areas of all local newspapers in Germany between 1979 and 2009 from the “*STAMM Leitfaden durch Presse und Werbung*” (Stamm and Tewes 1979), an annual publication that is intended for public relations and advertising purposes of companies, organizations, and agencies. We obtained, digitized, and hand-coded relevant chapters for all editions published between 1979 and 2012. This comprehensive data source allows us to precisely measure the exit and entry of newspapers into local media markets over more than thirty years.

Specifically, we coded three indicator variables that measure changes in the structure of the local media market.  $Exit_{c,t}$  is defined as the market exit of at least one local news outlet between time periods  $t$  and  $t - 1$  in county  $c$ . This is our main treatment variable. We visualize its distribution over time in figure 4. In over 84% of cases, it captures the exit of one single local outlet. In rare cases, multiple outlets exit from the same market between election periods. Analogously,  $Entry_{c,t}$  is defined as the market entry of at least one new local news outlet. Finally, we include a separate indicator variable for cases in which the market entry and exit of distinct news outlets occurs during the same time period. This, however, only occurs in rare cases. We also note that the measurement of our treatment

relates to the presence of unique newspaper titles, not changes in ownership structure.<sup>6</sup> More details on the coding scheme we used to measure the market entry and exit of newspaper outlets can be found in section A.1 in the appendix.

Figure 4: Newspaper exits over time



*Note:* The figure shows the distribution of our treatment over time. We show the share of counties who experienced local newspaper exits prior to each federal election. Our sample of counties only covers West-Germany prior to reunification in 1990. Because the coding of coverage areas in our main data source changed between 1999 and 2001, we do not exploit newspaper exits during this time period. For more information see Section A.1 in the S.I.

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<sup>6</sup>For example: when a newspaper is acquired by its competitor in a duopolistic market but continues to be published as a distinct outlet, this would not be coded as a newspaper exit in our data. When a newspaper is acquired and rebranded, this would count as both exit and entry at the same time, and hence be captured in our residual treatment category. Finally, suppose a newspaper ceases to be published as a distinct outlet. In this scenario, we would observe a newspaper exit in our data.



### 3.3 Estimation

To analyze the effect of local newspaper exits on electoral polarization, we estimate a series of first-difference OLS models of the following form:

$$\Delta Y_{c,t} = \alpha_t + \tau \mathbb{1}_{Exit_{c,t}} + \gamma \mathbb{1}_{Entry_{c,t}} + \delta \mathbb{1}_{Entry_{c,t} \cap Exit_{c,t}} + \epsilon_{c,t}$$

To partial out time-invariant confounders, we exploit the panel-structure of our data and measure both the outcome and treatment variables as within-county<sup>7</sup> changes over time. Our main outcome variable  $\Delta Y_{c,t} = Y_{c,t} - Y_{c,t-1}$  measures the change in political polarization (as defined above) between consecutive elections. The main parameter of interest is  $\tau$ , the effect of local newspaper exit on political polarization. We estimate robust standard errors clustered at the county-level for all of our analyses.

Our preferred specification includes period-fixed effects  $\alpha_t$ : we compare the change in polarization between counties that experienced local newspaper exits and those that didn't within a given election-period (e.g. between 1994 and 1998) but not across election-periods. We include fixed-effects for counties that experienced newspaper entries or both exits and entries to ensure that control counties did not experience any change in the market for local news between subsequent periods. Finally, we emphasize that while polarization exhibits strong spatial clustering (e.g. much higher levels of polarization in East Germany), we do not exploit such level-differences in polarization across disparate regions in our analysis.

The definition of  $t$  depends on the election cycle. Generally, we measure changes in both polarization and media market structure between consecutive elections. For example, we measure both the change in polarization and local news availability in a given county

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<sup>7</sup>Counties are small geographic areas that on average extend about 900 km<sup>2</sup> and contain  $\sim 200,000$  inhabitants. While county borders were subject to a number of administrative reforms throughout our study period, all our analyses are based on the county boundaries as of the year 2018.

between the federal elections 2009 and 2005. Federal elections are generally held every 4 years. For municipal elections, the election cycle varies across states. A detailed list of all elections covered in our analysis can be found in figure A.4 in the appendix.<sup>8</sup>

### 3.4 Media consumption data

To shed further light on the individual-level effects of local newspaper exit, we draw on a large-scale annual survey conducted by the *Media Analysis Group* (Hagenah, Meulemann and Akinci 2006).<sup>9</sup> Each year, about 23,000 respondents are surveyed about which national and local news outlets they read on a regular basis. In total, we leverage fine-grained individual-level data on the media consumption of more than 670,000 respondents during our study period 1980 - 2008. At the individual level, we measure the number of local and national news outlets respondents regularly read.<sup>10</sup> We observe whether respondents read one of the four largest national newspapers (Bild, SZ, FAZ, Welt), which combined accounted for more than 90 % of the national newspaper market as of 2010 (Brandt 2020).

We use this information to estimate the level of local vs. national media consumption at the county-level. This requires us to aggregate the survey data to the county level. Since our main outcome, electoral polarization, is not observed annually, we aggregate four-year periods of consumption data per county. As an example, we would obtain our consumption measure

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<sup>8</sup>Our county-panel only covers West-Germany from 1979 to 1991. Starting in 1991, our panel includes all counties in East Germany (former GDR). 1994 is hence the first election in which East German counties enter the analysis. For this election, we measure the change in the number of local news outlets between 1991 and 1994.

<sup>9</sup>The Media Analysis Group (Arbeitsgemeinschaft Media-Analyse) is a union of more than 250 publishing houses and broadcasting companies. The main objective of this commercial survey is to enable market research for advertising. The data collection is described in detail in (Hagenah, Meulemann and Akinci 2006).

<sup>10</sup>We consider a respondent as regularly exposed to a daily newspaper if he or she has read at least one issue of the paper within the last two weeks prior to the survey.

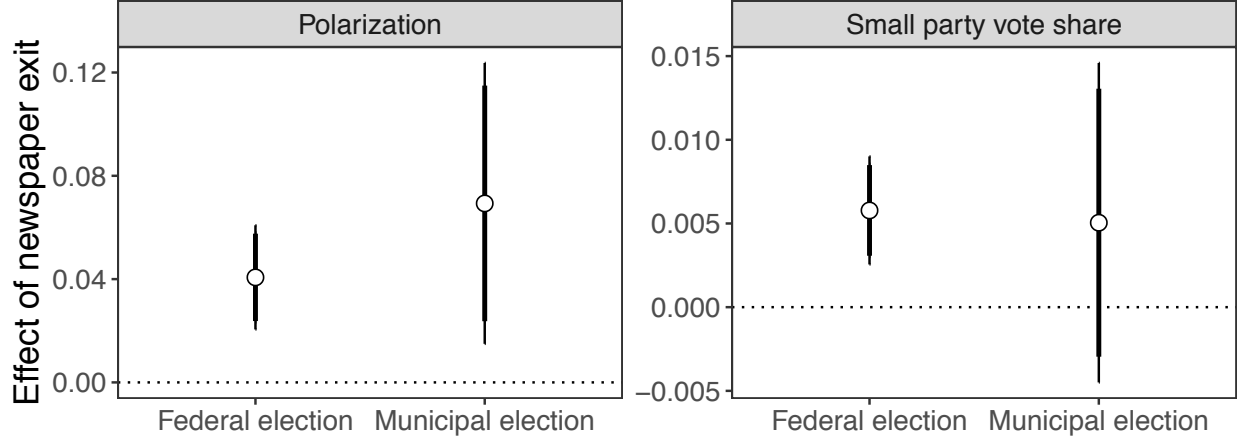
for a county  $c$  in the 1998 election by calculating the mean consumption across all respondents in this county between 1995 and 1998. While this method allows for easier comparison with the electoral polarization outcome, it also increases the number of respondents that are used to aggregate consumption behavior, and therefore allow us to obtain more accurate estimates. Similar to our main analysis, we difference our measure of media consumption at the county-level, i.e. we look at within-county changes in media consumption behavior after local news exit.

### 3.5 Individual partisanship

In an additional analysis, we examine the consequences of local newspaper exit for individual political attitudes and engagement. To do so, we use the German Socio-Economic Panel Study (SOEP). The SOEP is a large annual panel, which contains information on social, political and economic characteristics of about 20,000 respondents each year. Based on our theoretical expectations, we select SOEP outcomes that measure (i) the strength of individual partisanship on a scale from 0–5, (ii) the a binary indicator identifying with any party and (iii) a four-point scale of involvement in local parties, political causes, and initiatives.

We estimate first-differenced OLS models in the same manner as discussed in section 3. As a result, we assess the effect of newspaper exit on individual political outcomes for a respondent residing in county  $c$  at time  $t$ . Although the SOEP outcomes are measured annually or biannually, our time periods are based on federal election years to make this analysis closer to the main specification. Therefore, we utilize within-person in four-year intervals.

