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Julia Cagé,
Guilhem Cassan,
Francesca R. Jensenius

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Julia Cagé[†], Guilhem Cassan[‡], Francesca R. Jensenius[§]

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Abstract

Information conveyed through news media influences political behavior. But to what extent are media markets themselves shaped by political motives? We build a novel panel data set of newspaper markets in India from 2002 to 2017 to measure the impact of changes in electoral importance on how news markets develop over time. We exploit the announcement of an exogenous change in the boundaries of electoral constituencies to causally identify the relationship between the (future) electoral importance of news markets and the change in the number and circulation of newspapers. Using an event-study approach and a staggered difference-in-differences approach, we show that markets that became more electorally important experienced a significant rise in both circulation and the number of titles per capita. Both supply and demand seem to drive the increase, but we estimate that the former explains almost all the variation in the short run and around 60% in the long run. Finally, we document how effects vary with prior levels of political competition and newspapers' characteristics, and discuss implications for voting behavior and democratic accountability.

Keywords: newspapers, media, India, malapportionment, redistricting
JEL codes: L82, D72

[†]Associate Professor, Sciences Po Paris, E-mail: julia.cage@sciencespo.fr.
[‡]Professor, University of Namur, E-mail: guilhem.cassan@unamur.be.
[§]Professor, University of Oslo. E-mail: f.r.jensenius@stv.uio.no.

1 Introduction

Information conveyed through news media is known to influence electoral outcomes, distributional patterns, and the relative salience of political issues (see, e.g., Besley and Burgess, 2002; Strömberg, 2004; Gentzkow, 2006; George and Waldfogel, 2006; Snyder and Stromberg, 2010; Gentzkow et al., 2011; Gavazza et al., 2019).[1] Whereas the consequences of changes in the supply and content of news have been extensively studied, less is known about what shapes news media markets, in particular, the role played by political motives in how they develop over time.

In this paper we investigate the role played by the *electoral importance* of news markets in India – the world's largest competitive electoral system – on the development of the newspaper industry.[2] To estimate the effect of electoral importance on newspaper markets, we leverage the announcement of an exogenous change in electoral districts (or constituencies) across India.[3] After the 2001 Census, the boundaries of electoral constituencies were redrawn for the first time since the 1970s, with the result that many markets experienced a large and sudden change in the number of representatives they would send to the state assembly. There is no evidence of political interference in this redistricting (or "delimitation") (see, e.g., Jensenius, 2013; Iyer and Reddy, 2013; Kjelsrud et al., 2020). The delimitation process was centrally organized by an independent and nonpartisan institution, the Delimitation Commission of India, with a focus on creating similarly sized and geographically logical entities. The new constituencies' boundaries were announced separately for each state between 2005 and 2007,[4] years before they came into effect.[5] We use this exogenous change in the future electoral importance of media markets across India to measure the effect of electoral incentives on the newspaper industry's evolution.

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[1]It has also been shown that depending on the ownership structure of the media, the public may be exposed to more or less biased, complete, and accurate information, which can in turn affect citizens' political interests and behavior (Della Vigna and Kaplan, 2007; Chiang and Knight, 2011; Martin and Yurukoglu, 2017).

[2]We define a news market's electoral importance as the share of seats in the state legislative assembly elected from that market (see Section 3 for details). Although elections in India have been considered a festival of democracy, the state of India's democracy has been increasingly questioned in recent years. This is not, however, the topic of this research paper.

[3]Note that in India, electoral districts are called constituencies, whereas districts are called administrative units. Throughout the paper, we therefore refer to constituencies when speaking of electoral districts and to districts when speaking of administrative units.

[4]Goa's and Puducherry's new constituencies were announced in 2004 but these states are not present in our data.

[5]The new constituencies were used in the first election after 2008.

To measure the size of media markets, we built a novel panel data set of newspapers from yearly reports published by the Registrar of Newspapers for India (henceforth RNI), that we digitized, cleaned, and merged with census data and political data. This yearly governmental publication includes information on the universe of Indian newspapers, including their place of publication, circulation, language, and ownership. Our data set includes a total of $328,108$ newspaper observations from 2002 to 2017. To our knowledge, this is the first large-scale and micro-level data set on newspapers for a developing country.

Our empirical strategy takes advantage of the time lags in the delimitation process.[6] Using both an event-study approach and a difference-in-differences estimator with state-year and media-market fixed effects, we compare the evolution of newspaper markets whose electoral importance increased with that of those newspaper markets for which it remained unchanged or decreased. (Below we discuss the asymmetry in observed effect for places with an increase and a decrease in electoral importance.) We document an increase both in the number of newspapers and in the total newspaper circulation per capita following redistricting in markets with increased electoral importance, a result that is robust to using several different specifications – in particular to take into account heterogeneous treatment effects (de Chaisemartin and D'Haultfœuille, 2020; Borusyak et al., 2022) – as well as to alternative measures of the change in electoral importance.

The documented increase is both statistically and economically important: according to our estimates, news markets whose electoral importance increased saw an increase in newspaper circulation by a third of a standard deviation. Furthermore, whereas media markets are obviously affected by other factors than electoral importance,[7] we estimate that 12% to 18% of newspapers' circulation in India after delimitation is due to the change in electoral importance.

Furthermore, we show that the magnitude of the estimated effects varies with both political competition (measured before the delimitation) and newspapers' and their owners' character-

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[6]See Table A.1 in the Online Appendix for an overview of the states included in our data, the timeline for their delimitation, and the date when the delimitation was first implemented.

[7]For example, the size of the possible market and associated revenues, the interest of media owners in influencing the political opinions of their readers (see Duggan and Martinelli, 2011; Anderson and McLaren, 2012; Balan et al., 2014; Cagé et al., 2021), as well as technological factors such as the availability of a printing press (see, e.g., Schudson (1981) on the U.S., Jeffrey (2009) on Kerala, and Cagé and Rueda (2016) on sub-Saharan Africa).

istics. Using different measures of political competition (turnout, margin of victory, and the effective number of political parties), we show that the effect is stronger in markets characterized by weak electoral competition prior to the delimitation – places where there is more scope for political mobilization. We also show that the effect is stronger for local-language newspapers – those more likely to cover local politics.[8]

Because we observe only equilibrium outcomes, our findings may be driven by any combination of supply and demand responses. On the supply side, markets may respond for at least two reasons. First, if media owners are politically motivated, we should expect them to invest more in areas that become more electorally important because doing so increases their influence over who wins political positions. In this case, owners may not be maximizing the revenue of the media they own, but rather a utility function consisting of both monetary profit and perceived gains from political influence (see, e.g., Duggan and Martinelli, 2011; Anderson and McLaren, 2012; Balan et al., 2014).[9] Second, media owners may indeed maximize monetary revenues but may do so by considering all their business activities rather than only one media outlet's profitability. This will be the case, for example, if owning a media outlet allows them to acquire political power – for example through access – so as to influence the regulation of their other businesses' sector of activity (see, e.g., Cagé, 2015). As highlighted by Ståhlberg (2002), many Indian newspapers are "run at an economic loss (and without journalistic care) because the gain is the political strength that comes from ownership of a newspaper – and which could be utilised in dealing with the government and with politicians." Such a tendency has been documented in the Indian context: "corporate houses connived with the media in an attempt to influence political decision making to distort the market in a core infrastructure sector" (TRAI, 2013, p. 17).[10]

Of course, changes in electoral importance may also spur demand because politically motivated readers whose votes now carry more weight may want more information about elections.[11] To disentangle the relative importance of demand and supply in our estimated

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[8]However, we do not find statistically significant differences by newspapers' periodicity.

[9]See, for example, the investigation in Parthasaraty (2013) in the Indian context.

[10]Similarly, also describing the Indian newspaper industry, Jeffrey (1993) notes that "though most owners will proclaim their desire to serve the public, their main goals are power and profit." See also Cagé and Godechot (2017). Or: "...the intent of owning the news media goes far beyond returns on investment [...]. Arguably, it is the easiest and quickest path to reach a position of power" (TRAI, 2014, p. 48).

[11]Note however that a large body of evidence suggests that the Indian newspaper market is not mainly driven by demand. In particular, newspapers are very cheap. They are sometimes sold for less than their value

effects, our empirical approach is threefold. First, it is worth highlighting that the "treatment" we are considering is the *future* change in districts' political importance, not the actual implementation of the delimitation. As described in Section 3.1 below, the announcement of the new constituencies happened between 2005 and 2007 in different states, whereas the first post-delimitation elections happened between 2008 and 2012. On average, the first post-delimitation election happened 3.9 years after the new constituencies were announced. In other words, even if some particularly well-informed voters were aware of the forthcoming changes in the political boundaries, it seems unlikely that most voters would change their news consumption several years before the next elections. On the contrary, politically motivated media owners, well-aware that it takes time (and money) to enter a new media market or to expand in an existing market, may have changed their strategy at the time of the announcement so as to increase their penetration in places that became more electorally important. In other words, changes in the size of the news market right after the *announcement* of the delimitation – which is indeed what we observe in our data – are most likely to point toward a supply-side reaction.

Second, we show that the magnitudes of the estimated effects are much stronger for publications owned by "common ownership units" (COUs), i.e., by large media companies that own more than one newspaper, than for "independent" newspapers.[12] As discussed in Section 6.1, COU newspapers are more likely to have political motives entering their objective function in addition to purely monetary considerations.

Third, we exploit the fact that the media industry faces high fixed costs (see, e.g., Cagé, 2020). Entering into a newspaper market entails large monetary investments, such as setting up a newsroom and acquiring a printing press. Given these fixed costs, the supply-side response to a political shock should be asymmetric: an increase in electoral importance should lead to an increase in supply, whereas a decrease in electoral importance should not result in a similarly large decrease in supply, because newspapers have lower incentives to exit a market once they have already incurred the cost of entry. The demand side, however, does not face fixed costs and may react more symmetrically to changes in political events. Consistent with

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as waste paper because newspapers depend mainly on advertising revenue (and not on circulation revenue). See Section 6 for more details.

[12] "Independent" has been defined here as not belonging to a COU (i.e., regarding ownership, not regarding journalists' journalistic independence).

these expectations, we find that markets respond asymmetrically to a change in political importance. This points to the leading role of the supply side in the change in equilibrium outcomes observed. Indeed, we estimate that the supply-side response accounts for more than 80% of the change in circulation caused by electoral importance in the short run, and around 60% in the longer run.

Literature review Our paper is one of the few large-scale empirical studies of media markets in India and, to our knowledge, the first to study the relationship between changes in electoral importance and the media market in the developing-world context. We contribute to three strands of the literature.

First, our paper contributes to scholarship on media and politics. As discussed above, the focus of this literature has been on the political consequences of increased media competition or media entry (see, in addition to what has already been cited, Drago et al., 2013; Piolatto and Schuett, 2015; Prior, 2005; Strömberg, 2015; Angelucci et al., 2020).[13] Our finding that an increase in the electoral importance of a market leads to a sharp increase both in the number of newspapers and in their circulation indicates that media markets not only affect but are also affected by a number of political factors.

Second, our paper contributes to the literature on the historical evolution of the news media industry in India. Whereas the development of news media in India has been well documented – see in particular Jeffrey (1993, 1994, 2000, 2009), Ståhlberg (2002), and Reddy (2019) – our paper offers the first large-scale historical data set on the evolution of the Indian newspaper market. A number of studies have investigated the impact of the availability of news media in India. For example, Besley and Burgess (2002) show that state governments are more responsive to a drop in food production and crop flood damage where newspaper circulation is higher.[14] Hence, it is crucial to understand the determinants of newspaper penetration. Whereas technological factors and profitability have been shown to play a role, our paper is, to the extent of our knowledge, the first to quantify the role played by changes

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[13]A notable exception is a work in progress by Cagé et al. (2022) on the impact of the redistricting of state legislative districts in the U.S. See also Gentzkow et al. (2015b) for a study of the effect of party control of state governments on media markets in the U.S..

[14]See also Jensen and Oster (2009) who document the impact of the introduction of cable television in rural India on women's status, and Dreze and Sen (1989); Sen (1999); Dreze and Sen (2013).

in electoral incentives.

Third, our paper contributes to the literature on malapportionment – a topic that has come onto the agenda as a crucial factor for understanding variations in representation and development within countries. Since Baron and Ferejohn (1989), it is well known that over-represented political entities often receive favorable treatment (Ansolabehere et al., 2002). In India, malapportionment has been found to affect cabinet formation (Bhavnani, 2018) and economic development (Bhavnani, 2021). Our paper contributes to this literature by studying the impact of changes in malapportionment on the supply of and demand for news media.

The rest of the paper is organized as follows. In the next section, we briefly describe the Indian newspaper market. Section 3 introduces our empirical strategy and data. In Section 4, we estimate the causal effect of the change in electoral importance on the evolution of news markets and show the robustness of our results to different empirical specifications. Section 5 studies the heterogeneity of the effects, depending on the extent of political competition as well as on the newspapers'. In Section 6, we investigate the share of the effects that are driven by supply and discuss the policy relevance of our findings. Section 7 concludes.

2 The Indian newspaper market

The Indian newspaper market is vibrant (Reddy, 2019): according to the Office of the Registrar of Newspapers, there were more than $118,000$ publications in India in March 2018; the Audit Bureau of Circulations reports that the circulation of Indian newspapers has had an average annual growth rate of 4.9% between 2007 and 2017. In 2017–2018, the total circulation of the registered publications in India was $430,066,629$ (Registrar of Newspapers for India, 2018). According to the Media Research Users Council (2017), newspaper readership was 39% in 2017.[15] Estimates from the Indian National Election studies – the largest surveys of Indian voters – indicate that about half the voters read newspapers, and that many consider newspapers to be their main source of political information. Furthermore, print media

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[15]A 39% penetration rate is quite high compared to rates in other markets: newspaper readership is indeed estimated to be 36% in the U.K. for print media, 27% in Denmark, 20% in France, 37% Germany, and 21% in the U.S. according to the Reuters Institute (2018). In West Africa, newspaper penetration is equal to 21%, 25% in East Africa, 41% in South Africa, and 41% in North Africa according to the Afrobarometer (Round 5). Regular newspaper readership is highest in Mauritius (77% a few times a week/every day), Namibia (53%), and South Africa (51%). In contrast, access to newspapers is almost nonexistent in Burundi (1%) and Niger (2%) and is limited to a select few in Mali, Burkina Faso, and Guinea (5%) (Afrobarometer, Round 6).

has long been extremely profitable in India. According to Kohli-Khandekar (2013), the top newspaper groups in India have operating margins upwards of 25%. In 2018, print advertising generated revenue of Rs 210.60 billion ($3.27 billion) (Indian Brand Equity Foundation, 2018), and overall print industry revenue was Rs 218.90 billion ($4.95 billion).

Whereas the first Indian newspaper, *Hicky's Bengal Gazette*, or *The Original Calcutta General Advertiser*, was published in 1780, newspapers became influential only in the late 1970s: local-language newspapers took off after the end of Indira Gandhi's Emergency, 1975–1977, due to increasing demand, changing technology (the offset press and computer-based phototypesetting), and the end of limits on imports of printing technology (Jeffrey, 2000). The growth of newspapers has also been fueled by rising literacy and by a booming economy that increased advertising revenues. The rise in readership of local-language newspapers is also probably related to the increasing importance of state-level politics resulting from the gradual decline of the Indian National Congress – the party that had dominated India after independence. With the growing importance of regional parties (Jaffrelot, 1998) from the 1980s onward came increased readership of local newspapers.

In India – as elsewhere – there are strong political incentives for owning or supporting major media outlets (Duggan and Martinelli, 2011; Anderson and McLaren, 2012; Balan et al., 2014; Gentzkow et al., 2015a). One can model newspaper profits as coming from two sources: market profits and nonmonetary profits like political influence. The latter motivation has been well-documented in the Indian case (see, e.g., Ståhlberg, 2002; Parthasaraty, 2013; TRAI, 2013, 2014; Bhushan, 2015; Reddy, 2019). Jeffrey (2000) argues that "people of influence" acquired or founded newspapers to seek influence over bureaucracies and politicians. As noted by the Telecom Regulatory Authority of India: "there is an increasing trend of influence of political parties/politicians in the media sector" (TRAI, 2013, p. 14).[16]

This politicization of the media market has important implications for the type of information voters have access to, and hence for their ability to hold politicians and parties accountable for their performance in office.[17] Hence, it is important to know to what extent changes in electoral incentives affect the supply of news media, and also how much and how

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[16]See also Jeffrey (1993).

[17]It was previously thought that Indian voters seek to hold politicians accountable only to a limited extent based on their performance, but recent work demonstrates that Indian voters do reward the performance of governments and politicians when they have enough information to do so (Jensenius and Suryanarayan, 2022).

fast media markets change when these electoral incentives change.

3   Empirical Strategy, Data, and Descriptive Statistics

To identify the effects of changes in the electoral importance of media markets in India, we exploit the 2008 Delimitation of electoral constituencies. In this section, we first provide an overview of the Indian electoral system and the delimitation process. We then present our data and descriptive statistics.

