

# Ownership and Media Slant: Evidence from Swedish Newspapers

Marcel Garz, Jonna Rickardsson

*Jönköping International Business School, CEnSE, and MMTC*

May 2022

We thank Shon Ferguson, Orsa Kekezi, Johan Klaesson, Agostino Manduchi, Charlotta Mellander, Mart Ots, Andrea Schneider, Ferenc Szucs, Maiting Zhuang, seminar participants in Jönköping, and at the Workshop on Media Economics in Trier for their helpful comments and suggestions. We gratefully acknowledge funding by the Swedish Competition Authority (Konkurrensverket, Dnr 406/2019), as well as Stiftelsen Inger, Arne och Astrid Oscarssons Donationsfond. We also thank Love Börjeson, Torsten Johansson, Martin Malmsten, Christopher Natzen, and the staff at the National Library in Stockholm for their hospitality while accessing the “Svenska dagstidningar” database and their support in processing the newspaper text. Declarations of interest: none. Corresponding author: Marcel Garz, Jönköping International Business School, P.O Box 1026, SE-551 11 Jönköping. Email: [marcel.garz@ju.se](mailto:marcel.garz@ju.se)

## **Abstract**

This study investigates the role of media owners for the political bias of newspapers in Sweden, using an original dataset on outlets, consumer preferences, and ownership between January 2014 and April 2019. We construct an index of slant based on similarities in the language between newspapers and speeches given by members of parliament. Our results indicate that newspapers held by the same owner tend to offer the same mix of slant, rather than aligning their bias with consumer preferences in their area of circulation. Owners are even less inclined to differentiate the slant across outlets before elections, when the political returns to persuasion are high. We find no evidence that owners impose a one-size-fits-all slant because product differentiation is too costly. In addition, we find suggestive evidence of owner-independent bias induced by the writers of opinion articles. The Swedish context illustrates that supply-driven slant cannot be ruled out in market-based media systems if the ties between media and politics are strong.

*Keywords:* ideology; media bias; ownership concentration; persuasion; voting

*JEL classification:* D72; L10; L82

## 1. Introduction

Political media slant<sup>1</sup> can be driven by the demand side and the supply side of the news market. According to demand-side explanations, consumers often have a preference for news that confirms their existing beliefs. Providing the kind of slant that caters to these beliefs allows media companies to maximize profits. In the supply side, media slant could be driven by journalists, editors, and media owners if these actors let their personal views affect newsroom decisions, but it could also be a result of the influence of lobbies and government capture; see Gentzkow, Shapiro, and Stone (2015) for a review of theory on the drivers of media slant.

A few studies investigate media bias when the press is under government control or subject to government capture, such as in China (Qin, Strömberg, and Wu, 2018), Russia (Simonov and Rao, 2020), Venezuela (Knight and Tribin, 2019), and Hungary (Szeidl and Szucs, 2021). Empirical evidence on the drivers of newspaper slant in a democratic setting with a market-based, free press is limited to the US. For instance, Gentzkow and Shapiro (2010) find that the slant of US local papers is largely driven by the demand side, whereas supply-side factors play a minor role. Thus far, it remains unclear if this result applies to newspaper industries in other countries with a free press. We address this research gap by investigating newspaper slant in Sweden. Specifically, we ask: To what extent is political slant of Swedish newspapers driven by ownership, and how could ownership effects be possibly explained?

Our focus on newspaper owners in Sweden is motivated by the following reasons. As detailed in Section 2, multiple waves of mergers and acquisitions since the 1950s have led to a high level of concentration of media ownership in this country, which raises concerns about a lack of opinion diversity of local news (e.g., Ots, 2012, Ohlsson, 2016). Sweden affords a generous system of newspaper subsidies to counter this trend. In addition, there are concerns about ideological influence, due to historically strong ties between newspapers and politics in Sweden, to the point that some newspapers have been owned by political parties. In other cases, politicians occupy crucial positions as board members of holding companies (Bengtsson, Johansson, and Lindström, 2018). Critics argue that news and opinions are nowadays filtered by a few owners or ownership families that often share connections with political parties (Linderborg, 2019).

Thus, in the Swedish context, newspaper owners are the “prime suspect” of supply-driven slant.<sup>2</sup> Investigating their role in shaping newspaper slant is of first-order importance: Swedish newspapers are likely more relevant for opinion formation than newspapers in other countries, because a subsidized

---

<sup>1</sup> We define political media slant as bias in news coverage that favors a certain ideology or political party. This bias may occur in the form of distortion or filtering, where the former implies that outlets frame the same fact in different ways, whereas the latter refers to the selection of facts and topics covered (Gentzkow, Shapiro, and Stone, 2015).

<sup>2</sup> Journalists and editors could potentially induce bias on their own (e.g., Fengler and Russ-Mohl, 2008) but their influence is arguably secondary because owners decide which staff to employ (e.g., Baron, 2006; Archer and Clinton, 2018). In Section 5.4, we provide suggestive evidence of owner-independent bias induced by writers of opinion articles.

distribution system shared by all outlets guarantees exceptionally high readership rates (Nordicom, 2018). Under these circumstances, a lack of independent sources could have negative societal implications. For example, it is arguably much easier for media owners to persuade voters and manipulate collective decision-making if they control large audience shares (Prat, 2018).<sup>3</sup> If readers only have access to a few one-sided news outlets, they may not obtain the necessary information to make well-informed choices at the ballot box.

We compile an original dataset of Swedish local newspapers between January 2014 and April 2019. The data include information about owners, newspaper characteristics, circulation, and market ideology. We use parliamentary speech protocols and newspaper text archives to construct an index of political slant. Following Gentzkow and Shapiro (2010), this index is based on similarities between the language used by members of parliament and newspapers. The index captures the slant towards each of the eight main political parties in Sweden. We show that newspapers' stated ideologies are strong predictors of our slant measure, which supports the validity of our approach.

To evaluate the ownership effect on slant, we compare the slant between outlets that are owned by the same company but circulate in markets with different consumer ideologies (which applies to the vast majority of Swedish newspapers). Our findings show that newspaper slant strongly correlates with the average slant of co-owned outlets, even when we take consumer preferences and geographical clustering of owners into account. The ownership effect explains almost 40% of the variation in slant. In many municipalities, we observe a moderate to strong correlation between market-level slant and local consumer preferences. However, due to the lack of within-owner differentiation of slant, newspaper coverage in some municipalities is not well aligned with the tastes of the majority of consumers, or even negatively correlated. Regardless of the underlying mechanism, this finding raises concerns that certain groups may not find their political views represented in local news coverage, and that Swedish newspaper subsidies may not achieve their main objectives, as discussed later in the paper.

The observation that co-owned newspapers share very similar slants is not necessarily an indication that owners act on a desire to influence public opinion. This finding could also be driven by efforts of owners to soften competition and maximize economic profits. Swedish newspaper markets could be too small for individual outlets to offer a customized slant (the median newspaper has only 7,700 subscribers). Given the high fixed and low variable costs of the newspaper business, it could be a profit-maximizing strategy for owners to create the content of all papers by centralized editorial staff (Kekezi and Mellander, 2018). That is, owners may offset any revenue losses caused by ignoring local consumer preferences against the cost savings resulting from scaling their production. We call this alternative explanation profit maximization under costly product differentiation (Ferguson, 2015). To investigate

---

<sup>3</sup> See, for instance, DellaVigna and Kaplan (2007), Enikolopov, Petrova, and Zhuravskaya (2011), Hopkins and Ladd (2014), Barone, D'Acunto, and Narciso (2015), and Martin and Yurukoglu (2017) for evidence of effects of biased news media on voting.

it, we evaluate whether the tendency to offer a one-size-fits-all slant correlates with proxies for the costs of and returns to differentiating the slant, including market size, local advertising potential, and heterogeneity of consumer preferences. However, we do not find indications that profit-maximizing product differentiation is a dominating factor explaining the ownership effect.

We find a much smaller ownership effect when we investigate the slant of commentaries, editorials, and other opinion articles than for straight news articles. In the case of opinion articles, the average slant of co-owned newspapers explains only about 10% of the variation in a newspaper's own slant. Considering that the slant of opinion pieces is not correlated with the same newspaper's slant of straight news – and negatively correlated with local consumer preferences – we interpret this finding as suggestive evidence of bias induced by the writers of opinion pieces.

Finally, we use a time-varying measure of slant to investigate whether the ownership effect is larger when the political returns to persuasion are high. These returns are likely higher when elections take place, because changes in public opinion can have immediate effects on voting outcomes. Our results indicate that the relationship between slant and co-owned slant is slightly stronger before elections. Hence, we cannot rule out that Swedish newspaper owners act on a desire to influence the public.

Our contribution to the literature is threefold. First, our study adds to research on the sources of political media bias. A central question of this literature is whether media slant is driven by the demand- or supply-side of the news market. Empirical evidence from US newspapers suggests that their slant is largely driven by consumer preferences (Gentzkow and Shapiro, 2010; Lu, Shao, and Tao, 2018). Larcinese, Puglisi, and Snyder (2011) and Puglisi and Snyder (2011) confirm that the tastes of readers matter for the political bias of newspaper stories about unemployment and scandals, respectively, but both studies also present evidence that ideological preferences of owners and editors affect the bias. Martin and McCrain (2019) analyze a wave of acquisitions of local US television stations in 2017 by the Sinclair media group. They find that the overall slant of these stations shifted rightwards, in line with the political preferences of the new owner. We contribute to this literature by investigating media slant in a different empirical context. Our study is the first to provide a large-scale measure of media bias in Sweden. The Swedish case is similar to the US in the sense that both countries are characterized by historically strong ties between media and politics and increasing levels of concentration of media ownership. However, market forces play a somewhat smaller role in Sweden because of the greater level of state intervention and generous press subsidies in the country (Hallin and Mancini, 2004). In this context, we find that outlets held by the same owner tend to offer a similar mix of slant, rather than cater to local consumer preferences, and our analyses suggest that political preferences may explain at least part of this outcome. Our evidence thus implies that previous findings from US media markets are not necessarily generalizable. To our knowledge, our study is also the first to investigate slant separately for opinion articles and straight news articles, which helps us to produce suggestive evidence of owner-independent bias induced by journalists and editors.

Second, our research adds to studies on differentiation strategies in media markets, especially those that consider slant as a product characteristic (e.g., Anand, Di Tella, and Galetovic, 2007; Chan and Suen, 2008; Anderson and McLaren, 2012). Empirical evidence shows that newspapers in the US and France have historically been using partisan slant to soften competition for readers and advertisers from other outlets in the market (Gentzkow, Shapiro, and Sinkinson, 2014; Cagé, 2020). We also investigate slant from a product differentiation perspective, but our paper differs in that we evaluate whether observed patterns of differentiation within and across owners are compatible with profit maximization or not.<sup>4</sup>

Third, our study informs the debate on state aid for newspapers. In theory, press subsidies may help to remedy market failure related to journalistic content, to foster knowledge externalities, and to increase diversity and quality of news (e.g., Kind and Møen, 2015). However, if poorly implemented, press subsidies promote inefficient behavior (Picard, 2003) and lead to lower journalistic quality (Leroch and Wellbrock, 2011; Battagion and Vaglio 2018). Press subsidies in Sweden have the main goal to maintain local opinion diversity by helping unprofitable newspapers to survive (Ots, 2009). Eligibility for the subsidy is evaluated at the newspaper level, under the assumption that a greater number of outlets is beneficial for opinion diversity (Gustafsson, Örnebring, and Levy, 2009). The findings in this paper show that this assumption is not fulfilled when newspapers are held by the same owner. This is problematic because under the current regulation, newspapers may receive subsidies without contributing to opinion diversity. Thus, a straightforward policy recommendation is to adjust the press subsidy regulations. For instance, opinion diversity could be promoted by requiring greater levels of editorial independence between co-owned newspapers.

## 2. Background

The Swedish newspaper market is typically divided into three segments. The first segment refers to *free newspapers*, which are completely ad-financed and have relatively little editorial content. These publications are usually mailed to all households in a certain area of circulation. The second segment currently consists of four *evening tabloids* (*Aftonbladet*, *Expressen*, *Göteborgs-Tidningen*, and *Kvällsposten*) that are individually sold at the newsstand. The largest segment refers to *subscribed newspapers*, which are delivered to readers' homes via a national distribution system.

Most Swedish newspapers have been traditionally affiliated with political parties, especially the subscribed ones. Some researchers have pointed out trends towards more market-oriented, depoliticized journalism over the past decades, as reflected by political parties selling their newspaper holdings to commercial companies (e.g., Weibull and Anshelm, 1991). However, given historically strong ties

---

<sup>4</sup> We explicitly investigate the effects of competition between Swedish newspapers on slant in a companion paper (Garz and Rickardsson, 2022).

between newspapers and parties, many outlets still explicitly state a political affiliation in their self-description, and politicians still serve as editors or board members in some cases.

The segment of subscribed newspapers is heavily subsidized (Alonso et al., 2006). The subsidies were introduced in the 1970s as a response to a wave of newspaper closures, with the goal of maintaining local opinion diversity (Gustafsson, Örnebring, and Levy, 2009). The most relevant element of the subsidy aims to support the production process. It targets newspapers with a low level of household coverage in their circulation area. Eligibility for the production subsidy requires that at least 55% of a newspaper's total editorial content is produced by the newspaper itself, which restricts the amount of content that can be shared with co-owned outlets or purchased from news agencies. In addition, the newspaper needs to be subscribed to by less than 30% of the households in the publishing municipality, while having at least 1,500 paying subscribers in total (Presstödsförordning, 1990). Given these criteria, subsidized newspapers tend to be small outlets that are often considered the “second paper” in a market.

Due to the subsidy, and considering that Sweden is a sparsely populated country, the market consists of an unusually large number of local newspapers. About 130 subscribed newspapers are currently published for a population of 10 million people. Approx. 40% of these papers receive the production subsidy. There are few, if any, truly national outlets. As a consequence, local newspapers not only provide local news, but are also a main source of national and foreign news for most people (Gustafsson, Örnebring, and Levy, 2009). High readership rates suggest that newspapers play an important role in shaping public opinion, likely more so than in other countries. For instance, in 2014, 67% of the population aged 9-79 read a newspaper on a daily basis (Nordicom, 2018).

The segment of subscribed papers has been characterized by increasing ownership concentration and a centralization of content production. For example, between 1990 and 2018, the number of editorial offices decreased from 668 to 273 (Kekezi and Mellander, 2018). Newspapers have been increasingly outsourcing their content production to news agencies (e.g., TT Nyhetsbyrån), especially for national and foreign news. As a consequence, content is often shared across newspapers belonging to the same owner, although the exact extent of copying remains unclear (Nygren and Nord, 2017). While content sharing might be a method for companies to maximize profits through scale effects, it can also be a mechanism by which owners impose their personal views on news coverage.

### **3. Data**

#### *3.1 Newspaper characteristics and content*

The analyses in this paper utilize data from several different sources. Newspaper content is provided by the “Svenska dagstidningar” database of the National Library of Sweden. The database offers full-text access to most newspapers, covering their entire output between January 2014 (when the National

Library started to archive the content to its full extent) and April 2019 (the most recent observations at the time of accessing the data). This time frame defines our investigation period.

Data on newspaper circulation come from MPRT, the Swedish Press and Broadcasting Authority. MPRT provides data on essentially all Swedish newspapers that publish at least one issue per week and are generally subscribed to.<sup>5</sup> These criteria define the set of newspapers considered in this study, with the exception of two non-Swedish newspapers and a few newspapers that meet these criteria but are not included in the “Svenska dagstidningar” database.<sup>6</sup> Furthermore, MPRT does not provide specific figures on the local editions that some newspapers publish, in which case the data refer to the combined circulation of main and local editions. This gives us a total of 131 distinct newspapers during our study period. The circulation data refer to the number of households with a print subscription<sup>7</sup> and are available at the newspaper-municipality-year level, covering all 290 Swedish municipalities.

The circulation data allow us to assess in which municipalities a newspaper is read. We complement these data with information on the local scope of newspapers’ coverage. Most outlets divide their local section by the municipalities for which they produce news stories. To a large degree, local newspaper circulation correlates with the municipalities that are covered by a newspaper, but the former captures realized local reader demand, whereas the latter refers to the product offered to readers. We retrieve newspapers’ targeted municipalities by checking samples of their front pages and local sections during the investigation period. Newspapers’ decisions about which municipalities to cover are relatively stable over time. During our sample period, we observe three newspapers that made minor changes to their sets of targeted municipalities. As Figure B1 shows, about a quarter of the newspapers regularly produce news stories for only one municipality. On average, newspapers target five municipalities in their local coverage. The maximum number of covered municipalities by a newspaper is 26.

