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# Media competition, information provision and political participation: Evidence from French local newspapers and elections, 1944–2014<sup>☆</sup>

Julia Cagé\*

Sciences Po Paris, France  
CEPR, United Kingdom

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## ABSTRACT

This paper investigates the impact of increased media competition on the quantity and quality of news provided and, ultimately, on political participation. I build a new county-level panel dataset of local newspaper presence, newspapers' number of journalists, costs and revenues and political turnout in France, from 1944 to 2014. I estimate the effect of newspaper entry by comparing counties that experience entry to similar counties in the same years that do not. Both sets of counties exhibit similar trends prior to entry, but those with entry experience substantial declines in the average number of journalists. An increased number of newspapers is also associated with fewer articles and less hard news provision. Newspaper entry, and the associated decline in information provision, is ultimately found to decrease voter turnout at local elections. Exploiting the long time span covered by my data, I discuss a number of mechanisms that may drive these empirical findings. First, I examine the relationship between increased competition and media capture in the aftermath of WW2, when newspapers were biased and the advertising market was underdeveloped. I then show that in the recent period the effects are stronger in counties with more homogeneous populations, as predicted by a vertical product differentiation framework, whereas there is little impact in counties with more heterogeneous populations.

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\* Sciences Po Paris, France.

E-mail address: [julia.cage@sciencespo.fr](mailto:julia.cage@sciencespo.fr) (J. Cagé).

## 1. Introduction

Will an increase in competition in the marketplace for news and ideas – triggered by technical change and information technologies – lead to a better coverage of general information and an increase in political participation? Or might it have the opposite outcome? This paper investigates the consequences of an increase in the number of media outlets on the quantity and quality of news provided and, ultimately, changes in voter turnout at elections.

More media competition is often thought to imply an increase in the dissemination of information, thereby enhancing the extent of ideological diversity, promoting truth and contributing to the political process. In this spirit, recent studies in political economy have advanced the existence of a positive causal link between radio and newspaper entry and political participation (Strömberg, 2004b; Oberholzer-Gee and Waldfogel, 2009; Gentzkow et al., 2011). However, the focus of these studies is on media access – the move from 0 to 1 media outlet. Instead, in this paper, I consider media competition – the move from  $n > 0$  to  $n + 1$  media outlets. There is indeed

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no reason to expect that the intensive margin of the media acts as the extensive margin; in particular because media competition may affect the content of media outlets.

To tackle these questions, I build a new panel of local daily newspapers and local election turnout in France from 1944 to 2014. For several reasons, the French local daily newspaper industry is well suited to testing the impact of media competition on turnout at local elections. First, given that on average over 70% of the eligible voters in a county<sup>1</sup> read a local daily newspaper every day, this industry may be key to political participation at the local level. Newspapers are arguably the most important form of local media when it comes to local news and public affairs (see e.g. Snyder and Stromberg, 2010). Television and radio rarely allocate more than a few seconds to a local news story (Hess, 1991). Contrariwise, local daily newspapers in France tend to publish several editions: while these editions share a number of “national” or “regional” pages, several local news pages vary from one edition to the other. Second, during this time period, I observe many entries and exits of newspapers that I can use for identification. Finally, I choose to focus on this industry because of the availability of excellent data.

My dataset includes every local daily newspaper published in France between 1944 and 2014. I determine for each year the number of newspapers present in each French county – the natural news market; I collect annual data on each paper’s location and circulation. I also put together annual information on the total number of journalists working for each newspaper. Furthermore, for the sub-period 1960–2014, I collect annual information on each paper’s costs and revenues, as well as on the journalists’ monthly gross salary.<sup>2</sup> I use this data to quantify the effect of entry on the quality of newspapers; following the existing literature, I use the number of journalists on staff as my first proxy for newspaper quality (see e.g. Hamilton, 2004; Berry and Waldfogel, 2010; Angelucci and Cagé, 2019; Cagé et al., 2017). I supplement this data for recent years (2005–2012) with measures of newspaper content, in particular of the size of newspapers (number of articles and of words). I use the quantity of news as my second proxy for newspaper quality; indeed, more content is presumably always preferred to less (see e.g. Berry and Waldfogel, 2010). Finally, I use newspaper content data to classify each article as hard news or soft news.<sup>3</sup> Hard news corresponds to public affairs news, for example national and international news or economic news, and tends to be regarded as informative in the political process. On the contrary, soft news corresponds to entertainment or commodity news, say about sports or fashion.

The first empirical challenge is to isolate the impact of newspaper entry on incumbent newspapers. My identification strategy uses the timing of entries as shocks affecting incumbents. I estimate the effect of newspaper entry by comparing counties that experience an entry to similar counties in the same years that do not. Because the entry decision is made to maximize profits, counties that experience an entry are likely to differ from other counties, both at the time of entry and in future periods. The identifying assumption is that newspapers in these other counties form a valid counterfactual

for the incumbent newspapers in counties that experience an entry, after conditioning for differences in preexisting trends, newspaper fixed effects, year fixed effects, and a large set of demographic covariates controlling for the age composition, occupational structure and educational level of counties. In particular, I show that counties that experience entry and these counterfactual counties exhibit similar trends in circulation, revenues, expenses, and number of journalists prior to newspaper entry. I use both aggregate event studies and a fixed-effect model allowing for time-varying effects of entry to perform this analysis.

I show that entry reduces the circulation of incumbent newspapers by nearly 20%. This leads to a 38 to 43% decrease in incumbent newspapers’ revenues and expenses and a 19 to 35% decrease in the number of journalists working for incumbent newspapers. Moreover, this decrease in the number of journalists is not compensated by an overall increase in the aggregate number of journalists working at the news-market level. I provide anecdotal evidence of a “switching effect”, with a number of journalists working for the incumbent newspaper’s newsroom switching to the entrant’s one. Furthermore, using data for recent years (2005–2012), I show that an additional newspaper leads to a 16 to 53% decrease in newspapers’ size (depending on the measures used: number of articles, number of words, etc.), to a 9 to 13% decrease in the share of hard news and to a 25 to 32% decrease in the amount of hard news.

Finally, I look into the impact of media competition on participation at elections. I match my data on the number of local newspapers with city-level data on turnout at mayoral elections that I digitize from official records.<sup>4</sup> My empirical strategy follows Gentzkow et al. (2011). I look at changes in political participation in cities that experience a newspaper entry or exit relative to other cities in the same region and year that do not. I find that an increase in newspaper competition has a robust negative impact on local election turnout, with one additional newspaper decreasing turnout by approximately 0.3 percentage points. This effect is robust to a range of alternative specifications and controls, which brings confidence in interpreting it as being causal.

To sum up, I show that increased media competition is associated with a decline in information provision and a decrease in voter turnout at local elections. Ultimately, I take advantage of the richness of my data covering various newspapers over a long time span, and discuss a number of theoretical mechanisms that may drive these empirical findings depending on the historical moment. First I collect data on each newspaper’s political bias. In the aftermath of World War II, many local newspapers were the political organs of parties in France. Being controlled by political interests, they were guided both by a profit motive and by political aspirations. Under conditions of low potential advertising revenues available to media, increased competition may have led to a greater supply of biased news, and a decrease in readers’ willingness-to-pay. Focusing on the post-war period (1944–1958) I find that, in line with this prediction, the decline in circulation generated by entry is larger for partisan than for independent newspapers.

The Fifth Republic marked the end of biased coverage for local newspapers in France. In a context where newspapers deliver news preferred by consumers, vertical product differentiation provides an alternative simple explanation for the heretofore puzzling negative impact of increased media competition. I lay out a simple theoretical framework with heterogeneous consumers and two profit-maximizing newspapers facing quality-dependent fixed

<sup>1</sup> In this paper, for the sake of simplicity, I use the term “county” when referring to a “département”. In the administrative division of France, a “département” corresponds roughly to a county in the United States.

<sup>2</sup> To give a flavor of what is generally available in terms of newspaper cost and revenue data, it is worth remembering that in their study of how economic incentives shape ideological diversity in the media, Gentzkow et al. (2014) have no other choice but to use balance sheet data on anonymous newspapers that they match with newspapers using circulation value. In contrast, I have actual annual balance sheet data for French local daily newspapers from 1960 to 2014. Moreover, to the extent of my knowledge, I am the very first to provide detailed historical information on the annual number of journalists at the newspaper level.

<sup>3</sup> I use the term “hard” here in the colloquial and political science meaning of hardness as a measure of information content. Hard does not mean hard in the economic sense of verifiability.

<sup>4</sup> City-level data on turnout at mayoral elections is hardly available in the United States. Ferreira and Gyourko (2009) collect information on mayoral elections between 1950 and 2005 in over 400 cities which is, to the extent of my knowledge, the most complete dataset as of today.

costs.<sup>5</sup> When heterogeneity in consumers' willingness-to-pay is high, the market is not covered under competition. The entrant expands the market and newspapers differentiate on quality to soften price competition and increase market power. One duopolist produces a lower-quality newspaper than the monopolist, and the other one a higher-quality newspaper. In contrast, when heterogeneity is low, the market is covered under competition. In the extreme case of no heterogeneity, the entrant garners half of the market and halves the incumbent newspaper's circulation. Both duopolists produce a lower-quality newspaper than the monopolist. As predicted by this simple theoretical framework, I find that business stealing is particularly strong in low-heterogeneity areas with a 44% drop in the circulation of incumbent newspapers following entry. The extent of heterogeneity in the willingness-to-pay across counties is measured by regional-level income inequality (using exhaustive income tax data). Similarly, the drop in the size of the newsroom is 50% in low-heterogeneity counties.

## Literature review

My results complement a growing literature on media and politics. Considering different media outlets, a number of papers have found that media access increases political participation (Strömberg, 2004b; Gentzkow, 2006; Oberholzer-Gee and Waldfogel, 2009; Schulhofer-Wohl and Garrido, 2013; Banerjee et al., 2010; Snyder and Stromberg, 2010; Gentzkow et al., 2011). My paper contributes to this literature by studying the non-monotonicity of this finding. Moving from 0 to 1 newspaper (media access) can have very different effects than moving from  $n > 0$  to  $n + 1$  newspapers (media competition). Under certain conditions, an increase in the competitiveness of the market may indeed lead to a "race to the bottom" with a dumbing-down of newspaper content and a decrease in political participation (Zaller, 1999; Arnold, 2002). Considering the intensive margin of the media is thus of particular importance in today's high-choice media environment. George and Waldfogel (2006) show that the expansion of *The New York Times* led to substitution away from local newspapers among high-income readers, also affecting local newspapers' positioning.

To the extent of my knowledge, Drago et al. (2014) is the only paper to study the effect of newspaper competition on electoral participation beyond the effect of newspaper access.<sup>6</sup> They find that the entry of local newspapers leads to an increase in turnout in municipal elections in Italy. They also find that it increases total readership per capita, which may explain the increase in turnout they obtain and might be due to high heterogeneity of Italian readership.<sup>7</sup> Investigating whether the impact of competition varies with the extent of heterogeneity in consumer's willingness-to-pay is the second contribution of my paper.

While existing literature has focused on the economic incentives that shape ideological diversity in the media (Strömberg, 2004a; Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006; Anand et al., 2007; Gentzkow et al., 2014; Qin et al., 2018), I test empirically how an increase in the number of newspapers in a news market affects the quality of newspapers (the size of the newsroom and the number of articles) and the share of hard news in

newspapers' content. I document a negative relationship between media competition and the quantity and quality of news produced. I highlight two different mechanisms that may help rationalize this finding, and that are specific to different "stages of development" of newspapers (to use Petrova's (2008) terminology). The time period covered by my data is indeed characterized first by a media system in which newspapers depended on the political parties (roughly speaking the Fourth Republic), and then by the rise of nonpartisan reporting (since the end of the 1950s).