3.1   The 2008 Delimitation

India is a federal country, with state legislatures elected in single-member constituencies every five years. Since 1971, these state-level elections have been staggered, so that only a few states hold elections every year. The party systems in Indian states are competitive and fragmented, with many parties and independent candidates running for election in each constituency (Jensenius, 2017). Members of Legislative Assemblies (MLAs) therefore often attain power with a fairly small share of the votes. Elections are also highly competitive and have high electoral volatility, meaning that rather small shifts in voters' choices or turnout can swing an election. Finally, the electorate is generally not very well informed because of low education levels and a lack of reliable pre-election polls (see Rozenas and Sadanandan, 2018). All in all, there are clear incentives for using media to sway elections in this context.

It is hard to disentangle the importance of electoral incentives in shaping media markets from all the other factors that could be driving media supply and consumption. The exogenous change to electoral boundaries in the mid-2000s – resulting in the 2008 Delimitation – provides a perfect opportunity to see what happens in places that suddenly lose or gain electoral importance.

When the Constitution of India was drafted, the intention was that a new delimitation would be conducted after every decennial census, so all constituencies could retain approximately the same population size. Consequently, a Delimitation Commission was formed – and new constituency boundaries were drawn – in 1952, 1963, and 1972 (Jensenius, 2013). However, in the 1970s, it was decided to "freeze" all political boundaries until after the 2001

census, because increasing the political representation of areas with a higher birthrate was seen as a disincentive to the implementation of family planning programs (Jensenius, 2017). The result was that the boundaries of most constituencies in India remained unchanged between 1974 and 2007.

When electoral constituencies were drawn in the 1970s, they were created similar in term in terms of population size within each state, and state assembly constituencies were drawn to fit inside the larger administrative districts – the most important unit for the Indian state bureaucracy and the level at which we will study media markets (see Section 3.2 below). Over time, differences in birthrates and immigration patterns meant that constituencies grew at different rates, and by the beginning of the 21st century, there was serious malapportionment across political constituencies (Bhavnani, 2018, 2021).
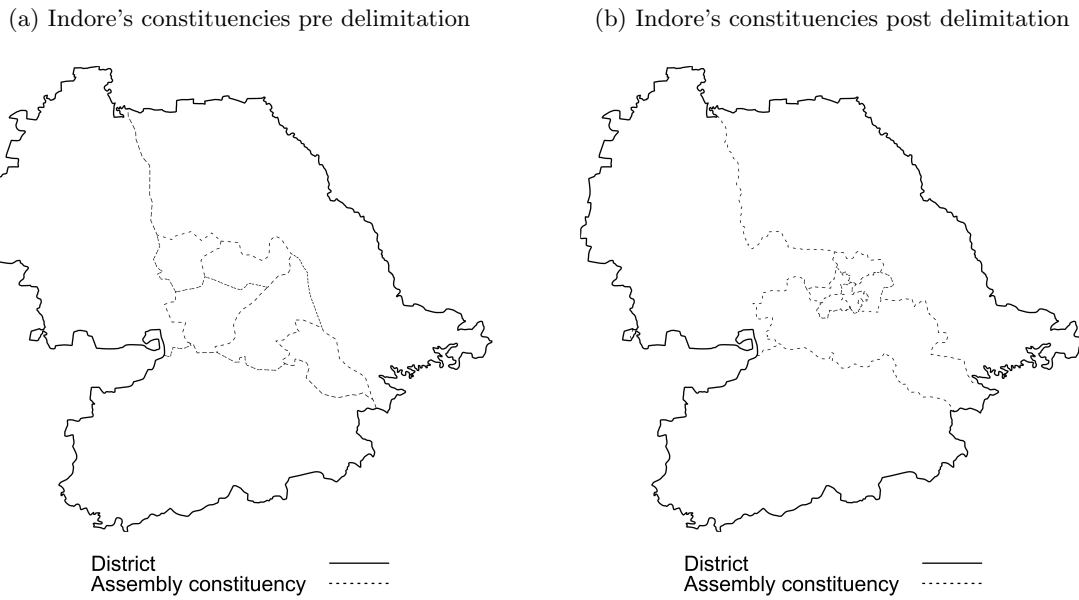
When new constituency boundaries were to be drawn following the 2001 census, efforts were made to even out the size of constituencies within states (the number of constituencies in each state remained the same). These efforts meant that some districts got more seats and some got fewer. Figure 1 illustrates the change that happened in the district of Indore, Madhya Pradesh. Indore had 8 constituencies prior to the delimitation, whereas it had 9 afterwards.[18]

We define a district's electoral importance as the share of state assembly seats elected from that district. For example, Madhya Pradesh has a total of 230 constituencies, meaning that Indore's electoral importance increased from 3.4% to 3.9%, a 0.4 percentage-point increase. Figure 2 shows the distribution of our "change in districts' electoral importance" variable. A bit less than half of the districts were unaffected by the delimitation, whereas around one third of them lost electoral importance and a quarter saw an increase in their electoral importance following the delimitation. Figure 3 shows the geographic distribution of changes both in the number of constituencies (left panel) and in electoral importance (right panel) across India. As the maps demonstrate, the changes are evenly distributed across the country.

The redrawing of electoral boundaries in the early 2000s can be treated as an exogenous shock to the electoral system. The new borders were drawn by the Delimitation Commission, a temporary body established by the Government of India under provisions of the Delimitation

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[18]See Appendix Figure A.2 for the distribution of the change induced by the delimitation in the number of constituencies across Indian districts.

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Figure 1: Increase in the number of constituencies in Indore district.

(a) Indore's constituencies pre delimitation

(b) Indore's constituencies post delimitation

District ——————
Assembly constituency ··········

District ——————
Assembly constituency ··········

Notes: The figure plots boundaries of constituencies located in the district of Indore (Madhya Pradesh) before and after the delimitation.

Figure 2: Districts' change in electoral importance following the 2008 Delimitation
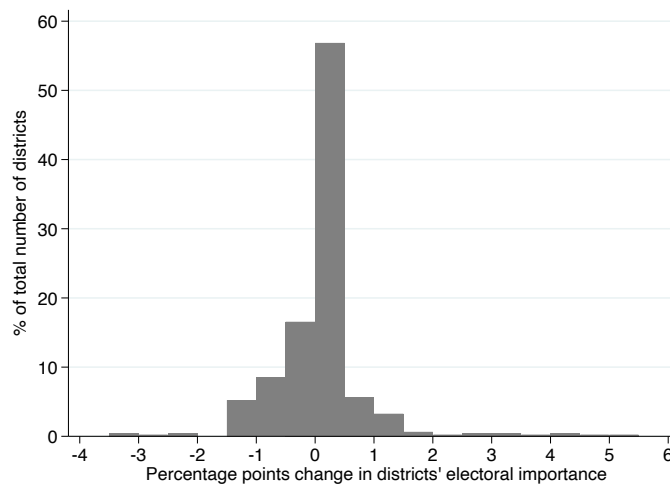
Notes: The figure plots the distribution of the change in districts' electoral importance following the 2008 Delimitation. Each observation is a district, and bins are of size 0.5. For example, in 5.7% of the districts, the delimitation caused a 0.5 to 1 percentage-point increase in electoral importance.

Figure 3: Map of districts' change in electoral importance

(a) Change in number of constituencies

(b) Change in electoral importance
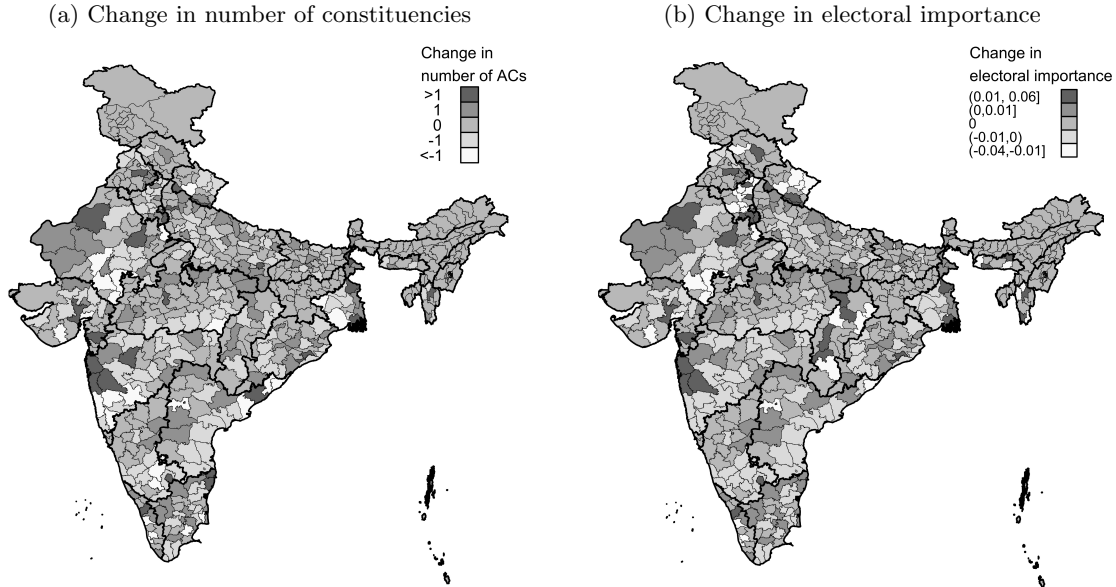
Notes: The figure plots changes in the number and share of constituencies within the state (electoral importance) from before to after the 2008 Delimitation.

Commission Act. The initial drafting work was conducted by a group of civil servants in Delhi, who drew new boundaries on the basis of the 2001 census figures, weighting the focus on population size with concerns about creating geographically logical entities (Jensenius, 2013). Given the various guidelines the Delimitation Commission was dealing with, it cannot have been evident to external actors what changes were to occur – neither how many constituencies each district would have nor which constituencies would remain similar and which would change.[19]

It was only when drafts of the new delimitation were circulated, first to a set of "associate members" – ten politicians from each state recruited to give input on the first draft of the delimitation for their state (Delimitation Commission of India, 2008) – and soon thereafter, when the draft delimitation for each state was published and announced, that the new electoral

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[19]The Delimitation was implemented in the following states: Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Nagaland, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal. It was not implemented in Arunachal Pradesh, Assam, Jammu & Kashmir, Jharkhand, Manipur, and Nagaland, because of legal disputes about the 2001 census numbers (https://timesofindia.indiatimes.com/india/Delimitation-deferred-in-5-states/articleshow/2691125.cms). See Table A.1 in the Online Appendix for an overview of the timing of the delimitation processes in different states.

incentives would have become evident to politicians and other stakeholders, such as media owners. Few changes to the state-wise delimitation reports were made between the release of the draft report and the publication of the final delimitation report. For the general public, implications of the changes probably became apparent only at the time of the next elections, if at all.[20]

We use the publication of the draft proposal of the delimitation across different Indian states as a shock to the electoral importance of administrative districts. Because all other determinants of media consumption are moving slowly over time, the discontinuous change in the future electoral importance of a media market resulting from the delimitation allows us to isolate the causal role of this political determinant from other determinants of media markets. Although the draft report can be considered a shock, we should only expect to see reactions to it happening over a period of a few years. Investments in new media outlets or changes in publication strategies can take time. To take these possible lags into account, we look at changes in the media market over the next years (furthermore, we use information available for the years preceding the shock to ensure that media markets were following similar trends).

Because we are interested in the effects of the changes in electoral importance, and because the delimitation announcement is timed differently across states, in our preferred specification, we balance the data in terms of time to the announcement of the draft delimitation. That is, we convert our data set, initially balanced with respect to year, into a panel balanced with respect to the number of years to the announcement. This approach ensures that each state has the same number of pretreatment and posttreatment years, thereby circumventing most concerns linked to staggered design approaches.[21] The resultant data set is a balanced district-level panel data set covering 14 years, 3 years before the state-wise delimitation announcement and 11 years after the announcement.

3.2 Data and main variables of interest

To perform our analysis, we compute a newspaper-market-level measure of electoral importance before and after the delimitation, and combine it with newspaper data, as well as with

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[20]We return to this point below when discussing the most likely mechanisms driving our findings on the positive relationship between the increase in electoral importance and the development of the news market.

[21]As discussed below, we also implement robustness checks for the staggered nature of our data.

census data and election data at the newspaper-market level. The "newspaper-market" unit we use is for the most part the districts (as defined in 2001).[22] The district is the main administrative unit in India. There were 593 districts in 2001, with an average population of 1.7 million inhabitants. Political constituencies are drawn so that they do not cross district boundaries, making it fairly easy to track changes in the number of constituencies within a district across delimitations. In addition, because districts are large units, they typically encompass both one or several cities and their rural surroundings. As discussed below, the original information we collect on newspaper circulation is at the city level. However, even though newspapers are printed in cities and circulation numbers are allocated to cities, newspapers obviously circulate in rural areas surrounding cities. Hence, the district is the most logical unit of analysis when studying local newspaper markets.

3.2.1 Change in electoral importance

Our main explanatory variable of interest is the change in the electoral importance of newspaper markets due to the 2008 redistricting. As described above, we define the electoral importance of a market as its share of the seats in the state assembly. Although not all states implemented the delimitation, we include in our analysis all states that did, leaving us with 459 markets. Online Appendix Section A provides details on the data construction.

That constituencies are nested within districts means we can aggregate various electoral outcomes at the district level.[23] There is a total of 3,492 constituencies in our data set, on average about 7.6 per district. For our analysis of heterogeneous effects, we are interested in measures of political competition: effective number of parties (ENOP), margin of victory (MoV), and electoral turnout. All these are measured in the last election before the announcement of delimitation. Electoral data were accessed from the TCPD Indian Elections Data (Jensenius and Verniers, 2017; Agarwal et al., 2021). To create district-level measures, we take a simple average across the constituencies in each district in our sample. We also control for district-level sociodemographic variables that are available through the 2001 and 2011 censuses, interpolated to create yearly variables. These include literacy rate, urbanization

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[22]In a few cases, where cities were larger than districts, we aggregated the data to the city level instead.

[23]Note also that because constituencies are nested within districts, there are no issues of congruence of newspaper markets with political boundaries.

rate, share of Scheduled Castes, share of Scheduled Tribes, and the population aged 6+.

3.2.2 Newspaper data

To investigate the impact of market-level changes in electoral importance, we have built a novel panel data set of Indian newspapers from 2002 to 2017 based on yearly reports from the RNI.

The RNI is a government agency in charge of receiving applications to start new newspaper publications. Its mission is, among other things, to ensure that titles are not duplicated and to verify circulation figures (Jeffrey, 1994). Since 1957, the RNI publishes the yearly report *Press in India* with information about the universe of newspapers published across India: their city of publication, circulation,[24] periodicity, and language. The RNI also reports whether a publication is owned by a COU – that is "a publication establishment owning two or more newspapers of which at least one is a daily [newspaper]." Based on these reports, we can determine whether a publication is part of a media group or can be considered "independent." We collected the yearly reports between 2002 and 2017 in paper format and digitized their contents.[25] Online Appendix Figure A.1 illustrates the original structure of the data.

Our resulting data set includes information on a total of $201,249$ newspapers-city-years and $45,236$ unique newspapers, which we aggregate at the market-year level. Our two outcomes of interest are circulation per capita and number of titles per capita.[26]

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[24]We checked the quality of the circulation numbers published in RNI by comparing them to those of the Indian Newspaper Society (INS) Handbook. The INS is a voluntary association of newspapers. It publishes a yearly handbook with data on each of its members' publications, and notably, verified circulation numbers. For the subset of newspapers present in the INS data, the correlation between INS circulation numbers and RNI circulation numbers is 0.95, thereby strengthening our confidence in the quality of circulation numbers provided in the RNI publication.

[25]For three reasons we did not collect older data. First, given that the delimitation happened in 2008, it was not useful to collect data related to a period far from that in which the variation we exploit occurs. Second, in 2001, several Indian states were redefined, changing boundaries and political equilibria. Finally, the format of the RNI reports changes from the 47th report published in 2002–2003, creating comparability issues with reports from previous years. We use 2017 as our last year of interest because it was the most recent year for which RNI data were available when we started this project. Furthermore, as will appear clearly in the Results Section below, considering 11 years after the shock seems to be sufficient to identify the causal effect (even over the long run) of the delimitation.

[26]We use the population aged 6+ to compute these variables, the closest we can get to the adult population with the existing census data.

3.3 Descriptive statistics

As noted above, our data set contains a total number of $45,236$ unique newspapers which we track over 14 years. Our unit of analysis is the market-year. Table 1 presents summary statistics by newspapers and newspaper types. The average circulation of a newspaper is $20,137$ copies, but this figure conceals heterogeneity across newspapers. If we look at the median instead of the average, we have $8,500$ copies per newspaper. Decomposing this figure by types of newspapers, we see that COU newspapers have an average circulation that is 2.5 times larger than that of independent newspapers. Local-language newspapers have somewhat lower circulation numbers than nonlocal-language newspapers.