Figure 5: Effects of newspaper exits on electoral polarization



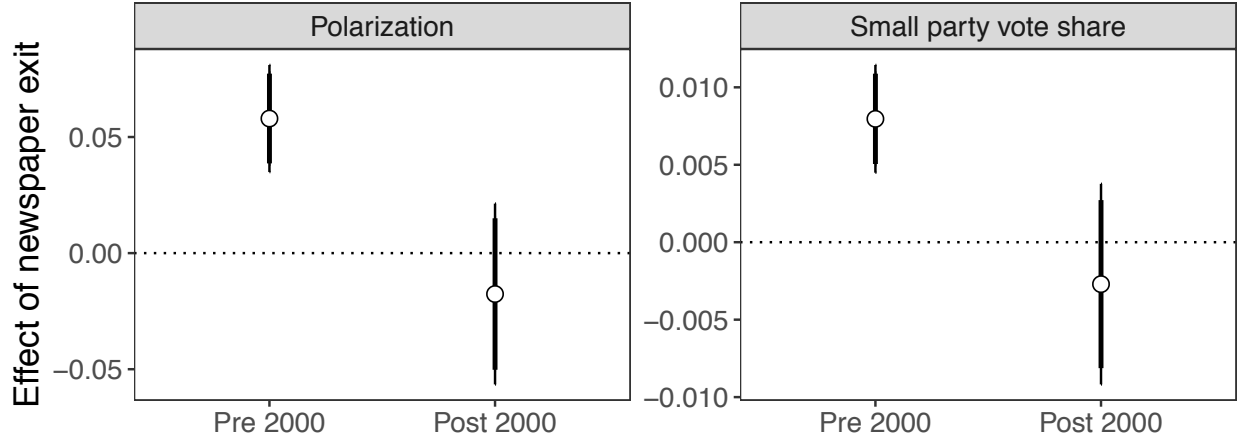
*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on two outcomes: political polarization, as well as the vote share of non-centrist parties. The results are based on the benchmark specification, which uses first-differenced outcomes and year fixed effects. Polarization is measured as the weighted ideological dispersion of party positions on the county level (see Dalton 2008). Small party vote share is obtained by summarizing the vote share of all non-mainstream parties. We consider Germany’s two largest parties, SPD and CDU/CSU, as being mainstream.

## 4 Results

We present the main results in figure 5. Here, we show the effect of newspaper exit on political polarization, for two outcomes and two different types of elections. We find that the exit of a local newspaper increases polarization, as measured by the distance from the party system average, in both federal and municipal elections. In the second panel of figure 5, we show that this effect stems from a greater propensity to vote for fringe parties that are further from the ideological center.

In the next step, we examine whether the treatment effect of newspaper exit changes over time. As we show in figure 2, newspaper readership in Germany has been in decline. As a result, the effects of newspaper exit may decrease over time, as fewer constituents are directly affected by consolidating media markets. In figure 6, we demonstrate that this the case. For elections prior to 2000, we find pronounced and significant effects of newspaper

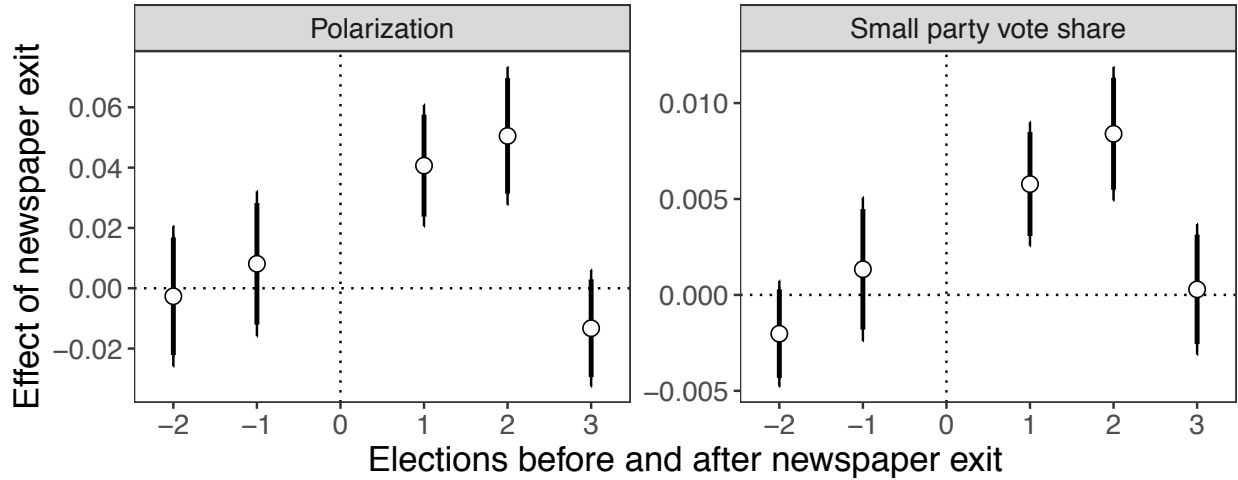
Figure 6: Effect heterogeneity over time



*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on two outcomes: political polarization, as well as the vote share of non-centrist parties. We only consider federal elections. The results are based on the benchmark specification, which uses first-differenced outcomes and year fixed effects. We split our sample into two subsets defined by elections before and after the year 2000, as indicated on the x-axis.

exit. For elections after 2000, we observe point estimates close to zero.

Figure 7: Main results – event study



*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on two outcomes: political polarization, as well as the vote share of non-centrist parties. We estimate the effects of future and past newspaper exits on two outcomes of interest. The x-axis indicates the election relative to the time when newspaper exit occurs. Elections labeled -1 and -2 are prior to exit, while elections labeled 1, 2, and 3 are after exit occurs. The effect for the election labeled 1 is the main effect presented in figure 5. Null effects for periods labeled -1 and -2 indicate that there are no detectable differences between counties where newspapers exit prior to the exit. See also footnote 11 for more details on the estimation.

A possible concern is that counties where local newspapers exit are already on a different trajectory than counties where this is not the case. Therefore, we examine whether counties where exits occur are already different prior to newspaper exit. Similarly, an important question is whether the effects of newspaper exit persist for longer than one electoral cycle. To answer these questions, we approximate an event study approach, where we estimate the effects of newspaper exit for multiple elections around the initial exit.<sup>11</sup> In figure 7, we present the results. Reassuringly, we find that counties where newspapers exit are not already different prior to exit. In the two elections preceding newspaper exit, we detect no significant differences in polarization and support for smaller parties. In addition, we find that the effects of newspaper exit persist for two electoral cycles after the initial treatment occurs. By the third election, the effects of newspaper exit have dissipated. Given the German legislative term of four years, this equals lasting effects of up to eight years.

## 4.1 National news consumption

In figure 8, we present event-study estimates of the effect of newspaper exits on absolute and relative levels of national newspaper consumption. We find evidence that national news consumption increases after local newspapers exit. Similar to the results in the previous section, these effects are largest in the second election after the exit. In addition, consumption trends between affected and unaffected counties do not appear to diverge before exits occur, lending support to the assumption that parallel trends hold in our setting. Given the richness of our consumption data, we can separately estimate consumption effects by outlet. We

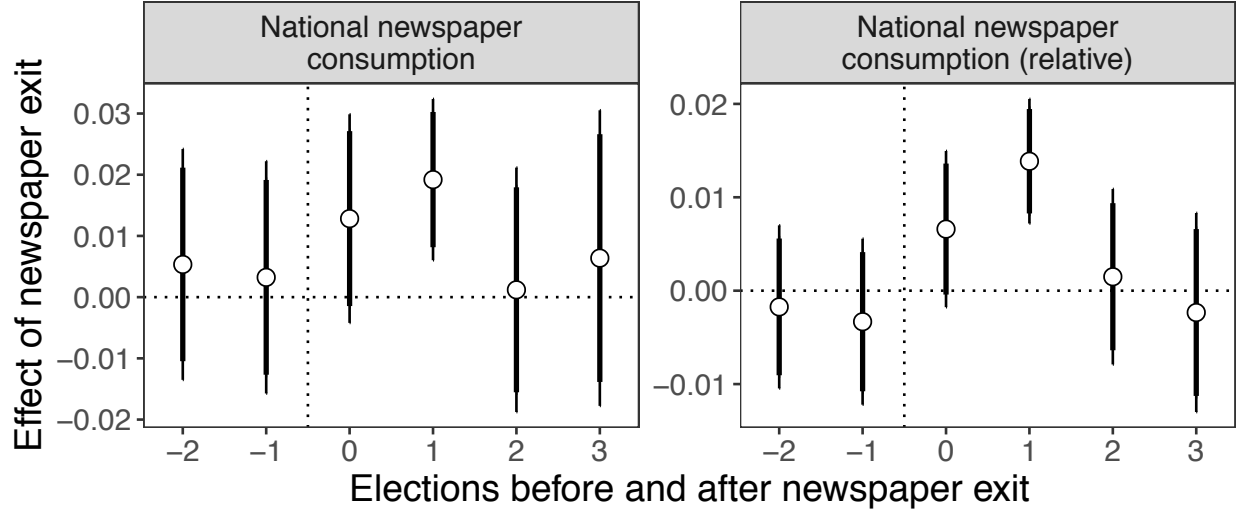
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<sup>11</sup>To implement this, we estimate a series of models of the form

$$\Delta Y_{c,t} = \alpha_t + \tau \mathbb{1}_{Exit,t+k} + \gamma \mathbb{1}_{Entry,t+k} + \delta \mathbb{1}_{Entry \cap Exit,t+k} + \epsilon_{c,t}$$

where  $k \in \{-2, -1, 0, 1, 2\}$ . For  $k > 0$ , we estimate whether a voting outcome  $\Delta Y_{c,t}$  is affected by *future* newspaper exits, while negative  $k$  indicates that we estimate the effect of newspaper exits for the second and third election after the exit happens. Finally,  $k = 0$  corresponds to the main specification where we estimate the contemporaneous effects of exit.