Data on newspaper owners come from publicly available sources, including websites of newspapers and media companies, press releases, and news reports. Treating subsidiaries held by the same parent company as one entity, we identify a total of 40 distinct owners, some of which exited the market during our study period. Very few newspapers are owned by multiple blockholders, in which case we evaluate the majority owner. As shown in Figures B2 and B3, about half of the companies owned just one newspaper. The largest number of outlets held by an owner was 24 (*Mittmedia* in April 2019). Ranking the owners by their circulation share (Figures B4 and B5) indicates a high level of concentration. For

---

<sup>5</sup> The data do not cover free newspapers. These kinds of outlets are completely ad-financed and contain relatively little editorial content if any. For historical reasons, MPRT does not consider (unsubscribed) evening tabloids either, which excludes the four outlets *Aftonbladet*, *Expressen*, *Göteborgs-Tidningen*, and *Kvällsposten*.

<sup>6</sup> The “Svenska dagstidningar” database does not provide access to 19 newspapers that are available in the MPRT database. During our period of investigation, 9 out of these 19 newspapers closed down, and the remaining newspapers accounted for a very small fraction of total circulation.

<sup>7</sup> Garz and Zhuang (2022) investigate data from 2020 and find that digital subscriptions accounted for approximately 19% of all subscription sales. This share was probably lower during our sample period (2014–2019), which is why it is unlikely that our results are affected by potential differences between print and digital circulation.



example, the five largest owners accounted for approximately 74% of the total circulation in 2019. As Figure B6 shows, approximately one quarter of the municipalities can be characterized as newspaper monopolies. These are municipalities where exactly one owner produces locally relevant news stories on a regular basis. About 45% of the municipalities are regularly served by two independent owners, whereas less than 20% have three distinct owners. The maximum number of owners per municipality is five.

We also retrieve the newspapers' self-stated ideologies. About one third of the outlets do not state any political affiliation (29) or indicate to be independent (12). 34 newspapers refer to themselves as being liberal, followed by 21 outlets with a Center Party affiliation. We count 13 social democratic and 10 moderate newspapers. See Table B1 for a full list of stated ideologies and how we map these ideologies to political parties.

### *3.2 Consumer preferences*

We use data from the Swedish Election Authority (“Valmyndigheten”) pertaining to the 2018 general elections to construct measures of consumers' ideological preferences in the newspaper's area of circulation. The data include municipality-level votes for all eight parties represented in the national parliament during the investigation period. Our main measure of market ideology is the total number of votes in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality. Thus, municipalities with more subscribers have a greater weight than municipalities where the newspaper is less popular. Using *total votes* to capture market ideology is likely more adequate than *vote shares*, considering that owners likely care about total sales, or the overall number of readers exposed to the content. However, for robustness, we also create an equivalent measure of market ideology based on weighted vote shares in the newspaper's area of circulation. To address endogeneity concerns – it is not clear whether newspaper slant drives consumer ideology or vice versa – we create analogous measures of voting in the 1982 general elections. We choose this election year because it is the earliest where the Green Party participated and because this election took place after the re-organization of Swedish municipalities, which makes it possible to link past consumer preferences to current newspaper circulation. Finally, we obtain register data from Statistics Sweden on demographic characteristics of the municipalities, including population size, average age, share of inhabitants with a higher-education degree, and average income.

### 3.3 Parliamentary speech protocols

We download the transcripts of all speeches given in Swedish Parliament during our period of investigation from the parliamentary register (<https://www.riksdagen.se/sv/dokument-lagar/>).<sup>8</sup> These transcripts cover 733 sessions. On average, there are about 34,360 words spoken per session. Overall, we observe an average of 3.1 million words per party, with a minimum of 1.8 million words spoken by members of the Christian Democrats and a maximum of 6.8 million words by Social Democrats. This variation mostly reflects differences in vote shares and seats. Overall, the size of the corpus allows us to reliably analyze speech patterns and determine characteristic phrases.

## 4. Measuring slant

We follow the approach by Gentzkow and Shapiro (2010) to construct an index of media slant by comparing the language of the political parties with the language of the newspapers. This approach is based on the idea that similarities in the language between newspapers and parties reflect similarities in ideology. The approach was originally applied to the two-party system in the US. We replicate the methodological steps taken by Gentzkow and Shapiro (2010), except that we adapt the approach to Sweden’s multi-party system.

### 4.1 Language of political parties

As a starting point, we combine the 733 parliamentary session transcripts downloaded from the parliamentary register (<https://www.riksdagen.se/sv/dokument-lagar/>) into a single corpus. The transcripts list the name and party affiliation of each speaker, which we use to partition the corpus into eight sub-corpora, one for each party. Following standard practice in computational linguistics (e.g., Gentzkow, Kelly, and Taddy, 2019), we transform the text to lower case and remove numbers, punctuation, and white space, as well as explicit party references (e.g., “centerpartiet”, “socialdemokrater”, and “liberalerna”). Next, we tokenize the texts. For example, the sentence “the swedish housing market performs poorly” is split into six tokens, each representing one word. We also apply a Swedish version of the Porter (1980) stemming algorithm to obtain word roots by stripping suffixes (i.e., we lemmatize the tokens). For instance, the word “poorly” in the above sentence turns into “poor”. We then obtain all possible two- and three-word phrases of a sentence – so-called 2- and 3-grams, such as “swedish hous”, “hous market”, and “market perform” – and count the number of their occurrences by party.

---

<sup>8</sup> Unfortunately, there are no sources to capture the language of local politicians. We assume that the language of national politicians matches that of their local colleagues and verify that our index of slant picks up ideologically relevant phrases in national and local news stories alike (Figure A6).

Using these counts, we compute Pearson’s  $\chi^2$  statistic to identify those phrases that are indicative of each party’s language. This statistic evaluates the likelihood that a party uses a given phrase more often than the other parties (i.e., the keyness of phrases). We denote  $f_{i,p}$  the number of occurrences of phrase  $i$  in the speeches by party  $p$  and  $f_{i,-p}$  the frequency of that phrase in the speeches of the other parties. Furthermore,  $f_{-i,p}$  refers to the occurrence of other phrases used by party  $p$  and  $f_{-i,-p}$  is the frequency of other phrases used by the other parties. Pearson’s  $\chi^2$  statistic for each two- and three-word phrase and party is then calculated as:

$$\chi_{i,p}^2 = \frac{(f_{i,p}f_{-i,-p} - f_{i,-p}f_{-i,p})^2}{(f_{i,p} + f_{i,-p})(f_{-i,p} + f_{-i,-p})(f_{i,p} + f_{-i,p})(f_{i,-p} + f_{-i,-p})} \quad (1)$$

Similar to Gentzkow and Shapiro (2010), we drop phrases that are extremely rare or occur too often in the transcripts (i.e., phrases overall used less than 10 times or more than 1,000 times). These phrases are very unlikely to be diagnostic of parties’ language patterns, but their removal speeds up computational procedures.

Note that is computationally not feasible to examine the newspapers’ use of all remaining phrases though. Evaluating only those phrases that have a statistically significant  $\chi^2$  value is not an option either, as we are still left with more than 2 million phrases when using the 1% level as a cut-off. Thus, we rank the expressions by their  $\chi^2$  statistic and select each party’s top 500 two-word phrases and top 500 three-word phrases, which corresponds to 8,000 phrases in total. In Tables B4 and B5, we verify the robustness of our main result when using other arbitrarily chosen cut-offs (i.e., the top 100 and top 1,000 expressions).

Table A1 illustrates that the approach selects phrases which are indeed associated with the parties’ core topics and ideologies. For instance, members of the green-liberal Center Party often use terms related to environmental protection (e.g., “green tax exchange”, “non-toxic everyday life”) and free markets (e.g., “cost reduction”). Christian Democratic speakers commonly refer to religious topics (e.g., “Christian residents”, “Islamic State”), whereas phrases by the Social Democrats point towards issues of inequality and protection of weaker members of society (e.g., “children and youth care”, “health and work”, “socially vulnerable areas”). Speakers of the national-conservative Sweden Democrats emphasize immigration-related topics (e.g., “security of the state”, “terrorist threat”, “Swedish defense”). As the table shows, these kinds of patterns can be observed for all relevant parties. The phrases also illustrate that our approach captures slant both in the form of distortion (i.e., the way *how* parties and media talk about issues) and filtering (*which* issues they focus on), thus matching theoretical models of media bias (Gentzkow, Shapiro, and Stone, 2015).

## 4.2 Language of newspapers

We clean the newspaper text in the same way we pre-processed the speech transcripts. We then count the number of occurrences of “political” phrases (i.e., the top 500 two-word phrases and top 500 three-word phrases) per newspaper, party, and month.<sup>9</sup> In a context with two ideologies, it would be possible to measure slant by first regressing phrase usage by politicians on their ideology (e.g., Republican or Democratic), and then predict newspaper ideology using the intercept and slope from that regression, as proposed by Gentzkow and Shapiro (2010). This is not feasible in a multi-party system because ideology cannot be captured by a single binary variable. It would be necessary to use a set of eight dummy variables, but in this case there is no slope estimate on the reference category. Thus, we pursue a slightly different yet conceptionally equivalent approach, as described in the following.

First, we use the outlets’ overall monthly number of (“political” and “general”) phrases  $F_{n,t}$  to normalize the number of occurrences  $f$  of “political” phrase  $i$  pertaining to party  $p$  used by newspaper  $n$  in month  $t$ , yielding relative frequencies  $\tilde{f}$ :

$$\tilde{f}_{i,p,n,t}^{newsp} = \frac{f_{i,p,n,t}^{newsp}}{F_{n,t}} \quad (2)$$

Using relative frequencies  $\tilde{f}$  helps to address differences across newspapers and over time in the overall amount of text published. To account for the varying keyness of phrases – that some phrases are more diagnostic of parties’ language differences than others – we weight the newspapers’ relative phrase frequencies by the phrases’  $\chi^2$  values as computed in Equation (1):

$$f_{i,p,n,t}^{weighted} = \tilde{f}_{i,p,n,t}^{newsp} \times \chi_{i,p}^2 \quad (3)$$

Averaging over weighted phrases  $f_{i,p,n,t}^{weighted}$  captures the *slant* of newspaper  $n$  towards party  $p$  in month  $t$ :

$$slant_{n,p,t} = \frac{1}{n} \sum_{i=1}^n f_{i,p,n,t}^{weighted} \quad (4)$$

Hence, our measure of slant comprises eight observations per newspaper, one for each of Sweden’s main political parties. To ease the interpretation of regression results, we rescale this measure by multiplying it by one million. The unit of measurement therefore denotes parts-per-million (ppm,  $10^{-6}$ ), i.e., the share of (weighted) political phrases pertaining to party  $p$  per million overall phrases.

---

<sup>9</sup> There could be a mechanical correlation between phrase usage and ideology due to direct quotes of political phrases. However, spot checks suggest that direct quotes of these phrases occur in a negligible amount.

It could be argued that our approach does not account for word embeddings and is therefore insensitive to the way a phrase is used by different actors. Gentzkow and Shapiro (2010) show that single words may be used in different contexts but not so much two- and three-word phrases, which is why we exclude single words. There might be certain two- and three-word phrases that are more prone to be used in different ways, depending on a newspaper’s ideology, but these phrases are unlikely to be included in our set of phrases. For example, consider the phrase “terrorist threat”, which is assumed to be diagnostic of the ideology of the right-wing Sweden Democrats. This phrase could be used by left-wing newspapers to downplay or deny this kind of threat (e.g., “There is *no* terrorist threat.”). However, if a phrase is prone to be used by different newspapers in different ways, we would expect members of parliament to use this phrase in different contexts too, depending on their ideology (e.g., when the Left Party downplays the risk of terrorist attacks during a parliamentary debate). By construction, the  $\chi^2$  statistic used to identify diagnostic phrases (Equation 1) does not select those used by multiple parties though. Hence, we are confident that our approach produces a valid measure of slant even though it does not explicitly model word embeddings, and we provide a number of plausibility checks in Section 4.4 in support of this claim.

### 4.3 Variables

We use the index of slant shown in Equation (4) as a dependent variable. Since most regression specifications do not require information about changes in slant over time, we also compute a time-invariant equivalent of the index, which captures newspapers’ average  $slant_{n,p}$  during the sample period. For each newspaper, we construct a variable  $\overline{slant}_{-n,p,c}$  that measures the average slant of the other newspapers  $-n$ , held by the same owner  $c$ , towards party  $p$ , as well as the time-varying equivalent  $\overline{slant}_{-n,p,c,t}$ . We use this measure of “co-owned”  $\overline{slant}$  as our main explanatory variable in most regressions.

In addition, we create measures of slant and co-owned slant that distinguish between opinion content and straight news content. Considering standard practices in the Swedish newspaper industry, we identify opinion articles as those that include any of the terms “debatt” (debate), “debattartikel” (debate article), “kommentar” (commentary), “ledare” (editor), or “åsikt” (opinion/view) in the headline or first sentence and treat all other articles as straight news.<sup>10</sup> Opinion articles account for approx. 1.24% of the total newspaper text but provide 8.58% of political phrases, which suggest that these articles are particularly slant heavy; see Table 1 for summary statistics.

---

<sup>10</sup> This approach fails to reliably identify opinion articles of 10 newspapers, which we exclude when analyzing differences in slant of opinion and straight news articles.

Table 1: Summary statistics of main variables

	Mean	SD	Min.	Max.	Obs.
Newspaper slant, all articles	16.463	5.956	5.727	40.985	1,016
Newspaper slant, opinion articles	1.413	0.909	0.039	6.134	936
Newspaper slant, straight news articles	15.018	5.622	4.145	37.551	936
Avg. slant of other newspapers by same owner	16.384	5.550	7.550	37.097	1,016
Market ideology in 1982 (circ.-weighted votes per party)	3.692	7.633	0.000	105.914	1,016
Market ideology in 2018 (circ.-weighted votes per party)	4.296	6.594	0.065	81.670	1,016

Notes: Slant is measured as the party-specific share of ideological phrases per million overall phrases. The data refer to max. 127 newspapers-owner combinations and 8 ideologies.

#### 4.4 Plausibility tests

We provide several plausibility tests supporting the validity of the slant index. First, we plot the index (average share of ideological phrases across newspapers and time) against each party’s vote share in the 2018 Swedish general elections; see Figure A1. The figure indicates a positive correlation between a party’s popularity and overall levels of slant towards that party. On average, newspapers are more likely to use a party’s key phrases, the higher the number of votes.

As Figure A2 shows, the use of ideological phrases was relatively stable over time. The lack of excess volatility suggests that the monthly amount of newspaper text is sufficiently large to measure slant in this kind of time interval. The spikes at the ends of 2014 and 2018 coincide with the Swedish general elections that took place early/mid-September these years. Thus the newspapers became more political during the final stages of the election campaigns.

As mentioned in Section 2, most Swedish newspapers explicitly state their political affiliation (see Table B1 for details). Thus it is straightforward to further validate our slant index by comparing it to self-stated ideologies. Table A2 shows results of regressions of the newspapers’ average  $slant_{n,p}$  on a binary variable  $SI_{n,p}$  that distinguishes outlets’ supported ideologies and other ideologies:

$$slant_{n,p} = a_1 + a_2 SI_{n,p} + \mu_n + \varphi_p + \varepsilon_{n,p} \quad (5)$$

where  $\mu_n$  and  $\varphi_p$  denote newspaper  $n$  fixed effects and party  $p$  (ideology) fixed effects, respectively.  $SI$  takes the value 1 if the stated ideology matches the corresponding dimension of the slant index, and 0 otherwise. The estimates indicate significantly higher levels of slant for the ideologies supported by the outlet. For example, the point estimate in Column (2) implies that there is approximately 8.4% more slant towards those parties that share the stated ideology of the newspaper (i.e., 1.384 divided by the

mean slant of 16.463). The difference corresponds to 23.2% of the standard deviation of slant (1.384 divided by 5.956).<sup>11</sup>

Figure A3 provides party-specific evidence on the relationship between slant and newspapers' self-description. Accordingly, outlets are more likely to use phrases by those parties tied to their ideology. The differences in slant are more pronounced and more precisely estimated for parties supported by many newspapers, including Center Party, Liberal Party, Christian Democrats, Moderate Party, and Social Democrats.