Figure 4 shows the development of the overall circulation and number of newspapers as a function of the time to the delimitation announcement. Over this period, the media market was thriving, with both circulation and the number of titles increasing steadily. However, the acceleration of the growth of the media market right after the delimitation announcement is striking.[27]

Table 1: Summary statistics on newspaper circulation

	Mean	St.Dev	P25	Median	P75	Max	N
All Newspapers	20,137	45,560	3,707	8,500	22,388	5,314,616	201,249
COU Newspapers	32,196	58,376	6,512	17,072	36,100	1,674,305	77,944
Non COU Newspapers	12,514	32,918	2,500	5,727	14,250	5,314,616	123,305
Local-Language Newspapers	19,517	39,970	4,300	8,652	22,200	5,314,616	169,085
Non-Local-Language Newspapers	23,396	67,649	2,000	7,448	22,912	2,421,500	32,164

Notes: The table gives summary statistics for newspapers. An observation is a newspaper-city-year. COU stands for "common ownership unit." See the text for further details.

Particularly the circulation of COU newspapers seems to accelerate after the delimitation announcement. However, in terms of the number of titles, both types of newspapers seem to evolve similarly until the end of the period, when the number of nonCOU newspapers increases rapidly. Regarding newspapers published in local languages (Figure A.4), which are more often covering local politics (Besley and Burgess, 2002), both circulation and the number of titles accelerate rapidly after the delimitation announcement, much more so than those of nonlocal-language newspapers.

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[27]Online Appendix Figures A.3 and A.4 provide further illustrations of the evolution of the markets over time, by showing it separately for COU newspapers (Figure A.3) and local-language newspapers (Figure A.4).

Figure 4: Evolution of the total circulation and number of newspapers before and after the delimitation announcement
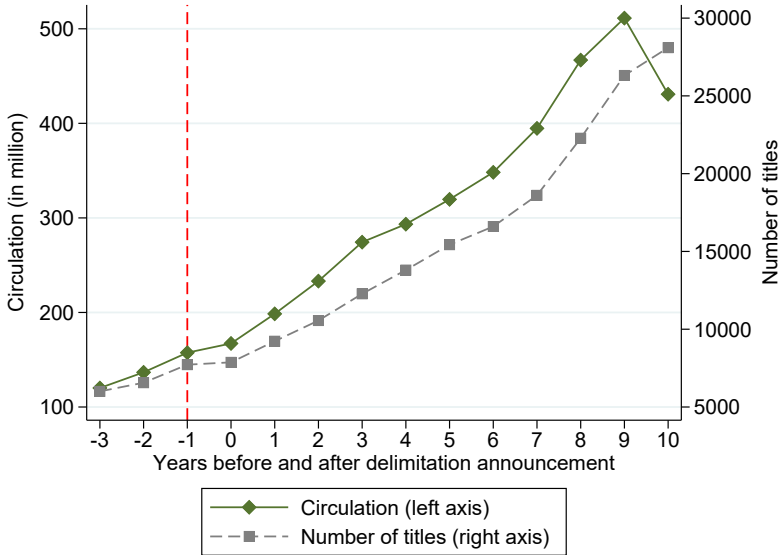
Notes: The figure presents the overall evolution of circulation and number of titles in India (we include only the states that faced delimitation in 2008). The time period is 2002–2017. The year of the delimitation announcement varied depending on the state (see the text for details). Source: RNI reports and authors' computations.

Table 2 presents descriptive statistics at the market-year level (i.e., our unit of observation in the econometric analysis below). There are on average 31 titles per market, with a total average circulation of 630,000. Among these markets, 23% experienced an increase in their electoral importance following the 2008 Delimitation and 31% a decrease.[28]

Figure 5 presents the development in our raw data of the total circulation per capita and the total number of titles per 10,000 inhabitants in markets that experienced an increase, reduction, or no change in electoral importance because of the delimitation. As the figure shows, although circulation and number of titles followed similar trends before the delimitation, the increase in these variables are greater in news markets that became more electorally important after the reform than in the other ones.

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[28]Appendix C presents the summary statistics of the control variables used in the econometric analysis.

Table 2: Summary statistics on media markets

	Mean	St.Dev	P25	Median	P75	Max	N
Newspaper data							
Circulation	630,646	2,335,009	15,628	103,753	411,366	64,465,708	6,426
Circulation per capita	0.23	0.68	0.01	0.07	0.21	14.57	6,426
Number of titles	31	123	2	7	21	2,878	6,426
Number of titles per 10,000	0.13	0.46	0.01	0.04	0.10	12.13	6,426
Electoral Importance data							
Change in pol. importance (% points)	-0.01	0.80	-0.35	0.00	0.00	5.36	6,426
Incr. dummy	0.23	0.42	0.00	0.00	0.00	1.00	6,426
Decr. dummy	0.31	0.46	0.00	0.00	1.00	1.00	6,426

Notes: The table gives summary statistics for the media markets. An observation is a market-year.

Figure 5: Evolution of media markets of increasing vs. decreasing electoral importance

(a) Circulation per capita
(b) Titles per 10,000 inhabitants
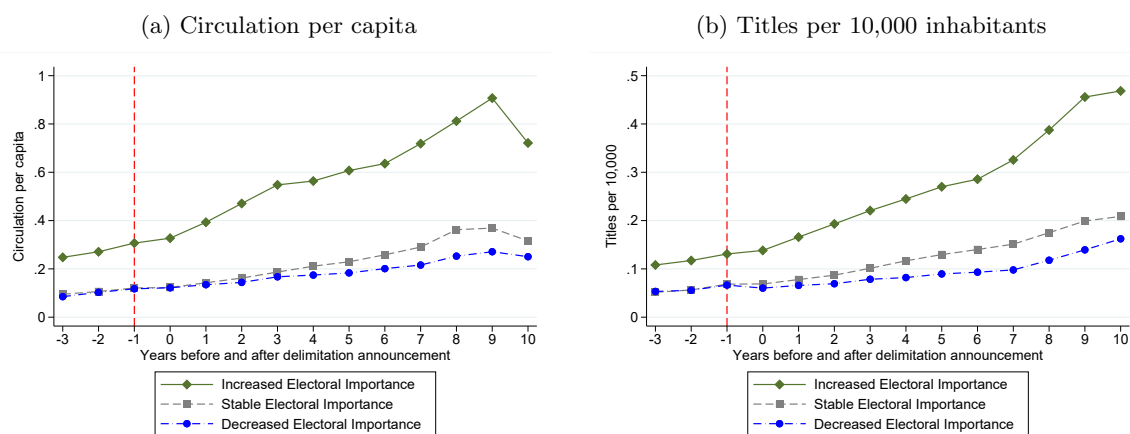
Notes: The figure presents the overall evolution of circulation and the number of titles in India, decomposed between markets whose electoral importance increases, decreases, or remains stable. Source: RNI reports and authors' computation. The time period is 2002–2017.

4 Empirical Specification and Results

Our identification strategy relies on the fact that the draft delimitation was announced suddenly and its results were hardly predictable. Therefore, determinants of media consumption, such as literacy levels or purchasing capacity – which are slow-moving – are not affected by this announcement, allowing us to attribute observed changes in the media markets to the announced change in electoral importance.[29] In addition, the announcement year is different across states, allowing us to further distinguish the impact of the announcement from that of any other common shock. Given the staggered design, we structure our data so that each state has the same number of periods before and after the announcement; we therefore observe all states from 3 periods prior to treatment and 11 periods from the year of the announcement onward. We next show that our results are robust to using novel estimation approaches proposed in the literature to circumvent issues associated with staggered difference-in-differences (de Chaisemartin and D'Haultfœuille, 2020; Borusyak et al., 2022).

We first perform an event study before turning to the difference-in-differences analysis, controlling for market fixed effects (so as to capture any fixed – or slow-moving – unobserved characteristics), as well as state-year fixed effects, capturing any state-year specific differences.[30] In all cases, we investigate the evolution of newspaper markets, comparing markets whose electoral importance increased with those whose electoral importance decreased or was not affected by the reform, before and after the announcement was made. To illustrate the intuition of our approach, remember Figure 1 picturing the district of Indore, whose electoral importance increases. Figure 6 shows that Indore clearly sees a trend break in its circulation per capita with the announcement of delimitation. Our empirical approach compares the evolution of news markets such as Indore, whose electoral importance increased, with the evolution of other news markets whose electoral importance did not increase.

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[29]Note that we cannot entirely rule out the possibility that this announcement may have been anticipated by market actors. If this were to be the case, then what we capture would be the additional effect of the announcement over anticipations, and we would therefore measure only a lower bound of the total effect. However, we do not believe anticipation to be an important factor here.

[30]This approach would, for example, control for any state-wide political cycle.

Figure 6: Evolution of circulation per capita in Indore
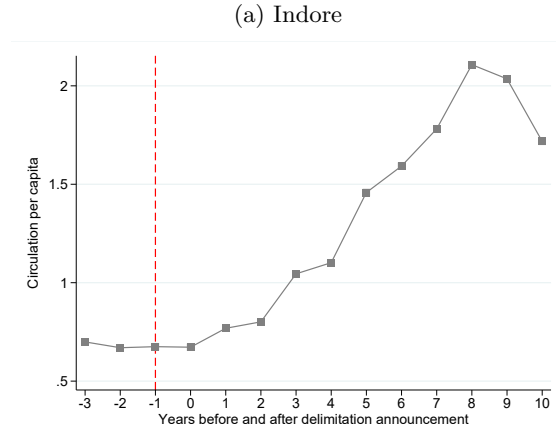
(a) Indore

Notes: The figure tracks the evolution of circulation per capita in Indore, whose electoral importance increases following the 2008 Delimitation.

4.1 Event-study analysis

Following Duflo (2001), we first perform an event-study analysis, taking advantage of the fact that newspaper markets are observed yearly. This analysis allows us to check for pre-delimitation trends as well as to understand the timing of the effect of the change in electoral importance. We estimate the following model:

$$\text{Media}_{d(s)t} = \alpha + \sum_{t=-3}^{10} \beta_t * \text{TimeToDelim}_{st} * \text{ChangeElecImportance}_{d(s)} + X_{d(s)t} + \lambda_d + \gamma_{st} + \epsilon_{sdt}$$

(1)

where s indexes the states, d the districts, and t the time. $TimeToDelim_{st}$ stands for the time to the announcement of the draft delimitation in state s, and $ChangeElecImportance_{d(s)}$ is a measure of how much the electoral importance of a district d (in state s) will change with the delimitation. Our preferred measure of such change is an indicator variable indicating whether district d's electoral importance is announced to increase.[31] X_{dt} is a set of time-varying district-level controls.[32] λ_d indexes district fixed effects, and γ_{st} is a set of state-year

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[31]In Appendix D, we show that our results are robust to using a continuous measure of the treatment.

[32]These are share of rural population, literacy rate, share of Scheduled Castes (SC), share of Scheduled Tribes (ST), population aged 6+, share of constituencies reserved for SC, and share of constituencies reserved for ST.

fixed effects.[33] Standard errors are clustered at the district level.

$Media_{d(s)t}$ is our outcome variable of interest: depending on the specifications, it corresponds to the newspaper circulation per capita or to the number of newspapers per $10,000$ inhabitants in market d (in state s) in period t.[34]

We are interested in the β_t coefficients. Our identification strategy requires parallel trends prior to treatment. That is, coefficients β_{-3} to β_{-1} should be close to zero and not significant because they refer to the effect of the announcement before it was made. Once the delimitation is announced, we expect districts with an increase in their electoral importance to diverge from the others. That is, we expect coefficients β_0 to β_{10} to be positive and significant.

Recall from Section 3 that the timing of the delimitation process – and therefore of the "treatment" – is different across states. Given our period of interest (2002–2017) and the time span of the delimitation announcement (from 2004 to 2007), we structure the data so they are balanced with respect to the number of years before and after the announcement of the delimitation rather than by the actual year. Figures 7a and 7b present the results for, respectively, circulation per capita and the number of newspapers per 10,000 inhabitants. In both graphs, the trends prior to delimitation are parallel. However, when the delimitation is announced, both circulation per capita and the number of newspapers per capita start to diverge: there is a clear increase in both circulation and the number of titles in markets that gain electoral importance. Compared to the other markets, markets with increasing electoral importance see their circulation per capita increase by around 0.2 after the implementation of the delimitation (sub-Figure 7a). When looking at the number of titles, markets of increasing electoral importance see their number of titles per 10,000 inhabitants increase by around 0.1 on average (sub-Figure 7b).

4.2 Difference-in-differences estimates

We now turn to the difference-in-differences approach and compare newspaper markets whose electoral importance increases with newspaper markets in the remaining districts, before and after the draft delimitation. The advantage of this approach is that it allows us to estimate

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[33]Note that these controls effectively control for any electoral cycle and include all $TimeToDelim_{st}$ fixed effects, which are therefore not present in our Equation 1.

[34]In Appendix D we show that the results hold when using an inverse hyperbolic sine transformation of these variables.

Figure 7: Change in electoral importance and evolution of news markets: Event-study analysis

(a) Circulation per capita

(b) Titles per 10,000 inhabitants
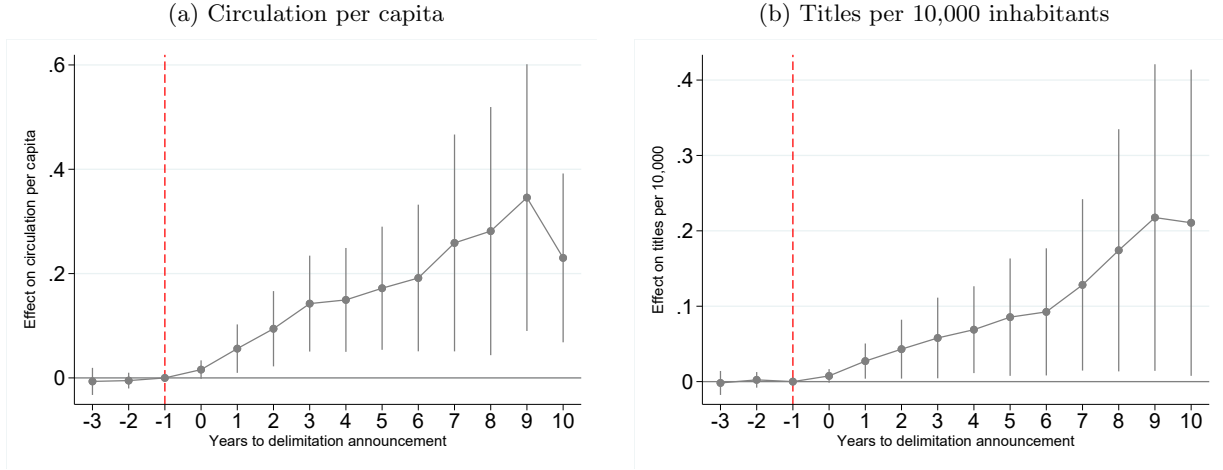
Notes: The figure shows the coefficients from a regression of circulation per capita and of the number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance (see equation 1 for details). The model includes time-varying district controls, district fixed effects, and state-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

one coefficient for the treatment effect, making discussing the results – and interpreting their magnitude – easier. It also allows us to show concisely the robustness of our findings to different definitions of the treatment and of the outcome variables. We estimate the following difference-in-differences model:

$$\text{Media}_{d(s)t} = \alpha + \beta \text{Post}_{st} * \text{ChangeElecImportance}_{d(s)} + X_{d(s)t} + \lambda_d + \gamma_{st} + \epsilon_{sdt} \quad (2)$$

The notation is the same as in Model 1. $Post_{st}$ is an indicator variable equal to 1 for the periods following the announcement of the draft delimitation, and to 0 for the preceding ones. $X_{d(s)t}$ is a vector of time-varying district-level controls. We also include district fixed effects (λ_c) and state-year fixed effects (γ_{st}). Standard errors are clustered at the district level.

Table 3 presents the results. In Columns (1) and (2) and (5) and (6), we estimate the impact of an increase in electoral importance using an indicator variable; in Columns (3) and (4) and (7) and (8), we study the effects of the observed change in electoral importance using a continuous measure. We show that markets whose electoral importance is announced to increase see their circulation per capita increase by 0.18 and their number of titles per 10,000 inhabitants increase by 0.1 (Column 2 of Panel A and Panel B of Table 3). Alternatively, markets whose electoral importance is announced to increase by 1% see their circulation per

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capita increase on average by 0.09 and their number of titles per 10,000 inhabitants increase by 0.05 (Column 4 of Panels A and B). [35] Comparing Columns (1), (2), (3), and (4) shows that the inclusion of controls has a negligible impact on the magnitude of the estimates. Finally, Columns (5) to (8) show that applying the inverse hyperbolic sine transformation to the outcome variables does not change the results and in fact, makes them more precisely estimated.