In the 1940s–1950s, most local newspapers were the organs of political parties. An important literature uncovers a negative relationship between competition and media capture. Theoretically, Besley and Prat (2006) show that competition decreases the government's ability to silence the media. Empirically, Bignon and Flandreau (2014), considering interwar France, underscore the quality effects of newspaper competition. Likewise, Djankov et al. (2003) highlight that "competition among media firms assures that voters, consumers, and investors obtain (...) unbiased and accurate information." In other words, an increase in the number of media outlets should result in more accountability and stronger checks and balances. On the contrary, this paper shows that an increase in media competition has led historically to a decrease in readers' willingness-to-pay and in newspaper quality. At the time of the Fourth Republic, the advertising market was underdeveloped in France. The further drop in advertising revenues generated by newspaper entry may have led to an increase in media bias — as predicted by Petrova (2012) when the special interest group does not care about the size of the audience — and a decline in readers' willingness-to-pay.<sup>8</sup> In line with this reasoning, I show that the negative effects of increased competition are stronger for partisan than for independent newspapers.

The French local newspaper industry is characterized by the rise of nonpartisan reporting in the 1960s–1970s. Despite the weakening of media capture, the negative relationship between increased competition and the quality of news produced still holds. With depoliticization, the focus of newspapers shifts entirely to local information. Newspaper readers are better described at that time as heterogeneous consumers who differ *vertically* in their willingness-to-pay for quality rather than *horizontally* in their political bias. From this point of view, my paper is related to the research on product quality in the context of vertical consumer heterogeneity (Shaked and Sutton, 1982; Tirole, 1988; Choi and Shin, 1992; Motta, 1993).

Finally, my findings on participation in local elections relate to studies by Falck et al. (2014), Gavazza et al. (2018) and Campante et al. (2017), who all estimate a negative effect of the introduction of the internet on turnout, due to a substitution away from media with greater news content.<sup>9</sup> Increased competition in the media market — or reciprocally, ownership consolidation through mergers (Fan, 2013) — may affect media outlets' content decision. Using evidence from radio broadcasting, Berry and Waldfogel (2001) find that increased concentration increases variety.<sup>10</sup> Similarly, Berry and Waldfogel (2010) show that in daily newspapers, the average quality

<sup>5</sup> Newspapers first choose simultaneously their quality and then compete simultaneously in price. Consumers are heterogeneous with respect to their willingness-to-pay for newspaper quality.

<sup>6</sup> Becker and Milbourn (2011) study the effect of increased competition in the ratings industry on the quality of ratings and find that it tends to decrease this quality.

<sup>7</sup> An alternative explanation is that increased competition decreased the capture of Italian media, and so increased readers' willingness-to-pay (to the extent that readers are adversely impacted by capture, a point well made by Bignon and Flandreau (2014) in the context of interwar France).

<sup>8</sup> Another mechanism may have been at play. Theoretically, Neven and Thisse (1989) have shown that when firms (here newspapers) compete both vertically on quality and horizontally on variety (here bias), they choose maximum differentiation on the political dimension and provide minimum quality if the horizontal range is broad enough relative to the quality range. Political polarization indeed allows the media to escape price competition. Obviously, these different interpretations are not mutually exclusive.

<sup>9</sup> See also Gentzkow (2006) and Prior (2005), who find that once television and cable TV, respectively, become available to US viewers, some of them stop watching news programs and sort into entertainment programs. Enikolopov et al. (2011) show that exposure to an independent TV news channel reduces turnout in parliamentary elections in Russia.

<sup>10</sup> See also DellaVigna and Hermle (2017) on media concentration and bias coverage.

of products increases with market size, but that the market does not offer much additional variety as it grows larger. Angelucci and Cagé (2019) document a negative effect of the introduction of advertising on French television on the amount of journalistic-intensive content produced by national newspapers, as proxied by the size of their newsroom. George (2007) also uses data on reporters when studying how differentiation and variety increase with concentration in markets for daily newspapers. This paper differs from this past empirical work in the direct use of media content to measure the size of newspapers and the shares of hard and soft news, in the large sample of media outlets I cover (287 newspapers), and in my ability to study these effects over a long period of time (1944–2014).

The remainder of the paper is organized as follows. In Section 2, I describe the French local daily newspaper industry, provide evidence on turnout at local elections, and review the new dataset I build for this study. In Section 3, I study empirically the impact of an entry on the quality of newspapers and on the content they produce. Section 4 describes the different mechanisms that may help rationalize the negative relationship between newspaper competition and information provision I uncover. In Section 5, I investigate the impact of changes in the number of newspapers on turnout at local elections. Section 6 discusses alternative mechanisms and external validity. Section 7 concludes. Finally, the paper is supplemented by an extensive online Appendix including all details of data sources and empirical specifications, as well as a full-fledged theoretical model and associated formal propositions and proofs.

## 2. Local daily newspapers and local elections in France: historical background, data and descriptive statistics

As stated in the introduction, the French local daily newspaper industry is particularly interesting to study because of the importance of this industry and the availability of high-quality data. I construct an annual dataset on the evolution of the newspaper market between 1944 and 2014. Section 2.1 presents a brief historical background on the newspaper industry, and on its evolution over time. Section 2.2 discusses basic industry characteristics and reviews the dataset. Finally, Section 2.3 describes the French electoral system for local elections and presents the new dataset I built on election results.

### 2.1. Historical background

The focus of this paper is on the local daily newspaper industry in France between 1944 and 2014. The choice of 1944 as my first year of interest arises from historical reasons: the Second World War marked an almost wholly clean break with the prewar media system, with the press industry effectively rebuilt from scratch once the conflict ended.

The pre-Second World War French newspapers were corrupted, and historians such as March Bloch “placed part of the blame for the country’s defeat (...) on France debasement of its media.” (Bignon and Flandreau, 2014). In the immediate post-war period, newspapers accused of collaboration with the Nazi occupiers were closed down and their assets redistributed to owners untainted by collaboration. While the old prewar press groups were eliminated, a new press system was reconstituted from independent companies. Of the 206 (local and national) daily newspaper titles that had been published in France in 1939, only 28 were able to resume operations after the war (Guillauma, 1988).

#### 2.1.1. The post-war regulations

Furthermore, in 1944–1945, new regulations were enacted to avoid repeating past mistakes. A number of reforms called for massive government intervention in the press sector and media ownership regulation. The so-called “Blue Notebook” (the press

reform prepared by the National Federation of the Clandestine press) noted that “a newspaper should not be considered as an industry.” The August 26th 1944 Press Reform Order (“ordonnance”) imposed very strong restrictions reflecting the imperative of newspaper independence from money interests. These reforms were never seriously implemented and suffered various fates, however.<sup>11</sup> As noted by Schwoebel (1968), rarely “a revolution has failed so miserably.”. In the end, the promise of a new statute of the press never succeeded. In 1954, a law was passed that permitted the sale of the confiscated equipment at 1940 prices to the newspapers that were currently using it. This can be considered the end of the post-war attempt to reorganize the rules under which the press would operate.

The post-war reforms nonetheless cleaned up the corruption that has been so prevalent in the press before the war (Albert, 1990). Moreover, some of the provisions of the 1944 press reforms have had lasting results, in particular regarding the provision of wire news and the distribution of newspapers. E.g. the “rebirth” of the Agence France Presse (AFP) in 1944 as a “public establishment” partly subsidized by generous government subscriptions marked the beginning of an original scheme of public subsidies to private (and very soon independent) wire news provision.<sup>12</sup>

#### 2.1.2. The post-war period: the golden age of the partisan press

In the wake of WW2, most newspapers were politically affiliated in France (Guillauma, 1988; Martin, 1997). I collect information on the political affiliation of the newspapers from Guillauma (1995), the *Cahiers de L’Institut Français de Presse*, and the French Ministry of Information archives.<sup>13</sup>

Fig. 1 reports the distribution of the local daily newspapers in 1946 (Fig. 1a) and in 1949 (Fig. 1b), depending on their political affiliation. In 1946, the Socialist party (i.e. the SFIO) had the highest number of affiliated newspapers (42), followed by the “Mouvement Républicain Populaire” (MRP) (35) and the Communist party (31). In terms of aggregated circulation, the orders of magnitude are mostly equivalent for these three political movements (around 2.4–2.5 million copies a day) as well as for the non-affiliated “information” newspapers (27 newspapers, with a total circulation of 2.5 million copies).

The total number of newspapers – and the total circulation – fell rapidly in the post-war period, which is also characterized by a change in the propensity of the newspapers to be affiliated to parties. Between 1946 and 1949, the number of newspapers affiliated to the Socialist party dropped from 42 to 32, and the number of newspapers affiliated to the Communist party fell from 31 to 18 (Fig. 1b). In 1955, there were only 15 remaining Socialist newspapers. The rise of nonpartisan reporting has been mostly driven by economic reasons: newspapers gave up their political affiliation in order to broaden their readership (Guillauma, 1988; Martin, 1997).

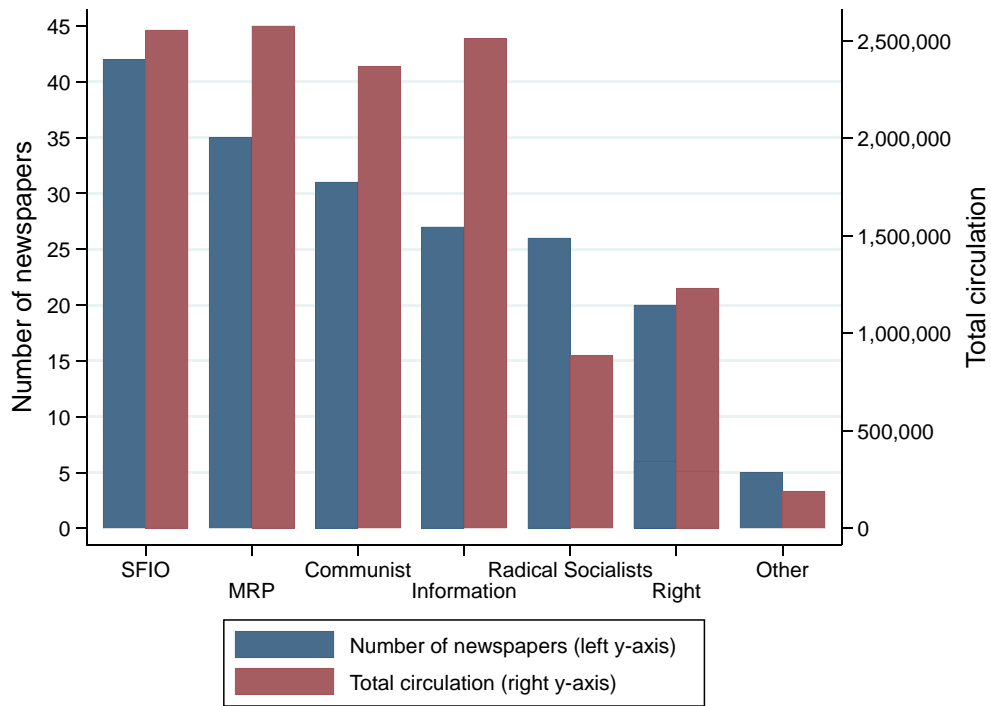
#### 2.1.3. The rise of nonpartisan reporting

The depoliticization of the newspapers in the post-war period explains their success in terms of circulation, much like their focus on local news. However, while most newspapers dropped their political affiliation after the 1950s, some nonetheless retained a biased editorial stance. To investigate the newspapers’ stance, I explore a previously unexploited data source, the “Reports of the Prefects with