To further corroborate the validity of our approach, we follow Garz, Sørensen, and Stone (2020) and compute a left-right index for each newspaper. This index condenses the eight-dimensional slant index into a single value by mapping the party-specific extent of slant to the parties' position in the political left-right spectrum. To quantify the parties' position in this spectrum, we rely on left-right scores provided by the Manifesto Project (Volkens et al., 2019); see Figure A4. The Manifesto Project obtains these scores by rating political preferences of parties stated in their election manifestos. Typically, left-wing parties score large negative values, whereas right-wing parties tend to have high positive scores. To convert our measure of newspaper slant into a left-right score, we first regress  $slant_{n,p}$  on newspaper  $\mu_n$  and party fixed effects  $\varphi_p$  – as in Equation (5) but without the  $SI$  dummy – and retain the residuals  $\varepsilon_{n,p}$  from this regression. Using these residuals avoids complications due to general differences in the extent of slant across newspapers and parties. We multiply the slant residuals  $\varepsilon_{n,p}$  with the parties left-right scores  $lr_p$  (as shown in Figure A4), where the sum of products then yields the left-right score  $lr$  of newspaper  $n$  ( $lr_n = \sum_{p=1}^P \varepsilon_{n,p} lr_p$ ).

Figure A5 compares average left-right scores with newspapers' self-stated ideologies. The figure indicates plausible patterns regarding newspapers' positioning. Conservative outlets and those with a Center Party affiliation are located most to the right in the political spectrum, whereas Social Democratic newspapers are located on the left end. Green newspapers exhibit particularly large negative left-right scores, a result driven by *Dagens ETC*, which is known to focus on feminist topics, gender issues, and climate change.

In summary, overall slant levels are relatively similar across months; we observe more slant towards more popular parties; and slant and newspapers' left-right scores correlate with their stated ideologies. Thus the plausibility checks discussed so far all indicate that our slant index measures what it is supposed to measure.

---

<sup>11</sup> In unreported results (available on request), we evaluate whether the link between newspaper slant and self-stated ideology varies across parties but do not find any significant differences. Hence, the provision of slant pertaining to newspapers' favored ideology tends to be similar in magnitude, regardless of the kind of preferred ideology.

## 5. Results

### 5.1 Newspaper slant and co-owned slant

Theoretical studies of media bias posit that profit-oriented owners will cater to the political preferences of consumers to maximize revenues (Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006; Chan and Suen, 2008), and empirical studies confirm that slant of US newspapers is largely driven by the demand side (Gentzkow and Shapiro, 2010; Lu, Shao, and Tao, 2018). Thus, differentiated slant across co-owned newspapers would indicate that owners want to maximize profits by catering to local preferences. However, if co-owned newspapers provide similar slant, despite differences in local preferences of consumers, the owner could instead be motivated by political factors.

To evaluate the influence of owners on slant, Gentzkow and Shapiro (2010) propose to compare the slant of newspapers with the slant of the other newspapers held by the same owner, while controlling for geographical and political clustering of owners.<sup>12</sup> As Table B2 shows, consumer preferences vary within an owner’s area of circulation, even though owners have strong location preferences (cp. Figure B7). While we observe changes in slant on a monthly basis, we only have two data points for changes in consumer preferences (the election dates). To evaluate the ownership effect, we therefore use our time-invariant measure of slant, which gives us a dataset of 1,016 observations.<sup>13</sup> As shown in Figure 1, Panel (a), there is a near-perfect correlation between average newspaper slant and average co-owned slant. We estimate versions of the following model to formally investigate if the *slant* of newspaper  $n$  towards party  $p$  correlates with the average  $\overline{slant}$  of the other newspapers  $-n$  held by the same owner  $c$ :

$$slant_{n,p,c} = a_1 + a_2 \overline{slant}_{-n,p,c} + a_3 v_{n,p} + \mu_n + \varphi_p + \varepsilon_{n,p,c} \quad (6)$$

where  $v$  controls for market ideology in the form of the number of votes for party  $p$  in the municipalities where the newspaper circulates, weighted by readership. We also include party/ideology fixed effects  $\varphi_p$  and newspaper fixed effects  $\mu_n$ . It is possible to use county fixed effects instead of newspaper fixed effects to control for geographical clustering of owners, but the latter additionally account for general differences in slant levels due to newspapers’ extent of coverage of ideologically relevant topics. We estimate Equation (6) by using OLS. To address concerns about biased estimates due to reverse causality

---

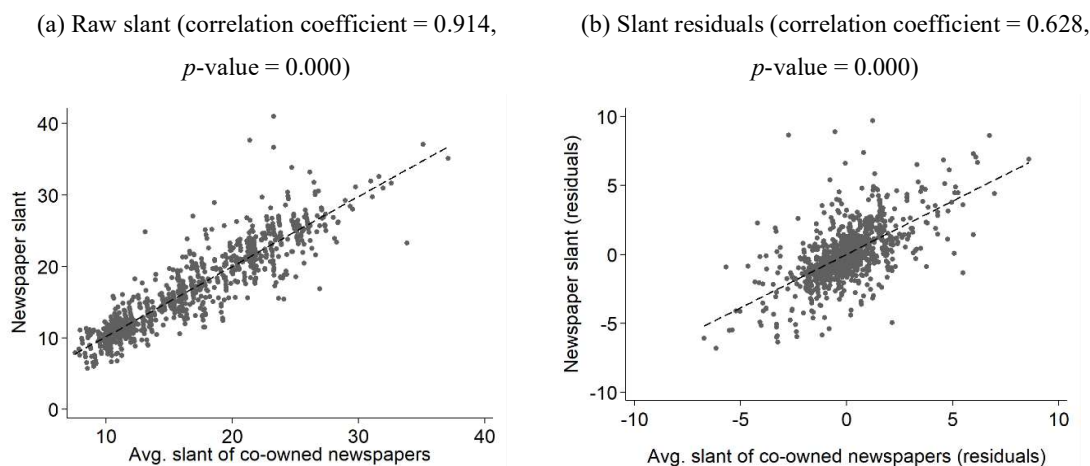
<sup>12</sup> We do not rely on newspapers’ stated ideologies for this test because these statements may not accurately reflect the true slant, even though both are correlated (Figure A3). Another possibility to evaluate the influence of owners would be to use political donations as a direct proxy of owner ideology. However, this approach is not feasible in the Swedish context, as details about private donations to parties are not made public. Importantly, Swedish party finance strongly relies on public subsidies, whereas donations only account for small fraction of the funding.

<sup>13</sup> 127 newspaper-owner combinations  $\times$  8 ideologies. During the study period this is equivalent to the total of 131 newspapers minus 23 single-owned newspapers that do not enter the estimation sample because there is no co-owned slant in these cases. Of the remaining 108 newspapers, 19 changed owners during the sample period. These newspapers are observed twice, once measuring their slant and co-owned slant before the acquisition and once more capturing their slant and co-owned slant after the takeover, resulting in 127 newspaper-owner observations.



between newspaper slant and market ideology, we alternatively use data on past voting (i.e., from the 1982 elections) and contemporary voting (i.e., from the 2018 elections).<sup>14</sup>

Figure 1: Newspaper slant and co-owned slant



Notes: The figure plots the newspapers' own slant against the average slant of the other newspapers owned by the same company. Slant is measured as the share of ideological phrases per million overall phrases, averaged over the period of study. Panel (a) shows the raw slant values, whereas Panel (b) shows the residuals of regressing slant on newspaper fixed effects, ideology fixed effects, and market ideology (i.e., the total number of votes in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality). Each data point represents a newspaper-owner-ideology combination ( $N = 1,016$ ).

In the OLS models, we cluster the standard errors by owner to correct for error correlation due to ideological clustering at that level. Newspapers are nested in owners, which implies that clustering by owner also accounts for within-newspaper correlation of errors. Considering that the number of clusters is relatively small – the total number of multiple-newspaper owners is 17 – we report both conventionally computed significance levels and  $p$ -values based on the wild cluster bootstrap method (Cameron et al., 2008). We do not cluster on party, or owner and party, because clustering within party is most likely exclusively related to differences in slant and voting that are the same across all observations in a given party. For instance, we generally observe less slant towards the Liberal Party than the Social Democrats because the vote shares of the former are normally lower. Thus party/ideology fixed effects are sufficient to absorb within-party clustering (Cameron and Miller, 2015).

<sup>14</sup> Gentzkow and Shapiro (2010) propose to use lagged church attendance as an instrumental variable for the Republican vote share. This approach is not feasible in a multi-party system because the link between religiosity and preferences for some of Sweden's eight parties is ambiguous.

Table 2: Regression of newspaper slant on co-owned slant

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.768*** (0.096) [0.000]	0.756*** (0.100) [0.000]	0.781*** (0.062) [0.000]	0.775*** (0.064) [0.000]
Market ideology (according to 1982 election)	0.035 (0.022) [0.135]		0.017* (0.008) [0.163]	
Market ideology (according to 2018 election)		0.060* (0.032) [0.059]		0.060*** (0.021) [0.035]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Partial eta <sup>2</sup> : avg. slant others	0.366	0.359	0.397	0.394
Partial eta <sup>2</sup> : market ideology	0.009	0.021	0.003	0.012
Adj. R <sup>2</sup>	0.864	0.866	0.918	0.919

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. *Partial eta<sup>2</sup>* is the share of variance explained by a regressor. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap p-values.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

Results are presented in Table 2. Throughout, the coefficients on market ideology have a positive sign, which implies that a higher number of votes for a party in a newspaper's area of circulation is associated with greater levels of slant towards that party. The correlation between slant and co-owned slant is positive and significant at the 1% level. With a value between 0.756 and 0.781, the point estimates suggest that average co-owned slant predicts the slant of the individual newspapers nearly perfectly. A coefficient of 1 would indicate perfect correlation, since both variables are measured on the same scale. However, according to Wald tests with wild cluster bootstrap *p*-values, we reject the null hypothesis that the coefficient on co-owned slant equals 1 (in all specifications at the 1% level). This test result rules out perfect copying of content but implies some degree of differentiation of slant across co-owned papers. According to the partial eta-squared<sup>15</sup> values, the average co-owned slant explains between 35.9% and 39.7% of the variance of a newspaper's slant, whereas market ideology only explains between 0.3% and 2.1%. Hence, a substantial part of the slant provided by the newspapers in our sample is determined by the companies they belong to, rather than local consumer preferences. By comparison,

<sup>15</sup> This metric is defined as  $SS^{regressor} / (SS^{regressor} + SS^{residual})$ , whereas *SS* denotes the sum of squares.

Gentzkow and Shapiro (2010) estimate that ownership explains close to 0% in their sample of US newspapers, whereas consumer preferences account for approx. 20% of the variation in slant.

Figure 1, Panel (b), complements the findings graphically. The figure shows the residuals of regressing (co-owned) slant on newspaper fixed effects, party/ideology fixed effects, and market ideology according to the 2018 election. The positive relationship remains, but its strength (correlation coefficient = 0.628) is lower than the relationship between the raw slant measures (correlation coefficient = 0.914).

### 5.2 Robustness checks

In Table B3, we re-estimate Equation (6) using a measure of market ideology that is based on vote shares rather than total votes. This measure is not significantly correlated with newspapers' slant, which confirms our argument that owners are concerned about total readers and subscriptions. As a consequence, the correlation between slant and co-owned slant increases slightly. We also consider further ways of measuring market ideology, including unweighted votes and vote shares, as well as the voting results in the municipality where the newspaper is published, rather than the entire circulation area. We do not obtain different results when we use these alternative measures (available on request) but find that they are generally worse predictors of newspaper slant than our baseline measure. Hence, we proceed with market ideology based on total votes in the subsequent analyses.

Robustness checks confirm that the strong relationship between slant and co-owned slant persists when we use modified versions of the slant index. In Tables B4 and B5, we re-estimate Equation (6) while including measures of slant that are based on using the top 100 and 1,000 expressions when checking the newspapers' use of political phrases. The coefficient of interest remains very similar to the baseline estimates, which are based on the top 500 expressions.

We also conduct a placebo exercise (Table B6), where we regress newspaper slant on the average slant of all newspapers held by other owners, instead of co-owned slant. The resulting estimates do not indicate any statistically significant relationship between individual and "national slant", giving us reassurance that our main finding is not a statistical artifact. The placebo estimates also imply that slant considerably differs *across* owners.

Our sample includes five owners that hold exactly two newspapers each. By construction, the slant of these newspapers is once included on the left-hand side of Equation (6) and once more as co-owned on the right-hand side. To rule out that this duplication drives our result, we re-estimate the baseline model while excluding all two-newspaper owners. Table B7 shows that the estimates are not sensitive to this restriction. Similarly, newspapers that changed owners during the investigation period are also included twice in the sample, once under the old and once under the new owner. According to Table B8, the results do not substantially change when we exclude these papers.

There might be further concerns about non-independence of observations in cases where owners hold many newspapers, as a higher number of co-owned papers could imply a greater correlation between observations for mechanical reasons. To mitigate this concern, we estimate Equation (6) while using the inverse number of co-owned newspapers as regression weights. Table B9 indicates that this modification does not affect the results either.

Another way to address concerns about non-independent observations is to collapse the data from the newspaper-party level to the newspaper level by using the one-dimensional left-right score described in Section 4.4 rather than the eight-dimensional slant measure. In Table B10, we regress the newspapers' left-right score on the average left-right score of the co-owned outlets. The results are qualitatively similar to the baseline specifications. However, the ownership effect is estimated to be somewhat smaller in models that include county fixed effects (Columns 3 and 4). That is, the coefficient of interest drops to a value of approx. 0.44 and the share of variation in outlets' left-right scores explained by ownership falls to 13.3%.

As mentioned in Section 2, there are not any truly national newspapers in Sweden, although *Dagens Nyheter*, *Svenska Dagbladet*, and *Dagens Industri* have many readers outside the Stockholm area. It could be argued that their owners provide a particularly uniform slant to target mainstream consumer preferences throughout Sweden. Table B11 shows that estimates remain similar when we exclude these outlets.

The slant index used in Equation (6) compares the language of national politicians with the news coverage of local newspapers. This could be problematic, as the language and thematic focus of national politicians might deviate from the language and topics of politicians of the same party at the local level. If our slant index fails to pick up local peculiarities, Equation (6) overestimates the true relationship between slant and co-owned slant, especially because some newspapers do not produce national news stories on their own but copy articles from news agencies (e.g., TT Nyhetsbyrån). We do not believe that this is the case. First, the eight parties under consideration are all represented in the municipal and regional councils. Additional local parties exist only in some cases. Second, as Table A1 shows, the phrases used in the national parliament refer to many local topics, such as regional divide, small businesses, beach protection, socially vulnerable areas, and housing shortage. Third, if our slant index would only capture differences in national coverage produced by news agencies, the placebo test in Table B6 should not indicate an insignificant relationship between individual and “national” slant. Importantly, as Figure A6 shows, the distribution of phrases does not significantly differ between local and national news. That is, for each party, we reject the null hypothesis that the mean share of phrases differs between the two types of news. Hence, we are confident that our slant index reliably captures slant in local and national coverage.

### 5.3 *Economic opportunities for product differentiation*

The homogeneity of slant in co-owned outlets has direct effects on diversity of total news supply, but the societal implications may vary with owner motives. The large ownership effect could reflect that owners act on a desire to persuade voters. The slant is then aligned with the owners' preferences rather than those of consumers, at the expense of economic profits. But the large ownership effect could also be motivated by economic profits, if costs saved from realizing scale effects and using synchronized journalism are higher than revenues lost from deviating from local consumer preferences. The correlation between slant and co-owned slant could therefore imply that owners maximize profits by pandering to the political preferences of the representative consumer in their market at large, and only to some extent, or not at all, differentiate across newspapers to satisfy local diverse demands. We call this mechanism profit maximization under costly product differentiation.

In practice, owner motives are likely not binary. Owners may care both about economic profits and political influence, which makes it difficult to pinpoint the exact mechanisms. However, if economic profits are the dominating factor, we should be able to observe differences in the tendency to supply a one-size-fits-all mix of slant, depending on market and owner characteristics. Slant should be more differentiated

- a) the greater the size of the market where the owner circulates (because costly product differentiation is more likely to be profitable; Berry and Waldfogel, 2010; Ferguson, 2015),
- b) the higher the average income in the owner's area of circulation (because higher advertising prices per subscriber create financial opportunities to differentiate; Wilbur, 2008; Chandra, 2009),
- c) and the more heterogeneous the consumer preferences in the owner's area of circulation (because of greater demand for differentiated slant; Allenby and Rossi, 1999).