These effects are not only statistically but also economically significant: according to our estimates, markets that increase in electoral importance (compared to similar markets that do not) see their circulation per capita increase by a third of a standard deviation on average and their number of titles per capita by a fifth of a standard deviation. In Section 6.1 below, we further explore the magnitude of the estimated effects on the evolution of news markets in India.

4.3 Robustness

The design we use is a staggered difference-in-differences approach. The literature suggests that this approach may lead to biased estimations in the presence of heterogeneous effects across treatment units. As a robustness check, we reproduce our main event-study analysis using the reweighting suggested by de Chaisemartin and D'Haultfœuille (2020) to correct for potential bias. Figure 8 presents the results of our main event-study regression using this reweighting. Results are qualitatively and quantitatively similar to those of our main approach presented in Figure 7. In Appendix F, we show that they also remain similar when using the alternative reweighting suggested by Borusyak et al. (2022).

5 Heterogeneity of Results

We now explore the heterogeneity of the impact of political importance on media markets. We study two dimensions: political heterogeneity and newspaper heterogeneity.

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[35] "Difference" is the percentage points difference in electoral importance before and after delimitation.

Table 3: Change in electoral importance and evolution of news markets: difference-in-differences estimates

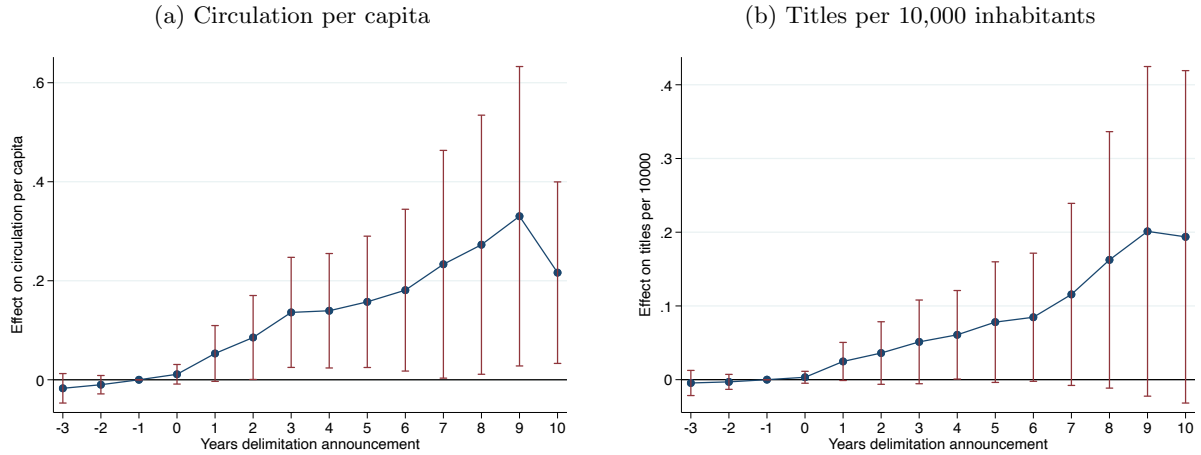Table 4: A: Circulation per capita

	Circulation per capita				IHS Circulation per capita			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post * Increase	0.19**	0.18**			0.07***	0.07***		
	(0.08)	(0.08)			(0.02)	(0.02)		
Post * Difference			11.07***	8.86**			5.13***	4.32***
			(3.87)	(3.88)			(1.24)	(1.30)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.80	0.81	0.80	0.81	0.92	0.92	0.92	0.92
Observations	6,426	6,426	6,426	6,426	6,426	6,426	6,426	6,426
Mean DepVar	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sd DepVar	0.7	0.7	0.7	0.7	0.3	0.3	0.3	0.3

Table 5: B: Titles per 10,000 inhabitants

	Titles per 10,000				IHS Titles per 10,000			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post * Increase	0.11*	0.10*			0.05***	0.05***		
	(0.06)	(0.05)			(0.02)	(0.02)		
Post * Difference			6.54***	5.26**			3.79***	3.27***
			(2.50)	(2.40)			(1.04)	(1.05)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.75	0.76	0.75	0.76	0.90	0.90	0.90	0.90
Observations	6,426	6,426	6,426	6,426	6,426	6,426	6,426	6,426
Mean DepVar	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sd DepVar	0.5	0.5	0.5	0.5	0.2	0.2	0.2	0.2

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the newspaper circulation per capita or its inverse hyperbolic sine transformation in Panel A, and the number of titles per 10,000 inhabitants or its inverse hyperbolic sine transformation in Panel B. "Increase" is an indicator variable equal to 1 if district d will see its electoral importance increase, and to zero otherwise. "Difference" is the difference in *Electoral Importance* resulting from the delimitation. Models are estimated using OLS. The unit of observation is a district-year. All models include district and state-year fixed effects. Time-varying state-level controls are literacy rate, urbanization rate, share of SC, share of ST, population aged 6+, share of ACs reserved for SC, and share of ACs reserved for ST. Standard errors in parentheses are clustered at the district level. More details are provided in the text.

Figure 8: Change in electoral importance and evolution of news markets: Robustness using did_multiplegt (de Chaisemartin and D'Haultfœuille, 2020).

(a) Circulation per capita

(b) Titles per 10,000 inhabitants

Notes: The figure shows the coefficients from a regression of circulation per capita and number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance (see equation 1 for details) using the did_multiplegt command developed by de Chaisemartin and D'Haultfœuille (2020). The model includes time-varying district controls, district fixed effects, and state-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017. More details are provided in the text.

5.1 Heterogeneity by political differences

We first look at heterogeneity depending on the political characteristics of the districts – considered before the delimitation announcement. Our motivation for doing so is that the change in political incentives induced by the delimitation is likely to depend on what political incentives were already in place. In particular, areas that are intrinsically highly competitive have a very active electorate, or areas that have a large number of candidates or parties fighting over votes are likely to have a highly electorally active population and attract the efforts of politicians and media to influence voters (see, e.g., Nichter, 2008; Keefer and Khemani, 2009; Jensenius and Chhibber, 2022). These areas are therefore likely to respond less to an increase in electoral importance. Indeed, there is less of a potential to make people come out to vote or to sway voters to vote differently, and hence less of a reason for an increase in the supply of news media in the event of changing electoral incentives.

To test this intuition empirically, we construct measures of political competition using data on the last election prior to the delimitation announcement. To capture the argument outlined above, we look at three measures: electoral turnout, margin of victory, and the effective number of parties. Our expectation is to find a stronger treatment effect in places

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with low turnout, a high margin of victory, and a low effective number of parties.

5.1.1 Event study

We start by running the following event-study OLS regression:

$$
\begin{aligned}
\text{Media}_{d(s)t} = {} & \sum_{t=-3}^{10} \beta_t * \text{TimeToDelim}_{st} * \text{ChangeElecImportance}_{d(s)} * \text{PoliticalLow}_{d(s)} \\
& + \sum_{t=-3}^{10} \eta_t * \text{TimeToDelim}_{st} * \text{ChangeElecImportance}_{d(s)} * \text{PoliticalHigh}_{d(s)} \\
& + \lambda_d + \gamma_{st} + \epsilon_{sdt}
\end{aligned}
\tag{3}
$$

where the notations are the same as above, and $\text{PoliticalLow}_{d(s)}$ (respectively $\text{PoliticalHigh}_{d(s)}$) is an indicator variable indicating that market d (in state s) is below (respectively above) its state's median for the political variable of interest. The β_t coefficients therefore picture the evolution of news markets with a low value of the political dimension and whose electoral importance will increase, whereas the η_t coefficients track markets whose electoral importance will increase and with a high value of the political dimension.

Consistent with our intuition, we find that markets that are less politically competitive initially, and therefore have more of a mobilization potential, are the ones where we see the strongest treatment effects (see respectively Figures 9, 10, and 11 for turnout, margin of victory, and effective number of parties). Note however that, even in highly electorally competitive markets, we observe a positive and statistically significant impact of an increase in electoral importance (though of a smaller magnitude).

5.1.2 Difference-in-differences

We next turn to the difference-in-differences approach and estimate the following model:

$$
\begin{aligned}
\text{Media}_{d(s)t} = {} & \alpha + \eta \text{Post}_{st} * \text{ChangeElecImportance}_{d(s)} * \text{PoliticalHigh}_{d(s)} \\
& + X_{dt} + \lambda_d + \gamma_{st} + \epsilon_{sdt}
\end{aligned}
\tag{4}
$$

Figure 9: Turnout, change in electoral importance, and evolution of news markets: Event-study analysis
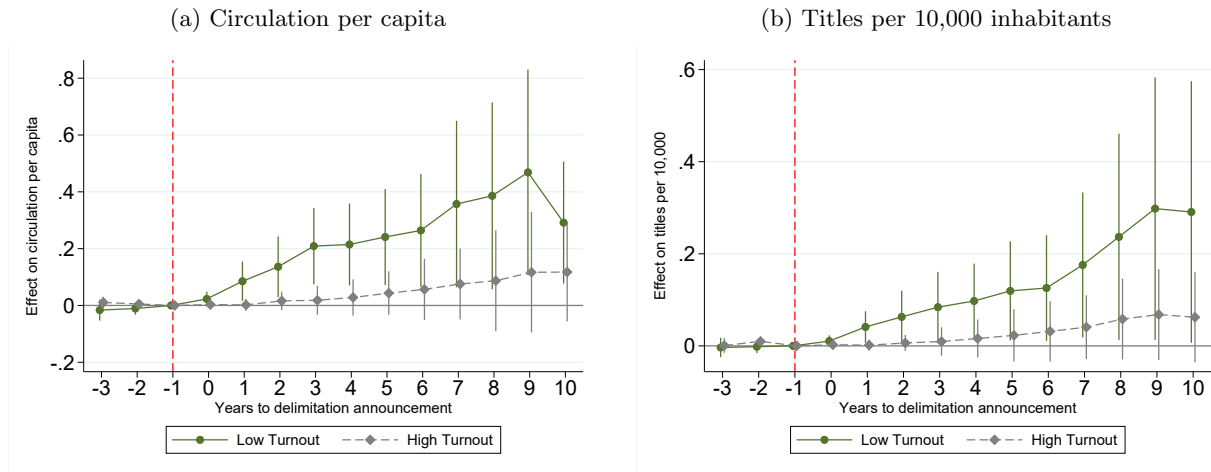
(a) Circulation per capita

(b) Titles per 10,000 inhabitants

Notes: The figure shows the coefficients from a regression model of circulation per capita and number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted wit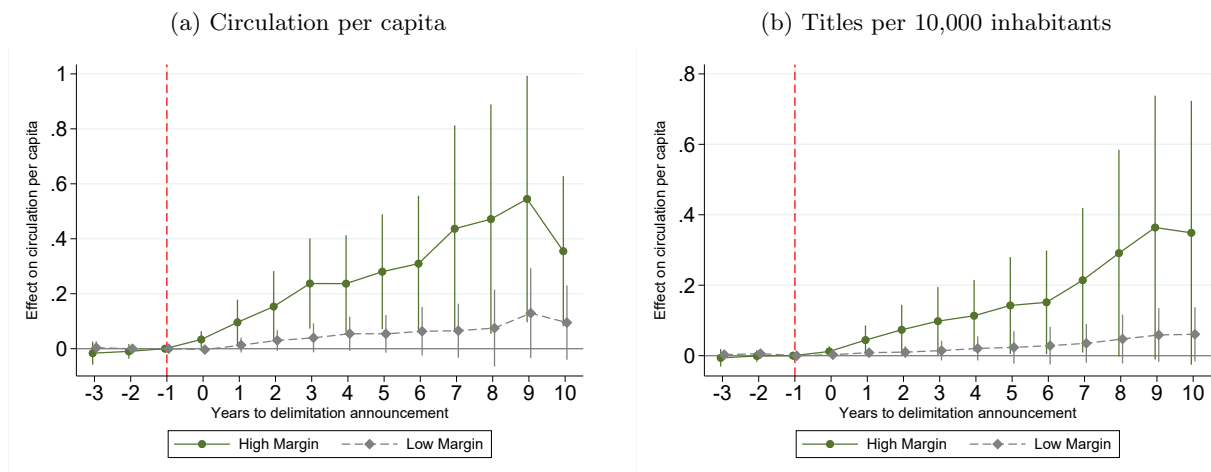h the announced change in electoral importance as well as with an indicator for high or low turnout prior to delimitation (see equation 3 for details). The model includes state-year fixed effects, district fixed effects, and district-level controls. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

Figure 10: Margin of victory, change in electoral importance, and evolution of news markets: Event-study analysis

(a) Circulation per capita

(b) Titles per 10,000 inhabitants

Notes: The figure shows the coefficients from a regression model of circulation per capita and number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance as well as with an indicator for high or low margin of victory prior to delimitation (see equation 3 for details). The model includes state-year fixed effects, district fixed effects, and district-level controls. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

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Figure 11: Effective number of parties, change in electoral importance, and evolution of news markets: Event-study analysis

(a) Circulation per capita
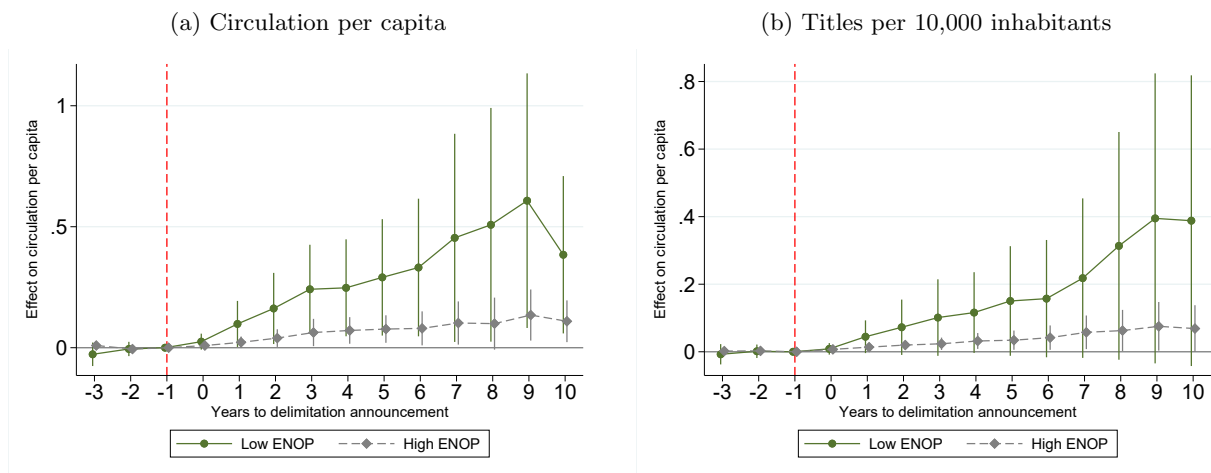
(b) Titles per 10,000 inhabitants

Notes: The figure shows the coefficients from a regression model of circulation per capita and number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance as well as with an indicator for high or low effective number of parties prior to delimitation (see equation 3 for details). The model includes state-year fixed effects, district fixed effects, and district-level controls. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced regarding the time before and the time after the delimitation announcement.

Table 6 presents the results: we show that the increase in circulation per capita is almost entirely driven by districts in which turnout is relatively low (Panel A, Column (1)), by districts in which the margin of victory is relatively high (Panel A, Column (2)), and by districts in which the effective number of parties is relatively low (Panel A, Column (3)). Results are qualitatively similar for the number of titles, albeit less precisely estimated (Panel B). This similarity indicates that most of the response is happening in markets with low initial political competition.