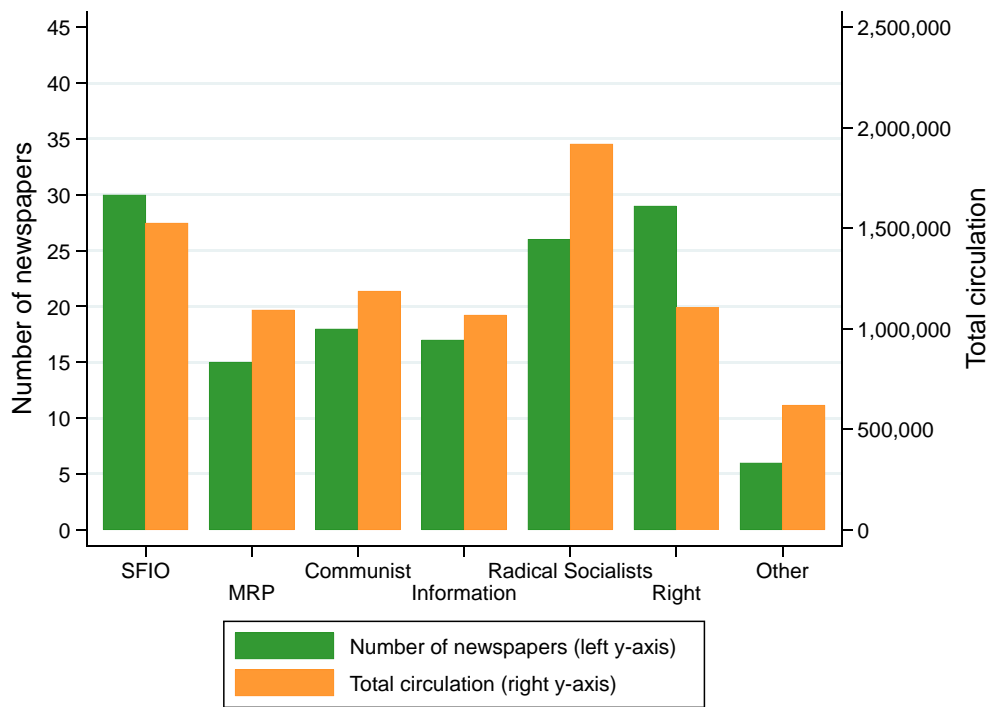
<sup>11</sup> Why is it so? First, their text was poorly drafted. Second, there was no penalty for failing to meet the requirements and no agency in charge of enforcement (Legrès, 1985). Furthermore, these reforms had little legal force because the regulations for applying them were never published (Thogmartin, 1998).

<sup>12</sup> From 1944 to 1957, the AFP could be considered a state-run agency. The news agency obtained its independence in 1957, while the State continued to provide more than half of the agency’s revenues (through purchase subscriptions).

<sup>13</sup> All details of these data sources as well as descriptive statistics on newspaper political affiliation are available in the online Appendix Section A.1.6.



(a) 1946



(b) 1949

**Fig. 1.** Distribution of the local daily newspapers in 1946 and 1949, depending on their political affiliation. **Notes:** The figure plots the distributions of the local daily newspapers in France in 1946 (Fig. 1a) and in 1949 (Fig. 1b) depending on their political affiliation. The blue bars (left y-axis) report the number of newspapers, and the red bars (right y-axis) their total circulation. The “Right” category gathers together newspapers from the Right, the “Parti Républicain de la Liberté” (PRL), the “Républicains Indépendants” (in 1946), the “Modérés” (in 1949), as well as Catholic newspapers. The “Radical Socialists” category gathers together the Radicals, the “Rassemblement des gauches”, and the “Union Démocratique et Socialiste de la Résistance” (UDSR). “Information” corresponds to the newspapers without political affiliation. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Source: The data come from the “Répartition politique de la presse” (political distribution of the press) files: box F41bis 2089 of the French Ministry of Information archives.

indications on the financial situation, political or denominational tendency, private life of the managers, etc.” of the newspapers. The reports were commissioned by the Ministry of Information in the 1960s and the 1970s, and are stored in the National Archives.

Online Appendix Fig. A.8 shows the distribution of the newspapers depending on their political stance and on the strength of their bias. One third of the newspapers (29 out of 86) can be considered completely neutral and unbiased during this time period. While 26 newspapers have a right-wing editorial stance, this bias tends to be relatively weak. On the contrary, the 9 newspapers with a Communist stance are strongly biased toward the Communist party.

Overall, three-quarters of the newspapers for which we have information are independent or have a weak political stance by the end of the 1970s. The vast majority of the newspapers can be considered commercial newspapers willing to maximize their profits. Furthermore, this tendency has increased in recent decades, and the Fifth Republic local daily news industry can basically be characterized by the independence of the newspapers with respect to the political parties.

Finally, in the online Appendix Section C, I describe a number of governance innovations (such as workers' cooperative production societies and “societies of journalists”) that characterized the post-WWII newspaper industry but came to an end in the 1980s. In the rest of this section, I describe the new dataset I build for this study.

## 2.2. News industry characteristics

My sample includes 287 local daily newspapers over the 1944–2014 period. These newspapers are general information newspapers that offer a mix of soft and hard news topics. On average, about two thirds of the space in these newspapers is devoted to soft news (one third to hard news) but this ratio can vary widely (Table 1 presents descriptive statistics on newspaper content). The average newspaper issue contains 421 articles of relatively small length (286 words per article). The size of newspapers is one of my proxies for quality. The other proxy I use is the number of journalists on staff. On average, 59 journalists work in each newspaper (Table 2 provides descriptive statistics on papers' costs, revenues and the size of the newsroom).

Overall, the local daily newspaper industry generated €2.3 billion in total revenues in 2014 (the last year of my sample), nearly four times more than the national daily newspaper industry (€632 million). It represents nearly 30% of the total revenues generated by the print media industry (€7.74 billion<sup>14</sup>). 66% of these revenues come from sales and 34% from advertisement. Its total circulation is around 4.4 million copies a day, compared to 883,000 for the national daily newspaper industry.

To get a sense of how important these circulation numbers are, it is useful to present them in terms of market penetration. The natural news market for a local daily newspaper in France is a county; there are 87 counties in metropolitan France excluding the area of Paris.<sup>15</sup> On average, there are 2.7 newspapers per county and the total newspaper circulation in a county is around 80,000 copies,

<sup>14</sup> I.e. 0.36% of the GDP. In comparison, according to the Newspaper Association of America (NAA), the US newspaper media industry generated \$37.6 billion in total revenues in 2013, i.e. 0.22% of the GDP (in 2014, the NAA stopped releasing industry-wide revenue data).

<sup>15</sup> In my analysis, I exclude the Paris area. In this area, local daily newspapers are indeed competing in a different way with national newspapers. Given that Paris has a national dimension, a lot of “local” information concerning the area of Paris is covered in national newspapers. So there is much more competition between the different newspapers than in the rest of France, and it would be misleading to consider only competition between local newspapers.

**Table 1**  
Summary statistics of newspaper content (2005–2012).

	Mean/sd	Mean/sd	Mean/sd
Number of words per front page	370 (222)		
Number of articles in the newspaper		421 (302)	
Number of words in the newspaper		107,044 (83,165)	
Average article length		286 (40)	
Share of articles on hard news			34.8 (13.4)
Share of articles on soft news			66.5 (11.5)
Share of words on hard news			32.7 (13.9)
Share of words on soft news			68.6 (11.9)
Newspaper specialization (Herfindahl Index)			0.17 (0.13)
Observations	94,901	30,503	28,180

**Notes:** The table gives summary statistics for newspapers' content. It presents the average and the standard deviations (in parentheses) of the variables. Variables are values for newspapers. Time period is 2005–2012. The share of articles on hard news is defined as the number of articles on agriculture, economics, education, environment, international affairs or politics, divided by the total number of articles I classify. The share of articles on soft news is defined as the number of articles on movies, culture, leisure activities, sports, “news in brief”, religion or health, divided by the total number of articles I classify. Newspaper specialization is an Herfindahl index of newspaper differentiation. The Herfindahl index is equal to the sum of the squares of the shares of the different newspaper topics in each newspaper issue: agriculture, culture, economics, education, environment, health, international affairs, leisure activities, movies, “news in brief”, politics, religion and sports.

representing 24% of the eligible voters (see Table 3 which presents summary statistics on newspaper circulation). Given that the average ratio of reported readership to circulation is 3, this implies that nearly three-quarters of the eligible voters in a county read a local daily newspaper. Therefore, the issue of how changes in the news-market structure affect the provision of information by daily local newspapers is key. Although there is a downward trend in circulation over the period 1944–2014, the total circulation of local newspapers has always been extremely large. The number of copies sold everyday ranges from 15 to 35% of the eligible voters during my period of interest.<sup>16</sup>

Given the high circulation across nearby counties – between 1944 and 2014, 42.7% of the local daily newspapers circulated in more than one county, and these newspapers circulated on average across 4 counties<sup>17</sup> – my main variables of interest are at the newspaper–county level.

### 2.2.1. Newspaper entries and exits

The central independent variable in my analysis is the change in the number of newspapers. My sample includes 703 newspaper–county pairs. I observe a total of 356 county-years with net newspaper entry and 355 county-years with net newspaper exit. Fig. 2 shows for each year the number of counties with net newspaper entry (Fig. 2a) and the number of counties with net newspaper exit (Fig. 2b). The high number of entries and exits between 1944 and 1955 is a result of the Second World War. As noted above, the wartime period marked an almost wholly clean break with the prewar media system. When I exclude this post-war period (1944–1954), I am left with a total of 96 county-years with net

<sup>16</sup> See the online Appendix Fig. B.5. This ratio was above 35% only for a few years following WWII.

<sup>17</sup> More detailed summary statistics on the circulation of newspapers across counties are available in the online Appendix Section B.

**Table 2**

Summary statistics of newspapers' costs, revenues and newsroom.

	Mean	Median	Sd	Min	Max
Total revenues (thsd €)	43,708	17,563	56,930	6	356,065
Revenues from sales (thsd €)	24,910	9,738	33,521	3	215,486
Revenues from advertising (thsd €)	18,621	7,026	25,552	0	331,169
Total expenditures (thsd €)	41,457	16,975	54,830	15	354,208
Number of journalists	59	28	76	1	563
Journalists' average monthly salary (€)	2,615	2,662	701	743	5,376

**Notes:** The table gives summary statistics for newspapers' revenues, expenses and number of journalists. The time period is 1960–2014, except for the number of journalists (1944–2014). Variables are values for newspapers. Variables are at the newspaper/year level. All variables (excepted the number of journalists and their average monthly salary) are in (constant 2014) thousand euros. Journalists' average monthly salary is in (constant 2014) euros.

**Table 3**

Summary statistics of newspapers' circulation (1944–2014).

	(1) Mean/sd	(2) Mean/sd	(3) Mean/sd
<b>County-level variables</b>			
Total county circulation (# copies)	79,597 (84,751)		
County circulation per eligible voter (%)	24.2 (16.8)		
Average number of newspapers in a county	2.7 (1.5)		
<b>Newspaper * county-level variables</b>			
Newspaper circulation per county (# copies)		32,769 (43,980)	
Newspaper circulation per county and eligible voter (%)		9.9 (10.8)	
<b>Newspaper-level variables</b>			
Total circulation (# copies)			82,662 (117,599)

**Notes:** The table gives summary statistics for newspapers' circulation. It presents the average and the standard deviations (in parentheses) of the variables. The time period is 1944–2014. Variables are at the county/year level in column 1, at the newspaper/county/year level in column 2, and at the newspaper/year level in column 3.

newspaper entry and 228 county-years with net newspaper exit.<sup>18</sup> The entering newspapers are either new newspapers entering the newspaper market from scratch (in 24% of cases<sup>19</sup>) or existing newspapers entering a neighboring market. Importantly, in more than 83% of cases, newspapers in a given market are owned by different owners.