We test these predictions in Table 3. In Column (1), we investigate whether market size affects the degree of differentiation. We measure market size in terms of the total population in the owner's area of circulation, categorize newspapers by quartiles of the distribution of this variable, and create interaction terms between quartile dummies and average co-owned slant. The estimates indicate that the ownership effect tends to be stronger for owners that operate in larger markets. That is, owners in the second and third quartiles are significantly less likely to offer differentiated slant than owners in the first quartile. According to the wild cluster bootstrap  $p$ -values, these differences are significant at the 5% and 10% levels, respectively. If economic profits were a dominating factor, we would expect the opposite pattern though, that differentiation of slant increases with market size. Column (2) shows results for interactions between co-owned slant and the average consumer income in the owner's area of circulation. The coefficients on these interactions are not significant. In Column (3), we evaluate the tendency to differentiate by the degree of ideological heterogeneity in the owner's area of circulation, measured as

the within-owner standard deviation of weighted vote shares. There are no significant differences either. Thus, there are no clear patterns that would support the costly product differentiation hypothesis.

Table 3: Regression of newspaper slant on co-owned slant, by market and owner characteristics

	(1)	(2)	(3)
Avg. slant of other newspapers by same owner	0.709*** (0.072) [0.000]	0.816*** (0.065) [0.000]	0.827*** (0.064) [0.000]
<i>Market size (reference category: 1st quartile)</i>			
Avg. slant others × 2nd quartile	0.075 (0.048) [0.063]		
Avg. slant others × 3rd quartile	0.085** (0.035) [0.039]		
Avg. slant others × 4th quartile	0.073 (0.044) [0.110]		
<i>Average consumer income (reference category: 1st quartile)</i>			
Avg. slant others × 2nd quartile		0.016 (0.035) [0.743]	
Avg. slant others × 3rd quartile		0.008 (0.024) [0.758]	
Avg. slant others × 4th quartile		-0.024 (0.021) [0.408]	
<i>Voter heterogeneity (reference category: 1st quartile)</i>			
Avg. slant others × 2nd quartile			-0.046 (0.032) [0.187]
Avg. slant others × 3rd quartile			-0.032 (0.021) [0.147]
Avg. slant others × 4th quartile			-0.004 (0.034) [0.920]
Market ideology (according to 2018 election)	0.053*** (0.017) [0.]	0.061*** (0.019) [0.020]	0.057*** (0.020) [0.027]
Ideology fixed effects	Yes	Yes	Yes
Newspaper fixed effects	Yes	Yes	Yes
Adj. $R^2$	0.920	0.923	0.923

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market size* ranks the newspapers by the total population in the municipalities where the owner circulates. *Average consumer income* ranks the newspapers by the average income in the owner's area of circulation, weighted by the share of readers living in the relevant municipalities. *Voter heterogeneity* ranks the newspapers by the within-owner average standard deviation of 2018 vote shares (e.g., the first quartile includes outlets by those owners that circulate in markets with rather homogenous voters, whereas the fourth quartile captures outlets by owners in heterogenous areas). *Market ideology* is the total number of votes in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality. The models include all constituent terms of the interactions (output omitted). Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 4: Regression of newspaper slant on co-owned slant, by type of content

	(1)	(2)	(3)	(4)
<i>Panel A: Straight news articles</i>				
Avg. slant of other newspapers by same owner	0.790*** (0.100) [0.000]	0.769*** (0.109) [0.003]	0.758*** (0.069) [0.000]	0.746*** (0.072) [0.002]
Market ideology (according to 1982 election)	0.043 (0.028) [0.101]		0.023* (0.011) [0.096]	
Market ideology (according to 2018 election)		0.070* (0.039) [0.052]		0.067** (0.026) [0.058]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Partial eta <sup>2</sup> : avg. slant other	0.363	0.350	0.337	0.330
Partial eta <sup>2</sup> : market ideology	0.016	0.033	0.005	0.018
Adj. R <sup>2</sup>	0.869	0.871	0.917	0.918
<i>Panel B: Opinion Articles</i>				
Avg. slant of other newspapers by same owner	0.493** (0.185) [0.117]	0.491** (0.184) [0.119]	0.584*** (0.119) [0.034]	0.590*** (0.116) [0.030]
Market ideology (according to 1982 election)	-0.008 (0.007) [0.218]		-0.005 (0.005) [0.206]	
Market ideology (according to 2018 election)		-0.009 (0.008) [0.292]		-0.005 (0.006) [0.314]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Partial eta <sup>2</sup> : avg. slant other	0.070	0.069	0.101	0.103
Partial eta <sup>2</sup> : market ideology	0.008	0.007	0.003	0.001
Adj. R <sup>2</sup>	0.635	0.634	0.759	0.758

Notes: OLS estimates, using data at the newspaper-ideology level (N = 936). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. *Partial eta<sup>2</sup>* is the share of variance explained by a regressor. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap *p*-values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

#### *5.4 Opinion articles*

A main advantage of language-based measures of slant is the detection and quantification of media bias in content that is not explicitly marked as opinion content. In Table 4, we investigate whether the ownership effect differs between opinion articles (i.e., columns, commentaries, debate articles, and editorials as described in Section 4.3) and straight news articles. Panel A of the table shows estimates of regressions of the outlets' slant of straight news articles on the average co-owned slant of straight news articles. These estimates are fairly similar to the baseline results, which is not surprising because straight news accounts for more than 91% of all slant.

However, results are quite different when we look at the estimates pertaining to opinion articles in Panel B of Table 4. The coefficient on co-owned slant is positive but smaller in magnitude than in the baseline specifications. According to the wild cluster bootstrap  $p$ -values, the ownership effect is significant at the 5% level when using newspaper fixed effects (Columns 3 and 4) but not significant when we include county fixed effects (Columns 1 and 2). The partial eta-squared values indicate that ownership explains only 6.9% to 10.3% of the variation of slant of opinion articles, compared to 33.0% to 36.3% in the case of straight news. The coefficients on market ideology all have a negative sign in Panel B. In addition, outlets' slant of opinion articles is not correlated with their own straight news slant (Table B16). Overall, these results indicate that the writers of opinion articles often deviate from the owner's average slant, which may imply supply-side bias induced by journalists and editors.

#### *5.5 Further differences between newspapers*

In Table B12, we evaluate whether the ownership effect differs between left- and right-wing outlets and newspaper groups. We do not find significant differences when we interact the owner's average left-right score with average co-owned slant, at least not according to the wild cluster bootstrap  $p$ -values. However, we find significant differences when looking at newspapers' average left-right score. As the estimates in Columns (1) and (2) indicate, the ownership effect is the weakest for outlets in the fourth quartile of the distribution of left-right scores, which implies that right-wing newspapers are more likely to deviate from the average slant of their co-owned papers than left-wing newspapers. This difference could be driven by a greater provision of slant in opinion articles by right-wing newspapers: The average share of political phrases in opinion articles of outlets in the first quartile of the distribution of newspapers' left-right score is 1.248 per million overall phrases, whereas this share equals 1.447 for outlets in the fourth quartile. Considering that opinion articles are generally more prone to deviate from the owner's average slant, journalists and editors of newspapers with large positive left-right scores could be more inclined to express their personal views than their colleagues from newspapers on the left



end of the political spectrum. Unfortunately, we cannot conclusively investigate this conjecture because we do not have comprehensive data on newspaper employees.<sup>16</sup>

As discussed in Section 2, several newspapers in our sample were previously owned by political parties. According to the *Nya Lundstedt dagstidningar* database of the National Library in Stockholm, there are 22 papers that were owned by the Social Democrats or the Center Party at some point after World War II. In Table B13, we use a dummy variable labeled *previous party ownership* to evaluate if the ownership effect differs for these newspapers, considering that newsroom cultures could be path dependent. The results indicate a somewhat stronger ownership effect for previously party-owned papers. However, the estimates also imply that ownership effects are not limited to these newspapers but can as well be observed for outlets that do not have a history of party ownership.

Table B14 offers a comparison between subsidized and unsubsidized newspapers. The ownership effect could be smaller for subsidized papers, considering that the subsidy regulations require these papers to produce at least 55% of their total editorial content autonomously, which restricts content sharing. The estimates do not indicate significant differences in the ownership effect though, perhaps because subsidies are not concentrated within certain companies but most owners hold both subsidized and unsubsidized papers.

Finally, in Table B15, we assess whether the ownership effect differs before and after the acquisition of a newspaper. This comparison does not necessarily help to disentangle profit maximization and political motives because the slant of an acquired outlet may converge towards the average slant of the new owner for either or both motives. However, comparing the pre- and post-acquisition strength of the ownership effect makes it possible to assess the implications of the increasing concentration of the industry: If there is a reduced ownership effect after an acquisition, concerns about decreasing diversity of viewpoints could perhaps be less warranted, as the editorial stance of the acquired paper may remain independent. This is not case though. The estimates indicate a (statistically insignificant) increase in the ownership effect after the takeover. Unless acquiring owners exclusively take over papers that initially match the average slant of the acquiring company, concerns about decreasing viewpoint diversity remain.

---

<sup>16</sup> An exception are the chief editors, whose names are listed for all newspapers in our sample in the *Nya Lundstedt dagstidningar* database of the National Library in Stockholm (see <http://tidning.kb.se/nld/nld/nlnav>). We cross-reference the editors' first and last names with the first and last names of the members of the national parliament and the members of the county and municipal counties, as listed in the 2014 and 2018 parliamentary directories of the Swedish Election Authority. This exercise indicates 34 potential matches, which we manually evaluate for plausibility checking editors' LinkedIn profiles and similar sources. Most of the potential matches are false positives due to homonymity, but we verify that two editors in our sample acted as elected members for a political party in their regional councils. One of these "politician editors" served a single-newspaper owner, where we do not observe any co-owned slant by definition. The other politician editor was in charge of a newspaper held by a two-newspaper company. In unreported regressions (available on request), we do not find a statistically different ownership effect for that newspaper.

### 5.6 Political returns to persuasion

Based on the above results, we cannot rule out that preferences of owners for political influence play a role in determining the slant of Swedish newspapers. Acting in accordance with these preferences is subject to a trade-off, because owners have to sacrifice economic profits for efforts of persuasion. However, the political returns to efforts of persuasion are not constant. These returns are likely higher when elections take place because changes in public opinion can have immediate consequences at the ballot box (Garz and Sörensen, 2021). Importantly, election outcomes shape political outcomes for several years.

Elections to the national parliament, county councils, and municipal councils all take place at the same time in Sweden, which implies that the incentives to influence policy making are concentrated at one point of time. General elections took place twice during our period of investigation, on September 14, 2014, and on September 9, 2018. If owners act on a preference to influence public opinion, we expect the slant of individual newspapers to correlate even more with the average co-owned slant in the time before these elections. There is no unique definition of the time span of the election phase in Sweden, but the peaks in newspapers' use of political expressions in August and September shown in Figure A2 suggest that the most intensive part of campaigning takes place in these two months.

We use the time-varying version of our slant index to evaluate the relationship between newspaper *slant* and co-owned  $\overline{slant}$  during the election phase:

$$slant_{n,p,c,t} = a_1 + a_2 \overline{slant}_{-n,p,c,t} + a_3 E_t + a_4 \overline{slant}_{-n,p,c,t} \times E_t + a_5 X_{n,p,t} + \varepsilon_{n,p,c,t} \quad (7)$$

where the indices  $n$ ,  $p$ ,  $c$ , and  $t$  denote newspapers, parties, owners, and months, respectively. The binary variable  $E$  equals 1 in August and September of elections years and 0 otherwise. The interaction between  $\overline{slant}$  and  $E$  allows us to evaluate if the correlation between the slant of the individual outlet and average co-owned slant changes when elections take place. We estimate Equation (7) conditional on measures of market ideology, as well as newspaper, party/ideology, year, and month fixed effects, all included in  $X$ .

Results are presented in Table 5. The sign of the coefficient on the interaction is positive, which suggests a stronger relationship between slant and co-owned slant before elections than usually. The difference is significant at the 5% level. After controlling for market ideology, the point estimate indicates an increase in the correlation between slant and co-owned slant of approximately 2.8% ( $0.022 / 0.794 \approx 0.028$ ). Thus the size of the ownership effect is slightly larger when the returns to persuasion are higher. Given the within-owner heterogeneity of consumer preferences (cp. Table B2), there is no reason why a more homogenous mix of slant should be motivated by economic profits. In contrast, the lower degree of differentiation of slant between co-owned newspapers before elections is an indication that owners' political motivations matter.

Table 5: Role of elections for the relationship between newspaper slant and co-owned slant

	(1) Slant	(2) Slant	(3) Slant
Avg. slant of other newspapers by same owner	0.797*** (0.033) [0.000]	0.796*** (0.034) [0.000]	0.794*** (0.035) [0.000]
Election (yes/no)	0.155 (0.140) [0.320]	0.153 (0.140) [0.326]	0.150 (0.141) [0.334]
Avg. slant others × election	0.021** (0.009) [0.042]	0.022** (0.009) [0.043]	0.022** (0.009) [0.041]
Market ideology (according to 1982 election)		0.000** (0.000) [0.414]	
Market ideology (according to 2018 election)			0.048*** (0.011) [0.038]
Newspaper fixed effects	Yes	Yes	Yes
Ideology fixed effects	Yes	Yes	Yes
Year and month fixed effects	Yes	Yes	Yes
Adj. $R^2$	0.864	0.864	0.864

Notes: OLS estimates. The regressions use data at the newspaper-ideology-month level (N = 54,680). Dependent variable: share of ideological phrases per million overall phrases. *Election* is a binary variable that equals 1 in the month before and month of a national election, and 0 otherwise. *Market ideology* is the total number of votes in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Results are presented in Table 5. The sign of the coefficient on the interaction is positive, which suggests a stronger relationship between slant and co-owned slant before elections than usually. The difference is significant at the 5% level. After controlling for market ideology, the point estimate indicates an increase in the correlation between slant and co-owned slant of approximately 2.8% ( $0.022 / 0.794 \approx 0.028$ ). Thus the size of the ownership effect is slightly larger when the returns to persuasion are higher. Given the within-owner heterogeneity of consumer preferences (cp. Table B2), there is no reason why a more homogenous mix of slant should be motivated by economic profits. In contrast, the lower degree of differentiation of slant between co-owned newspapers before elections is an indication that owners' political motivations matter.

### 5.7 Market-level outcomes

The results presented so far indicate that newspapers' slant may not be well aligned with consumer preferences. Approximately three quarters of Swedish municipalities are served by more than one owner

(Figure B4), while most newspapers target multiple municipalities (Figure B1), which raises the question of how well the aggregated, market-level slant fits local consumer preferences. To answer this question and complement the newspaper-level analysis, we compute the correlation between the combined average slant in municipality  $m$  and the distribution of vote shares of parties  $p$  in the 2018 elections in this municipality:

$$fit_m = \frac{\sum(slant_{m,p} - \overline{slant}_m)(v_{m,p} - \bar{v}_m)}{\sqrt{\sum(slant_{m,p} - \overline{slant}_m)^2(v_{m,p} - \bar{v}_m)^2}} \quad (8)$$

which yields a measure of *fit* for each municipality  $m$  between market-level slant and local consumer preferences. This measure is bound between -1 and 1.

Empirically, the *fit* ranges from -0.32 to 0.83, which indicates substantial variation in how well market-level slant matches local preferences; see Figure B8 for the complete distribution of correlation coefficients. Hence, there are some municipalities where consumer preferences are met particularly well and others where the market-level slant does not match the tastes of the majority of consumers. For instance, the correlation coefficient is smaller than 0.3 in 10% of municipalities and negative in 2.4% of cases.

Figure B9 illustrates how the fit between slant and consumer preferences varies by demographic characteristics of the municipalities. Accordingly, market-level slant tends to be more compatible with local tastes in places with a small population size, low levels of income and education, and a large share of old citizens. We also find a positive correlation between the share of newspaper readers in a municipality and the fit of the slant, but this relationship is weak at best. On the one hand, these findings cast further doubts that owners primarily pursue profit-maximizing strategies. If this were the case, slant should be well-aligned in places with many affluent consumers and much advertising potential, rather than small, low-income municipalities. On the other hand, the patterns in Figure B9 suggest that the ideological preferences of certain groups are systematically neglected, such as young and well-educated people, which could translate into group differences in participation in local politics.

## 6. Conclusion

In this study, we investigate to what extent newspaper slant towards political parties can be explained by ownership. For that purpose, we collect data on newspapers, owners, and consumers between January 2014 and April 2019 in Sweden. Comparing the language of the political parties with the language of the newspapers allows us to construct an index of political slant. Our results show that ownership explains almost 40% of the variation in slant, whereas local consumer preferences account for about 2% at most. This finding indicates that owners are generally not much inclined to offer differentiated slant

across their newspapers, even though heterogeneous consumers likely prefer a customization of coverage. A consequence of the one-size-fits-all slant is that we observe a poor or even negative correlation between market-level slant and consumer preferences in some municipalities. We find no evidence that profit maximization under costly product differentiation is a dominating factor explaining the ownership effect. However, we find that co-owned newspapers are less differentiated before elections, when the political returns to persuasion are high. Hence, we cannot rule out that Swedish newspaper owners act on a desire to influence the public. In addition, we provide suggestive evidence of supply-side bias induced by the writers of opinion articles, such as editorials, columns, and commentaries.