5.2 Heterogeneity by types of newspapers and owners' characteristics

Our data also allow us to exploit a different dimension of heterogeneity. Indeed, we have so far considered all newspapers together, no matter their type. In this section, we look into how, within a given market, newspapers react as a function of their characteristics. We explore three types of heterogeneity. Following Besley and Burgess (2002), we first compare local-language newspapers with those in other languages (mainly English or Hindi). These local-language newspapers are more likely to cover local politics and would therefore be expected to be more responsive to local political motives. Second, we compare newspapers that are part of a media

Table 6: Political heterogeneity, change in electoral importance, and evolution of news markets. Difference-in-differences approaches

A: Circulation per capita

	Circulation per capita			IHS Circulation per capita		
	(1)	(2)	(3)	(4)	(5)	(6)
Post*Incr.	0.27**	0.06	0.35**	0.10***	0.05**	0.12***
	(0.12)	(0.05)	(0.17)	(0.03)	(0.02)	(0.04)
Post*Incr.*High Turnout	-0.24*			-0.07*		
	(0.12)			(0.04)		
Post*Incr.*High Margin		0.25*			0.05	
		(0.15)			(0.04)	
Post*Incr.*High ENOP			-0.29*			-0.08*
			(0.17)			(0.04)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.80	0.80	0.80	0.92	0.92	0.92
Observations	6,426	6,426	6,426	6,426	6,426	6,426
Mean DepVar	0.2	0.2	0.2	0.2	0.2	0.2
Sd DepVar	0.7	0.7	0.7	0.3	0.3	0.3

B: Titles per 10,000 inhabitants

	Titles per 10,000			IHS Titles per 10,000		
	(1)	(2)	(3)	(4)	(5)	(6)
Post* Incr.	0.15*	0.03	0.20*	0.07***	0.03**	0.09**
	(0.08)	(0.03)	(0.12)	(0.03)	(0.02)	(0.04)
Post* Incr.*High Turnout	-0.13*			-0.04		
	(0.08)			(0.03)		
Post* Incr.*High Margin		0.15			0.04	
		(0.10)			(0.03)	
Post* Incr.*High ENOP			-0.17			-0.06
			(0.11)			(0.04)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.75	0.75	0.75	0.90	0.90	0.90
Observations	6,426	6,426	6,426	6,426	6,426	6,426
Mean DepVar	0.1	0.1	0.1	0.1	0.1	0.1
Sd DepVar	0.5	0.5	0.5	0.2	0.2	0.2

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the newspaper circulation per capita or its inverse hyperbolic sine transformation in Panel A, and the number of newspapers per 10,000 inhabitants or its inverse hyperbolic sine transformation in Panel B. "Incr." is an indicator variable equal to 1 if district d will see its electoral importance increase, and to zero otherwise. "High Turnout," "High Margin," and "High ENOP" are, respectively, indicator variables equal to 1 if district d is above the median of its state's turnout, margin of victory, and effective number of parties in the last election prior to the delimitation announcement. Models are estimated using OLS estimations. The unit of observation is a district-year. All models include district and state-year fixed effects. Time-varying market-level controls are literacy rate, urbanization rate, share of SC, share of ST, population aged 6+, share of ACs reserved for SC, and share of ACs reserved for ST. Standard errors in parentheses are clustered at the district level. More details are provided in the text.

group with independent newspapers.[36] If media groups are more often motivated by political objectives than independent newspapers are, we would expect these groups to react more to a change in political importance. Finally, we compare daily newspapers with others.

To explore these dimensions of heterogeneity, we structure our data at the market-type level rather than at the market level, as in the previous section. This structure allows us to exploit within-market variations and therefore implement extremely demanding specifications including market-year fixed effects (λ_{dt}). As before, we use both an event-study approach and a difference-in-differences approach. We estimate the following models:

$$\text{Media}_{d(s)th} = \alpha + \delta \text{Heterogeneity}_h + \sum_{t=-3}^{10} \eta_t * \text{TimeToDelim}_{st} * \text{ChangeElecImportance}_{d(s)} * \text{Heterogeneity}_h$$
$$+ \lambda_{dt} + \gamma_{st} + \epsilon_{sdth}$$

(5)

and

$$\text{Media}_{d(s)th} = \alpha + \delta \text{Heterogeneity}_h + \eta \text{Post}_{st} * \text{ChangeElecImportance}_{d(s)} * \text{Heterogeneity}_h$$
$$+ \lambda_{dt} + \gamma_{st} + \epsilon_{sdth}$$

(6)

where Heterogeneity_h is an indicator variable indicating a dimension of heterogeneity. The inclusion of market-year fixed effects (λ_{dt}) strengthens the identification, because all market-year-level shocks are now controlled for.[37]

Heterogeneity by language An important dimension of heterogeneity is the language of the newspapers. As discussed in Section 3 above, whereas around half of the newspapers are in Hindi, a number of them are also published in the other languages of India. Here, we

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[36]As noted above, our data identify newspapers that are part of a COU. We consider these as part of a media group and all others as "independent" newspapers.

[37]The inclusion of these fixed effects also prevents the identification of the coefficients $\sum_{t=-3}^{10} \beta_t * \text{TimeToDelim}_{st} * \text{ChangeElecImportance}_d$ and $\text{Post}_{st} * \text{ChangeElecImportance}_d$, which are fully colinear with the newspaper market-year fixed effects and are therefore not included in Model 5.

Figure 12: Local-language newspapers, change in electoral importance, and evolution of news markets. Event-study analysis.
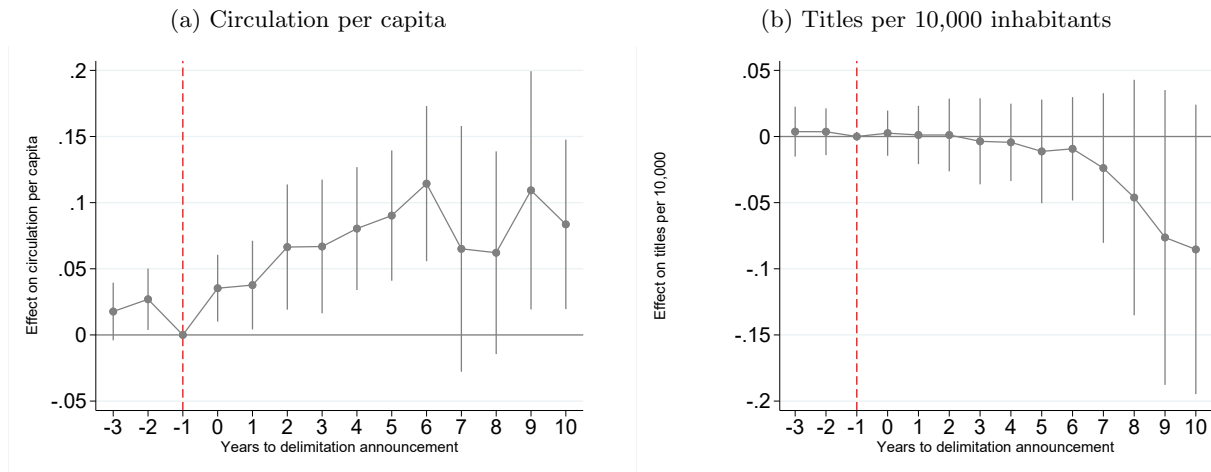
(a) Circulation per capita

(b) Titles per 10,000 inhabitants
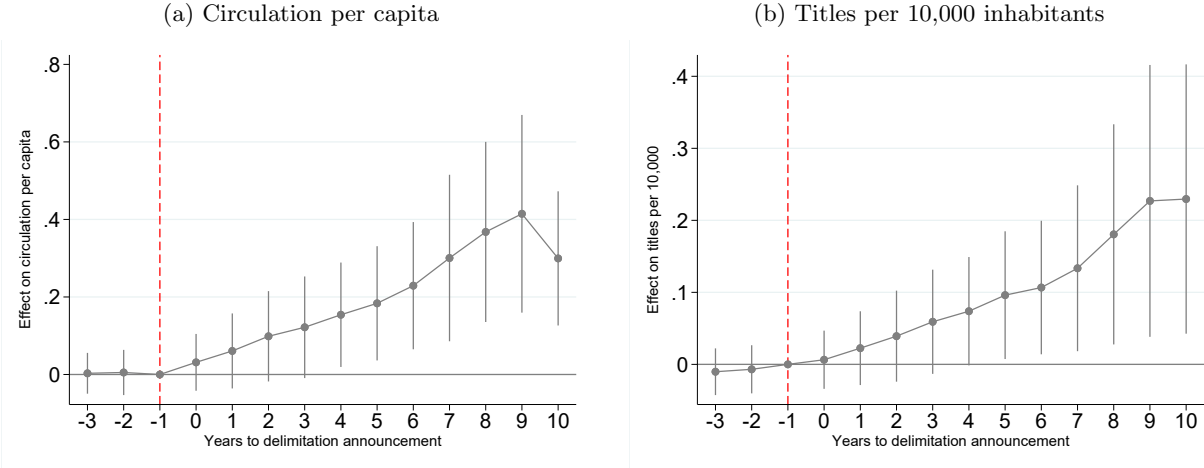
Notes: The figure shows the coefficients from a regression model of circulation per capita and number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance as well as with an indicator for newspapers published in the state's language (see equation 5 for details). The model includes district-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

investigate whether newspapers react differently depending on their language. In particular, following Besley and Burgess (2002), we differentiate between newspapers published in the language of the state and those published in a language that is not that of the state. The former being more "local," they are more likely to cover the state's political news and therefore to react more to changes in local political importance.

Results are presented in Figure 12. Following an increase in the electoral importance of a city, we obtain a positive and statistically significant increase in the total circulation of "local-language" newspapers (sub-Figure 12a) as well as in the number of newspapers (sub-Figure 12b). These increases suggest that newspapers responding more to the announcement of the change in political importance are precisely those that cover the more local political content.

Heterogeneity by the structure of ownership   Our data contain information on newspapers' ownership structures. In particular, we know whether newspapers belong to a COU. As discussed in Section 3, a COU is an entity comprising several newspapers, of which at least one is a daily. That is, COU newspapers belong to media groups. Figure 13 presents the results. Newspapers owned by media groups see their circulation increase faster (sub-Figure 13a) but the number of newspapers is unchanged up to 6 years after treatment, when it starts

Figure 13: COU newspapers, change in electoral importance, and evolution of news markets. Event-study analysis.
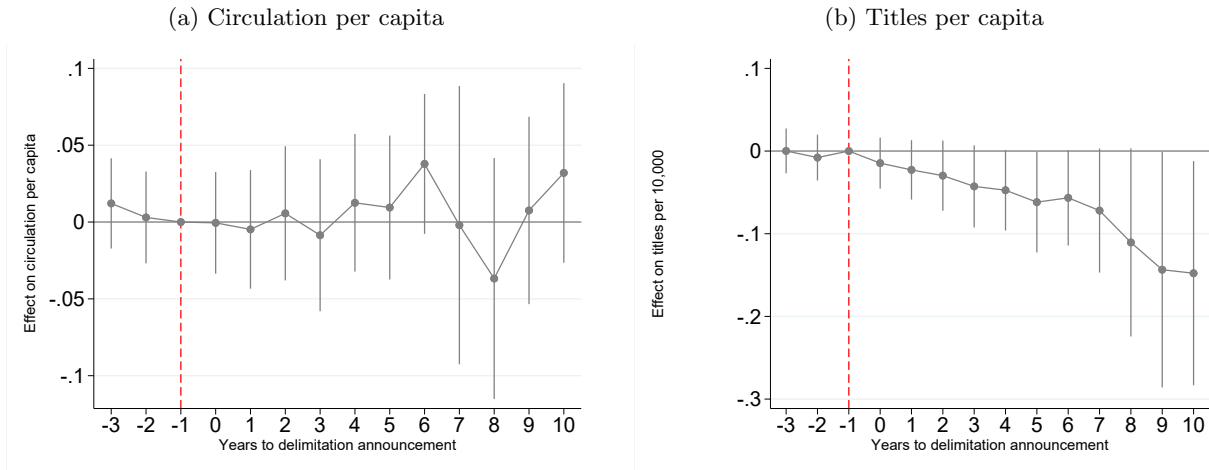

(a) Circulation per capita

(b) Titles per 10,000 inhabitants

Notes: The figure shows the coefficients from a regression model of circulation per capita and number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance as well as with an indicator for newspapers belonging to a COU (see equation 5 for details). The model includes district-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

to decrease relatively (though not significantly) (sub-Figure 13b). That is, the circulation effect is driven by an increase in the readership of COU newspapers, not by the entry of new COU newspapers. The fact that there is no entry of COU newspapers might be due to the fact that media groups – larger by definition than independent newspapers – were already present in districts whose electoral importance increases, and thus put more effort into expanding their circulation than in creating new titles.[38] On the contrary, newer newspapers might have been introduced "independently" by owners who decided to enter the market following redistricting.

Heterogeneity by periodicity Since a COU, by definition, contains at least one daily newspaper, the previous finding on COU newspapers may in fact be driven by the evolution of dailies rather than by the characteristic of newspaper ownership. To check whether that is the case, we next allow the effect of the treatment to vary by periodicity, comparing dailies with nondailies. Figure 14 presents the results. Figure 14a illustrates that the increase in circulation per capita of COU newspapers does not seem to be driven by the general evolution

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[38]Note that a newspaper's circulation might be increased in many different ways that we cannot, unfortunately, measure here, because of data limitation reasons – for a detailed discussion, see Section 6.3. In particular, for a given quality, media owners might decide to decrease subscription prices; they might also decide to increase quality without increasing subscription prices.

Figure 14: Daily newspapers, change in electoral importance, and evolution of news markets. Event-study analysis.

(a) Circulation per capita

(b) Titles per capita

Notes: The figure shows the coefficients from a regression model of circulation per capita (sub-Figure 14a) and number of titles per 10,000 inhabitants (sub-Figure 14b) on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance interacted with an indicator for daily newspapers (see equation 5 for details). The model includes district-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

of the circulation of dailies, which does not differ from the evolution of newspapers with different periodicity. However, Figure 14b follows a pattern similar to that of Figure 13b. Therefore, whereas for circulation it is clearly COU newspapers rather than dailies that are driving the results, the distinction is less clear for the number of titles. In fact, the decline in the relative number of dailies is quite notable right after treatment and becomes marginally significant toward the end of the study period: the pattern is much clearer for dailies than it is for COU newspapers. This difference could be due to the fact that political news is actually covered not only in daily newspapers but also in weekly and monthly publications.

Table 7 summarizes these heterogeneities when estimating the difference-in-differences model; the results we obtain are similar to the ones estimated with the event-study approach.

6   Discussion

In this section, we first quantify the share of the effects of the increase in electoral importance that is due to a reaction of the supply side of the news market and the share that is due to demand. We then discuss the policy implications and relevance of our findings.

Table 7: Newspaper types, change in electoral importance, and evolution of news markets. Difference-in-differences estimates

A: Circulation per capita

	Circulation per capita			IHS Circulation per capita		
	(1)	(2)	(3)	(4)	(5)	(6)
Post* Incr.*Local Language	0.34***			0.22***		
	(0.09)			(0.04)		
Post* Incr.*COU		0.10***			0.08***	
		(0.03)			(0.01)	
Post* Incr.*Daily			0.03			0.04***
			(0.03)			(0.02)
District-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.62	0.91	0.88	0.69	0.92	0.89
Observations	12,852	12,852	12,852	12,852	12,852	12,852
Mean DepVar	0.1	0.1	0.1	0.1	0.1	0.1
Sd DepVar	0.4	0.4	0.4	0.2	0.2	0.2

B: Titles per 10,000 inhabitants

	Titles per 10,000			IHS Titles per 10,000		
	(1)	(2)	(3)	(4)	(5)	(6)
Post* Incr.*Local Language	0.18***			0.13***		
	(0.06)			(0.03)		
Post* Incr.*COU		-0.05*			-0.04***	
		(0.03)			(0.01)	
Post* Incr.*Daily			-0.11***			-0.07***
			(0.04)			(0.02)
District-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.59	0.82	0.70	0.66	0.90	0.80
Observations	12,852	12,852	12,852	12,852	12,852	12,852
Mean DepVar	0.1	0.1	0.1	0.1	0.1	0.1
Sd DepVar	0.3	0.3	0.3	0.2	0.1	0.2

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the newspaper circulation per capita or its inverse hyperbolic sine transformation in Panel A, and the number of newspapers per 10,000 inhabitants or its inverse hyperbolic sine transformation in Panel B. "Incr." is an indicator variable equal to 1 if district d will see its electoral importance increase, and to zero otherwise. Models are estimated using OLS estimations. The unit of observation is a district-year. All models include district-year fixed effects. Standard errors in parentheses are clustered at the district level. More details are provided in the text.

6.1 Disentangling supply and demand

The previous sections have shown that the announced increase in the electoral importance of a media market leads to an increase in the number of newspapers circulating in that market, as well as to an increase in the circulation of newspapers in that market. In theory, the increase could be driven either by an increase in the supply of news media – e.g., because newspaper owners want to increase their influence in the more politically important areas – or by an increase in the demand for news (because the more pivotal voters may be willing to be better informed). Because we observe only equilibrium outcomes, we cannot strictly isolate the share of the increase that is due to supply and the share that is due to demand. However, several pieces of evidence indicate that our findings are most probably driven by altered supply more than by demand.

Time of the announcement First, remember that the treatment is not the time of the actual change in political importance, but the year that this future change in political importance is announced. As highlighted in Section 3.1 above, in most states, there were several years before the first elections were held using the new constituencies, meaning that – even conditional on citizens being aware of this rather technical announcement – there was no rush for voters to change their news consumption diet as soon as they knew about the new borders. For example, in Uttar Pradesh – India's largest state – the draft proposal was published in 2006. The first elections using these new constituencies were held in 2012. It is highly unlikely that voters decided to adapt their news consumption 6 years before the elections. On the contrary, founding a new newspaper, entering a new market, or trying to increase an existing newspaper circulation can take time and money. Hence, media owners interested in gaining political power might have decided to change their investment strategy as soon as they became aware of the new delimitation.