Given that entries and exits are key for my identification strategy, it is critical to understand the forces that cause them. The existing literature suggest two primary determinants of the number of newspapers in a market: income and population (see e.g. *Gentzkow et al., 2011*). As I underline above, newspapers have fixed costs, so market size is a major determinant of the number of newspapers in a market (*Berry, 1992; Bresnahan and Reiss, 1991*). In the online Appendix Table E.1, I provide evidence that the market size is a good predictor of the number of active newspapers, and that newspapers move in where there is a trending population.

### 2.2.2. Newspaper data

I now briefly describe the news dataset I have constructed for this paper. I discuss further details of the construction of the data in the online Appendix (Section A). Those readers who feel uninterested in these technical details may want to go directly to Section 2.3.

**2.2.2.1. Newspaper circulation, costs and revenues.** To determine for each year between 1944 and 2014 the number of newspapers present in each French county, I use various sources of information (e.g. official registries) that I digitize and merge. I count local daily newspapers from these sources: in each year, I extract the name and the counties in which every local daily newspaper circulates. I match newspapers across time using their title and counties. For each county-year, I also compute the number of local daily newspapers which serves as my key explanatory variable.

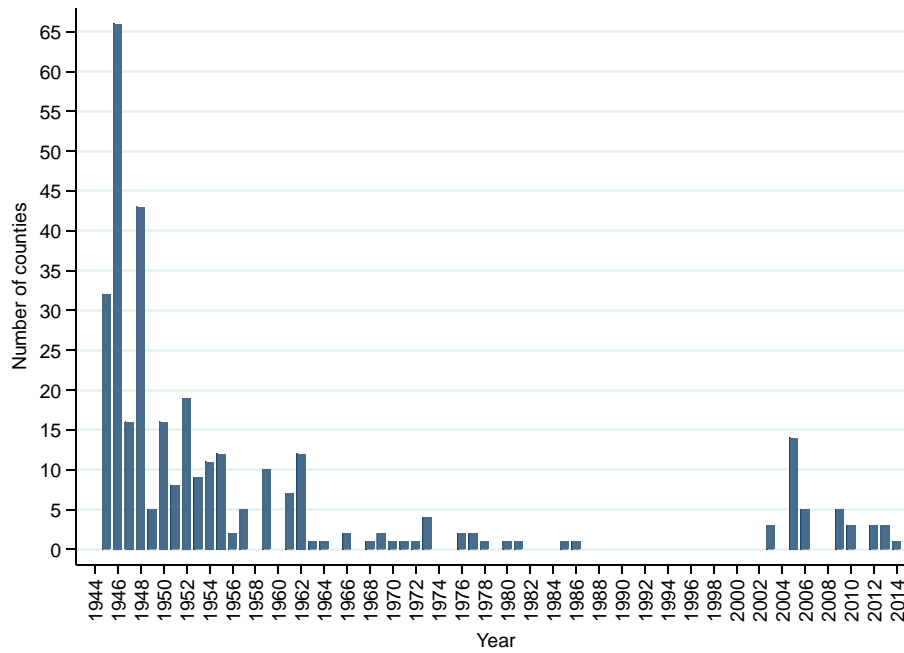
For the period 1944–1989, newspaper circulation data comes from official data I digitize and merge. Data for recent years (1990–2014) comes from the French press observatory. For each newspaper, I have annual information not only on their total circulation but also – for newspapers circulating across nearby counties – on their circulation in each of the counties in which they circulate.

For local daily newspapers between 1960 and 2014, I compute annually a number of important economic indicators, namely total operating revenues that I can split between revenues from sales and revenues from advertising, and total operating expenses. This dataset is, to the extent of my knowledge, the most complete existing dataset on newspapers' costs and revenues. I collect data covering the period 1960–1974 from the archives of the Ministry of Information. Between 1960 and 1974, French newspapers were asked by the Ministry of Information to report annually on circulation, expenditures and revenues. From 1984 to 2014<sup>20</sup>, the data comes

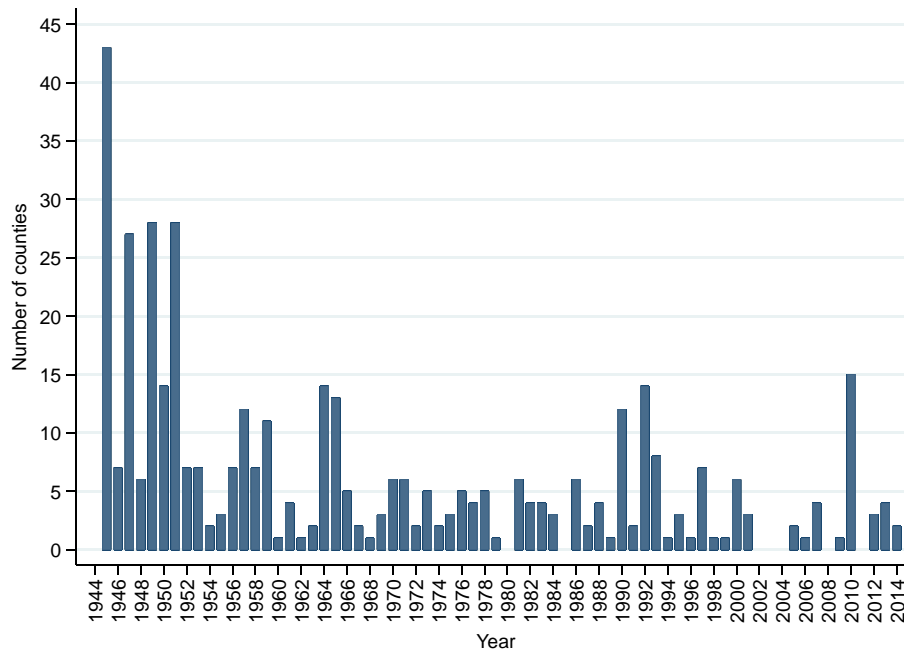
<sup>18</sup> Section B in the online Appendix presents a more detailed overview of this data.

<sup>19</sup> 85 out of the 356 county-years with net newspaper entry I observe come from these new newspapers. Of these 85 cases, 71 are caused by new newspaper owners entering the local daily newspaper industry.

<sup>20</sup> Unfortunately, no data is available for the period 1975–1983. However, I collect annual data on the number of journalists for the entire 1944–2014 period (see below).



(a) Number of counties with net entry



(b) Number of counties with net exit

**Fig. 2.** Number of counties with net newspaper entry/net newspaper exit by year. **Notes:** The figure shows for each year the number of counties with net newspaper entry (Fig. 2a) and the number of counties with net newspaper exit (Fig. 2b).

from the Enterprise Survey of the French National Institute of Statistics (INSEE). I identify newspapers in the dataset using the French registry of establishments and enterprises. For the newspapers not covered in the Enterprise Survey, I use information from the Bureau van Dijk's websites (in particular ORBIS).

Given that my analysis is at the newspaper–county level, I need to construct newspaper–county–level values of the variables. This is simple when the only newspapers circulating in a county are headquartered in this county and do not circulate outside. It is more problematic when a newspaper circulates across nearby counties. In



this case, I use data on the geographical dispersion of circulation; for each newspaper, I assign to the counties in which it circulates a percentage of the value of the variable (e.g. total revenues from sales, operating expenses,...) equal to its share of the newspaper circulation.<sup>21</sup>

**2.2.2.2. Size of the newsroom.** I collect annual data on the number of journalists at the newspaper level from the non-publicly available paper records of the “*Commission de la carte d’identité des journalistes professionnels*” (the organization that issues press cards to journalists). These data are from Cagé (2016). For each of the local daily newspapers, I know the number of journalists (including both monthly-paid salaried workers and freelancers) on an annual basis from 1944 to 2014. I also compute information on each journalist’s annual compensation, i.e. their monthly gross salary from 1960 to 2014. To the extent of my knowledge, this is an unprecedented dataset on newspapers’ newsrooms.

The number of journalists on staff can be considered a relevant proxy for newspaper quality, even though other important factors enter into the news production function. In particular, local daily newspapers tend to rely very much on wire dispatches for national and international news. Roughly all the newspapers subscribe to the AFP during my period of interest, however, and the subscription price they are charged depends on their circulation (see e.g. Baron, 2014). Hence, from an estimation point of view, the existence of the AFP is not a threat to my empirical strategy, which includes year and newspaper fixed effect.

**2.2.2.3. Newspaper content.** I supplement this data for recent years with measures of newspaper content, in particular of the size of newspapers. I use three different measures of size. First, for each newspaper issue, I count the number of words by front page. Front pages are available daily for 51 newspapers over the period 2006–2012. I download them from the local daily press syndicate website using an automated script.<sup>22</sup>

Second, I collect data on the entire daily content of each newspaper by using an automated script to retrieve for each day all the articles published in the newspaper. I download the data from two different websites which aggregate content from newspapers (Factiva and Lexis-Nexis). I construct a dataset covering 22 different newspapers over the period 2005–2012 with information on the total number of articles and the total number of words per issue.

Finally, I use the metadata (tag) associated with each article on Lexis-Nexis (title, subject, topic) to classify articles as hard news or soft news. The share of articles on hard news is defined as the number of articles on agriculture, economics, education, environment, international affairs or politics, divided by the total number of articles I am able to classify. The share of articles on soft news is defined as the number of articles on movies, culture, leisure activities, sports, “news in brief” (*faits divers*), religion or health, divided by the total number of articles I am able to classify.

### 2.3. Local elections and demographic controls

The focus of this paper is on local (city-level) elections (the so-called “*élections municipales*”). As of today, there are 36,570 cities in metropolitan France. There are 2,282 towns and cities with more than 3,500 inhabitants outside the area of Paris. I focus on these cities over 3,500 inhabitants since the electoral rule for local elections for

towns with fewer than 3,500 inhabitants is different. For each election, I measure turnout as the ratio of cast votes to eligible voters in the first round of the election. I use cast votes rather than total votes since in France blank votes are not included in turnout.

Local elections take place in France every six years. Between 1944 and 2014, 12 elections took place: 1947, 1953, 1959, 1965, 1971, 1977, 1983, 1989, 1995, 2001, 2008, and 2014.<sup>23</sup> Before 1983, data on French local elections have never been digitized. I construct the first electronically available dataset on French local elections results at municipal level between 1944 and 1982, using official data sources in paper format. More recent data are available in digitized format from the *Centre de Données Socio-Politiques* (CDSP) of Science-Po Paris, the Interior Ministry, and Bach (2011). Not all municipalities have data for all years, and I include municipalities if they have turnout data available for a majority of the years from 1947 to 2014.

#### 2.3.1. Local elections and local news

Note that while newspapers enter/exit at the county level, the entry/exit “treatment” can be applied to towns. French local daily newspapers indeed provide in-depth municipal-level coverage of local news stories. First, newspapers publish several local editions: eight on average (online Appendix Fig. B.6). Moreover, most of them also have local news desks. The average number of news desks for the local daily newspapers in 2014 is 8.4 (online Appendix Fig. B.7). In other words, local daily newspapers in France, despite being county-based, provide in-depth municipal-level coverage.

#### 2.3.2. Demographic controls

Finally, I collect municipal-level demographic data. Demographic data from the French census is available in electronic format from 1962 to 2014. I digitize data for the 1936, 1946 and 1954 censuses from original paper publications by the French National Institute of Statistics. I compute the share of the population by age group, occupation and degree. For each measure, I interpolate both the numerator and denominator between census years using a natural cubic spline (Herriot and Reinsch, 1973) and divide the two to obtain an estimate of the relevant share.