Our study is not without limitations. For example, while plausibility checks support the validity of our index of slant, we encourage future research to apply more sophisticated language models when constructing measures of media bias. Specifically, it would be useful to reduce the noise in these measures by employing models that account for word embeddings and the contextuality of language (e.g., Devlin et al., 2018; Spinde et al., 2021). In addition, while it is beyond the scope of our study to analyze the changes in newspaper ownership in detail, a comprehensive investigation of mergers and acquisitions could be useful to obtain deeper insights into the market forces and political motives that shape newspaper slant.

The implications of our findings for competition policy and society are as follows. First, as discussed in the introduction, it is advisable to require even greater levels of editorial independence when granting newspaper subsidies than is currently the case. As our results show, co-owned newspapers are otherwise unlikely to contribute to the main objective of the subsidy, the diversity of sources and viewpoints in local news.

Second, our finding that the fit between market-level slant and consumer preferences is systematically correlated with demographic characteristics of municipalities could be problematic from a societal perspective. Certain groups, such as young citizens, may not find their political views represented by the newspaper(s) in their municipality. It could be argued that news consumers nowadays have nearly unlimited possibilities to access different opinions online, but the local newspaper and its website are normally the only sources for news about municipality-related events and politics. As a consequence, these groups might disengage from local politics, which could have negative effects on political accountability and civic commitment in municipalities (e.g., Snyder and Strömberg, 2010; Hayes and Lawless, 2015; Martin and McCrain, 2019).

Third, competition authorities that consider the societal implications of media mergers typically use owners' audience shares to proxy opinion diversity. This kind of assessment is based on the assumption that the number and weight of owners in a market equals the number and weight of viewpoints about a given topic (e.g., Just, 2009). Our findings show that this assumption is largely justified in the Swedish newspaper context. Under different conditions, however, owners have been shown to strongly

differentiate the slant across their outlets (Gentzkow and Shapiro, 2010). It seems therefore advisable for competition authorities to use explicit measures of opinion diversity. For instance, using text-based measures of slant, as done in this study, would allow regulators to evaluate the question of opinion diversity in a much more detailed way.

#### **Data availability statement**

The data and code necessary to replicate the empirical findings of this study are openly available on Harvard Dataverse at <https://doi.org/10.7910/DVN/PBBYPO>.

## References

- Allenby, G. M., & Rossi, P. E. (1999). Marketing Models of Consumer Heterogeneity. *Journal of Econometrics*, 89, 57–78.
- Alonso, I. F., de Moragas, M., Blasco Gil, J. J., & Almiron, N. (eds.) (2006). *Press Subsidies in Europe*. Barcelona: Generalitat de Catalunya.
- Anand, B., Di Tella, R., Galetovic, A. (2007). Information or Opinion? Media Bias as Product Differentiation. *Journal of Economics & Management Strategy*, 16, 635–682.
- Anderson, S. P., & McLaren, J. (2012). Media Mergers and Media Bias with Rational Consumers. *Journal of the European Economic Association*, 10, 831–859.
- Archer, A. M., & Clinton, J. (2018) Changing Owners, Changing Content: Does Who Owns the News Matter for the News? *Political Communication*, 35, 353–370.
- Baron, D. P. (2006). Persistent Media Bias. *Journal of Public Economics*, 90, 1–36.
- Barone, G., D’Acunto, F., & Narciso, G. (2015). Telecracy: Testing for Channels of Persuasion. *American Economic Journal: Economic Policy*, 7, 30–60.
- Battaglion, M. R., & Vaglio, A. (2018). Newspapers and Public Grants: A Matter of Quality. *Scottish Journal of Political Economy*, 65, 27–38.
- Bengtsson, H, Johansson, Ö., & Lindström, S. (2018). Miljoner i presstöd räddades till storföretagen. Svenska Dagbladet, 7 Aug 2018, <https://www.svd.se/miljoner-i-presstod-raddades-till-storforetagen>.
- Berry, S., & Waldfogel, J. (2010). Product Quality and Market Size. *Journal of Industrial Economics*, 58, 1–31.
- Cagé, J. (2020). Media Competition, Information Provision and Political Participation: Evidence from French Local Newspapers and Elections, 1944–2014. *Journal of Public Economics*, 185, 1–24.
- Cameron, A. C., Gelbach, J. B., & Miller, D. L. (2008). Bootstrap-Based Improvements for Inference with Clustered Errors. *Review of Economics and Statistics*, 90, 414–427.
- Cameron, A. C., & Miller, D. L. (2015). A Practitioner’s Guide to Cluster-Robust Inference. *Journal of Human Resources*, 50, 317–372.
- Chan, J., & Suen, W. (2008). A Spatial Theory of News Consumption and Electoral Competition. *Review of Economic Studies*, 75, 699–728.
- Chandra, A. (2009). Targeted advertising: The role of subscriber characteristics in media markets. *The Journal of Industrial Economics*, 57, 58–84.

- DellaVigna, S., & Kaplan, E. (2007). The Fox News Effect: Media bias and voting. *Quarterly Journal of Economics*, 122, 1187–1234.
- Devlin, J., Chang, M.-W., Lee, K., & Toutanova, K. (2018). BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding. arXiv:1810.04805v2.
- Enikolopov, R., Petrova, M., & Zhuravskaya, E. (2011). Media and Political Persuasion: Evidence from Russia. *American Economic Review*, 101, 3253–3285.
- Fengler, S., & Ross-Mohl, S. (2008). The Crumbling Hidden Wall: Towards an Economic Theory of Journalism. *Kyklos*, 61, 520–542.
- Ferguson, S. M. (2015). Endogenous Product Differentiation, Market Size and Prices. *Review of International Economics*, 23, 45–61.
- Garz, M., & Rickardsson, J. (2022). Media Competition, Multimarket Contact, and Ideological Diversity. Mimeo.
- Garz, M., & Sörensen, J. (2021). Political Scandals, Newspapers, and the Election Cycle. *Political Behavior*, 43, 1017–1036.
- Garz, M., & Sörensen, J., & Stone, D. F. (2020). Partisan Selective Engagement: Evidence from Facebook. *Journal of Economic Behavior & Organization*, 177, 91–108.
- Garz, M., & Zhuang, M. (2022). Media Coverage and Pandemic Behaviour: Evidence from Sweden. Working Paper.
- Gentzkow, M., Kelly, B. T., & Taddy, M. (2019). Text as Data. *Journal of Economic Literature*, 57, 535–574.
- Gentzkow, M., & Shapiro, J. M. (2006). Media Bias and Reputation. *Journal of Political Economy*, 114, 280–316.
- Gentzkow, M., & Shapiro, J. M. (2010). What Drives Media Slant? Evidence from U.S. Daily Newspapers. *Econometrica*, 78, 35–71.
- Gentzkow, M., Shapiro, J. M., & Sinkinson, M. (2014). Competition and Ideological Diversity: Historical Evidence from US Newspapers. *American Economic Review*, 104, 3073–3114.
- Gentzkow, M., Shapiro, J. M., & Stone, D. F. (2015). Media Bias in the Marketplace: Theory. In S. Anderson, D. Strömberg, & J. Waldfogel (eds.): *Handbook of Media Economics* (pp. 623–645). Amsterdam: North Holland.
- Gustafsson, K., Örnebring, H. & Levy, D. A. L. (2009). Press Subsidies and Local News: The Swedish Case. Reuters Institute for the Study of Journalism Working Paper.



- Hallin, D., & Mancini, P. (2004). *Comparing Media Systems: Three Models of Media and Politics*. Cambridge: Cambridge University Press.
- Hayes, D., & Lawless, J. L. (2015). As Local News Goes, So Goes Citizen Engagement: Media, Knowledge, and Participation in US House Elections. *Journal of Politics*, 77, 447–462.
- Hopkins, D. J., & Ladd, J. M. (2014). The Consequences of Broader Media Choice: Evidence from the Expansion of Fox News. *Quarterly Journal of Political Science*, 9, 115–135.
- Just, N. (2009). Measuring Media Concentration and Diversity: New Approaches and Instruments in Europe and the US. *Media, Culture & Society*, 31, 97–117.
- Kekezi, O., & Mellander, C. (2018). Geography and Consumption of Local Media. *Journal of Media Economics*, 31, 96–116.
- Kind, H. J., & Møen, J. (2015). Effects of Taxes and Subsidies on Media Services. In R. Picard & S. Wildman (eds.): *Handbook on the Economics of the Media* (pp. 350–382). Cheltenham: Edward Elgar.
- Knight, B., & Tribin, A. (2019). The Limits of Propaganda: Evidence from Chavez’s Venezuela. *Journal of the European Economic Association*, 17, 567–605.
- Larcinese, V., Puglisi, R., & Snyder Jr., J. M. (2011). Partisan Bias in Economic News: Evidence on the Agenda Setting Behavior of U.S. Newspapers. *Journal of Public Economics*, 95, 1178–1189.
- Leroch, M. A., & Wellbrock, C. (2011). Saving Newspapers with Public Grants – The Effects of Press Subsidies on the Provision of Journalistic Quality. *Information Economics and Policy*, 23, 281–286.
- Linderborg, Å. (2019). Likriktningen av journalistiken redan allvarligt problem. Aftonbladet, 8 Feb 2019, <https://www.aftonbladet.se/kultur/a/ddKBnq/likriktningen-av-journalistiken-redan-allvarligt-problem>.
- Lu, Y., Shao, X., & Tao, Z. (2018). Exposure to Chinese Imports and Media Slant: Evidence from 147 U.S. Local Newspapers over 1998–2012. *Journal of International Economics*, 114, 316–330.
- Martin, G. J., & McCrain, J. (2019). Local News and National Politics. *American Political Science Review*, 113, 372–384.
- Martin, G. J., & Yurukoglu, A. (2017). Bias in Cable News: Persuasion and Polarization. *American Economic Review*, 107, 2565–2599.
- Mullainathan, S., & Shleifer, A. (2005). The Market for News. *American Economic Review*, 95, 1031–1053.
- Nordicom (2018): Dagstidningsläsare i befolkningen 9–79 år en genomsnittlig dag, 1990–2017. Gothenburg: Nordicom.

- Nygren, G., & Nord, K. O. (2017). Färre nyhetsproducenter – men fler nyheter i nätverkens flöden. In L. Truedson (ed.): *Mediestudiers årsbok: tillståndet för journalistiken 2016/2017* (pp. 32–73). Stockholm: Institutet för mediestudier.
- Ohlsson, J. (2016). Svensk tidningsmarknad under 2000-talet. Strukturförändringar och ekonomisk utveckling. Gothenburg: Nordicom.
- Ots, M. (2009). Efficient servants of pluralism or marginalized media policy tools? The case of Swedish press subsidies. *Journal of Communication Inquiry*, 33, 376–392.
- Ots, M. (2012). Competition, Collaboration and Cooperation: Swedish Provincial Newspaper Markets in Transition. *Journal of Media Business Studies*, 9, 43–63.
- Picard, R. (2003). Press Support and Company Performance: The Swedish Case. In U. Carlsson (ed.): *Pennan, Penningen & Politiken: Medier och mediefortag förr och nu* (pp. 95–107). Gothenburg, Nordicom.
- Porter, M. F. (1980). An Algorithm for Suffix Stripping. *Program*, 14, 130–137.
- Prat, A. (2018). Media Power. *Journal of Political Economy*, 126, 1747–1783.
- Presstödsförordning [The Press Subsidies Act]. Kulturdepartementet, SFS 1990: 524.
- Puglisi, R., & Snyder Jr., J. M. (2011). Newspaper Coverage of Political Scandals. *Journal of Politics*, 73, 931–950.
- Qin, B., Strömberg, D., & Wu, Y. (2018). Media Bias in China. *American Economic Review*, 108, 2442–2476.
- Simonov, A., & Rao, J. (2020). Demand for Online News under Government Control: Evidence from Russia. *Journal of Political Economy*, forthcoming.
- Snyder, J. M., & Strömberg, D. (2010). Press Coverage and Political Accountability. *Journal of Political Economy*, 118, 355–408.
- Spinde, T., Rudnitckaia, L., Hamborg, F., & Gipp, B. (2021). Identification of Biased Terms in News Articles by Comparison of Outlet-specific Word Embeddings. Proceedings of the iConference 2021.
- Szeidl, A., & Szucs, F. (2021). Media Capture through Favor Exchange. *Econometrica*, 89, 281–310.
- Volkens, A., Krause, W., Lehmann, P., Matthieß, T., Merz, N., Regel, S., & Weßels, B. (2019). The Manifesto Data Collection. Manifesto Project (MRG/CMP/MARPOR). Version 2019b. Berlin: Wissenschaftszentrum Berlin für Sozialforschung (WZB).
- Weibull, L., & Anshelm, M. (1991). Signs of Change: Swedish Media in Transition. *Nordicom Review*, 2, 37–63.

Wilbur, K. C. (2008). A Two-Sided, Empirical Model of Television Advertising and Viewing Markets. *Marketing Science*, 27, 356–378.

Supplementary information for “Ownership and Media Slant: Evidence from Swedish Newspapers” by Marcel Garz and Jonna Rickardsson

**Online Appendix A: Details on Measuring Newspaper Slant**

Table A1: Examples of characteristic of parties’ characteristic phrases

Centerpartiet (Center Party)	Liberalerna (Liberal Party)	Kristdemokraterna (Christian Democrats)	Moderaterna (Moderate Party)
cost reduction	educate themselves	Christian refugee	expensive to hire
green tax exchange	European carbon tax	Christian residents	fiscal council
mobile broadband	European cooperation	civil society	foreign born
non-toxic everyday life	European drug control	inviolable value	their first job
nutrition and activity	highest marginal tax	Islamic State	jobs and growth
private investment research	improve Swedish schools	national dementia plan	mininster of finance
regional divide	more freedom	other ethno-religious	profitable to work
regular medical contact	national minority	payroll tax for elderly	rut och rot <sup>1</sup>
small and growing	Swedish housing market	social enterprise	strong economic trend
small businesses	tax planning	unique and inviolable	strong public finances
Miljöpartiet (Green Party)	Socialdemokraterna (Social Democrats)	Sverigedemokraterna (Sweden Democrats)	Vänsterpartiet (Left Party)
biodiversity <sup>2</sup>	children and youth care	civil defense	arms exports
beach protection	deficient public finance	immigration policy	equal society
climate change	European Council	immigration to Sweden	housing shortage
green climate fund	health and work	security of the state	human rights
reduced emissions	national food strategy	Security threats	peace and disarmament
reduced energy use	public sector	Swedish culture	private profit
renewable energy	socially vulnerable areas	Swedish defense	profit hunting
sports and health	Swedish model	Swedish power system	sick and unemployed
sustainable consumption	university and college	Swedish tax payer	warfare state
valuable nature	youth unemployment	terrorist threat	women’s rights

Notes: English translations of phrases used in the Swedish Parliament (2014 – 2019), selected from each party’s set of two- and three-word phrases with the highest  $\chi^2$  values.

<sup>1</sup> Refers to tax deductions on labor costs when hiring someone to do ROT work (repairs, conversion, and extension) and RUT work (cleaning, maintenance, and laundry).

<sup>2</sup> The Swedish translation is the two-word phrase “biologisk mångfald”.