Figure 8: Effects of newspaper exits on national news consumption



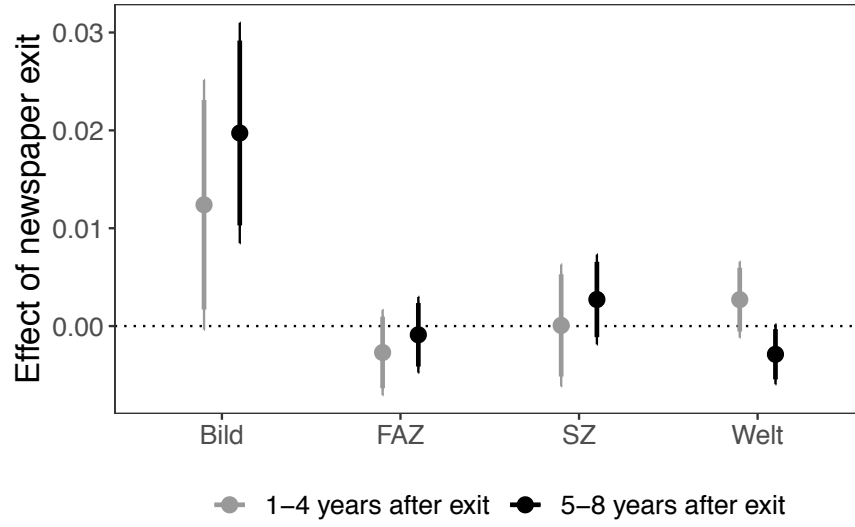
*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on two outcomes: absolute levels of national newspaper consumption, and the relative share of national outlets among all newspapers that individuals consume. We estimate the effects of future and past newspaper exits on two outcomes of interest. The x-axis indicates the election relative to the time when newspaper exit occurs. Elections labeled -1 and -2 are prior to exit, while elections labeled 1, 2, and 3 are after exit occurs. Null effects for periods labeled -1 and -2 indicate that there are no detectable differences between counties where newspapers exit prior to the exit.

present outlet-specific results in figure 9. Here, we show how exits affect the likelihood of consuming four different national newspapers. We observe the strongest effects for the largest German tabloid, *BILD*. These results are consistent with the argument made in the theoretical section, where we posit that polarizing effects of newspaper exits may stem from a shift towards nationalized news consumption.

## 4.2 Effects on partisanship

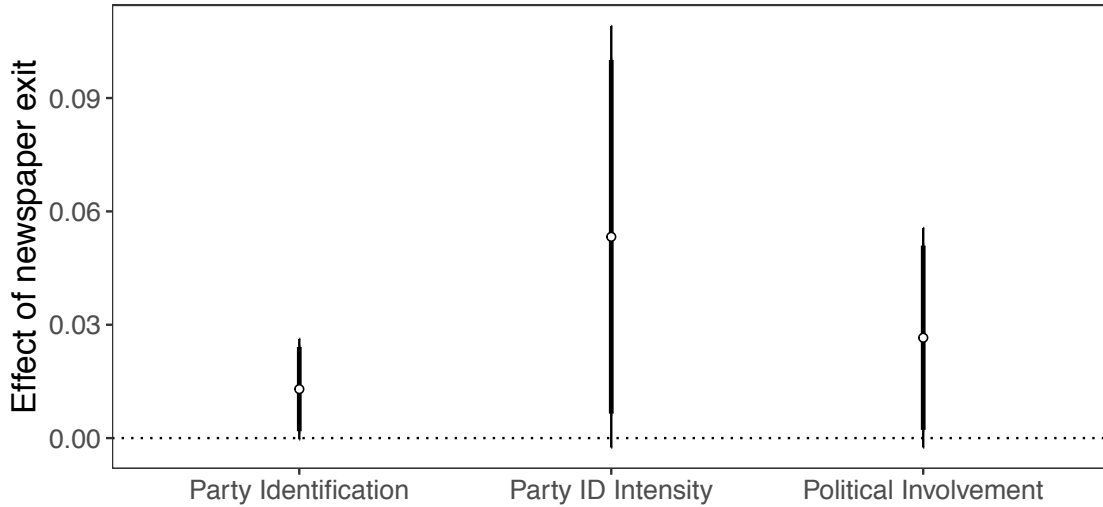
We now turn to the effect of newspaper exits on individual-level outcomes based on the SOEP panel survey. As shown in figure 10, local newspaper exit increases constituents' level of identification with a party and their willingness to become involved in politics. Respondents in counties where newspapers exit are more likely to identify with a party, report stronger feelings towards said party and are more likely to be politically active.

Figure 9: Effects of newspaper exits on national news consumption, by outlet



*Note:* The plot shows the estimated effect ( $\tau$ ) of a local newspaper exit on consumption of four national newspapers. We employ the same first-difference specification as in the main analyses. We present effects one election after exit (labeled ‘1-4 years after exit’) and two elections after exit (labeled ‘5-8 years after exit’).

Figure 10: Effect of newspaper exit on individual-level outcomes



*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on three outcomes: A binary party identification dummy, Party ID intensity measured on a scale from 0 to 5, and political involvement measured on a scale from 0 to 4. For both continuous variables, higher values denote involvement or identification with a party. The results are based on the model specification with differenced outcomes and year fixed effects. 90% (thick lines) and 95% (thin lines) confidence intervals are reported based on robust standard errors clustered by county.



We believe that the observed patterns are in line with a shift towards national news. National reporting focuses more strongly on conflict between parties. When confronted with partisan conflict and disagreement about policies, voters are more likely to associate themselves with a political faction and develop a stronger partisan identity. This, in turn, increases the strength of party identification and may also affect involvement in politics.

### 4.3 Alternative specifications and robustness

As an additional robustness check, we use two further specifications to estimate the effect of newspaper exits on political polarization. The first omits period fixed effects ( $\alpha_t$ ) in the main model, while the second one adds three additional covariates to account for changes in population, employment, and GDP/capita. We present the results of these additional specifications in figure [A.6](#) and table [A.3](#). We find that our results are generally robust to estimating alternative specifications. As suggested by the findings in figure [6](#), this is especially true for the period prior to 2000, where all but one specification is significant at  $\alpha = 0.01$ .

In the next step, we evaluate whether our results are sensitive to varying definition of the party system mean  $\bar{\tau}$ . In our main specifications, we use weighted RILE scores in election  $t$ , with party vote shares at the federal level as weights. In figure [A.9](#) in the appendix, we present results using two alternative definitions of  $\bar{\tau}$ , using state- and county-level vote shares as weights for the party system mean. Reassuringly, we find that the results remain unchanged when using alternative definitions of the party system mean.

Next, we disaggregate newspaper exits by the number of remaining outlets. In doing so, we evaluate whether exits that represent more severe changes to the local market for news have larger effects. In figure [A.8](#), we confirm that this is the case. We find that exits where three or more local outlets remain have no effect on either the polarization index or the vote share of non-centrist parties. In contrast, we observe strong positive effects for larger

changes to the market for news. When only one or two outlets remain, the effect of an exit is sizable. We consider this evidence to be consistent with the main results. In settings where many local outlets remain, the shift towards national news coverage is likely less pronounced than in cases where only a few outlets continue to exist.

Before moving to the conclusion, we discuss an alternative explanation for our results. As elaborated in section 2, the observed positive effect on polarization may stem from a common cause, such as economic downturns. If a county loses population or experiences declining employment, the demand for local newspapers decreases, resulting in newspaper exit. At the same time, voters might react to economic downturns by punishing the centrist SPD and CDU/CSU parties and defecting to parties further from the ideological center. We present several pieces of evidence to demonstrate that demand effects cannot explain our results.

First, we demonstrate that our results remain unchanged when controlling for trends in employment, population, and GDP/capita, as shown in figure A.6. Second, we show that counties where newspapers exit does not experience changes in polarization prior to exit. As discussed before, the results in figure 7 suggest that counties where newspapers eventually exit are on different trajectories with respect to electoral behavior. Third, there are likewise no differential trends in economic or population growth between counties with and without newspaper exits, as we demonstrate in figure A.10. Fourth, we show that our results are primarily driven by newspaper exits prior to 2000. If the primary driver behind our results is economic or demographic decline, there is little reason to expect that we would only find effects prior to 2000. However, this pattern is consistent with the general shift from traditional to online news sources, which would suggest that the exit of regional newspapers has smaller effects when baseline readership is lower. The fact that the effect of newspaper exits declines over time, therefore, supports the claim that newspaper exits drive polarization.