## 3. Newspaper competition and news quality

In this section, I study how newspaper quality varies with the market structure. To measure empirically the quality of newspapers, I follow the existing literature and use the number of journalists on staff (see e.g. Hamilton, 2004; Berry and Waldfogel, 2010; Fan, 2013; Angelucci and Cagé, 2019; Cagé et al., 2017). The advantage of this measure is that it allows me to use the panel dimension of the dataset to exploit the timing of entries and exits for identification. My second proxy for quality is “quantity” – the size of newspapers. Indeed, consumers presumably always prefer more content to less. I use quantity to estimate both the impact of competition on newspaper quality and on the type of news produced – hard versus soft news. I perform this analysis taking a reduced-form approach. I use all the variations in the data from  $n > 0$  to  $n + 1$  newspapers.

### 3.1. Empirical strategy

The main empirical challenge is to isolate the impact of entries and exits on incumbent newspapers. My identification strategy relies on the timing of these events. I estimate the effect of the entry (or exit) of a newspaper by comparing counties that experience an entry (or exit) to similar counties in the same year that do not. Given that

<sup>21</sup> I show that the results are robust to rather assigning to each county an equal share of the variable of interest.

<sup>22</sup> Using front pages is not new in literature for this field (see e.g. Di Tella and Franceschelli, 2011).

<sup>23</sup> A mayoral election also took place in 1945. I choose not to include it in the dataset since this election took place before the end of the Second World War in very special conditions and just two years before the 1947 election.

the entry decision is made to maximize profits, counties that experience an entry are likely to differ from other counties, both at the time of entry and in future periods. The identifying assumption is that newspapers in these other counties form a valid counterfactual for the incumbent newspapers in counties that experience an entry, after conditioning for differences in preexisting trends, newspaper fixed effects, year fixed effects, and a large set of demographic covariates controlling for the age composition, occupational structure and educational level of counties. I provide evidence below that entries are orthogonal to the outcomes I study: there are no pre-trends in circulation, revenues, expenses and the number of journalists before entries (Section 3.2).<sup>24</sup>

Given the existence of treatment and control counties with a common underlying trend, I can quantify the entry effect that induces a sharp deviation from this trend. As underlined above, between 1944 and 2014, I observe a total of 356 county-years with net entry and 355 county-years with net exit, and a total of 96 county-years with net entry and 228 county-years with net exit when I drop the post-war period.

### 3.2. The effect of newspaper entry on circulation

To start with, I use my panel data on newspaper competition and track the impact of a change in competition on newspapers' circulation. I study how a change in the number of newspapers in a county affects (i) the circulation of incumbent newspapers (per eligible voter) in the county; and (ii) the total newspaper circulation (per eligible voter) in the county. I estimate alternatively aggregate event studies and a fixed-effect model that allows for time-varying effects of entries and exits.

#### 3.2.1. Aggregate event studies

The event of an entry (alternatively an exit) is the cross-sectional dimension and the years around the event are the temporal dimension of my panel. In the case of an entry, incumbent newspapers are defined as the newspapers circulating in the county the year before the entry. I study how the circulation of these newspapers is affected by the introduction of a new newspaper. Business stealing corresponds to a decrease in the circulation of incumbent newspapers. In the case of an exit, incumbent newspapers are defined as the newspapers circulating in the county the year before the exit *except* the newspaper which exits. The exit of a newspaper should either increase or have no effect on the circulation of incumbent newspapers. The analysis is robust to summing the variables of interest over incumbent newspapers or to consider each incumbent newspaper separately (in which case the cross-sectional dimension is the interaction of an event and a newspaper). I present the results here using the sum over incumbents.

I study the effect of newspaper entry and exit separately since the impact of entry and exit on circulation may not be symmetrical.<sup>25</sup>

#### 3.2.2. Newspaper entry

I first consider newspaper entry. Let  $c$  index counties,  $e$  index entry events,  $t$  index calendar years and  $j$  index event periods. By normalization, entry takes place in  $j = 0$ . The outcome of interest,

$circulation_{cte}$ , is the (aggregate) circulation of incumbent newspaper(s) per eligible voter.

I estimate the following model:

$$circulation_{cte} = \sum_{k=-10}^{+10} \alpha^k \mathbf{1}_{cte}^{j=k} + \mathbf{X}_{ct} \delta + \gamma_t + \eta_c + \varepsilon_{cte} \quad (1)$$

where  $\gamma_t$  are year fixed effects,  $\eta_c$  county fixed effects, and  $\varepsilon_{cte}$  is the error term. The vector of controls  $\mathbf{X}_{ct}$  includes the share of the population with only secondary and vocational education diplomas, with the (French) baccalaureate, and with higher (post-secondary) education, the share of the population below 24, between 25 and 54, and between 55 and 64 years old, the share of the working population made up of farmers, artisans, shopkeepers and company managers, senior executives or knowledge workers, employees, and which has intermediate occupations, and the total population in county  $c$  and year  $t$ . Standard errors are clustered by events.

The set of coefficients  $\alpha^k$  are my coefficients of interest.<sup>26</sup> In Fig. 3, I first plot these coefficients  $\alpha^k$  for the entire period 1944–2014. The dependent variable is total circulation (per eligible voter) in the upper figure (Fig. 3a) and the circulation of incumbent newspapers (per eligible voter) in the bottom figure (Fig. 3b). Two things need to be underlined. First, whether I consider total county circulation or circulation of incumbent newspapers, there is no pre-trend before the entry. All the  $\alpha^k$  coefficients before the event are not statistically significant and the point estimates are close to zero. Second, despite the fact that there is some market expansion – the total circulation per capita increases by around 5 percentage points (Fig. 3a) – we observe a strong and permanent business-stealing effect (Fig. 3b). The circulation of incumbent newspapers per eligible voter decreases by more than 6 percentage points after entry, which corresponds to a 20% decrease.<sup>27</sup>

Given the specificity of the post-war period, I show in the online Appendix Fig. E.1 that these results are robust – albeit of a smaller magnitude – to only considering the post-1960 period. This also corresponds to the time period for which I have the newspapers' revenue and expenditure data. As an additional robustness check, I only consider as entry episodes the cases of entry of existing newspapers (already operating in neighboring markets at the time of entry). Online Appendix Fig. E.2 presents the results. While we observe a slight increase in the standard errors (due to the lower number of episodes), reducing my sample of entries to the episodes of entry by existing newspapers does not affect my main results.

#### 3.2.3. Newspaper exit

Does an exit symmetrically increase the circulation of remaining newspapers? I estimate Eq. (1) considering only episodes of exit. Online Appendix Fig. E.5 shows the coefficients  $\alpha^k$  from this estimation for the period 1960–2014 controlling for demographics. Contrary to what we observe for entries, the magnitude of the effects for exits is very small. This difference in magnitude may come from the fact that while newspapers enter large, they exit small (the circulation of exiting newspapers follows a decreasing trend before exit).<sup>28</sup> We observe an increasing trend in the circulation of incumbent newspapers before exit. Incumbent newspapers recover the circulation of the exiting newspaper even before the actual exit of the

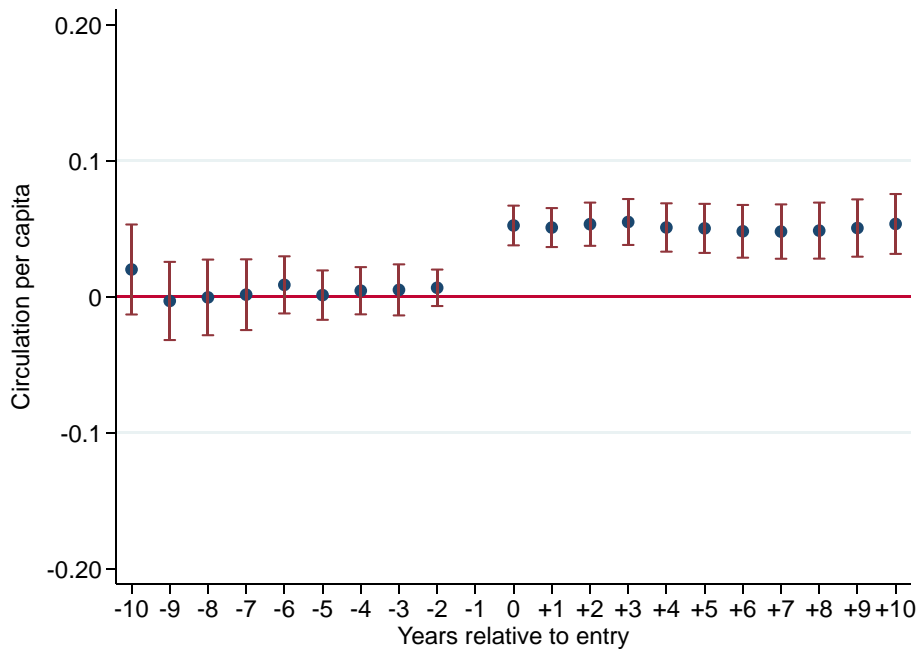
<sup>24</sup> Orthogonality may come from the fact that, in the spirit of a latent variable model with threshold crossing, small increases in population create a discontinuity. While entry is discontinuous, demographic characteristics indeed change smoothly.

<sup>25</sup> There are some episodes during which there are simultaneously one (or more) entry(ies) and one (or more) exit(s) in a given county a given year. When entry(ies) and exit(s) cancel out I drop the episode. My results are robust to either considering as entries the episodes during which there are more entries than exits (net entry) or to dropping them. Similarly, they are robust to either considering episodes of net exit as exit or dropping them.

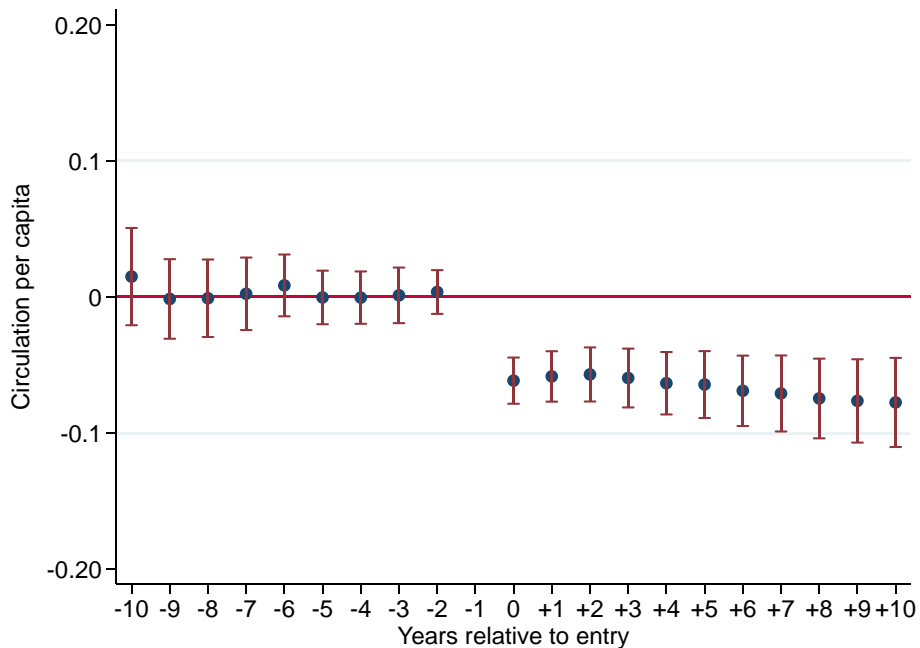
<sup>26</sup> Years around the event go from  $-10$  to  $+10$  but results are robust to the use of other time intervals. Results are also robust to estimating the model in first differences rather than in level.

<sup>27</sup> Between 1944 and 2014, the average circulation of incumbent newspapers per eligible voter the year before an entry is 30%.

<sup>28</sup> On average, circulation in the year of entry is equal to 116% of a newspaper's lifetime average circulation; circulation in the last year before exit is equal to 75% of the lifetime average.