Second, some of the heterogeneous effects documented above point toward the supply side dominating the observed evolution of the markets. For example, it is unlikely that readers would change their demand for COU-owned newspapers in a different way than they would change their demand for independent newspapers. Media groups, on the other hand, might be more responsive to political factors than independent newspapers are, because their owners

might tend to give more weight to political factors in their decisions and they might have the resources to do so rapidly.

Importance of advertising   Next, note that newspapers are sold very cheaply in India; their price can be below the paper's value as waste paper, home delivery is free (paid for by the publishers), and subscribers also make money when recycling their newspapers (through the so-called *raddi* recycling program). The low price of newspapers comes from the fact that, as highlighted by Vineed Jain – the managing director of India's largest media group – in an interview in *The New Yorker*, "we are not in the newspaper business, we are in the advertising business."[39] In other words, the demand side seems to play only a marginal role in the supply of newspapers in India.

Entry costs and the asymmetry of the effects   Finally, we exploit the fact that, whereas changing newspaper consumption habits are associated with small fixed costs – buying an additional newspaper comes at the marginal cost of paying only for that newspaper – entering a new media market entails significant fixed costs. In particular, it entails large monetary investments, such as setting up a newsroom – editorial costs – or acquiring a printing press, and/or setting up a website (see, e.g., Cagé, 2020).[40]

This asymmetry of costs between supply and demand has implications for what should be observed in the data. In particular, if demand responds to variations in political importance, demand should respond symmetrically to an increase and to a decrease in the political importance of a district. But the latter is not true for supply: given the significant fixed costs associated with market entry, we should expect a strong asymmetry in the response to an increase versus a decrease in the political importance of markets from the supply side. In particular, we should expect the supply side to respond less to a decrease in political importance than to an increase of similar magnitude.

Building on this intuition, we consider how news markets react to increases versus decreases in electoral importance. We start by estimating a model allowing for an asymmetric response

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[39]See "Citizens Jain. Why India's newspaper industry is thriving," Ken Auletta, October 1, 2012, *The New Yorker* (https://www.newyorker.com/magazine/2012/10/08/citizens-jain).

[40]The main variable costs of a newspaper being the per-copy cost of printing and distribution, including paper and ink costs and mailing and delivery costs (see Gentzkow et al., 2015b).

to an increase vs. a decrease in electoral importance. We then build on these findings to propose a back-of-the-envelope estimation of the total change in the news market caused by changes in political importance, and decompose this change into its supply and demand components.

To test for an asymmetry in market response to an increase versus a decrease in electoral importance, we estimate the following model:

$$
\begin{aligned}
\text{Media}_{d(s)t} = &\sum_{t=-3}^{10} \beta_t * \text{TimeToDelim}_{st} * \text{AbsChangeElecImportance}_{d(s)} * \text{Decrease}_{d(s)} \\
&+ \sum_{t=-3}^{10} \eta_t * \text{TimeToDelim}_{st} * \text{AbsChangeElecImportance}_{d(s)} * \text{Increase}_{d(s)} \\
&+ \lambda_d + \gamma_{st} + \epsilon_{sdt}
\end{aligned}
\tag{7}
$$

where the notations are the same as above, and $\text{AbsChangeElecImportance}_{d(s)}$ is the absolute value of the announced change in electoral importance. $\text{Increase}_{d(s)}$ (respectively $\text{Decrease}_{d(s)}$) is an indicator variable for whether this change is strictly positive (respectively strictly negative). Therefore, the β_t coefficients indicate the evolution of the news market when facing a decrease in electoral importance, whereas the η_t coefficients track the differential evolution of a news market facing an increase in electoral importance of similar (absolute) magnitude. If markets' response to a shock to electoral importance is symmetric no matter the direction of the shock, then we should have $\beta_t = -\eta_t$ for all t. If that is not what we observe, this indicates an asymmetry in the response.

Figure 15 presents the results. The response to a decrease in electoral importance leads to no response in circulation per capita up to 6 years after the announcement and a small decrease afterwards (dashed gray line with dots), whereas the response to an increase comes after a year and is of a much larger (absolute) magnitude (green line with diamonds) (sub-Figure 15a). The evolution of the number of titles per capita is comparable, but with a faster response to a decrease, from year 4 onward (sub-Figure 15b). This asymmetric response to increases and decreases in electoral importance combined with the differences in fixed costs associated with supply of versus demand for newspapers strongly suggests that the supply-

Figure 15: Increasing vs. decreasing electoral importance and evolution of news markets. Event-study analysis.

(a) Circulation per capita

(b) Titles per capita
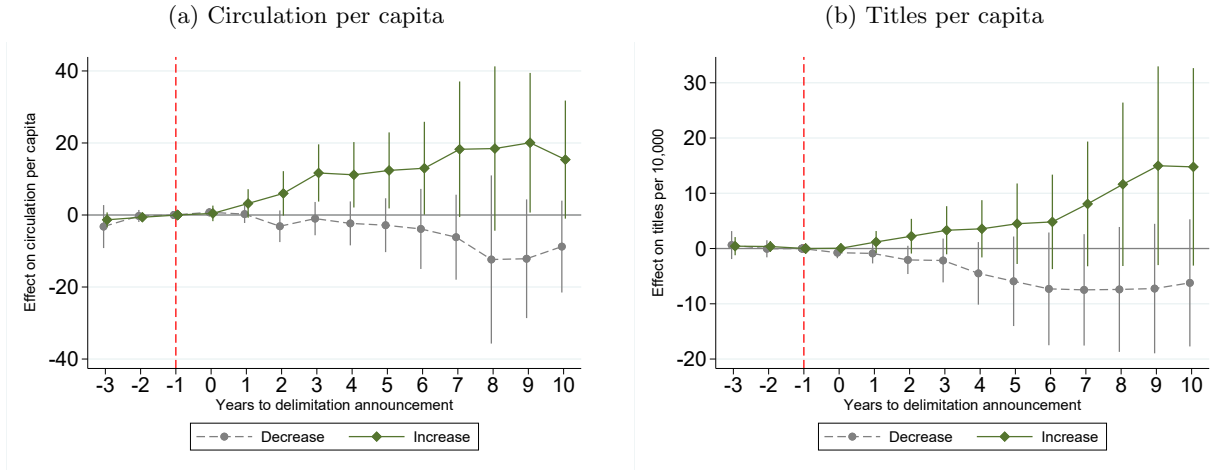
Notes: The figure shows the coefficients from a regression of circulation per capita (sub-Figure 15a) and number of newspapers per capita (sub-Figure 15b) on a vector of leads and lags of the delimitation announcement interacted with the announced absolute value of the change in electoral importance as well as with an indicator for the sign of the change (see equation 7 for details). The model includes district fixed effects and state-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. Time-varying state-level controls are literacy rate, urbanization rate, share of SC, share of ST, population aged 6+, share of ACs reserved for SC, and share of ACs reserved for ST. The time period is 2002–2017, and the panel is balanced with respect to the time before and the time after the delimitation announcement. More details are provided in the text.

side response is a dominant factor in the observed impact on news markets of the change in electoral importance.

We next turn to the difference-in-differences estimates to assess the evolution of markets whose electoral importance increases compared with the evolution of those for which it decreases, and estimate the following model:

$$
\begin{aligned}
\text{Media}_{d(s)t} = & \beta \text{Post}_{st} * \text{AbsChangeElecImportance}_{d(s)} * \text{Decrease}_{d(s)} \\
& + \eta \text{Post}_{st} * \text{AbsChangeElecImportance}_{d(s)} * \text{Increase}_{d(s)} \\
& + \lambda_d + \gamma_{st} + \epsilon_{sdt}
\end{aligned} \tag{8}
$$

Table 8 presents the results. The first column shows that for circulation per capita, the response to a given absolute change in electoral importance is four times larger for an increase than for a decrease (Columns (1) and (2)). Regarding the number of titles per 10,000 inhabitants: though noisily estimated, the response to an increase appears to be more than 1.5 times larger than the response to a decrease (Columns (3) and (4)).

37

Table 8: Increasing vs. decreasing electoral importance and evolution of news markets: Difference-in-differences estimates

	Circulation per capita	IHS Circulation per capita	Titles per 10,000	IHS Titles per 10,000
	(1)	(2)	(3)	(4)
Post*Abs. Elec. Change*Dec.	-3.79	-1.90	-5.18	-2.16
	(6.75)	(2.64)	(5.04)	(1.68)
Post*Abs. Elec. Change*Inc.	14.98**	6.87***	7.28	4.66**
	(6.77)	(1.91)	(4.82)	(1.82)
Controls	Yes	Yes	Yes	Yes
Distict FE	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes	Yes
R-sq	0.80	0.92	0.75	0.90
Observations	6,426	6,426	6,426	6,426
Mean DepVar	0.2	0.2	0.1	0.1
Sd DepVar	0.7	0.3	0.5	0.2

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is newspaper circulation per capita, number of newspapers per 10,000 inhabitants, and their inverse hyperbolic sine transformation. "Abs. Elec. Change" is the absolute value of the change in electoral importance. "Inc." and "Dec." are indicator variables for an increase (respectively decrease) in electoral importance. Models are estimated using OLS estimations. The unit of observation is the news market-year. All models include district and state-year fixed effects. Time-varying market-level controls are literacy rate, urbanization rate, share of SC, share of ST, population aged 6+, share of ACs reserved for SC, and share of ACs reserved for ST. Standard errors in parentheses are clustered at the district level. More details are provided in the text.

Overall, our results show that news markets are more responsive to an increase than to a decrease in electoral importance. This asymmetry points to the importance of the supply-side response in driving the response to changes in electoral importance. Note however that, whereas this inference relies on the credible assumption that there are no fixed costs of demand (contrary to supply), a mechanism we cannot rule out is the existence of news consumption habits. People may indeed develop a taste for news reporting when they are young, and with habit formation might continue to consume news even following a decline in the electoral importance of the district they live in. However, the existing literature instead points toward the short-lasting effect of changes in news consumption (Levy, 2021; Broockman and Kalla, 2021).[41]

6.2 Decomposing the aggregate changes in news markets between politically motivated supply and demand

Building on these results, we now turn to a back-of-the-envelope calculation to estimate the effect of the change in electoral importance on overall circulation per capita, and decompose this change into a supply and a demand component.

---

[41]Note also here that we are not claiming that monetary incentives do not enter the utility function of media owners in India. Privately owned newspapers in India are mainly run for profit – and can indeed be highly profitable, as already highlighted. But our findings show that newspapers expand not only when owners see commercial opportunities but also when they see room for political influence.

We start by using the estimation of Model 7 to predict circulation per capita for each market, and recover total circulation by simply multiplying it by each market's population. The aggregation gives us the total predicted circulation of news markets, which we convert in per capita terms. We then estimate circulation per capita in the absence of changes in electoral importance, by predicting their evolution had delimitation not taken place, that is by setting AbsChangeElecImportance$_{d(s)}$ to zero. This calculation gives us the circulation per capita in a counterfactual world in which the delimitation did not take place. The difference between these two predictions can be considered the change in circulation attributable to the change in political importance, combining both supply and demand effects.

With additional assumptions, we can decompose this change into its supply and demand components. Under the assumption that demand's response to political importance change is symmetric to increases and decreases (a credible assumption as discussed above), we can use the η_t coefficients to estimate the extent of the supply-driven response. Indeed, η_t coefficients encompass both the symmetric response of demand and the asymmetric part of the supply response. Therefore, $\beta_t + \eta_t$ gives a lower bound for the supply response to political shock net of the demand response: the combination of these coefficients washes out all demand effects, as well as the symmetric part of the supply effect. We can therefore predict the evolution of news market in the absence of a demand response by using $\beta_t + \eta_t$ rather than β_t. Figure 17 shows the results of this exercise for all of India, whereas Figure 16 focuses on the subset of the markets whose electoral importance increases.

When focusing on markets whose electoral importance increases with delimitation (Figure 16), we observe that circulation increases by 35–40% because of the political shock. In the short run, most of this change is due to the supply side, and it is only in the long run that demand ends up accounting for around 40% of the increased circulation.

At the all-India level (Figure 17), circulation per capita increases by 12 to 18% in response to political motives. The fact that the total effect remains positive indicates that the increase in circulation in markets whose political importance increases more than compensates for the decrease in circulation elsewhere. A large share of this increase is due to supply-side responses. Indeed, in the first 7 years after the announcement, around 80% of the circulation change is driven by supply. In the longer run, the demand component increases so that it drives 40%

Figure 16: Decomposition between supply and demand responses to a change in electoral importance: News markets of increasing electoral importance.

(a) News markets' responses to a political shock, markets of increasing electoral importance

(b) Decomposition into supply and demand, markets of increasing electoral importance
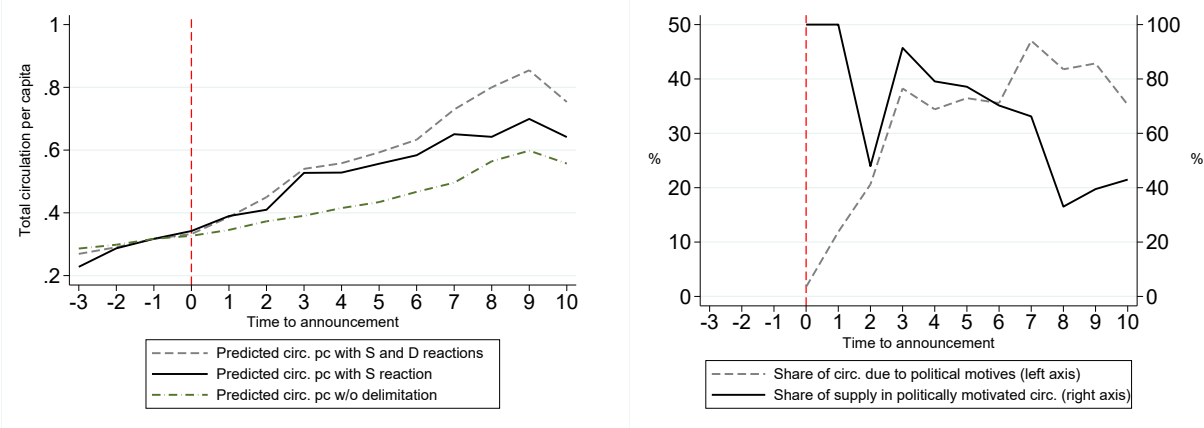
Notes: The left-hand-side figure shows the regression-based predicted evolution of circulation per capita in news markets whose electoral importance increased, their predicted circulation per capita had the delimitation not happened, and the part of the increase of circulation per capita that can be attributed to the supply side's reaction to the delimitation. The right-hand-side figure shows the share of the total predicted circulation caused by news markets' reactions to political determinants and shows the share of the supply side in this reaction. See the text for more details.

of the total change.

Therefore, political motivation seems to be a very important factor in the evolution of newspaper circulation. In particular, the supply-side component represents by far the largest contributor to the evolution documented. This suggests that media owners' willingness to affect political life is an important determinant of the media markets. Note that, unfortunately, our data do not allow us to check if this political motivation of supply leads to biased coverage or manages to bias readers' behavior in any way.

6.3 Limitations of the data and additional robustness checks

The novel data set we built for this paper suffers from a number of limitations. First, we have only very limited information on newspapers' owners' characteristics (whether or not they are a COU), and have no data on the content of those newspapers. Therefore, we do not know whether (and how) newspaper owners are involved politically nor whether such involvement would bias newspaper content.

Therefore, we cannot draw conclusions about the quality of information available to readers as a consequence of the delimitation and leave this question to future research. Nor do we have

Figure 17: Decomposition between supply and demand responses to a change in electoral importance: News markets of increasing electoral importance. All India

(a) News markets' responses to a political shock, all India

(b) Decomposition into supply and demand, all India

Notes: The left-hand-side figure shows the regression-based predicted evolution of circulation per capita in India, the predicted circulation per capita had the delimitation not taken place, and the part of the increase of circulation per capita that can be attributed to the supply side's reaction to the increase in electoral importance. The right-hand-side figure shows the share of the total predicted circulation caused by news markets' reactions to political determinants and shows the share of the supply side in this reaction. See the text for more details.