## 5 Conclusion

Does the decline of local news affect political polarization? Based on a novel data set on the entry and exit of all German local newspapers between 1979 and 2009, we show that local newspaper exits increase electoral polarization, as measured by an ideological dispersion index and the vote share of non-centrist parties. To account for time-invariant confounding, we employ a difference-in-differences design, comparing counties where newspaper exit to those where this is not the case. Through a series of robustness checks, we show that treated and untreated counties are on similar trajectories with respect to the outcomes and relevant covariates prior to exit. Taken together, our results strongly suggest a positive causal effect of newspaper exit on polarization.

To explain our findings, we propose that local newspaper exits induce a shift from local to the national news consumption. While local politics is relatively consensual and bipartisan, national politics tend to be more partisan and adversarial, which is reflected in national news reporting (Holtkamp 2008; Wehling and Kost 2010). Strong partisan cues in national reporting could activate partisan identities, inducing a desire to seek out positions that confirm partisan preconceptions (Levendusky 2013a). What is more, exposure to more pronounced partisan positions may have persuasive effects, leading individuals to become more politically extreme (Taber and Lodge 2006). Two pieces of evidence support this argument. First, we show that both absolute and relative consumption of national newspapers increases after local newspapers exit. Second, we use survey data to demonstrate that exits lead individuals to become decidedly more partisan in their views, consistent with the activation of partisan identities through national news exposure.

Assessing alternative explanations, we emphasize that demographic and economic trends do not explain newspaper exits. What is more, we find no evidence for differential trends in political behavior or news consumption prior to newspaper exits. Therefore, we argue that

the decline of local news and the observed increases in polarization do not merely from a common cause.

Overall, our findings highlight that consolidation in the market for local news contributes to electoral polarization, hinting at one mechanism to understand the origins of mass-level polarization. Recent research on the polarizing effects of media emphasizes self-selection into highly partisan outlets. Contrasting the narrative about the perils of high-choice environments, we demonstrate that a diverse media landscape can prevent radicalization. In addition, we observe rising polarization when constituents shift to more nationalized news environments, even before the internet was a widely available source of information. Finally, our paper contributes to the debate on the decline of consensual local politics in established democracies more generally. As local politics increasingly mirrors sorting along national lines of partisan conflict, constituents lack exposure to political compromise. In an environment where collaboration across party lines is rare, individuals develop stronger partisan identities and more extreme ideological positions.

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# A Supporting Information (Online Only)

## Contents

A.1 Treatment coding . . . . .	2
A.2 Descriptive statistics . . . . .	4
A.3 Overview of results . . . . .	9
A.4 Additional results & alternative specifications . . . . .	10
A.5 Results by number of remaining outlets after exit . . . . .	11
A.6 Results for different reference categories . . . . .	12
A.7 Covariate trends before and after exit . . . . .	13
A.8 Predicting newspaper exit . . . . .	14
A.9 Local and National Newspaper Reporting on Small Parties . . . . .	16

## A.1 Treatment coding

We collected data on the market exit, entry and coverage areas of all local newspapers in Germany from the *STAMM Leitfaden durch Presse und Werbung* (“STAMM Leitfaden”), an annual publication that is intended for public relations and advertising purposes of companies, organizations, and agencies. This compendium contains points of contact, advertising prices, circulation, and various other information on local newspapers and local editions of regional and national newspapers. We obtained, digitized, and hand-coded relevant chapters for all editions published between 1979 and 2012, with the exception of 1999.

In 1999, the general layout of the STAMM Leitfaden and the way that newspapers’ coverage areas are recorded changed. This change resulted in a reduction in the number of captured newspapers from 1999 to 2001. For this reason, we treat the years 1979 – 1999 and 2001 – 2012 as separate datasets: We never exploit variance in local newspaper market structure across the two time periods. For the 2002 federal election for instance, we measure the change in local newspaper coverage since the year 2000, not since 1998.

The raw data is collected at the municipality and county level. That is, for each newspaper, we observe the municipality in which its headquarters are located. We also observe municipalities and counties that local editions of regional and national newspapers appear in. We aggregate this information up to the county-level, and measure the number of unique outlets available in each county. Coverage regions generally go beyond a single municipality and span the entire surrounding county.

Our categorical treatment variable measures changes in the number of unique local news outlets available in a given county. To do this, we compare the outlets available in county  $c$  at time  $t$  to the outlets available in the same county  $c$  at time  $t - 1$ . To account for measurement error in our original data source, we do not count the following events as changes in local newspaper market structure from year to year:

- the entry of a newspaper at time  $t$  that exited in the previous year  $t - 1$
- the entry of a newspaper at time  $t$  that exits again in the next period  $t + 1$
- the exit of a newspaper at time  $t$  that will re-enter the dataset in the next year  $t + 1$
- the exit of a newspaper in time  $t$  that just entered in the previous period  $t - 1$

We also exclude any changes that relate to ‘non-unique newspapers’. For example, when two newspapers are editorially identical, because two local editions of the same regional newspapers contain the same content, we assign them the same newspaper id. If both are available in county  $c$  at time  $t$  but only one of them is available at time  $t + 1$ , we do not count this as a market exit. We also exclude regional editions of the national newspaper *Bild* from our dataset. For East-Germany, we record changes in local newspaper availability starting in 1992.

When we measure changes between election-years (e.g. between 1994 and 1998), we sum up all yearly changes that occurred between the two periods. If at least one unique newspaper entered the local market in at least one year, we code this as ‘market entry’. If at least one unique newspaper exited the local market in at least one year, we code this as ‘market exit’. If both events occurred between the two periods, we code this as ‘exit and entry’. If neither of the events happened, we code this as ‘no change’ (all indicator variables are set to zero).

## A.2 Descriptive statistics

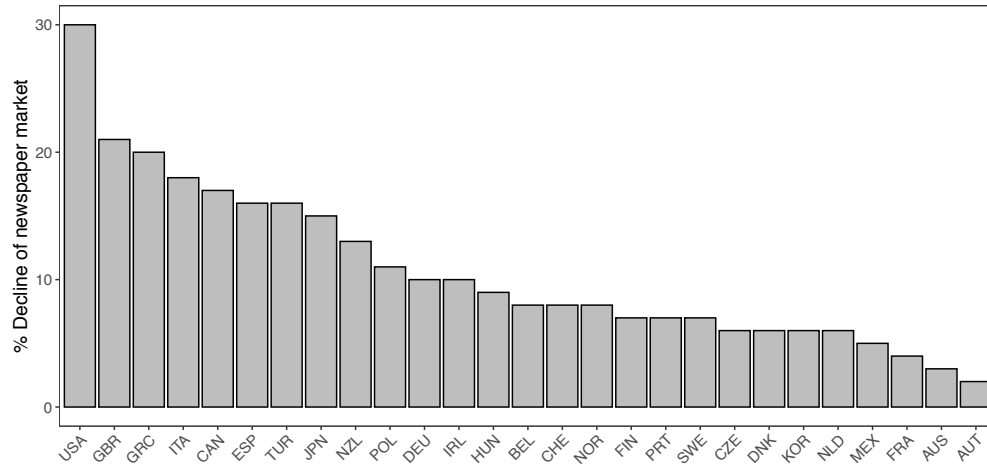
Table A.1: Summary statistics, federal election data

Variable	Mean	S.D.	N	Min	Max
SPD voteshare	0.33	0.10	2651	0.10	0.65
CDU/CSU voteshare	0.42	0.11	2651	0.14	0.75
Greens voteshare	0.07	0.03	2651	0.00	0.26
FDP voteshare	0.09	0.04	2651	0.02	0.34
Left party voteshare	0.06	0.08	2003	0.00	0.38
Other parties voteshare	0.04	0.03	2651	0.00	0.14
Turnout	0.78	0.07	2651	0.55	0.93
Newspaper entry (0/1)	0.05	0.22	2570	0.00	1.00
Newspaper exit (0/1)	0.09	0.29	2570	0.00	1.00
Newspaper exit and entry (0/1)	0.04	0.20	2570	0.00	1.00
Electoral polarization	8.89	2.72	2651	4.85	15.50
East Germany (0/1)	0.16	0.37	2651	0.00	1.00
Population size (thousands)	198.51	214.68	2637	33.33	3472.01
GDP per capita (thousands)	24.73	10.99	1491	9.32	89.58
Employment rate	0.48	0.14	1542	0.22	1.15

Table A.2: Summary statistics, federal election data (first-differences)