(a) Total circulation



(b) Circulation of incumbent newspapers

**Fig. 3.** Impact of newspaper entry on newspapers' circulation (1944–2014), controlling for demographics. **Notes:** The figures show coefficients from a regression of circulation on a vector of year dummies going from  $-10$  to  $+10$  with the events of entry taking place in  $j = 0$  (see Eq. (1) for details). In Fig. 3a, the dependent variable is total county circulation per eligible voter. In Fig. 3b, the dependent variable is the circulation of incumbent newspapers per eligible voter. Models include year and county fixed effects and demographic controls. Error bars are  $\pm 2$  standard errors. Standard errors are clustered by events. Time period is 1944–2014.

newspaper. The existence of a pre-trend in the circulation of incumbent newspapers before an exit makes the event-study approach less relevant for the analysis of the effect of exits (contrary to entries). In the next section I will thus focus on the impact of entry on incumbent newspapers.

### 3.3. The effect of newspaper entry on the size of the newsroom

How does the market structure affect the size of the newsroom? To answer this question, I use my panel of newspaper economic indicators that covers the period 1944 to 2014. In particular, for each

newspaper, I observe the number of journalists on an annual basis as well as, for the sub-period 1960–2014, journalists' compensation, i.e., their monthly gross salary. I study how the entry of a newspaper into the market affects the value of these outcomes for incumbent newspapers.

### 3.3.1. Aggregate event studies

In Fig. 4, I plot the coefficients  $\alpha^k$  that I obtain by estimating Eq. (1) with, as before, a  $-10$  to  $+10$  window. The dependent variable is the total number of journalists working in the county in the upper figure (Fig. 4a) and the number of journalists working for incumbent newspapers in the bottom figure (Fig. 4b).

If we first consider the number of journalists working for incumbent newspapers, it appears clearly that there is no pre-trend. The negative effect of entry happens on impact and persists over time (similarly to what happens for circulation). I find that the number of journalists working for incumbent newspapers decreases by 4 to 8.5 after an entry. Table D.1 in the online Appendix presents descriptive statistics for incumbent newspapers the year preceding an entry. The total number of journalists working for incumbent newspapers is on average equal to 44. The entry of a newspaper thus leads to a decrease of around 19% of the size of the newsroom of incumbent newspapers. This decrease was expected given the decrease in incumbent newspapers' circulation.

Although small in terms of magnitude, one may be surprised by the on-impact decrease in the number of journalists. This may be due to the decision of the entrant newspaper to poach journalists from the incumbent newspaper (and therefore of journalists to quit the incumbent newspapers without being encouraged to do so). Given the importance of local coverage for local daily newspapers, it would make perfect sense for the entrant newspaper to choose such a strategy. Faced with a decrease in its circulation (as shown above), the incumbent newspaper may decide not to hire a new journalist as a replacement.

Interestingly, the drop in the size of the newsroom seems indeed to come from the fact that, when there is an entry, a number of journalists working for the incumbent newspaper(s) go and work for the entrant. Indeed, I find nearly no change in the total number of journalists working in the county after an entry (Fig. 4a). Consistently with this intuition, I show that, in the entry year, the average compensation of the journalists working for the entrant newspaper(s) is typically 5.5% higher than in the incumbent newspaper(s).<sup>29</sup>

One can use the journalist dataset constructed by Cagé (2016) in order to illustrate this phenomena with some informative anecdotal evidence. Consider the example of the newspaper *L'Union* which circulates in the Marne county. In 1981, *L'Union*, which was at the time in a monopolistic situation in the county, faced the entry of *L'Est Républicain*. While 115 journalists were working for *L'Union* before the entry, there were only 110 in 1982–1983, 108 in 1984, 93 in 1985 and 84 in 1987, i.e. a 31-journalist drop within the six years following the shock. I find that 10 of them went to work for the entrant, *L'Est Républicain*. Obviously, this does not mean that there was a one-to-one transfer from the incumbent to the entrant newspaper. A number of journalists simply quit journalism at the time. Some journalists also left *L'Union* to find a job in a newspaper other than *L'Est Républicain*. But it is of interest to see that to some extent there is a split both in the size of the newsroom and in the circulation due to the business-stealing effect.

<sup>29</sup> The average compensation of the journalists working for the entrant is not always higher than that of the journalists working for the incumbent newspaper(s). However, there are more entry years when it is higher than years when it is lower. Moreover, the absolute magnitude of the difference is larger when the difference is positive (i.e. when the average entrant compensation is higher). See online Appendix Fig. E.6.

As a robustness check, I reduce my sample of interest to those newspapers facing an entry in the county in which they are headquartered. In this case, for each newspaper, rather than assigning to the counties in which it circulates a percentage of the newsroom equal to its share of the newspaper circulation, I consider its total number of journalists. I perform the analysis at the newspaper level. Hence I estimate the following model:

$$\text{circulation}_{nte} = \sum_{k=-10}^{+10} \kappa^k \mathbf{1}_{nte}^{j=k} + \mathbf{X}_{ct} \delta + \gamma_t + \varphi_n + \varepsilon_{nte} \quad (2)$$

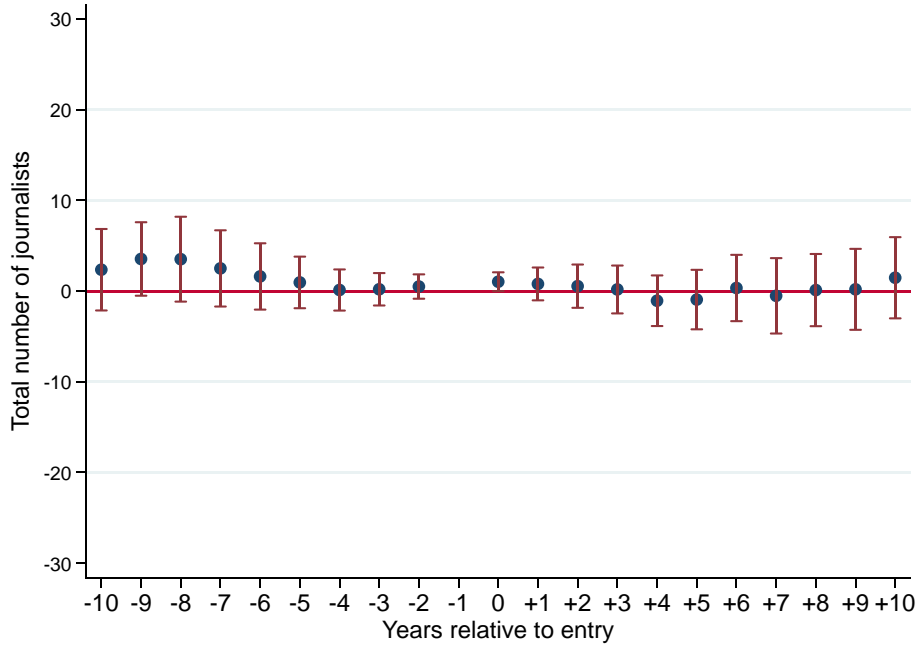
where  $\gamma_t$  are year fixed effects, but I now control for newspaper fixed effects ( $\varphi_n$ ). Online Appendix Fig. E.7 plots the coefficients  $\kappa^k$  for two different left-hand side variables: the total number of journalists working for the incumbent newspapers and the average journalist compensation of these journalists. If we first consider the number of journalists, it is reassuring to observe that, as for the previous specification, there is no pre-trend before entry. Moreover, we observe a statistically significant drop in the size of the newsroom after entry. In terms of magnitude, the number of journalists decreases by 2.5 on impact, and by 8.3 ten years after the entry. On average, newspapers facing an entry in the county in which they are headquartered employ 85 journalists the year preceding the entry. In other words, the decrease in the size of the newsroom they suffer is on average nearly 10% ten years after the shock.

What are the characteristics of the journalists leaving the incumbent newspapers? To provide some elements of response to this question, I compute the average journalists' compensation. I find no change in journalists' monthly salary around the time of the entry (online Appendix Fig. E.7b). This may be due to the fact that both the (mainly younger and less experienced) newcomers and the oldest journalists (at the age of retirement) leave, so that on average there is no change in the average compensation paid. Such a hypothesis is consistent with the fact that there is no change in the average age of the journalists working for the incumbent newspaper around the time of entry (online Appendix Fig. E.8a). I also investigate the extent to which entry affects the share of women working in the newsroom. The effects are small and are statistically significant at the 5%-level for only a subset of the post-shock years, but if anything I do find that the share of women working in incumbent newspapers' newsrooms decreases following the entry of a newcomer (online Appendix Fig. E.8b).

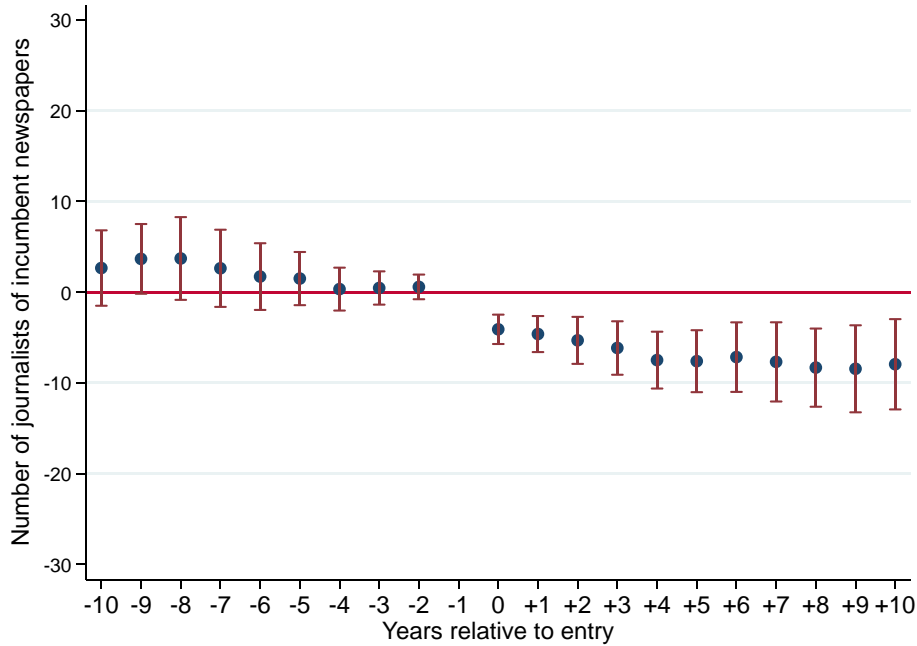
I perform an additional robustness check to ensure that the drop in the number of journalists does not happen "by construction" for those newspapers circulating across counties (given that in this case in the main specification I allocate the number of journalists to the different counties depending on the share of the newspaper's circulation in each county). Rather than computing a circulation-weighted number of journalists, I simply allocate to each of the  $n$ th counties in which the newspaper circulate  $\frac{1}{n}$  times its number of journalists (i.e. for a newspaper with a 100-journalist newsroom circulating across two counties, I attribute 50 journalists to each county). Online Appendix Fig. E.3 presents the results. They are entirely consistent with the findings of Figs. 4b and E.7a. On the one hand, there is no change in the size of the newsroom before an entry. On the other hand, there is a statistically significant drop following the entry which grows larger over time. If anything, the impact of the entry is of higher magnitude.

### 3.3.2. Fixed effects model

I next show that these results are robust to estimating a fixed effects model. The fixed effects model allows me to control for the events of exit, and can be seen as a robustness check of my results.



(a) Total number of journalists working in the county



(b) Number of journalists working for the incumbent newspapers

**Fig. 4.** Impact of newspaper entry on newspapers' size of the newsroom, county-level analysis (1944–2014). **Notes:** The figures show coefficients from a regression of the number of journalists on a vector of year dummies going from  $-10$  to  $+10$  with the events of entry taking place in  $j = 0$  (see Eq. (1) for details). In Fig. 4a, the dependent variable is the total number of journalists working in the county. In Fig. 4b, the dependent variable is the number of journalists working for incumbent newspapers. Models include year and county fixed effects, and demographic controls. Error bars are  $\pm 2$  standard errors. Standard errors are clustered by events. Time period is 1944–2014.