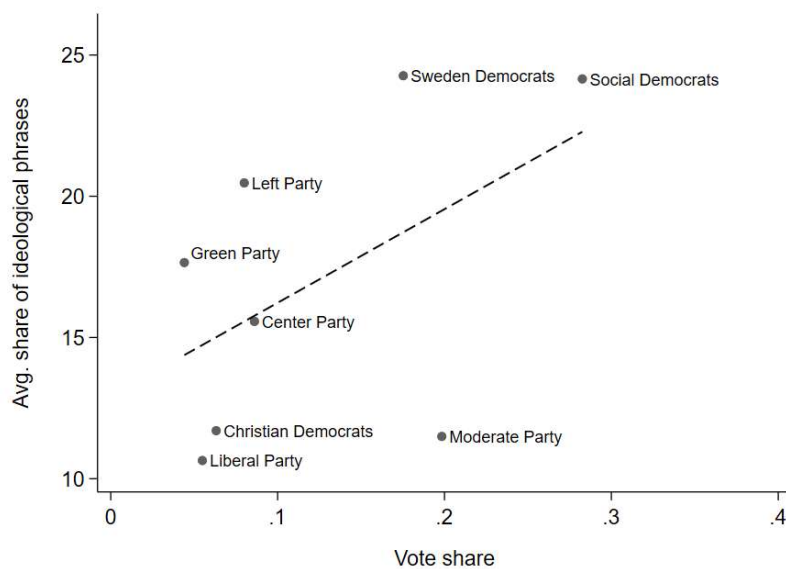
Table A2: Newspaper slant and stated ideology

	(1) All newspapers	(2) All newspapers	(3) Only outlets with stated ideology	(4) Only outlets with stated ideology
Supported ideology (yes/no)	1.394*** (0.423) [0.003]	1.384** (0.512) [0.002]	1.542*** (0.460) [0.001]	1.493** (0.555) [0.003]
Ideology fixed effects	Yes	Yes	Yes	Yes
Newspaper fixed effects	No	Yes	No	Yes
Adj. $R^2$	0.720	0.869	0.737	0.883
Observations	1016	1016	824	824

Notes: OLS estimates, using data at the newspaper-ideology level. Dependent variable: newspaper slant (share of ideological phrases per million overall phrases). *Supported ideology* takes the value 1 for ideologies endorsed by the newspaper, according to the outlet's self-description (see Table B1 for details). Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

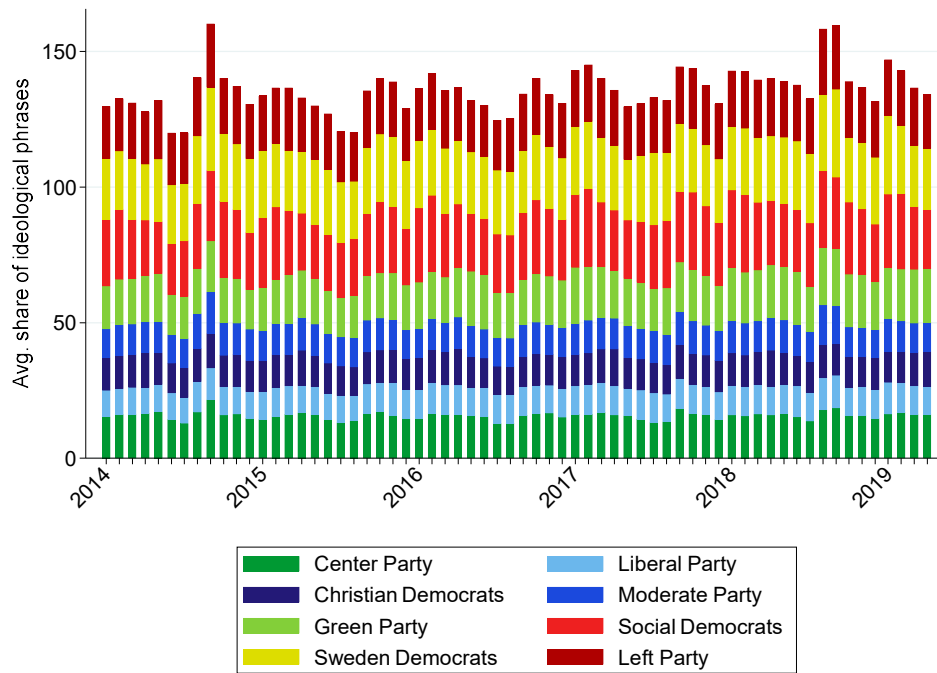
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Figure A1: Slant and 2018 vote shares



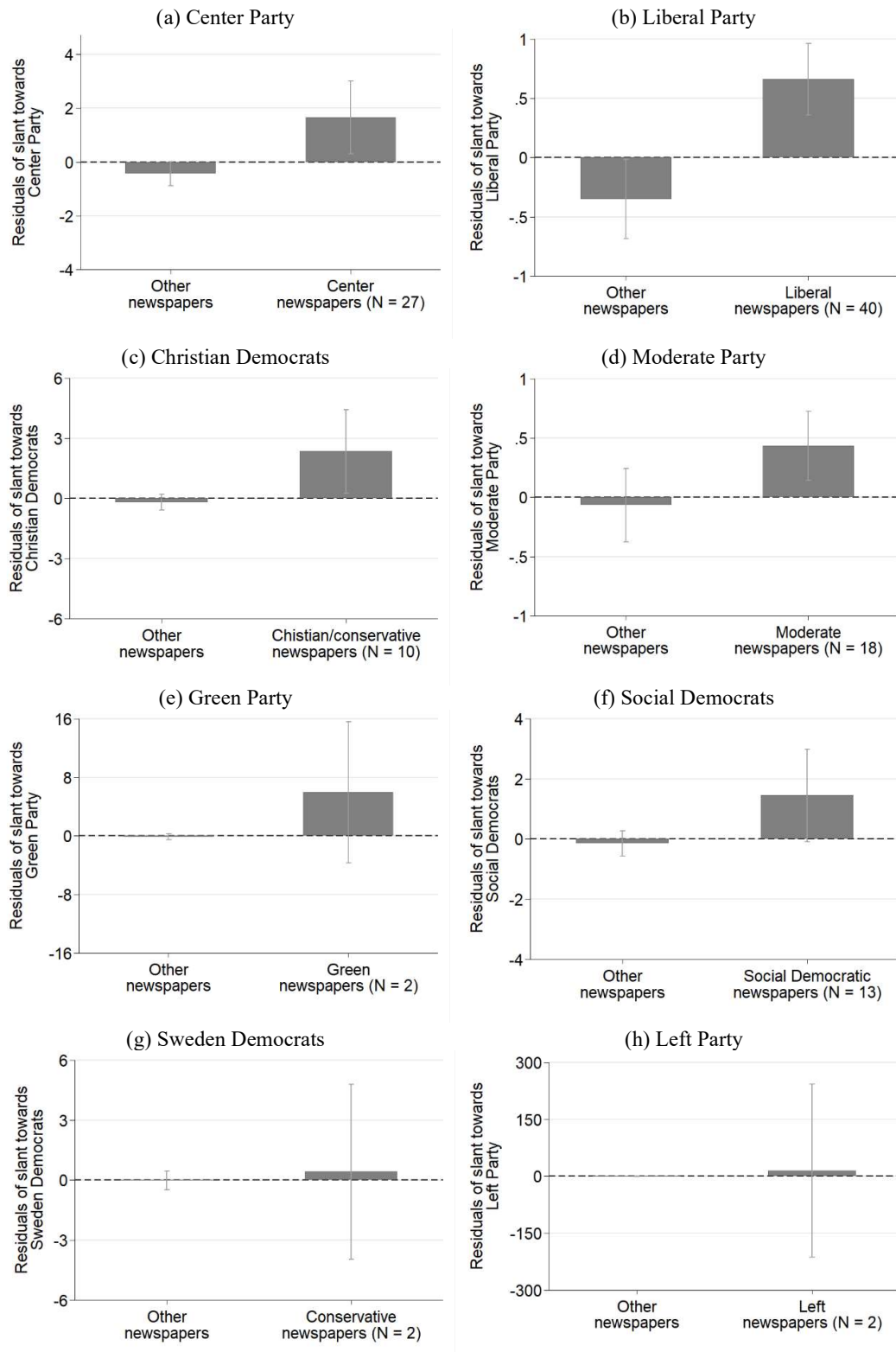
Notes: On the y axis, the graph shows average shares of ideological phrases corresponding to party  $p$  per million overall phrases, restricted to the time between the 2014 and 2018 elections and averaged over all 131 newspapers.

Figure A2: Slant over time, by party



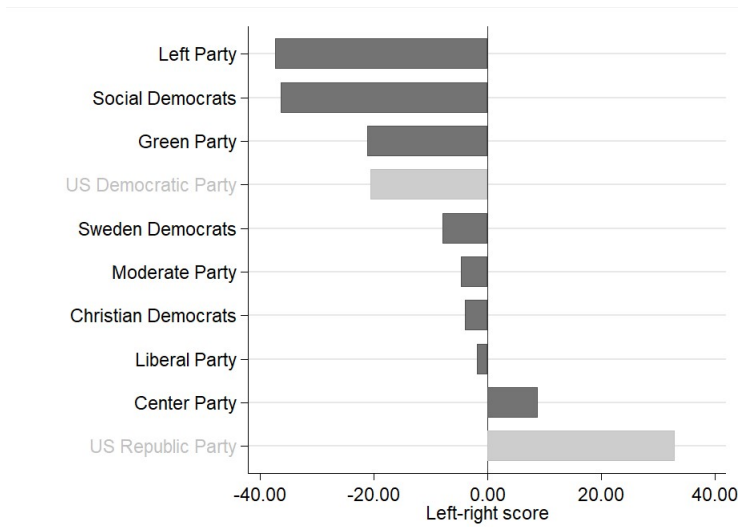
Notes: The graph shows the share of ideological phrases per million overall phrases per party and month, averaged over all newspapers.

Figure A3: Slant, by party and newspapers' stated ideology



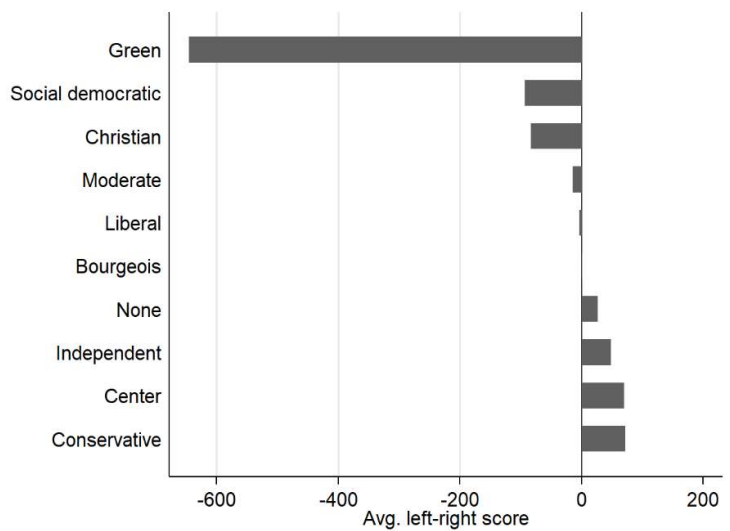
Notes: The graphs show mean values of residuals of regressing outlet-party level slant on newspaper and party/ideology fixed effects. The errors bars denote the 95% confidence interval.

Figure A4: Left-right scores of political parties



Notes: The figure shows left-right scores of Sweden’s main political parties, based on data from the Manifesto Project (Volkens et al., 2019). Scores of the main political parties in the US are shown for comparison. The scores were compiled by Manifesto Project by analyzing the content of the 2014 and 2018 election manifestos of the Swedish parties and the 2016 election manifestos of the US parties. More negative values imply stronger leanings to the left, whereas more positive values indicate stronger leanings to the right.

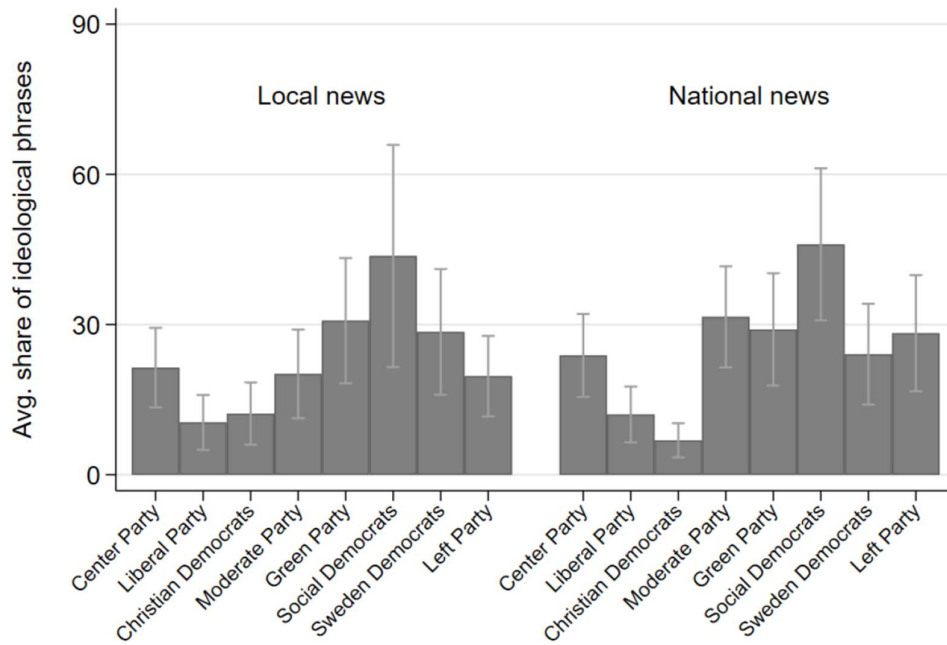
Figure A5: Left-right score, by self-stated newspaper ideology



Notes: The y axis refers to newspapers’ self-stated ideology. For details on the computation of the scores on the x axis see Section 4.4 in the main text.



Figure A6: Slant, by type of news



Notes: The graph is based on samples of 10,000 articles from newspapers' local news sections and 10,000 articles from their national news sections. Since the newspaper content data used in the study does not explicitly facilitate the distinction between local and national news, we retrieve these samples by using sets of keywords that likely indicate local news (i.e., names of municipalities and counties) and national news (i.e., "sverige\*", "svensk\*", "riket", or "landet", where the asterisk indicates a wildcard). The y axis shows average shares of ideological phrases corresponding to party p per million overall phrases. The errors bars denote the 95% confidence interval.

## Online Appendix B: Additional Tables and Figures

Table B1: Newspapers' stated ideologies

Stated ideology	Translated ideology	Number of outlets	Party ties
none	none	29	none
liberal	liberal	34	Liberal Party
centerpartistisk	center (agrarian liberal)	21	Center Party
socialdemokratisk	social democratic	13	Social Democrats
obunden	independent	12	none
moderat	moderate	10	Moderate Party
borgerlig	bourgeois	6	Center Party, Christian Democrats, Liberal Party, Moderate Party
grön	green	2	Green Party, Left Party
konservativ	conservative	2	Christian Democrats, Moderate Party, Sweden Democrats
kristen	Christian	2	Christian Democrats

Notes: The party ties are based on the authors' judgment.

Table B2: Heterogeneity in consumer preferences

Party	2018 national election vote share	
	Mean	Within-owner standard deviation
Center Party	0.09	0.02
Liberal Party	0.05	0.01
Christian Democrats	0.06	0.02
Moderate Party	0.20	0.04
Green Party	0.04	0.01
Social Democrats	0.28	0.05
Sweden Democrats	0.18	0.04
Left Party	0.08	0.02

Notes: The within-owner standard deviation reflects differences in vote shares between the municipalities in which the newspapers of an owner circulate.