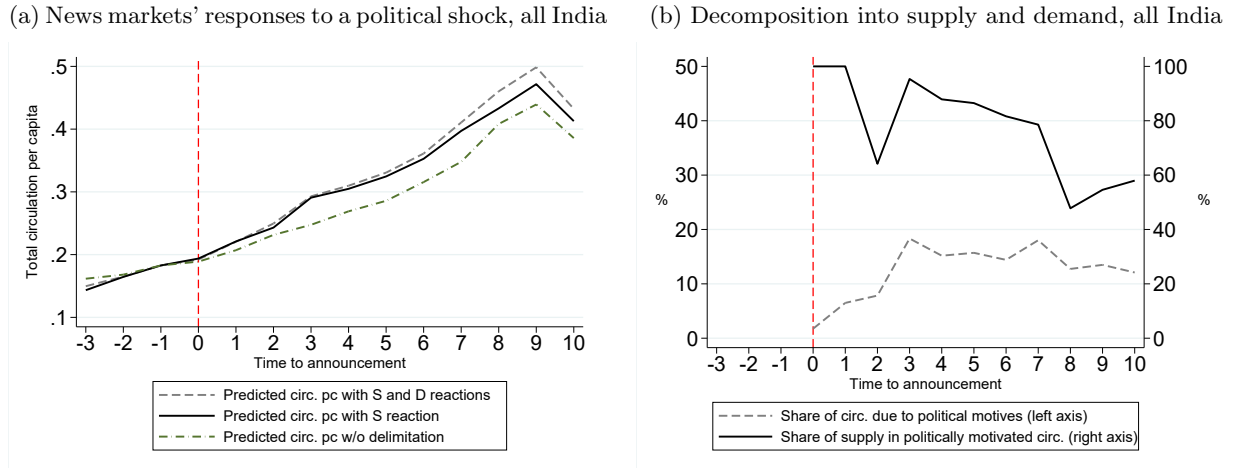information about the total page counts of newspapers or about the size of their newsrooms, which otherwise could be used as a proxy for their quality (see, e.g., Fan, 2013; Angelucci and Cagé, 2019).

Finally, we do not have information on the circulation and advertising prices for the newspapers in our data.[42] Therefore, we cannot analyze the price channels to further understand the change in newspaper circulation. Despite all these limitations that we fully acknowledge, the data set of Indian newspapers we built for this paper is, to the best of our knowledge, unprecedented, and we hope it will be useful to future researchers.

Note furthermore that we ensure that our results are robust to a large number of specifications and definitions of our sample and main variables of interest. In addition to what we already discussed, we show in the Online Appendix that our findings are unchanged if we use alternative definitions of the treatment group (Section D) or if we omit any state (Section E).

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[42]Data on newspaper prices are indeed not provided in the RNI that we use here as our main source of information. This information appears in the *Indian Newspaper Society Handbook* (INS), but unfortunately, these handbooks – unlike the information provided by the RNI – are far from being exhaustive. Only the media outlets that were willing to do so indeed decided to declare their numbers to the INS.

7   Conclusion

News and information have a major impact on electoral outcomes, the distribution of re-
sources, and the relative salience of political issues. Whereas there is a growing literature
on biased news and its consequences, little is known about the determinants of the entry or
expansion of media outlets in a given market. Media supply may vary depending on a host
of factors, including demographic patterns and economic incentives. It may also depend on
electoral incentives. Media owners, investors, and politicians might indeed be more interested
in shaping media markets if doing so gives them higher political benefits. In this paper, using
a novel data set and quasi-experimental evidence, we study the causal impact of a change
in the electoral importance of media markets on their evolution. We do so in the context
of India, the world's largest democracy and a country where the newspaper market is still
expanding.[43]

We document an increase in both the number of newspapers and the newspaper circulation
in markets that gained electoral importance. We show that a one-percentage-point increase in
the electoral importance of a district is associated with an increase in the newspaper circulation
per capita in that district corresponding to 50% of the mean. Interestingly, this increase is
almost immediate and continues over the ten-year period we look at after the delimitation
announcement.

We also find clear evidence of heterogeneity in the overall causal effect. We show that the
size of the effect varies depending on previous electoral dynamics and political actors. We also
find that its magnitude is stronger for COU newspapers and for newspapers whose language
is the same as the main language of the state.

These results have important implications for how we understand vote choice and demo-
cratic processes. Political information conveyed through media outlets shapes voters' ability
to make political choices and to hold politicians accountable. When not only the content of
existing news outlets are shaped by political interests but also the supply of news media, we
are faced with a reality where voters have a drastically different starting point for becoming
active political participants. Efforts to improve the information flow in democracies should

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[43]Interestingly, India is also a country where the entry of new media owners – such as Prime Minister
Narendra Modi's billionaire ally Gautam Adani, who recently took over NDTV – represents a challenge to
democracy.

be focused not only on fact-checking but also on the extent to which the entire media market is politicized.

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Appendices

A Data and sample

Table A.1: Overview of the delimitation process in Indian states

State code	State name	First meeting with associate members		Publication of draft proposal		First post-delim. state elections		Delimitation implemented
28	Andhra Pradesh	April	2005	January	2007	April	2009	1
12	Arunachal Pradesh	August	2005	July	2007	October	2009	0
18	Assam	May	2005	May	2007	April	2011	0
10	Bihar	October	2004	June	2007	November	2010	1
22	Chhattisgarh	June	2005	December	2005	November	2008	1
30	Goa	September	2004	November	2004	March	2012	1
24	Gujarat	May	2005	May	2006	December	2012	1
6	Haryana	December	2005	October	2006	October	2009	1
2	Himachal Pradesh	August	2005	March	2006	November	2012	1
1	Jammu & Kashmir							0
20	Jharkhand	November	2004	April	2007	December	2009	0
29	Karnataka	August	2005	March	2007	May	2008	1
32	Kerala	November	2004	March	2005	April	2011	1
23	Madhya Pradesh	August	2005	January	2007	November	2008	1
27	Maharashtra	August	2005	March	2006	October	2009	1
14	Manipur	August	2007			January	2012	0
17	Meghalaya	December	2005	March	2007	February	2013	1
15	Mizoram	December	2004	April	2005	December	2008	1
13	Nagaland	August	2005			March	2008	0
7	NCT of Delhi	July	2005	January	2006	November	2008	1
21	Orissa	May	2005	March	2006	April	2009	1
34	Puducherry	August	2004	October	2004	April	2011	1
3	Punjab	May	2005	December	2005	January	2012	1
8	Rajasthan	April	2005	August	2005	December	2008	1
11	Sikkim	September	2004	August	2005	April	2009	1
33	Tamil Nadu	January	2005	April	2007	April	2011	1
16	Tripura	November	2004	February	2005	February	2013	1
5	Uttaranchal	June	2005	September	2006	January	2012	1
9	Uttar Pradesh	March	2005	July	2006	February	2012	1
19	West Bengal	March	2005	August	2005	April	2011	1

Notes: The state code refers to the code used in the Indian census in 2001 and 2011. The first meeting with associate members (five MLAs and five MPs) in each state (from Delimitation Commission of India, 2008) is what we consider the first leak of the new delimitation. The publication of the draft proposal (from Delimitation Commission of India, 2008) is the first public announcement of the delimitation. A few states did not have, or did not implement, a delimitation; these are coded 0.

Details on data construction Districts' boundaries have changed over time as new districts were formed. Such boundary changes affect the construction of our data in three ways. First, whereas the district that a constituency was in after the delimitation was coded based on information from the 2008 Delimitation report (Delimitation Commission of India, 2008), we could not do the same for pre-delimitation constituencies, because several districts had changed since the publication of the previous Delimitation report in the 1970s (GOI, 1976). Instead, we assigned the pre-delimitation constituencies

to districts from the 2001 census by overlaying GIS maps.[44] *Electoral importance* for both the pre- and post-delimitation periods was calculated as the number of constituencies in a district divided by the total number of state assembly constituencies in the state. Second, to create district-level controls based on data from the 2001 and 2011 censuses, we had to take into account how districts split during that period. We did so by aggregating 2011 census data to the 2001 district level. Third, since our newspaper data are at the city level and since two cities (Delhi and Mumbai) overlap with more than one district, the districts across which those cities were spread were aggregated. Delhi, however, is not in our final sample since the Delhi territory is a single newspaper market.

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[44]The maps have been created by MLInfo, and were accessed through the library of Harvard University.

Figure A.1: Original structure of the digitized newspaper data from the Press in India report

|					
77	68702	NIBHA	HINDI	MONTHLY	VAISHALI/ HAJIPUR	200
78	68715	RAVEENA	HINDI	MONTHLY	VAISHALI/ HAJIPUR	200
79	131679	MORNING INDIA	ENGLISH	DAILY	PATNA	45320
80	139509	BIHAR KATHA	HINDI	WEEKLY	GOPALGANJ	15700
81	128905	SANATAN SURSARI	HINDI	MONTHLY	ARA	500
82	122238	AWAZ E BIHAR	URDU	DAILY	PATNA	26475
83	102729	ANG BHARAT	HINDI	DAILY	BHAGALPUR	66000
84	131716	KHOJI PATRIKA	HINDI	DAILY	PATNA	17000
85	125108	DAINIK BHASKAR	HINDI	DAILY	PATNA	284744
86	124896	SUNAMI TIMES	HINDI	MONTHLY	PATNA	24100
87	109745	PRABHAT KHABAR	HINDI	DAILY	BHAGALPUR	90206
88	90639	RASHTRIYA SAHARA	HINDI	DAILY	PATNA	69957
89	137378	TIMES TO TIMES	HINDI	MONTHLY	PATNA	24025
90	105943	VISHWA NAAI SANDESH	HINDI	MONTHLY	PATNA	8500
91	96615	DESH VANI	HINDI	WEEKLY	MOTIHARI(EAST CHAMPARAN)	11500
92	120612	LIKHATE RAHO	HINDI	WEEKLY	MUZAFFARPUR	20200
93	130689	HAMARI NAZAR	HINDI	DAILY	BEGUSARAI	24800
94	137636	DUR AUR PAAS	HINDI	DAILY	PATNA	13800
95	105875	PRATAH SANDESH	HINDI	DAILY	DARBHANGA	75400
96	136640	MAITHIL AMAR VANI	BILINGUAL	WEEKLY	DARBHANGA	2000
97	93484	PRATYUSH NAVBIHAR	HINDI	DAILY	PATNA-1	36000
98	127389	AZIZ TANZIM	URDU	DAILY	PATNA	15500
99	126420	MEDIA DARSHAN	HINDI	DAILY	ROHTAS	78960
100	136103	INSIGHT MITHILA	HINDI	WEEKLY	DARBHANGA	2000
101	72587	ASIAN TIMES	HINDI	FORTNIGHTLY	PATNA	24600
102	113616	IQRA KHABAR	URDU	DAILY	PATNA	16700
103	102724	SIYASAT PANCHAYAT	HINDI	FORTNIGHTLY	PATNA	2510
104	115576	WORKING MEDIA	BILINGUAL	MONTHLY	PATNA	25000
105	139922	ABHINAV PRABHA	HINDI	MONTHLY	MUZAFFARPUR	10000
106	136116	INQUILAB E HIND	HINDI	DAILY	KATIHAR	1900
107	122825	GHAR GHAR KI AAWAZ	URDU	DAILY	PATNA	37430
108	99457	ARDH VIRAM	HINDI	DAILY	PATNA	16375
109	96576	AKHBARE KASHIF	URDU	FORTNIGHTLY	PATNA	2000
110	132839	WAQAR E HIND	URDU	DAILY	PATNA	43075
111	105563	DAUR E JADEED	URDU	DAILY	PATNA	26000
112	139879	THE BIHAR MANTHAN	HINDI	DAILY	PATNA	22725
113	123875	JADEED HINDUSTAN	URDU	DAILY	PATNA	15400
114	126962	TAASIR	URDU	DAILY	MUZAFFARPUR	44995
115	119746	DAINIK JAGRAN	HINDI	DAILY	BHAGALPUR	184140
116	113847	DAINIK BHASKAR	HINDI	DAILY	GAYA	65886
117	126121	SADA E BIHAR	URDU	DAILY	PATNA	15800
118	81587	TARUN MITRA	HINDI	DAILY	PATNA	69361
119	132114	ANUPAM SANDESH	HINDI	DAILY	MUZAFFARPUR	5200
120	126490	SUNAMI EXPRESS	HINDI	WEEKLY	PATNA	23475
121	109806	PRABHAT KHABAR	HINDI	DAILY	MUZAFFARPUR	117109
122	134923	PIYARI TANZEEM	URDU	DAILY	PATNA	36700
123	140232	HALAT E INDIA	URDU	DAILY	PATNA	2000
124	138948	ANIL SANDESH	HINDI	MONTHLY	BHAGALPUR	9000
125	135353	PRATAH SAMWAD	HINDI	DAILY	PATNA	15200
126	130066	MOASHRAH	URDU	DAILY	PATNA	42850
127	129190	THE ECONOMIC TIMES ON SATURDAY	ENGLISH	WEEKLY	PATNA	2292
128	144537	SADA E AWAM	URDU	DAILY	GAYA	25300
129	147030	JAN JOSH	HINDI	WEEKLY	GAYA	1875
130	116784	AMAN CHAIN	URDU	DAILY	PATNA	44580
131	129629	DAINIK NYAY MARG	HINDI	DAILY	PATNA	26000
132	125436	SAMPURNA JAGRAN	HINDI	DAILY	BETTIAH	500
133	115638	THE MEDIA TIMES	BILINGUAL	MONTHLY	PATNA	25000
134	134378	HAMARA METRO	HINDI	DAILY	PATNA	500
135	136366	IMARAT E TANZEEM	URDU	DAILY	PATNA	15530
136	146313	MOIN EXPRESS	URDU	DAILY	PATNA	16530
137	142115	JAN PRAHARI TIMES	HINDI	MONTHLY	PATNA	18686
138	131301	ARYAVARTA EXPRESS	HINDI	WEEKLY	PATNA	30900
139	129424	THE ECONOMIC TIMES	ENGLISH	DAILY	PATNA	3339
140	139093	ATULYA HINDUSTAN	HINDI	DAILY	DARBHANGA	24300
141	137779	THE NEWS HERALD	HINDI	DAILY	PATNA	1800
142	139534	SANJEEVANI BIHAR	HINDI	FORTNIGHTLY	SAMASTIPUR	11000

3

B   Additional figures

Figure A.2: Districts' change in the number of constituencies following the 2008 Delimitation
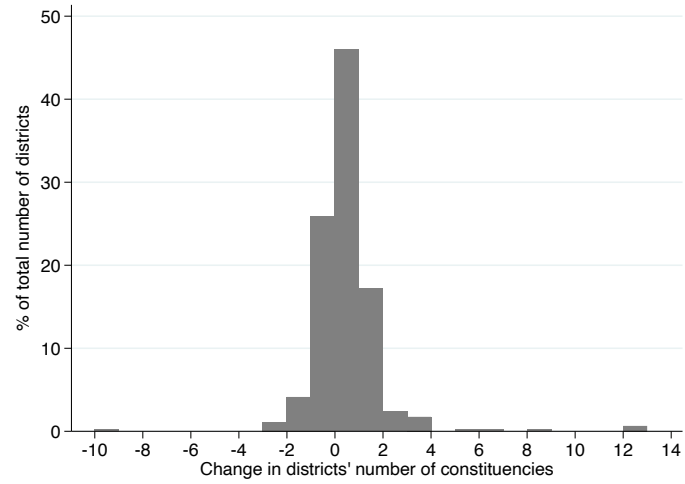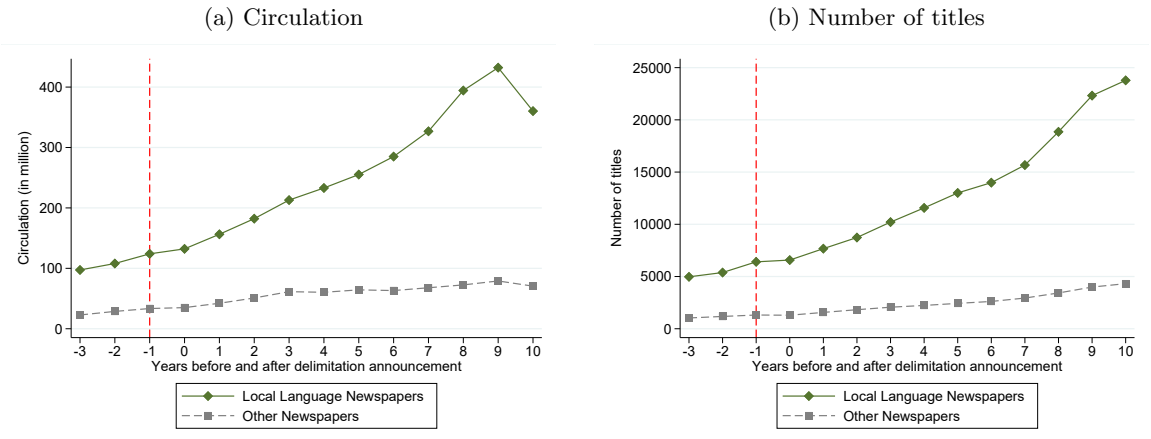

Notes: The figure presents the distribution of the changes in the districts' number of constituencies. Each observation is a district, and bins are of size 1.