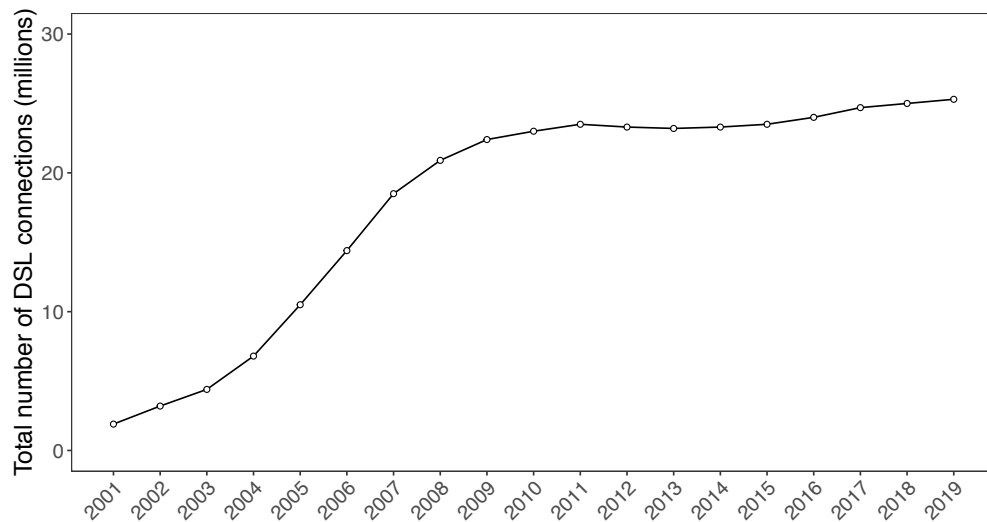
Variable	Mean	S.D.	N	Min	Max
SPD voteshare	-0.02	0.06	2574	-0.22	0.17
CDU/CSU voteshare	-0.02	0.04	2574	-0.19	0.09
Greens voteshare	0.01	0.02	2574	-0.10	0.10
FDP voteshare	0.00	0.03	2574	-0.28	0.09
Left party voteshare	0.03	0.03	1602	-0.05	0.19
Other parties voteshare	0.01	0.02	2574	-0.13	0.10
Electoral polarization	-0.79	4.28	2250	-7.22	9.80
Population size (thousands)	2.04	10.03	2236	-99.68	136.05
GDP per capita (thousands)	2.43	2.32	1090	-7.61	23.90
Employment rate	0.01	0.02	1141	-0.08	0.19

Figure A.1: Newspaper decline in OECD countries



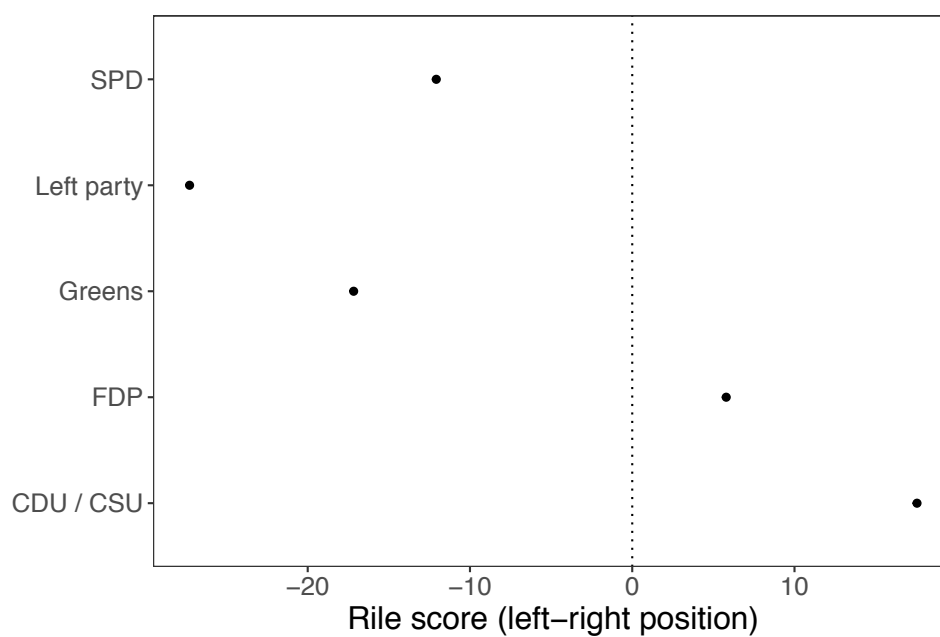
*Note:* Estimated newspaper publishing market decline in OECD countries, 2007-2009 (in percent). Data obtained from the [OECD](#).

Figure A.2: Broadband internet in Germany 2001 – 2019



*Note:* The figure shows the total number of digital subscriber lines (DSL) in Germany between 2001 and 2019. Data obtained from [statista.com](#).

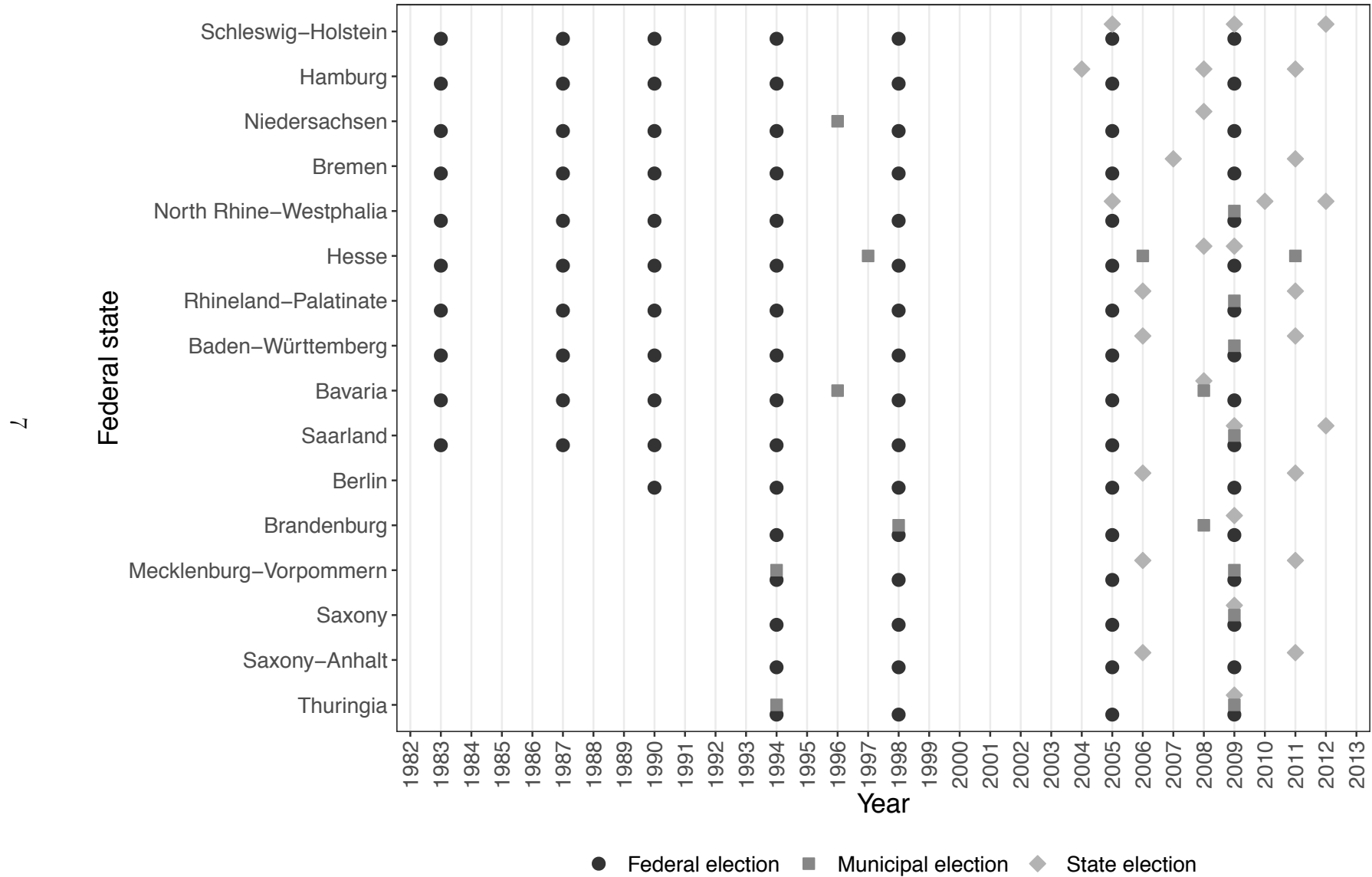
Figure A.3: Left-right position of political parties in Germany



*Note:* The figure shows the average RILE scores of political parties in Germany between 1979 and 2009, based on the Manifesto data (Volkens et al. 2020). Higher scores correspond to more right-wing political platforms.