Table B3: Regression of newspaper slant on co-owned slant (market ideology based on vote shares)

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.775*** (0.094) [0.000]	0.773*** (0.094) [0.000]	0.784*** (0.062) [0.000]	0.781*** (0.061) [0.000]
Market ideology (based on 1982 vote shares)	2.075 (1.417) [0.163]		2.091 (1.511) [0.167]	
Market ideology (based on 2018 vote shares)		0.855 (2.952) [0.815]		0.848 (3.083) [0.811]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.863	0.863	0.918	0.918

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is based on the vote shares in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B4: Regression of newspaper slant on co-owned slant (100 top expressions used to construct slant measure)

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.785*** (0.084) [0.000]	0.772*** (0.087) [0.000]	0.824*** (0.060) [0.000]	0.817*** (0.062) [0.000]
Market ideology (according to 1982 election)	0.091* (0.051) [0.126]		0.030 (0.024) [0.307]	
Market ideology (according to 2018 election)		0.174** (0.074) [0.076]		0.160* (0.076) [0.036]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.849	0.851	0.888	0.889

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is the total number of votes in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B5: Regression of newspaper slant on co-owned slant (1,000 top expressions used to construct slant measure)

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.743*** (0.111) [0.000]	0.729*** (0.111) [0.000]	0.759*** (0.062) [0.000]	0.753*** (0.065) [0.000]
Market ideology (according to 1982 election)	0.023* (0.013) [0.139]		0.010* (0.005) [0.302]	
Market ideology (according to 2018 election)		0.042* (0.020) [0.062]		0.037*** (0.010) [0.032]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.852	0.854	0.922	0.923

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is the total number of votes in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B6: Regression of newspaper slant on average slant of all newspapers held by other owners (placebo)

	(1)	(2)	(3)	(4)
Avg. slant of all newspapers	-1.127 (1.114) [0.387]	-1.085 (1.102) [0.392]	-0.283 (0.854) [0.808]	-0.266 (0.850) [0.814]
Market ideology (according to 1982 election)	0.049*** (0.016) [0.008]		0.018 (0.011) [0.414]	
Market ideology (according to 2018 election)		0.094*** (0.026) [0.085]		0.088*** (0.025) [0.041]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.791	0.796	0.865	0.867

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is the total number of votes in the municipalities where the newspaper circulates, weighted by the share of readers living in each municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B7: Regression of newspaper slant on co-owned slant (excluding owners holding less than three newspapers)

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.723*** (0.089) [0.002]	0.700*** (0.096) [0.006]	0.783*** (0.072) [0.002]	0.776*** (0.076) [0.002]
Market ideology (according to 1982 election)	0.038 (0.022) [0.171]		0.019* (0.009) [0.186]	
Market ideology (according to 2018 election)		0.066* (0.033) [0.077]		0.061** (0.022) [0.061]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.875	0.877	0.918	0.919

Notes: OLS estimates, using data at the newspaper-ideology level (N = 936). Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B8: Regression of newspaper slant on co-owned slant (excluding papers with ownership change during sample period)

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.812*** (0.100) [0.000]	0.807*** (0.100) [0.002]	0.847*** (0.071) [0.000]	0.841*** (0.073) [0.001]
Market ideology (according to 1982 election)	0.021* (0.011) [0.059]		0.013 (0.009) [0.318]	
Market ideology (according to 2018 election)		0.051** (0.020) [0.031]		0.043*** (0.013) [0.011]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.873	0.874	0.922	0.923

Notes: OLS estimates, using data at the newspaper-ideology level (N = 752). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B9: Regression of newspaper slant on co-owned slant (using inverse of number of newspapers per owner as regression weights)

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.721*** (0.141) [0.001]	0.713*** (0.143) [0.001]	0.774*** (0.091) [0.000]	0.767*** (0.093) [0.000]
Market ideology (according to 1982 election)	0.021 (0.016) [0.132]		0.016* (0.008) [0.263]	
Market ideology (according to 2018 election)		0.039 (0.025) [0.069]		0.050*** (0.014) [0.044]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.829	0.830	0.910	0.910

Notes: Weighted OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B10: Regression of newspapers' left-right scores on co-owned left-right scores

	(1)	(2)	(3)	(4)
Avg. left-right score of other newspapers by same owner	0.818*** (0.057) [0.001]	0.833*** (0.061) [0.002]	0.439*** (0.139) [0.037]	0.441*** (0.138) [0.034]
Market left-right score (according to 1982 election)	0.073 (0.063) [0.263]		0.021 (0.075) [0.810]	
Market left-right score (according to 2018 election)		0.076 (0.091) [0.331]		0.015 (0.117) [0.905]
County fixed effects	No	No	Yes	Yes
Partial $\eta^2$ : avg. slant others	0.395	0.395	0.133	0.133
Partial $\eta^2$ : market ideology	0.032	0.032	0.003	0.003
Adj. $R^2$	0.423	0.413	0.544	0.543

Notes: OLS estimates, using data at the newspaper level (N = 127). Dependent variable: left-right score as described in Section 4.4 in the main text. *Market ideology* is measured as the left-right score of voting in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. *Partial  $\eta^2$*  is the share of variance explained by a regressor. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B11: Regression of newspaper slant on co-owned slant (excluding national newspapers)

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.784*** (0.093) [0.000]	0.776*** (0.094) [0.000]	0.801*** (0.055) [0.000]	0.795*** (0.057) [0.000]
Market ideology (according to 1982 election)	0.063* (0.036) [0.103]		0.017 (0.024) [0.504]	
Market ideology (according to 2018 election)		0.121** (0.051) [0.026]		0.085** (0.033) [0.019]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.868	0.871	0.925	0.925

Notes: OLS estimates, using data at the newspaper-ideology level (N = 992). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



Table B12: Regression of newspaper slant on co-owned slant, by left-right scores of newspapers and owners

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.866*** (0.068) [0.000]	0.858*** (0.070) [0.000]	0.802*** (0.064) [0.000]	0.792*** (0.065) [0.000]
Newspaper's left-right score (reference category: 1st quartile)				
Avg. slant others × 2nd quartile	-0.075* (0.039) [0.111]	-0.073* (0.040) [0.132]		
Avg. slant others × 3rd quartile	-0.145*** (0.045) [0.008]	-0.142*** (0.045) [0.011]		
Avg. slant others × 4th quartile	-0.213*** (0.046) [0.002]	-0.208*** (0.046) [0.002]		
Owner's left-right score (reference category: 1st quartile)				
Avg. slant others × 2nd quartile			-0.035 (0.022) [0.208]	-0.026 (0.023) [0.326]
Avg. slant others × 3rd quartile			-0.049 (0.030) [0.199]	-0.042 (0.031) [0.251]
Avg. slant others × 4th quartile			-0.051* (0.029) [0.108]	-0.043 (0.029) [0.156]
Market ideology (according to 1982 election)	0.015* (0.008) [0.247]		0.016* (0.008) [0.194]	
Market ideology (according to 2018 election)		0.051*** (0.015) [0.051]		0.056*** (0.019) [0.026]
Ideology fixed effects	Yes	Yes	Yes	Yes
Newspaper fixed effects	Yes	Yes	Yes	Yes
Adj. $R^2$	0.924	0.924	0.918	0.919

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. The models include all constituent terms of the interactions (output omitted). *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B13: Regression of newspaper slant on co-owned slant, by previous party ownership

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.761*** (0.098) [0.000]	0.751*** (0.101) [0.000]	0.772*** (0.064) [0.000]	0.765*** (0.067) [0.000]
Previous party ownership (yes/no)	-0.864* (0.409) [0.012]	-0.704 (0.411) [0.078]	-3.005*** (0.466) [0.021]	-3.059*** (0.462) [0.031]
Avg. slant others × prev. party ownership	0.038 (0.025) [0.057]	0.034 (0.023) [0.074]	0.056* (0.029) [0.006]	0.056* (0.029) [0.010]
Market ideology (according to 1982 election)	0.033 (0.023) [0.171]		0.017* (0.008) [0.180]	
Market ideology (according to 2018 election)		0.058 (0.035) [0.087]		0.060*** (0.020) [0.038]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.864	0.866	0.919	0.920

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Previous party ownership* is a binary variable that takes the value 1 for newspapers previously owned by a political party. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B14: Regression of newspaper slant on co-owned slant, by newspaper's subsidy status

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.724*** (0.107) [0.000]	0.711*** (0.109) [0.000]	0.774*** (0.065) [0.000]	0.767*** (0.068) [0.000]
Subsidized (yes/no)	-1.007* (0.539) [0.088]	-1.041* (0.545) [0.081]	-2.777*** (0.616) [0.189]	-2.749*** (0.613) [0.182]
Avg. slant others × subsidized	0.076 (0.060) [0.264]	0.077 (0.060) [0.257]	0.037 (0.045) [0.401]	0.036 (0.044) [0.408]
Market ideology (according to 1982 election)	0.035 (0.021) [0.131]		0.017* (0.008) [0.165]	
Market ideology (according to 2018 election)		0.061* (0.030) [0.054]		0.060*** (0.019) [0.036]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.865	0.867	0.919	0.920

Notes: OLS estimates, using data at the newspaper-ideology level (N = 1,016). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B15: Newspaper slant and co-owned slant before and after ownership change

	(1)	(2)	(3)	(4)
Avg. slant of other newspapers by same owner	0.372*** (0.072) [0.031]	0.376*** (0.068) [0.031]	0.363** (0.094) [0.063]	0.361** (0.091) [0.094]
After acquisition	-1.080 (1.331) [0.625]	-1.005 (1.356) [0.656]	-1.046 (1.516) [0.625]	-1.014 (1.523) [0.625]
Avg. slant others × acquisition	0.126 (0.096) [0.406]	0.120 (0.095) [0.436]	0.124 (0.099) [0.375]	0.122 (0.100) [0.375]
Market ideology (according to 1982 election)	0.179*** (0.029) [0.125]		0.072 (0.046) [0.156]	
Market ideology (according to 2018 election)		0.325*** (0.050) [0.000]		0.195*** (0.039) [0.125]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.893	0.906	0.915	0.917

Notes: OLS estimates, using data at the newspaper-ideology level ( $N = 264$ ). Observations only include newspapers with a change in ownership during the sample period. Dependent variable: share of ideological phrases per million overall phrases. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

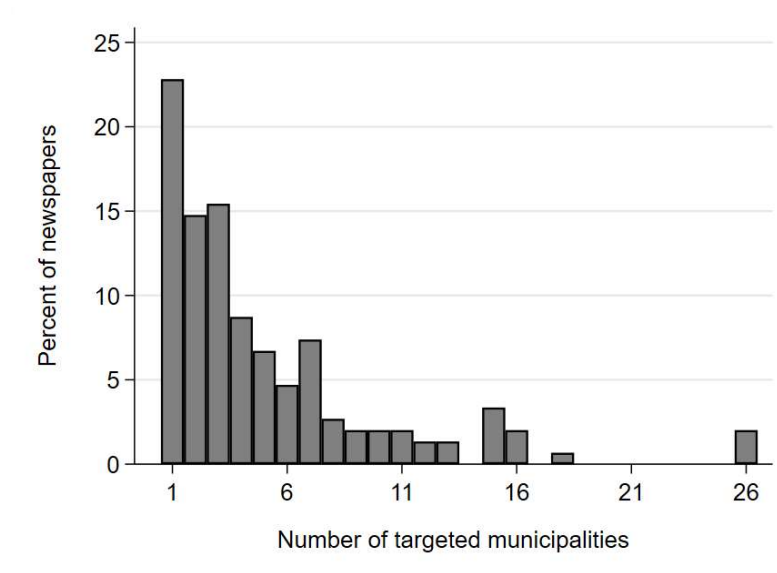
Table B16: Comparison of newspaper slant of opinion articles with the slant of straight news

	(1)	(2)	(3)	(4)
Slant of straight news articles by the same newspaper	-0.007 (0.014) [0.641]	-0.004 (0.014) [0.781]	0.012 (0.021) [0.591]	0.013 (0.021) [0.543]
Market ideology (according to 1982 election)	-0.012* (0.006) [0.020]		-0.009** (0.004) [0.054]	
Market ideology (according to 2018 election)		-0.013* (0.006) [0.002]		-0.013** (0.005) [0.060]
Ideology fixed effects	Yes	Yes	Yes	Yes
County fixed effects	Yes	Yes	No	No
Newspaper fixed effects	No	No	Yes	Yes
Adj. $R^2$	0.607	0.607	0.732	0.731

Notes: OLS estimates, using data at the newspaper-ideology level ( $N = 936$ ). Observations do not include single-newspaper owners. Dependent variable: share of ideological phrases per million overall phrases in opinion articles. *Market ideology* is measured as the parties' number of votes in the newspaper's area of circulation, where each municipality's vote outcome is weighted by the share of readers living in the municipality. Standard errors (in parentheses) are clustered by owner. Values in brackets are wild cluster bootstrap  $p$ -values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Figure B1: Newspapers' scope of local coverage



Notes: A targeted municipality is one for which a newspaper produces news stories on a regular basis.