Given the finding that the effect of an entry on both circulation and the number of journalists grows larger over time, I allow for time-varying effects of entry on outcomes (Laporte and Windmeijer, 2005). More precisely, to quantify the dynamics effects of the event and control for lags and leads, I define indicator variables for different

years around the event and an indicator variable isolating the long-run effect of the shock. My estimating equation is

$$y_{cnt} = \sum_{k=-2}^{+5} \beta_k \mathbf{1}entry_{ct}^{j=k} + \sum_{k=-2}^{+5} \gamma_k \mathbf{1}exit_{ct}^{j=k} + \eta_t + \rho_n + \mathbf{X}_{ct} \delta + \varepsilon_{cnt} \quad (3)$$

**Table 4**  
The effect of entry on newspapers' newsrooms, revenues and expenses (newspaper-level analysis).

	(1) Number of journalists	(2) Total	(3) Sales	(4) Ad	(5) Total expenditures
$1entry^{j=-2}$	-0.13 (0.15)	-0.07 (0.19)	-0.06 (0.20)	-0.12 (0.18)	-0.12 (0.19)
$1entry^{j=-1}$	-0.21 (0.14)	-0.20 (0.19)	-0.21 (0.19)	-0.25 (0.17)	-0.26 (0.18)
$1entry^{j=0}$	-0.35** (0.14)	-0.33* (0.18)	-0.33* (0.18)	-0.36** (0.17)	-0.39** (0.18)
$1entry^{j=1}$	-0.35** (0.14)	-0.37** (0.18)	-0.40** (0.18)	-0.35** (0.16)	-0.40** (0.17)
$1entry^{j=2}$	-0.35** (0.14)	-0.37** (0.16)	-0.35** (0.17)	-0.38** (0.16)	-0.44** (0.16)
$1entry^{j=3}$	-0.38*** (0.14)	-0.39** (0.16)	-0.31* (0.16)	-0.32** (0.16)	-0.44** (0.16)
$1entry^{j=4}$	-0.34** (0.14)	-0.46*** (0.15)	-0.34** (0.15)	-0.35** (0.15)	-0.52** (0.14)
$1entry^{j \geq 5}$	-0.32** (0.15)	-0.18 (0.14)	-0.07 (0.14)	-0.10 (0.14)	-0.18 (0.14)
Newspaper FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
R-sq	0.50	0.53	0.55	0.55	0.57
Observations	11,492	7534	6560	6667	6594
Clusters (county)	87	87	87	87	87

**Notes:** Standard errors in parentheses are clustered by county. Time period is 1960–2014. Models are estimated using OLS estimations. The dependent variables are in logarithm. All variables (except for the number of journalists) are in thousand (constant 2014) euros. Models include year and newspaper fixed effects and demographic controls. Variables are described in more details in the text.

- \* p < 0.10.
- \*\* p < 0.05.
- \*\*\* p < 0.01.

where  $c$  indexes counties,  $n$  indexes newspapers and  $t$  indexes years.  $1entry_{ct}^{-2} = 1$  in the 2nd year before an entry;  $1entry_{ct}^{-1} = 1$  in the 1st year before an entry;  $1entry_{ct}^0 = 1$  the year of an entry;  $1entry_{ct}^1 = 1$  in the 1st year after an entry;...; and  $1entry_{ct}^5 = 1$  in the 5th year after an entry and all subsequent years. The base period is the years before the entry, excluding the 2nd and 1st years before entry (i.e. from  $t - 3$  backwards). I control for a set of indicator variables for exit  $1exit_{ct}^{j=k}$  that are defined the same way.<sup>30</sup> The vector of controls  $X'_{ct}$  is the same as before. The dependent variable  $y_{cnt}$  is alternatively the logarithm of newspapers' size of the newsroom, revenues (total, from sales and from advertising) and total expenditures.

Table 4 presents the results for incumbent newspapers.<sup>31</sup> For all the dependent variables, I find no statistically significant effect for the pre-entry indicator variables  $1entry^{-2}$  and  $1entry^{-1}$ . Moreover, as expected given the results I obtain with the aggregate event studies specification, I find a negative and statistically significant impact of entry on the different outcomes of interest. For the number of journalists, the negative effect is statistically significant beginning the year of the entry (minus 35%) and then grows larger over time (minus 39% three years after entry). The long-term effect of entry on the number of journalists (captured by the indicator variable  $1entry^5_{ct}$ ) is minus 32% and is statistically significant at the 5% level (column 1).

Reassuringly, results are of the same order of magnitude for the other outcomes of interest (revenues and expenditures), in spite of the less balanced data coverage. Total revenues decrease by 33% on impact (column 2). This effect comes both from a decrease in revenues from sales and in advertising revenues. We observe a similar decrease in total expenditures (column 5). The negative effect is

statistically significant for the four years following the entry; however the statistical significance vanishes for the long-term effect ( $1entry^5_{ct}$ ).

Furthermore, while entry has a strong negative effect on each individual newspaper's revenues, expenses and number of journalists, I show in the online Appendix Table E.2 – in which the dependent variables are values aggregated at the county level – that it has no positive effect at the aggregate market level. There are no statistically significant changes in total county's journalists, revenues and expenses at the time of an entry nor in the following years. Given the fixed costs of news production, through the duplication of these costs, the entry of a newspaper may lead to a decrease in the total amount of news produced at the county level.

### 3.4. The effect of newspaper entry on the content of newspapers

#### 3.4.1. The size of newspapers

How does the structure of the news market affect the quantity of news produced by newspapers? I cannot estimate as before the impact of the entry of a newspaper given the fact that I only have data on newspaper content for recent years (2005–2012). I thus simply estimate the impact of the number of newspapers on the size of newspapers using a cross-sectional approach. A potential issue is that there may be selection in the cross-section. Reassuringly, the results of the previous section are robust to such an approach.

Let  $c$  index counties,  $d$  index the date (in days),  $t$  index year and  $n$  index newspapers. I assume that

$$size_{ntd} = \alpha_1 + \alpha_2 N_{nct} + X'_{ct} \alpha_3 + \mu_t + \varepsilon_{ntd} \tag{4}$$

where  $N_{nct}$  is the number of newspapers in year  $t$  in the county  $c$  in which the newspaper  $n$  is headquartered,  $X'_{ct}$  is a vector of observable characteristics,  $\mu_t$  is a year fixed effect and  $\varepsilon_{ntd}$  is a newspaper-county-date-year shock.  $size_{ntd}$ , my key dependent variable of interest, is the size of the newspaper. I compute three different indicators of the size: (i) the number of articles by newspaper; (ii) the total

<sup>30</sup> To save on space, I only report the coefficients for entry variables since they are the only coefficients of interest. Results are robust to controlling or not for the exit indicator variables.

<sup>31</sup> Given that the balance sheet data is only available from 1960, I report the results for the 1960–2014 period for the sake of comparability. Consistently with the graphical evidence presented in the aggregate event study, results are robust to considering the entire 1944–2014 for journalists, and are available upon demand.

number of words by newspaper; (iii) the total number of words on the newspaper front page. To adjust standard errors for possible dependence in residuals, I cluster them at the county-year level.

Table 5 shows the impact of the number of newspapers on the size of newspapers. In column 1, I consider the total number of articles in the newspaper, in column 2 the total number of words, and in column 3 the total number of words on the front page. I find that the number of articles in a newspaper statistically significantly decreases with the number of newspapers on the market: one additional newspaper decreases the number of articles by 178, a 42% decrease. The total number of words decreases by 53% and the number of words on the front page by 16%.

### 3.4.2. The type of news produced

I now investigate how the content of newspapers (hard vs. soft news) varies with the market structure. Classifying newspaper content into hard and soft news is an empirical challenge *per se*, especially because there are “news hybrids” and because what is informative in the political process for one citizen may not be for another. I consider as hard news articles which are informative for the reader at the time of the elections, even if they sometimes incorporate elements from entertainment. In contrast, soft news is non-informative in the political process.

In order to study the distribution of articles by topic, I use the information provided by the website Lexis-Nexis. When I retrieve the content of newspapers, I also retrieve all the metadata associated with each newspaper article, and in particular its title, topic and subject. Combining information from the title, topic and subject, I determine the category of each article. I create 13 different categories: agriculture, culture, economics, education, environment, health, international affairs, leisure activities, movies, “news in brief” (*faits divers*), politics, religion and sports. I define the share of hard news articles as the number of articles on agriculture, economics, education, environment, international affairs or politics, divided by the total number of articles classified by topics. Symmetrically, I define the share of soft news articles as the number of articles on culture, health, leisure activities, movies, “news in brief”, religion or sports, divided by the total number of articles classified by topics.

I then estimate Eq. (4) with the share of hard news articles, the number of hard news articles and the number of soft news articles as my dependent variables of interest. Columns 4 to 6 of Table 5 present the results. I find that the share of articles on hard news decreases with the number of newspapers on the market (column 4). An increase of one in the number of newspapers decreases the

share of articles on hard news by around 2.6 percentage points, a 7.7% decrease. This decline comes from a decrease in the number of articles on hard news: in column 5, I show that an increase of one in the number of newspapers decreases the number of articles on hard news by 81. I also find that the number of articles on soft news decreases with the number of newspapers.

## 4. Competition and news production: mechanisms

In the previous section, I have documented a negative relationship between increased competition and the circulation and quality of newspapers. In this section I examine a number of theoretical mechanisms that may drive these empirical findings. I first consider the post-war period and discuss the importance of media capture in a context in which most newspapers were politically biased. I then turn to the most recent period characterized by nonpartisan reporting. I lay out a simple vertical product differentiation framework, and interact empirically the effect of market structure with the degree of heterogeneity in consumers’ willingness-to-pay.

### 4.1. Competition, capture, and the extent of media bias

As detailed in the historical background Section 2.1, the post-war period can be considered the golden age of the partisan press in France. During this period, to the extent that the newspapers that were the organ of political parties did not care about the size of the audience, an increase in competition may have led to an increase in the bias – in particular through a drop in advertising revenues – and to a decline in readers’ willingness-to-pay, as predicted by Petrova (2012).

I first investigate whether the negative impact of competition on circulation and the size of the newsroom still hold if we focus on the Fourth Republic period. Online Appendix Fig. E.9 estimates model (1) for the Fourth Republic sub-period (1944–1958). The overall pattern is similar to that presented in Fig. 3 using the entire time period. If anything, the magnitude of the drop in the circulation of incumbent newspapers is larger in the post-war period.

One possible explanation for this decline in circulation is a decrease in consumers’ willingness-to-pay produced by an increase in bias. The existing data do not allow me to measure empirically the extent to which incumbent newspapers have increased their slant in response to the increase in competition. However, to investigate whether this mechanism may drive my results, I can use the information on newspapers’ partisan affiliation I collect from the National

**Table 5**

The effect of the number of newspapers on newspaper content.