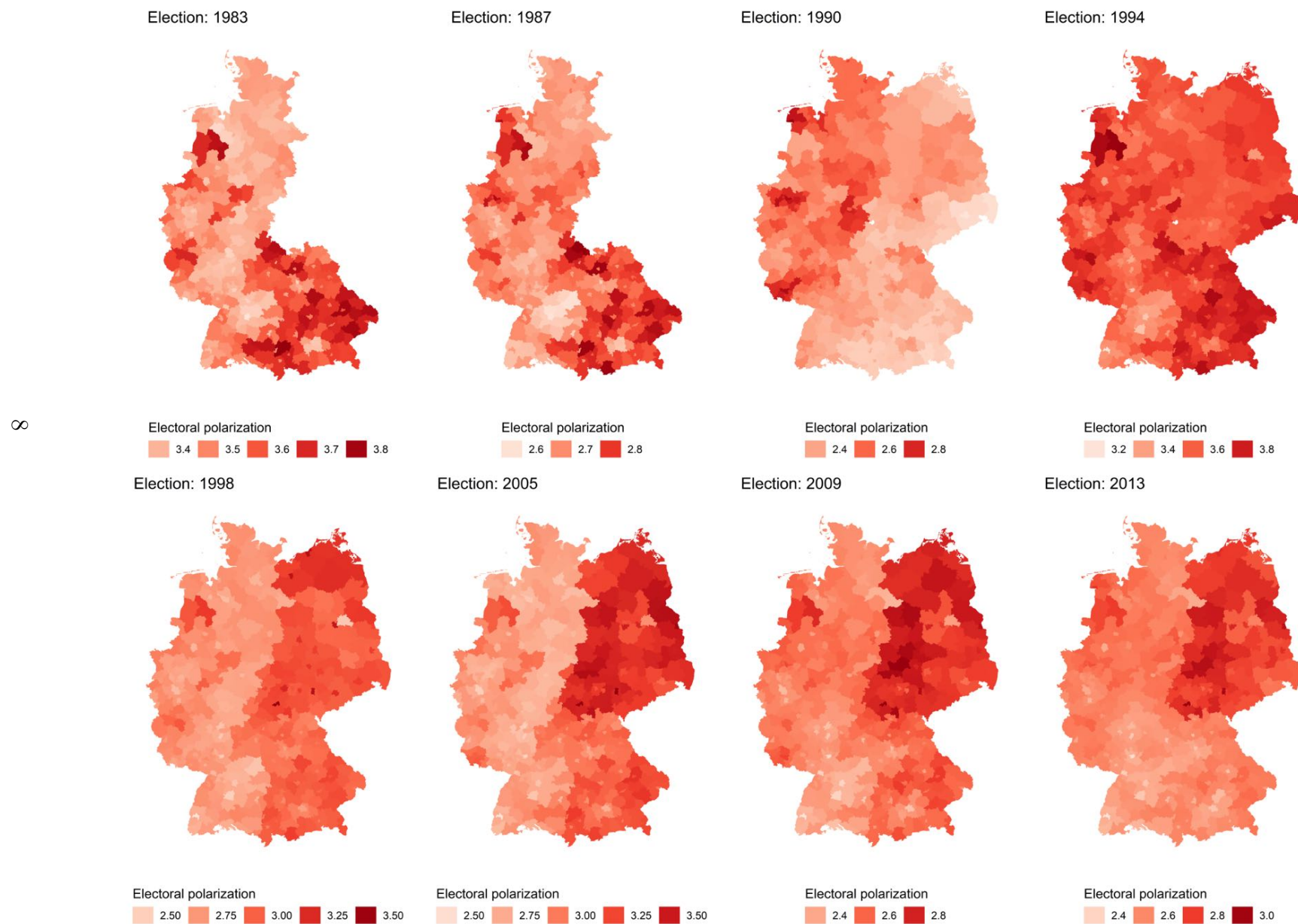


Figure A.4: Elections by state and year



*Note:* The figure shows all elections used in our analysis, by state, year and type of election. The five states at the bottom of the table are East German states, where free elections were first held after the German unification in 1989.

Figure A.5: Electoral polarization over time



*Note:* The figure shows the geographic distribution of our polarization measure described in section [3](#) for each federal election year. Federal elections are held in 1990 (after reunification) for the first time in East Germany.

### A.3 Overview of results

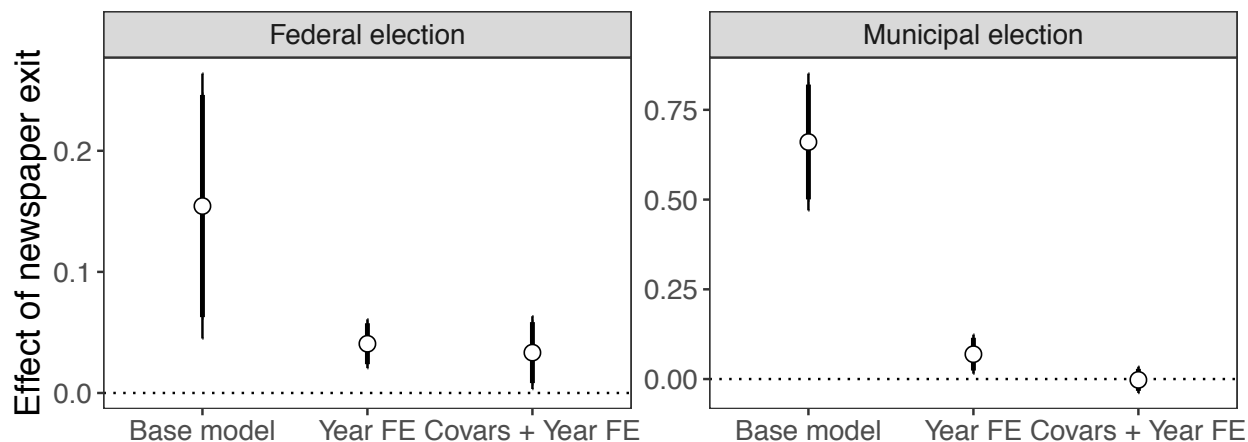
Table A.3: Summary of main results for different samples, outcomes and model specifications.

Outcome	Election	Model	Estimate	SE	P	N
<b>1. Full sample</b>						
Small party vote share	Federal	Year FE	0.006	0.002	0.000	2568
Small party vote share	Federal	Base model	-0.006	0.003	0.031	2568
Small party vote share	Federal	Covars + Year FE	0.001	0.002	0.568	1039
Polarization	Federal	Year FE	0.041	0.010	0.000	2244
Polarization	Federal	Base model	0.154	0.056	0.006	2244
Polarization	Federal	Covars + Year FE	0.033	0.015	0.030	1039
Small party vote share	Municipal	Year FE	0.005	0.005	0.300	5107
Small party vote share	Municipal	Base model	0.006	0.004	0.159	5107
Small party vote share	Municipal	Covars + Year FE	0.011	0.004	0.011	3601
Polarization	Municipal	Year FE	0.069	0.028	0.012	11687
Polarization	Municipal	Base model	0.660	0.097	0.000	11687
Polarization	Municipal	Covars + Year FE	-0.002	0.019	0.905	9068
<b>2. Before 2000</b>						
Small party vote share	Federal	Year FE	0.008	0.002	0.000	1772
Small party vote share	Federal	Base model	0.006	0.002	0.004	1772
Small party vote share	Federal	Covars + Year FE	0.008	0.003	0.025	319
Polarization	Federal	Year FE	0.058	0.012	0.000	1448
Polarization	Federal	Base model	0.223	0.071	0.002	1448
Polarization	Federal	Covars + Year FE	0.084	0.020	0.000	319
<b>3. 2000 and later</b>						
Small party vote share	Federal	Year FE	-0.003	0.003	0.412	796
Small party vote share	Federal	Base model	0.001	0.004	0.817	796
Small party vote share	Federal	Covars + Year FE	-0.005	0.003	0.103	720
Polarization	Federal	Year FE	-0.018	0.020	0.375	796
Polarization	Federal	Base model	-0.076	0.046	0.100	796
Polarization	Federal	Covars + Year FE	-0.029	0.020	0.151	720

*Notes:* The table lists estimates and related quantities for the main models presented in the paper. Each row represents an estimate of the coefficient  $\tau$  (see also the discussion in section 3). We present estimates for three different samples, two elections and three different model configurations. The last column lists the number of observations. We note that covariates are only available starting in 1992, which explains why models with covariates have a lower number of observations.

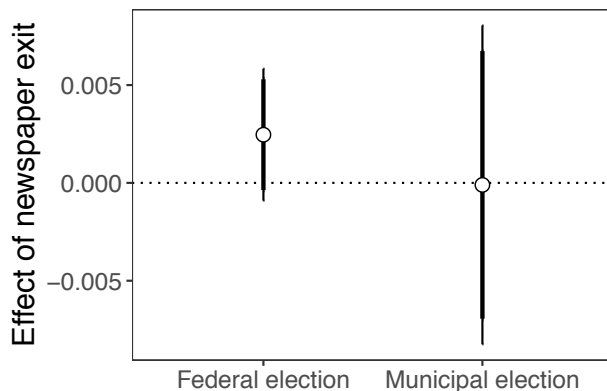
## A.4 Additional results & alternative specifications

Figure A.6: Effect of newspaper exit on polarization – alternative specifications



*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on two outcomes: political polarization, as well as the vote share of non-centrist parties. The results are based on the benchmark specification, which uses first-differenced outcomes. We show results based on three different specifications: one without fixed effects, the baseline with year fixed effects, and the an additional specification where we control for changes in population, employment and GDP/capita.

Figure A.7: Effect of newspaper exit on turnout



*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on turnout. The results are based on the benchmark specification, which uses first-differenced outcomes and year fixed effects.