Figure B2: Newspaper owners, by number of newspapers in January 2014

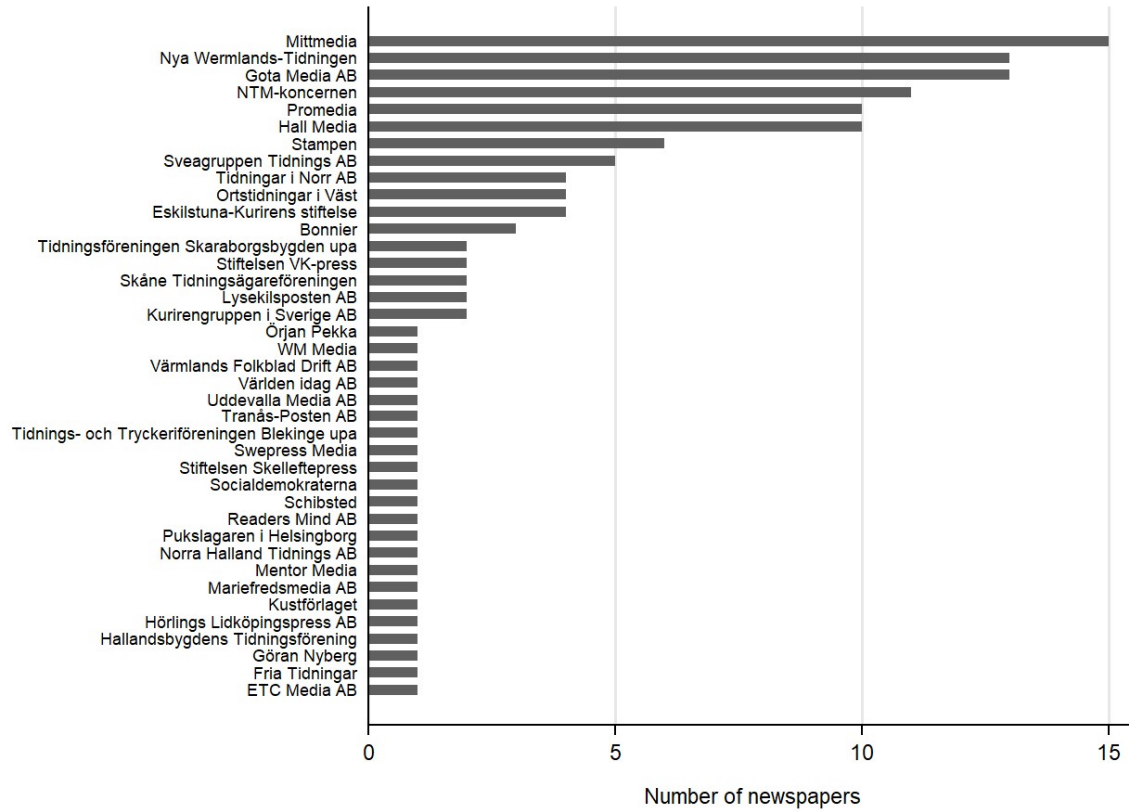


Figure B3: Newspaper owners, by number of newspapers in April 2019

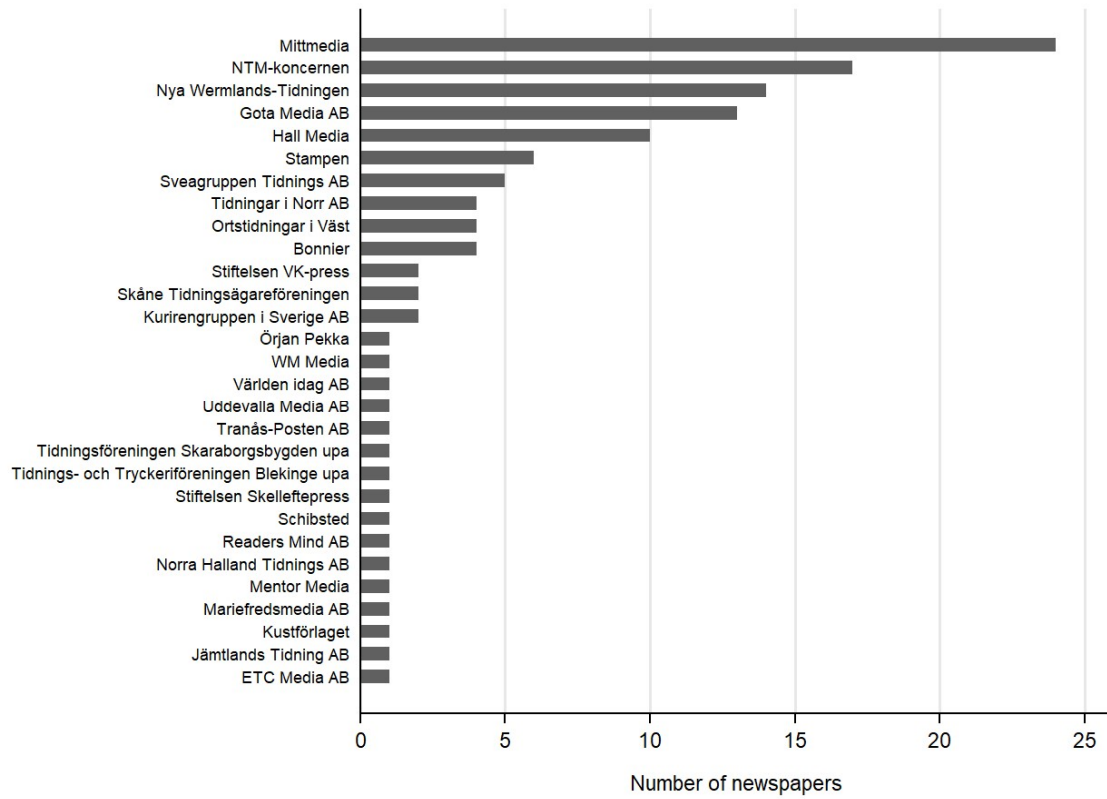


Figure B4: Newspaper owners, by circulation share in January 2014

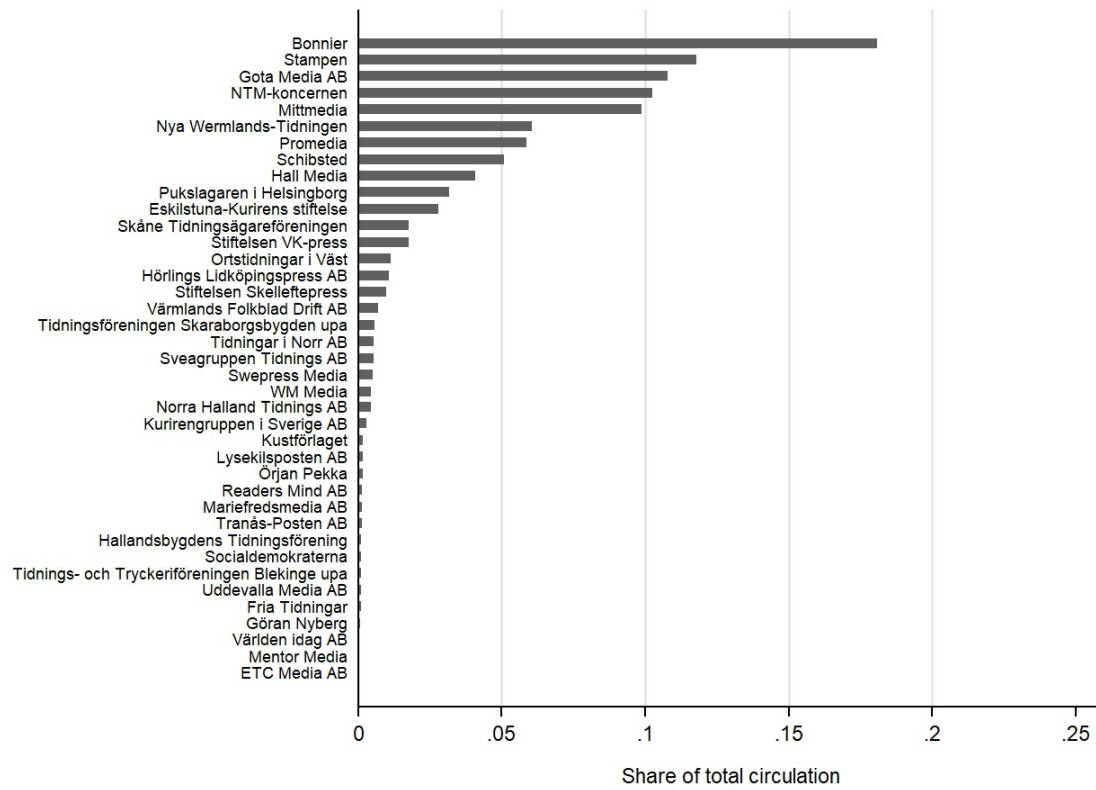




Figure B5: Newspaper owners, by circulation share in April 2019

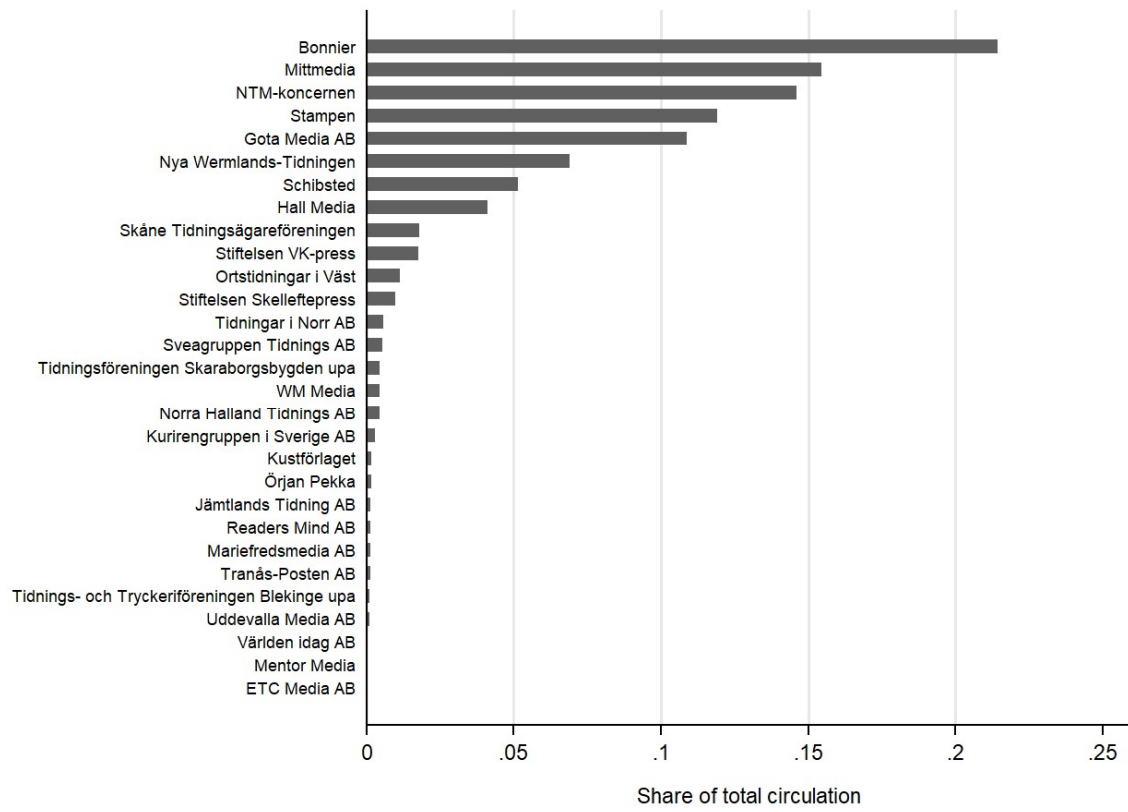
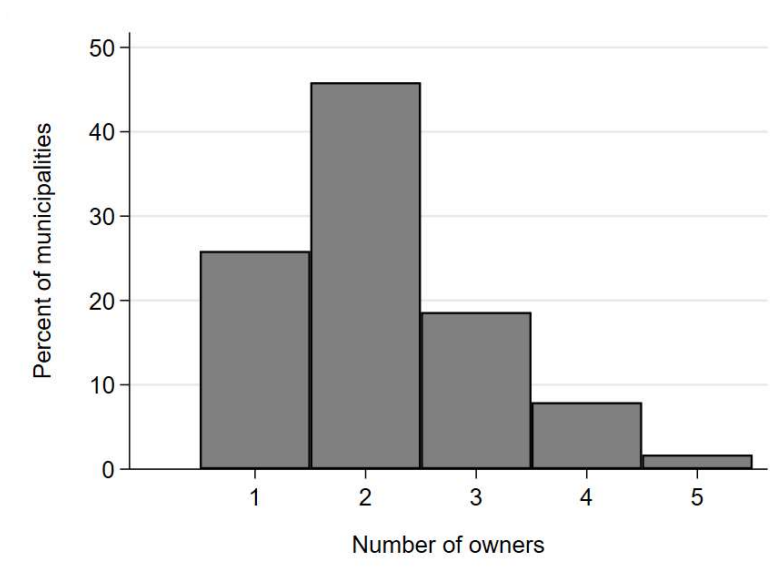
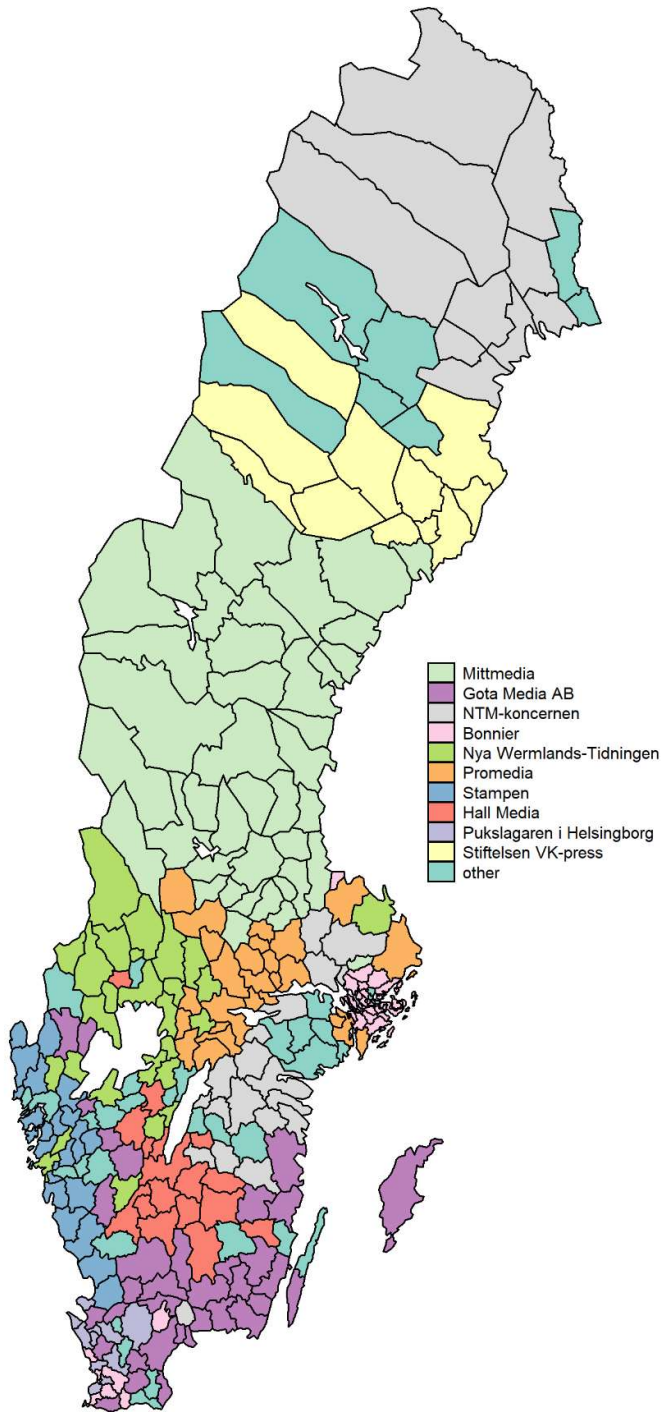


Figure B6: Number of owners per municipality



Notes: The figure shows the distribution of municipalities by the number of owners that produce news stories for the relevant municipality on a regular basis.

Figure B7: Most dominant newspaper owners, by municipality



Notes: The map shows each municipality's dominant newspaper owner, based on owners' total circulation in that municipality.

Figure B8: Variation in fit between municipality-level slant and consumer preferences

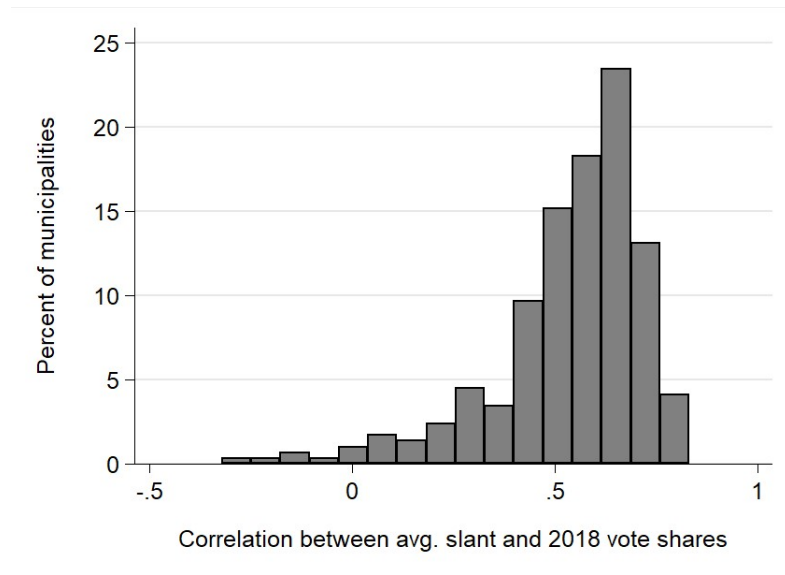
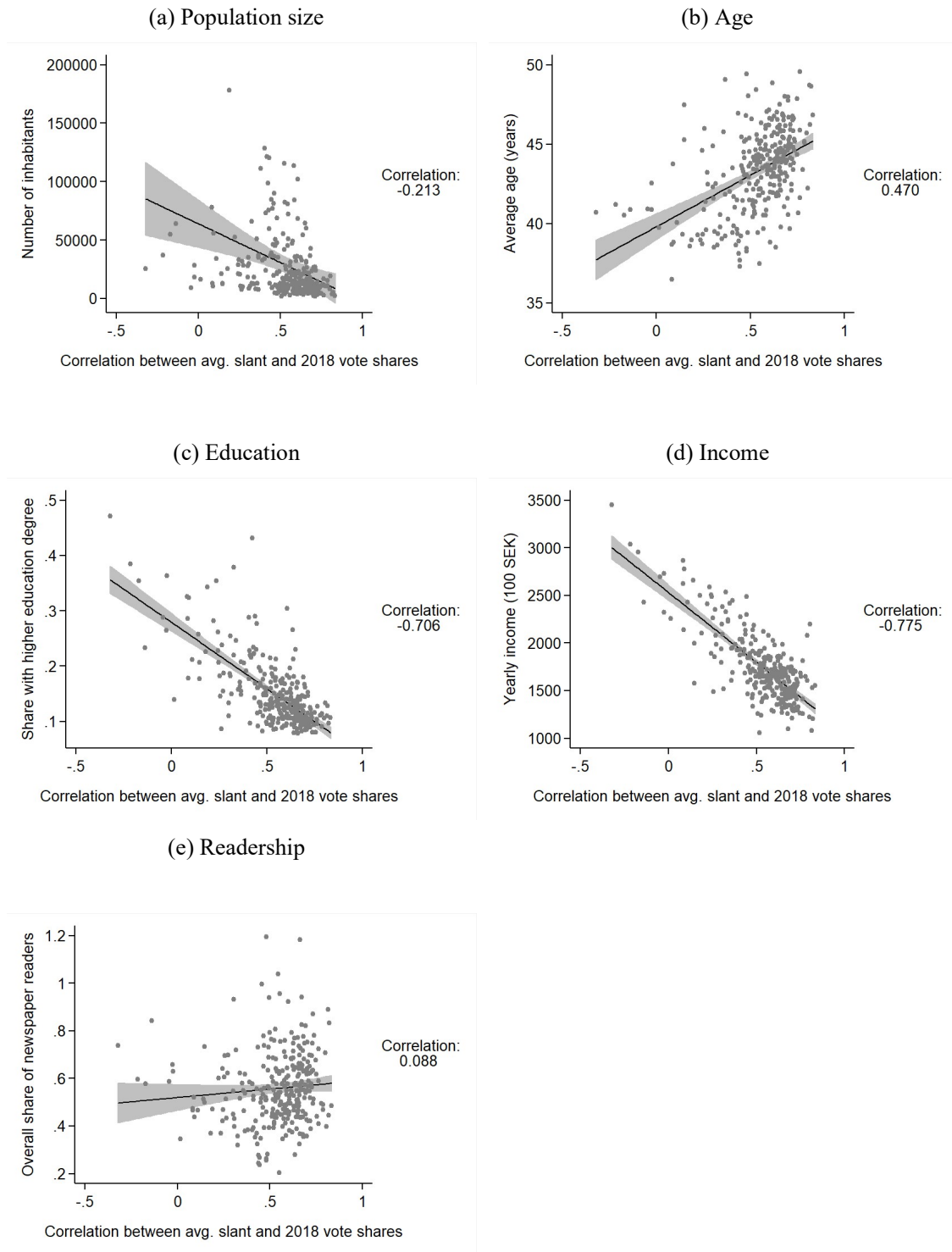


Figure B9: Variation in fit between municipality-level slant and consumer preferences, by characteristics of municipalities



Notes: Each marker represents a municipality. The black solid line shows the linear fit and the shaded area denotes the corresponding 95% confidence interval.