Figure A.3: Evolution of the circulation and number of titles of the COU newspapers and other newspapers
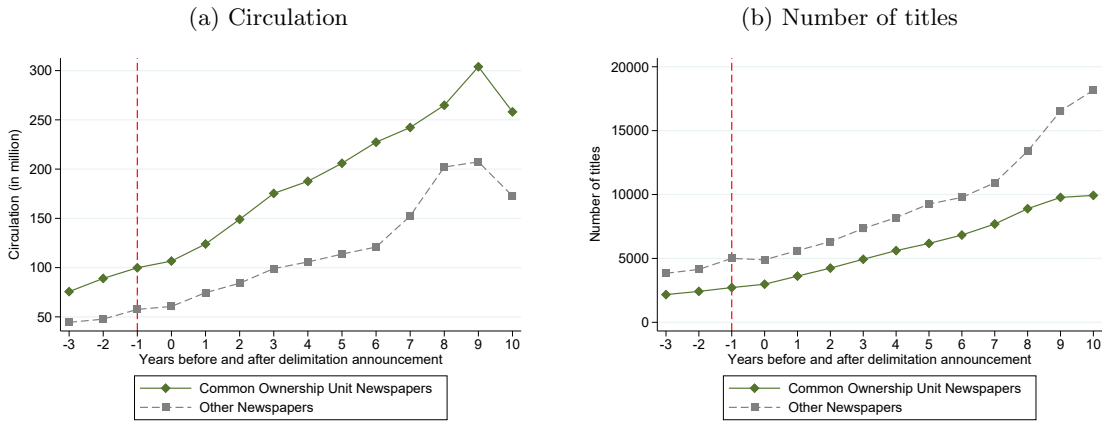
(a) Circulation

(b) Number of titles

Notes: The figure presents the overall evolution of circulation and number of titles in India, decomposed between newspapers belonging to COUs and other newspapers. Source: RNI reports and authors' computation. Period: 2002–2017.

Figure A.4: Evolution of the circulation and number of titles of the local-language and other-language newspapers

(a) Circulation

(b) Number of titles

Notes: The figure presents the overall evolution of circulation and number of titles in India, decomposed between journals published in their state's official language and others. Source: RNI reports and authors' computation. Period: 2002–2017.

C Additional descriptive statistics

Table A.2 presents the summary statistics of the market-year-level controls used in the paper.

Table A.2: Summary statistics on control variables

|	Mean	St.Dev	P25	Median	P75	Max	N
Control variables							
Pop. 6+	2,037,883	1,698,012	1,092,752	1,649,239	2,625,862	25,210,414	6,426
Literacy rate	0.71	0.11	0.64	0.72	0.79	0.98	6,426
Share of rural pop.	0.75	0.18	0.68	0.79	0.88	1.00	6,426
Share of SC	0.18	0.08	0.13	0.18	0.22	0.50	6,426
Share of ST	0.10	0.17	0.00	0.02	0.12	0.95	6,426
Share constituencies reserved for SC	0.17	0.13	0.09	0.17	0.25	1.00	6,426
Share constituencies reserved for ST	0.10	0.24	0.00	0.00	0.00	1.00	6,426

Notes: The table gives summary statistics for media markets. An observation is a market-year.

D   Alternative definitions of the treatment group

In the event study of Section 4, we define the treatment group as all markets whose electoral importance was reported to have increased after delimitation. An alternative would be to use a continuous measure of treatment. Figure A.5 reproduces Figure 7 of Section 4 using the actual difference of electoral importance rather than a dummy. Results remain qualitatively similar.

In addition, our outcomes are the variables of interest (newspapers per capita and titles per 10,000 inhabitants) with no transformation. To check if outliers in these variables might drive the results, we reproduce here our main results using their inverse hyperbolic sine transformation. Figure A.6 presents the event-study analysis using these transformed variables. Results remain qualitatively similar.

Figure A.5: Change in electoral importance and evolution of news markets: Event-study analysis. Continuous treatment.
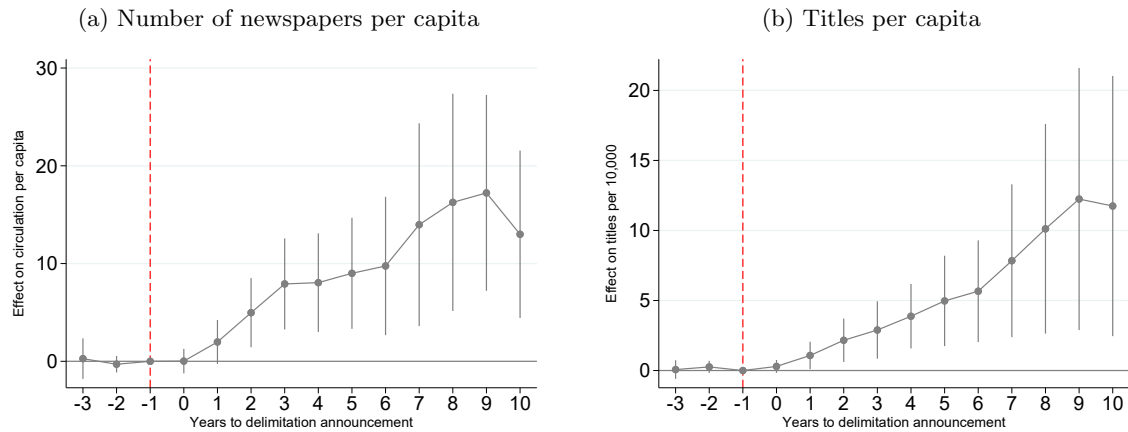
(a) Number of newspapers per capita   (b) Titles per capita

Notes: The figure shows the coefficients from a regression of circulation per capita and number of newspapers per capita on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance (see equation 1 for details). The model includes time-varying district controls, district fixed effects, and state-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

Figure A.6: Change in electoral importance and evolution of news markets: Event-study analysis. IHS outcomes.
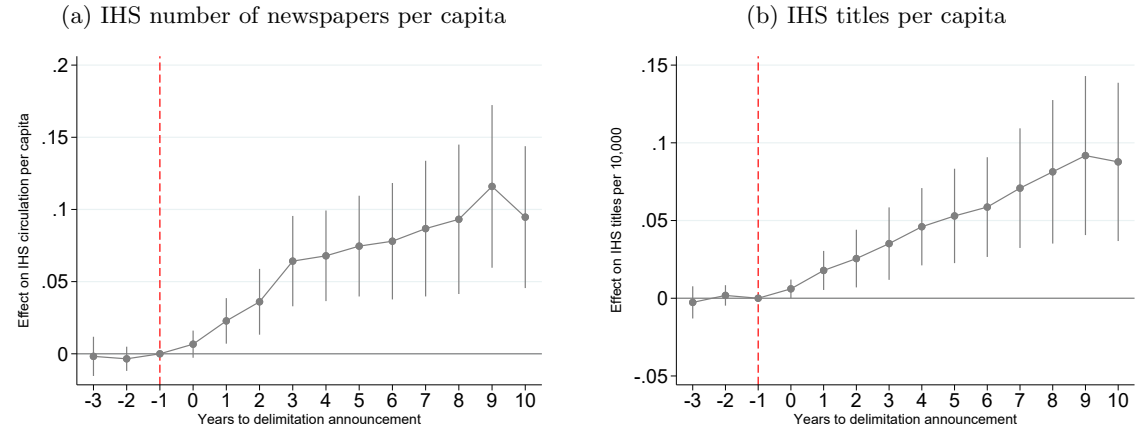
(a) IHS number of newspapers per capita

(b) IHS titles per capita

Notes: The figure shows the coefficients from a regression of circulation per capita and number of newspapers per capita on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance (see equation 1 for details). The model includes time-varying district controls, district fixed effects, and state-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

E Robustness to state removal

We test here if our results are robust to the omission of any single state, starting with the specific case of Andhra Pradesh, which is split in 2014 with the creation of Telangana. We then check if our results are robust to the omission of any single state.

E.1 Robustness to the omission of Andhra Pradesh

In 2014, the state of Andhra Pradesh was split into Andhra Pradesh and Telangana. While the new constituencies created with the delimitation remained unchanged, this split is likely to have altered the political equilibria in both states.

In this section, we show that our main results are unaffected by the omission of these states. Figure A.7 and Table A.3 show our main event-study and difference-in-differences specifications run without Andhra Pradesh. Results are qualitatively similar.

Figure A.7: Change in electoral importance and evolution of news markets: Event-study analysis omitting Andhra Pradesh
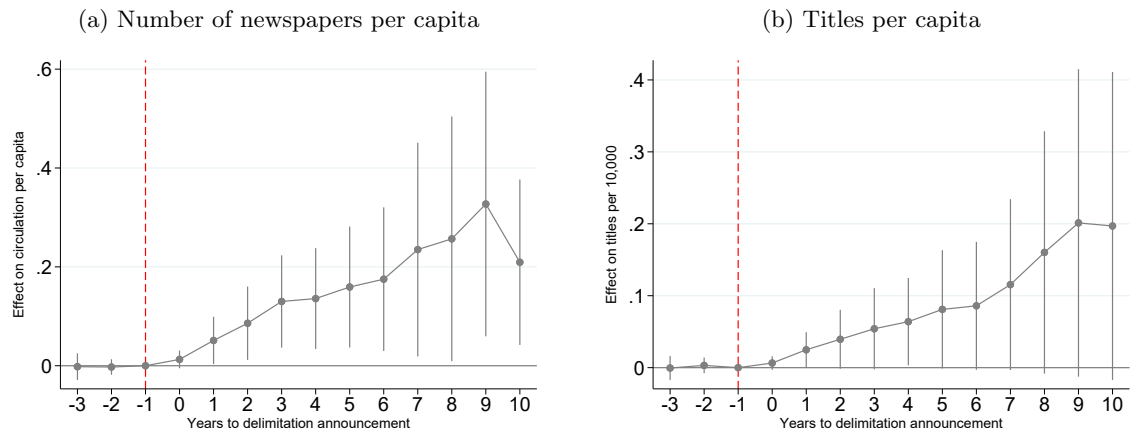
(a) Number of newspapers per capita

(b) Titles per capita

Notes: The figure shows the coefficients from a regression of circulation per capita and number of newspapers per capita on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance (see equation 1 for details). The model includes time-varying district controls, district fixed effects, and state-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

E.2 Robustness to the omission of any state

We now generalize the approach above by reproducing our event-study approach, removing each state one by one. This approach allows us to see whether our findings are driven by one specific state. Figure A.8 presents the results of these 18 different event studies. For readability, we omit the confidence

Table A.3: Change in electoral importance and evolution of news markets: Difference-in-differences omitting Andhra Pradesh.
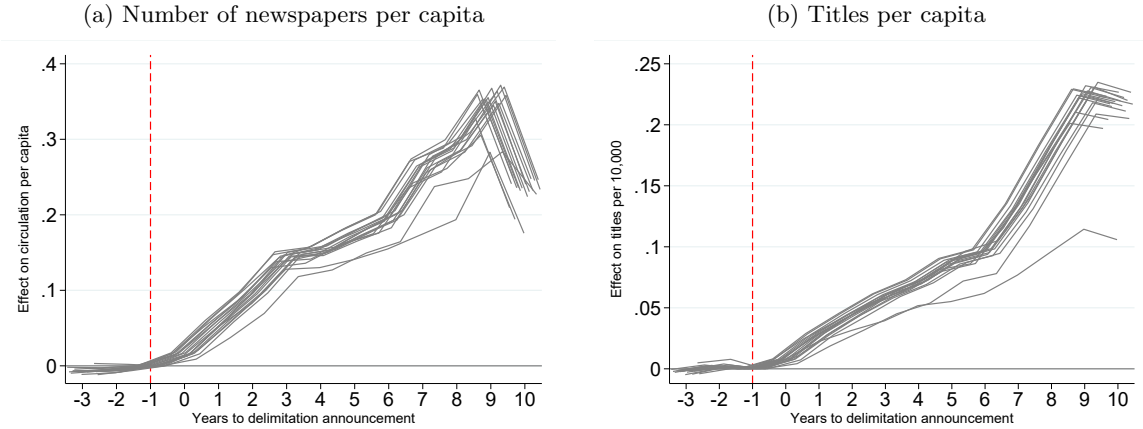
A: Circulation per capita

	Circulation per capita				IHS Circulation per capita			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post * Increase	0.18**	0.16*			0.07***	0.06***		
	(0.08)	(0.08)			(0.02)	(0.02)		
Post * Difference			8.53***	5.82*			4.33***	3.28***
			(3.23)	(3.08)			(1.10)	(1.12)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.79	0.80	0.79	0.80	0.91	0.92	0.91	0.92
Observations	6,104	6,104	6,104	6,104	6,104	6,104	6,104	6,104
Mean DepVar	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sd DepVar	0.7	0.7	0.7	0.7	0.3	0.3	0.3	0.3

B: Titles per 10,000 inhabitants

	Titles per 10,000				IHS Titles per 10,000			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post * Increase	0.10*	0.09			0.05***	0.04**		
	(0.06)	(0.06)			(0.02)	(0.02)		
Post * Difference			5.38**	3.88*			3.09***	2.43***
			(2.42)	(2.27)			(0.91)	(0.88)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.75	0.76	0.75	0.75	0.90	0.91	0.90	0.91
Observations	6,104	6,104	6,104	6,104	6,104	6,104	6,104	6,104
Mean DepVar	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sd DepVar	0.5	0.5	0.5	0.5	0.2	0.2	0.2	0.2

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables are the newspaper circulation per capita and its inverse hyperbolic sine transformation (first panel), and the number of newspapers per 10,000 inhabitants and its inverse hyperbolic sine transformation (second panel). "Difference" is the difference in the share of ACs in the state assembly coming from district d after delimitation. Increase is an indicator variable equal to 1 if district d will see its electoral importance increase, and equal to zero otherwise. Models are estimated using OLS estimations. The unit of observation is a district period. All models include district and state-year fixed effects. Time-varying state-level controls are literacy rate, urbanization rate, share of SC, share of ST, population aged 6+, share of ACs reserved for SC, and share of ACs reserved for ST. Standard errors in parentheses are clustered at the district level.

Figure A.8: Change in electoral importance and evolution of news markets: Event-study analysis omitting one state at a time.


(a) Number of newspapers per capita

(b) Titles per capita

Notes: Each line in the figure shows the coefficients from a regression, omitting one state, of circulation per capita and number of newspapers per capita on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance (see equation 1 for details). The model includes time-varying district controls, district fixed effects, and state-year fixed effects. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.

intervals. Results remain qualitatively similar no matter which state is omitted.

F   Robustness to staggered design reweighting

In Section 4.3, we showed that our results were robust to the staggered design reweighting suggested by de Chaisemartin and D'Haultfœuille (2020). We show here that our results are also robust to the different reweighting suggested by Borusyak et al. (2022). Figure A.9 presents the results. They are very similar to those of our main approach, as shown in Figure 7, and to those using de Chaisemartin and D'Haultfœuille (2020)'s approach and shown in Figure 8.

Figure A.9: Change in electoral importance and evolution of news markets. Event-study analysis, staggered design robustness check as suggested in Borusyak et al. (2022).
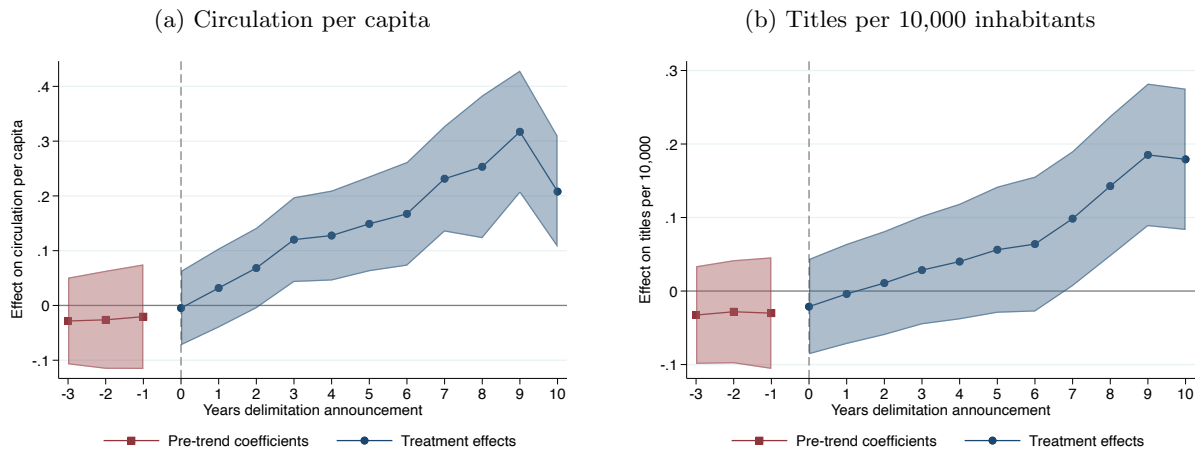
(a) Circulation per capita   (b) Titles per 10,000 inhabitants

Notes: The figure shows the coefficients from a regression of circulation per capita and number of titles per 10,000 inhabitants on a vector of leads and lags of the delimitation announcement interacted with the announced change in electoral importance (see equation 1 for details) using the reweighting suggested in Borusyak et al. (2022). The model includes time-varying district controls, district fixed effects, and state-year fixed effects. Error bars are 90% confidence intervals. Standard errors are clustered at the district level. The time period is 2002–2017 and the panel is balanced with respect to the time before and the time after the delimitation announcement.