## A.5 Results by number of remaining outlets after exit

We now differentiate exits according to how many outlets remain after an exit occurs. In doing so, we estimate an augmented version of the main specification:

$$\Delta Y_{c,t} = \alpha_t + \sum_j \tau_j \mathbb{1}_{Exit_{c,t}^j} + \gamma \mathbb{1}_{Entry_{c,t}} + \delta \mathbb{1}_{Entry_{c,t} \cap Exit_{c,t}} + \epsilon_{c,t}$$

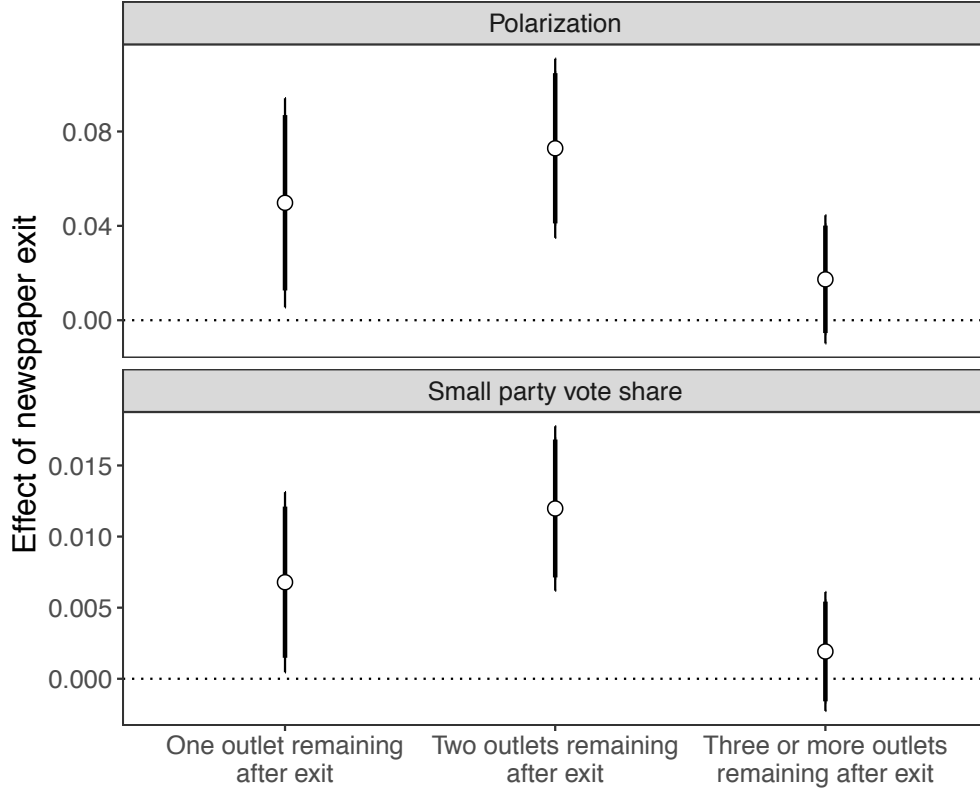
Except for the second term on the right-hand side, the specification is the same as the main specification described in section 3. Instead of one term for newspaper exits, we now distinguish between three types of newspaper exits, indexed by  $j$ : exits where one outlet remains, exits where two outlets remain, and exits where three or more outlets remain.<sup>12</sup> In about 85% of observations for which exits occur, one newspaper exits. Therefore, these categories can also be considered to measure the relative reduction in the number of available outlets. Exits with one remaining outlet correspond to a  $\sim 50\%$  reduction, exits with two remaining outlets correspond to a  $\sim 33\%$  and exits with three or more remaining outlets correspond to at most a 25% reduction.

From the specification above, we obtain three coefficients  $\tau_j$  for each of these three scenarios. In figure A.8, we present coefficient estimates for the three  $\tau_j$  for our two main outcomes in federal elections. We find that the estimated effects are strongest for exits where one or two newspapers remain. For exits where three or more outlets remain, we do not observe significant effects. These results are consistent with the argument that more severe changes in the market for local news have greater consequences for political behavior.

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<sup>12</sup>There is never a situation where no outlets remain, i.e. all counties in our sample always have access to at least one local newspaper

Figure A.8: Effect of newspaper exit on polarization – alternative specifications



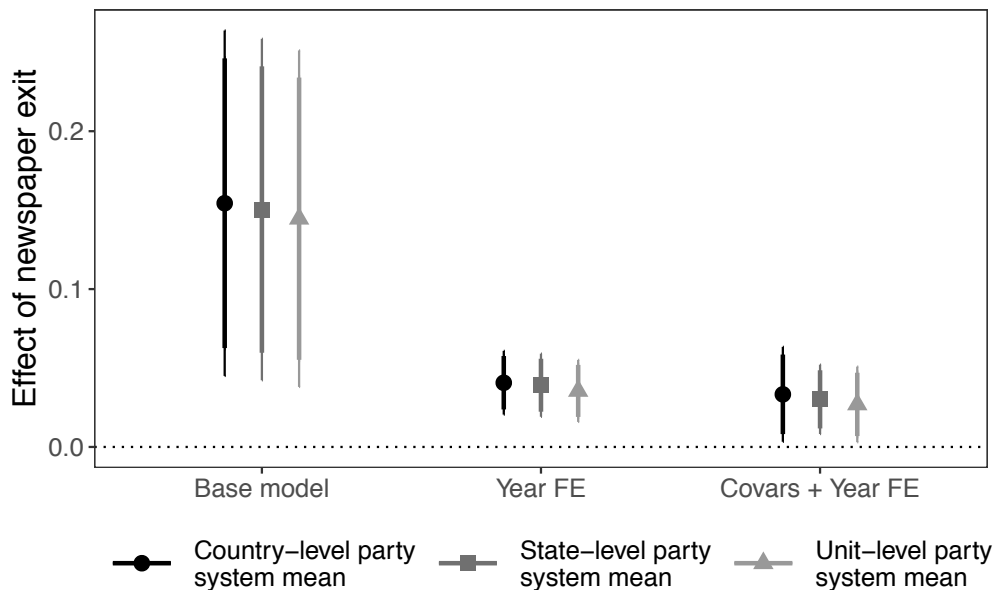
*Note:* The plot shows the estimated effects ( $\tau_j$ ) of three types of newspaper exits on two outcomes: political polarization, as well as the vote share of non-centrist parties. The results are based on the benchmark specification, which uses first-differenced outcomes.

## A.6 Results for different reference categories

As described in section 3, our main outcome measures electoral polarization as the weighted distance from a party system mean  $\bar{\tau}_t$  at time  $t$ . In our main specifications shown in the paper, this is the country-level party system mean in election  $t$ , i.e. it is defined as  $\sum_j \psi_{j,t} \tau_{j,t}$  where  $\psi_{j,t}$  and  $\tau_{j,t}$  are the vote share and left-right party position of party  $j$  in federal election  $t$ , respectively. Instead of using the country-wide party system mean, an alternative approach would be to use the state-level party system mean, or a more local measure like county-level party system means. In figure A.9, we show that the choice of reference unit (i.e. country, state or county) makes little difference for our main results. This result holds

when we add year fixed effects as well as covariates to the base first-difference specification.

Figure A.9: Effect on polarization using difference reference categories



*Note:* The plot shows the estimated effect ( $\tau$ ) of a newspaper exit on political polarization. Polarization is measured as the weighted ideological dispersion of party positions on the county level, relative to one of three different reference categories (see Dalton 2008). These reference categories are represented by the color and shape of the symbols in the figure. We present results for three different specifications.

## A.7 Covariate trends before and after exit

Our identification assumption requires that counties where newspapers exit are on similar trajectories with respect to political polarization as those counties where no change in local media market structure occurs. We have provided direct evidence in support of this assumption in figure 7. We now conduct a supplementary analysis to verify that treated and control counties are also on similar trajectories with respect to potential determinants of polarization. Our motivation is as follows: newspapers might exit because of economic or demographic changes at the local level that occur prior to exit. If this is the case, we might also expect changes in voting behavior as a consequence of those economic or demographic changes.

To examine whether treated and control counties display differential trends on observable covariates before newspapers exit, we rely on a specification of the following form:

$$\Delta X_{c,t} = \alpha_t + \tau \mathbb{1}_{Exit,t+k} + \gamma \mathbb{1}_{Entry,t+k} + \delta \mathbb{1}_{Entry \cap Exit,t+k} + \epsilon_{c,t}$$

where  $k \in \{0, 1\}$ . As for our main analysis, the periods  $t$  are defined by federal election years. For  $k = 1$ , we examine whether counties that experience a newspaper exit in the subsequent period already experience differential trends on observable covariates in the period prior to exit,  $\Delta X_{c,t} = X_{c,t} - X_{c,t-1}$ . For  $k = 0$ , we test for the contemporaneous effect of newspaper exit between periods  $t$  and  $t - 1$  on changes in observable covariates during the same time period.

We present the results (i.e. the coefficient  $\tau$ ) in figure [A.10](#). We find no evidence that counties where newspapers exit are already on a different trajectory with respect to changes in employment, population or GDP/capita than countries where no newspapers exit. To put it differently, there is little reason to believe that counties where newspapers exit are experiencing differential amounts of population, employment or GDP growth compared to counties where newspapers do not exit, both before and after exit occurs. We discuss a similar finding in section [A.8](#), where we document that changes in the aforementioned covariates do not predict newspaper exit.

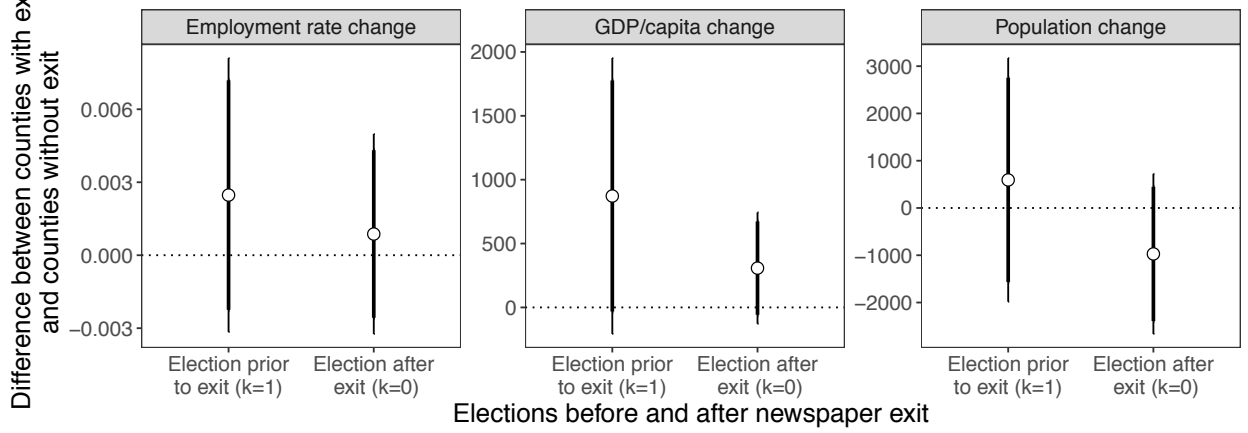
## A.8 Predicting newspaper exit

In this section, we use a simple specification to examine whether changes in demographic and economic conditions are correlated with newspaper exit. In doing so, we estimate a specification of the following form:

$$\mathbb{1}_{Exit} = \alpha_t + \beta \Delta X_{c,t} + \epsilon_{c,t}$$



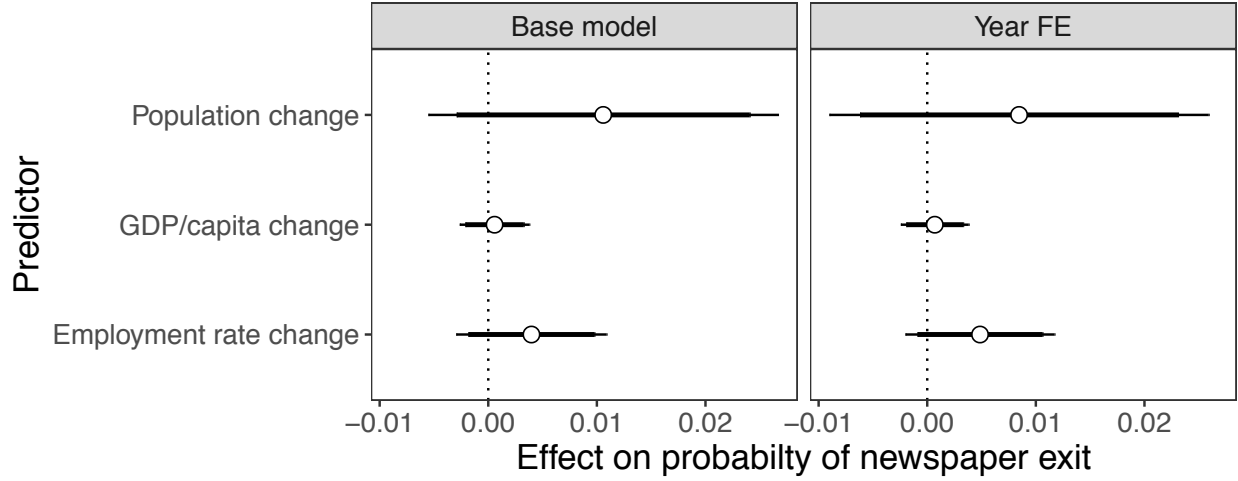
Figure A.10: Covariate trends before and after exit



*Note:* The plot shows the estimated difference in covariate trends between treated and control counties before and after newspaper exit. The x-axis indicates the election relative to the time when newspaper exit occurs. See the discussion preceding this figure for more details on the estimation.

As in the main specification,  $\mathbb{1}_{Exit}$  indicates whether a newspaper exits in county  $c$  between  $t - 1$  and  $t$ . Since we use a binary outcome, the control group (i.e.  $\mathbb{1}_{Exit} = 0$ ) consists of counties where the number of newspapers stays constant. Similarly,  $\Delta X_{c,t} = X_{c,t} - X_{c,t-1}$  is the matrix of first-differenced covariates. We estimate the model with and without year fixed effects  $\alpha_t$ . The coefficient vector  $\beta$  tells us whether changes in demographic and economic conditions predict newspaper exits. We present the results in figure [A.11](#).

Figure A.11: Predicting newspaper exit



*Note:* The plot shows the association between the three first-differenced control variables listed on the y-axis and the probability of newspaper exit. We estimate the base model without fixed effects (left-hand side panel) and with year fixed effects (right-hand side panel). All controls are standardized. Therefore, the estimates are the changes in the probability of newspaper exit between  $t$  and  $t - 1$  if the first-differenced predictor increases by one standard deviation.

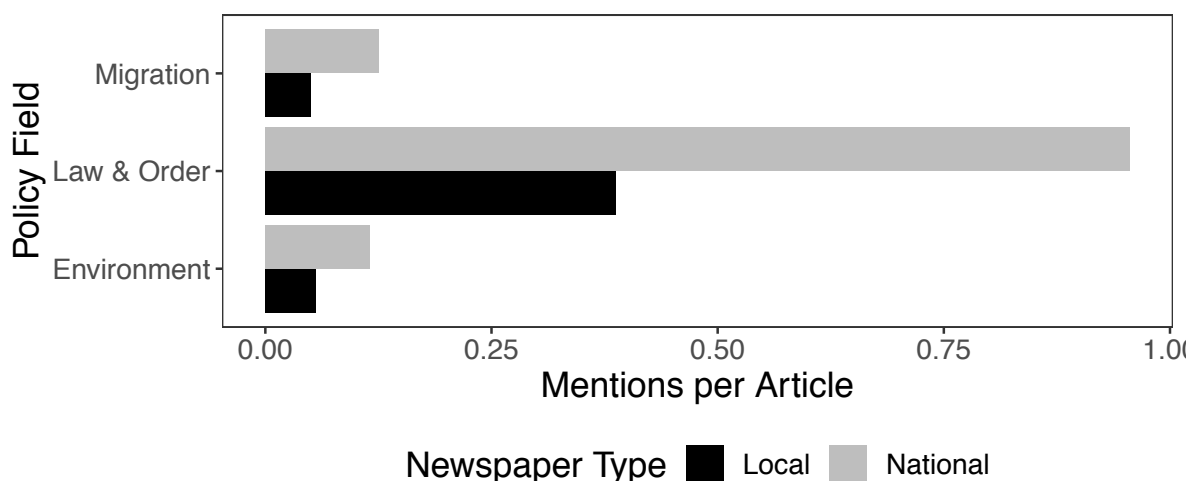
## A.9 Local and National Newspaper Reporting on Small Parties

We validate that local newspapers report less frequently on small parties by drawing on data from the German Longitudinal Election Survey (GLES, [Roßteutscher et al. 2017](#)). GLES is the most comprehensive German election survey and offers a newspaper content analyses for the time period from 2009 to 2013. Around local and federal elections, GLES has collected newspaper articles from the main page and politics section of three national newspapers (FAZ, SZ, Bild), two national magazines (Spiegel, Focus), as well as fourteen regional newspapers. Matches between newspaper content and dictionary items were counted on the article-level. Although the GLES newspaper tracking includes only a fraction of the entire German local newspaper market (that we use in the main analysis), the data enables us to test if local and national newspapers differ in terms of their content. We found that local newspapers mention small parties (i.e. Left Party, FDP, Greens) less frequently than national newspapers. We find 0.44 mentions of small parties per article ( $N=4,020$ ) for the

local papers, whereas national newspapers mentioned small party names 0.61 times per article (N=19,007). The difference across both groups is significant (two sample t-test;  $p < 0.001$ ).

In addition, Figure A.12 shows the mentions of items associated with three policy fields per article for local and national newspapers in the corpus. We chose migration, law and order, and environmental policy because they are prime examples of policy fields that are regularly and intensely discussed in the national arena. We observe that national newspapers include items associated with these policy fields much more frequently than their local counterparts.

Figure A.12: Local and National Newspaper Content



*Note:* The plot shows results of 23'027 content-coded local and national newspaper articles around federal and national elections between 2009 and 2013. Articles stem from the title page and politics section of each medium. The article content has been coded by GLES (2017) following a dictionary approach. The plot shows the ratio of keywords associated with three policy fields – Environment, Law and Order, and Migration – per article in the corpus. We find that national outlets are significantly more likely to report on these three issue areas (two sample t-tests;  $p < 0.001$ ).