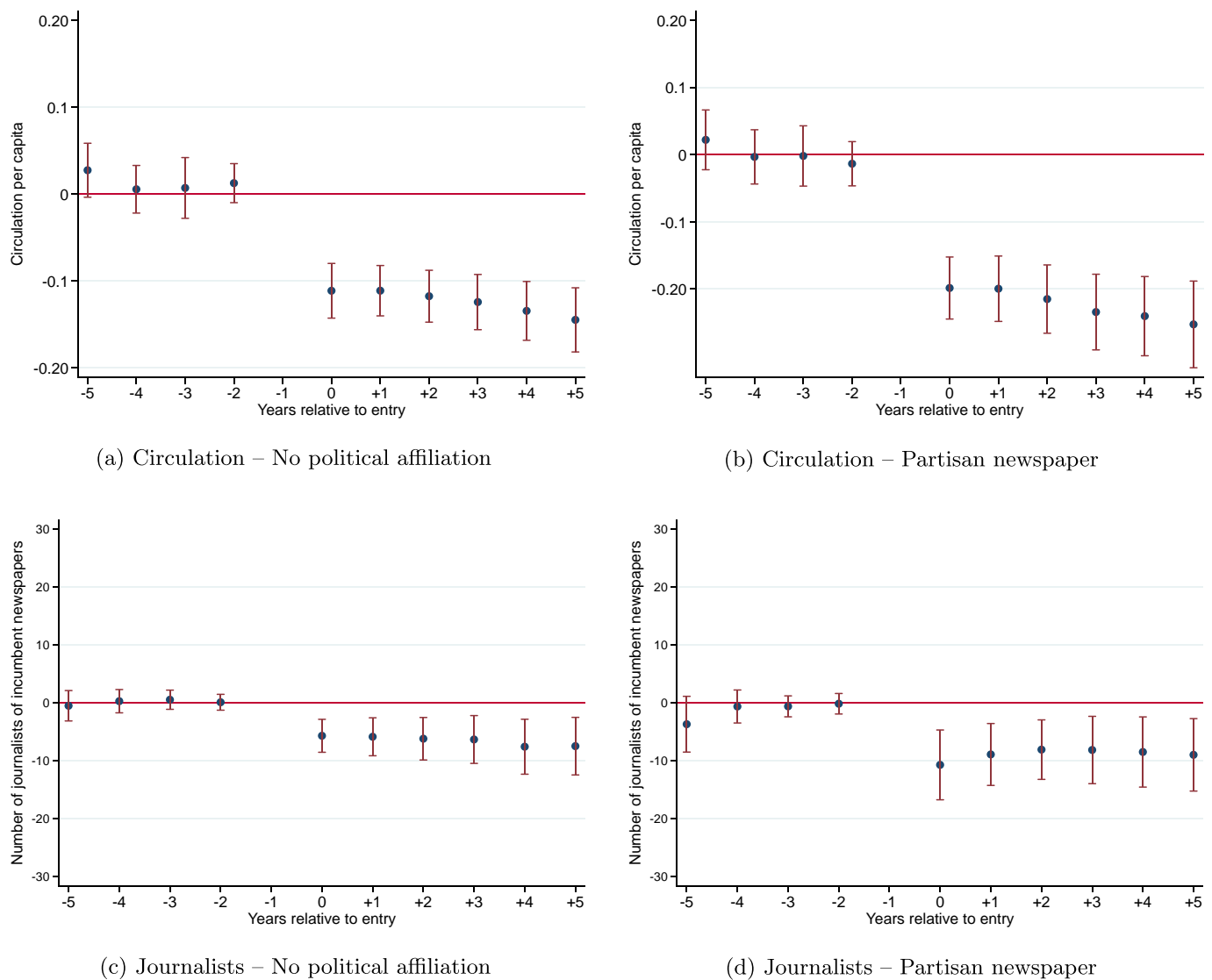
	Nb articles	Nb words	Nb words front page	Share hard news	Nb hard news	Nb soft news
	(1)	(2)	(3)	(4)	(5)	(6)
Number of newspapers	−177.8 <sup>***</sup> (17.8)	−56,295.7 <sup>***</sup> (5284.3)	−60.2 <sup>***</sup> (16.1)	−2.6 <sup>**</sup> (1.0)	−81.2 <sup>***</sup> (11.8)	−133.8 <sup>***</sup> (20.9)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.70	0.69	0.18	0.22	0.57	0.59
Observations	27,708	30,502	94,901	25,745	27,170	27,291
Clusters (county-year)	106	106	274	88	94	94
Mean DepVar	421	107,044	370	34	91	166
Sd DepVar	302	83,165	222	11	89	139

**Notes:** Standard errors in parentheses are clustered by county-year. Time period is 2005–2012. Models are estimated using OLS. In column 1, the dependent variable is the number of articles per newspaper; in column 2, the number of words per newspaper; in column 3, the number of words per newspaper front page; in column 4, the share of articles on hard news which is defined as the number of articles on agriculture, economics, education, environment, international or politics, divided by the total number of articles classified by topics; in column 5, the number of articles on hard news; and in column 6, the number of articles on soft news. Models include year fixed effects and demographic controls. Variables are described in more details in the text.

\*  $p < 0.10$ .

\*\*  $p < 0.05$ .

\*\*\*  $p < 0.01$ .



**Fig. 5.** Impact of newspaper entry on incumbent newspapers' circulation and on the size of the newsroom: The Fourth Republic, 1944–1958, depending on the political bias. **Notes:** The figures show coefficients from a regression of circulation on a vector of year dummies going from  $-5$  to  $+5$  with the events of entry taking place in  $j = 0$  (see Eq. (1) for details). In the upper Fig. 5a and b, the dependent variable is the circulation of incumbent newspapers per eligible voter. In the bottom Fig. 5c and d, the dependent variable is the number of journalists working for the incumbent newspapers. The “Partisan newspaper” sample includes all the incumbent newspapers that were partisan newspapers in 1950. The “No political affiliation” sample includes all the incumbent newspapers that were “information” newspapers (without political affiliation) in 1950. Models include year and county fixed effects and demographic controls. Error bars are  $\pm 2$  standard errors. Standard errors are clustered by events. Time period is 1944–1958.

Archives. While straight after the Libération almost all the newspapers were politically-affiliated, the partisan-reporting decline began at the end of the 1940s. Hence, one may expect that the newspapers that were still politically-affiliated in 1950 were also the most likely to further increase their bias following a newspaper entry. In other words, one can expect the drop in circulation generated by entry to be larger for biased newspapers.

I split my sample between newspapers that were partisan newspapers in 1950 and “information” newspapers (without political affiliation).<sup>32</sup> Fig. 5 shows the results. The upper figures Fig. 5a and Fig. 5b report the impact of entry on the circulation of incumbent newspapers. While this impact is negative both for politically-affiliated and for information newspapers, the decline is particularly strong for partisan newspapers. We also observe a larger drop in the

size of the newsroom for partisan newspapers (Fig. 5d) than for information newspapers (Fig. 5c); however in this case the difference is not statistically significant.

These findings alone do not demonstrate that the extent of media capture is the main driver of my empirical results, and they should be taken with a grain of salt. However, they point toward such a mechanism for the Fourth Republic period, and are consistent with the predictions of Petrova (2012) in the context of an underdeveloped advertising market.

#### 4.2. Competition on quality and consumers' heterogeneity

The Fifth Republic marked the end of biased coverage for local newspapers in France. In a context where newspapers deliver news preferred by consumers, vertical product differentiation provides an alternative simple explanation for the heretofore puzzling negative impact of increased media competition on the provision on information. In this section, I lay out a simple theoretical framework and then

<sup>32</sup> The results are not driven by the choice of 1950 as a base year, and still hold when I use earlier or later reference years.



investigate empirically whether the impact of competition varies with the extent of heterogeneity in consumers' willingness-to-pay.

#### 4.2.1. Theoretical framework

I present my theoretical framework and a number of qualitative predictions that guide the subsequent empirical exercise and help to interpret the results. For the sake of concision, and also because the main contribution of the paper is empirical in nature, the presentation of the full-fledged theoretical model is left to the online Appendix (Sections F and G). Here I only describe the main intuitions.

My theoretical framework builds upon models of vertical product differentiation. For simplicity, I consider a model where two profit-maximizing newspapers compete to attract readers. I assume that there exists a single attribute along which newspapers can differentiate themselves, namely newspaper quality, and that readers are heterogeneous in their willingness-to-pay for quality. I also assume that there are increasing returns to scale in the production of newspaper quality, in the sense that higher quality involves higher fixed costs (typically a larger newsroom and journalist wage bill) but no additional marginal cost (once the higher-quality news is produced, it can be reproduced for a limited cost). Newspapers first choose simultaneously their quality, and then compete simultaneously in price. Under fairly general conditions, one can obtain the following theoretical prediction:

#### **Prediction 1.** (Newspaper quality)

- (i) *When heterogeneity in the willingness-to-pay for quality is high, one duopolist produces a lower-quality newspaper than the monopolist, and the other a higher-quality newspaper.*
- (ii) *When heterogeneity in the willingness-to-pay for quality is low, both duopolists produce a lower-quality newspaper than the monopolist.*

The basic intuition behind **Prediction 1** is the following. When heterogeneity is high, the market is not covered under competition, and newspapers can differentiate on quality to soften price competition and increase market power. One duopolist produces a lower-quality newspaper than the monopolist, and the other a higher-quality newspaper. In contrast, when heterogeneity is low, the market is covered under competition, leading to a business-stealing effect. Newspapers have little space for differentiation, which leads to stronger price competition (battle for market shares), decrease in profit, and lower resources available for quality investment.

The extreme case involves no heterogeneity at all in taste for quality. Under these conditions, it is clear that competition does not bring anything useful in terms of social efficiency. The business-stealing effect dominates, and both newspapers under duopoly can end up producing a lower-quality newspaper than the monopolist. By continuity, this result also applies when heterogeneity is small.<sup>33</sup>

Finally, if we combine this model of newspaper competition with a model of information acquisition and voting behavior, then we also obtain a corollary prediction on media competition and turnout:

#### **Prediction 2.** (Turnout)

- (i) *When heterogeneity in the willingness-to-pay for quality is high, the entry of a newspaper leads to an increase in turnout.*

<sup>33</sup> In the online Appendix, I also introduce a second dimension of heterogeneity between readers, namely regarding their preference for hard news vs soft news. I show that when heterogeneity in the willingness-to-pay for hard news is higher than heterogeneity in the willingness-to-pay for soft news, one duopolist produces lower-quality hard news than the monopolist and the other one higher-quality hard news. In contrast, when heterogeneity in the willingness-to-pay for hard news is lower than heterogeneity in the willingness-to-pay for soft news, both duopolists produce lower-quality hard news than the monopolist.

- (ii) *When heterogeneity in the willingness-to-pay for quality is low, the entry of a newspaper leads to a decrease in turnout.*

#### 4.2.2. Measures of heterogeneity

An important feature of my simple theoretical framework is that the effect of entry depends on the extent of heterogeneity in consumers' willingness-to-pay. The choice of the data to quantify the extent of heterogeneity in the willingness-to-pay for quality across counties is a complicated issue. The most natural way to proceed is to use income inequality measures. Exhaustive income tax tabulations are available at the regional level over the 2004–2014 period in France. I use this data and generalized Pareto interpolation techniques (Blanchet et al., 2017) in order to compute regional measures of income dispersion. The regions with the highest income inequality levels tend to be located in the South-Eastern part of the country.

I then split my sample of counties between low-heterogeneity and high-heterogeneity counties on the basis of the regions to which they belong. That is, I classify as high-heterogeneity counties all counties in the top four high-inequality regions (Provence-Alpes-Côtes d'Azur, Languedoc-Roussillon, Rhône-Alpes, and Corsica).<sup>34</sup> Counties from other regions are classified as low-heterogeneity counties located in low-heterogeneity regions. Given the fact that in my simple theoretical framework the results depend on whether a county is below or above a heterogeneity threshold, such a binary measure of heterogeneity is more relevant than a continuous measure.

Generally speaking, my results suggest that counties are characterized by relatively low heterogeneity in France, in the sense that the business-stealing effect appears to dominate (on average). However, as I show below, this result comes entirely from the low-heterogeneity counties, and does not apply in high-heterogeneity counties (i.e. located in the top four high-inequality regions). Importantly, we observe entries and exits during my time period both in low-heterogeneity and in high-heterogeneity counties.<sup>35</sup>

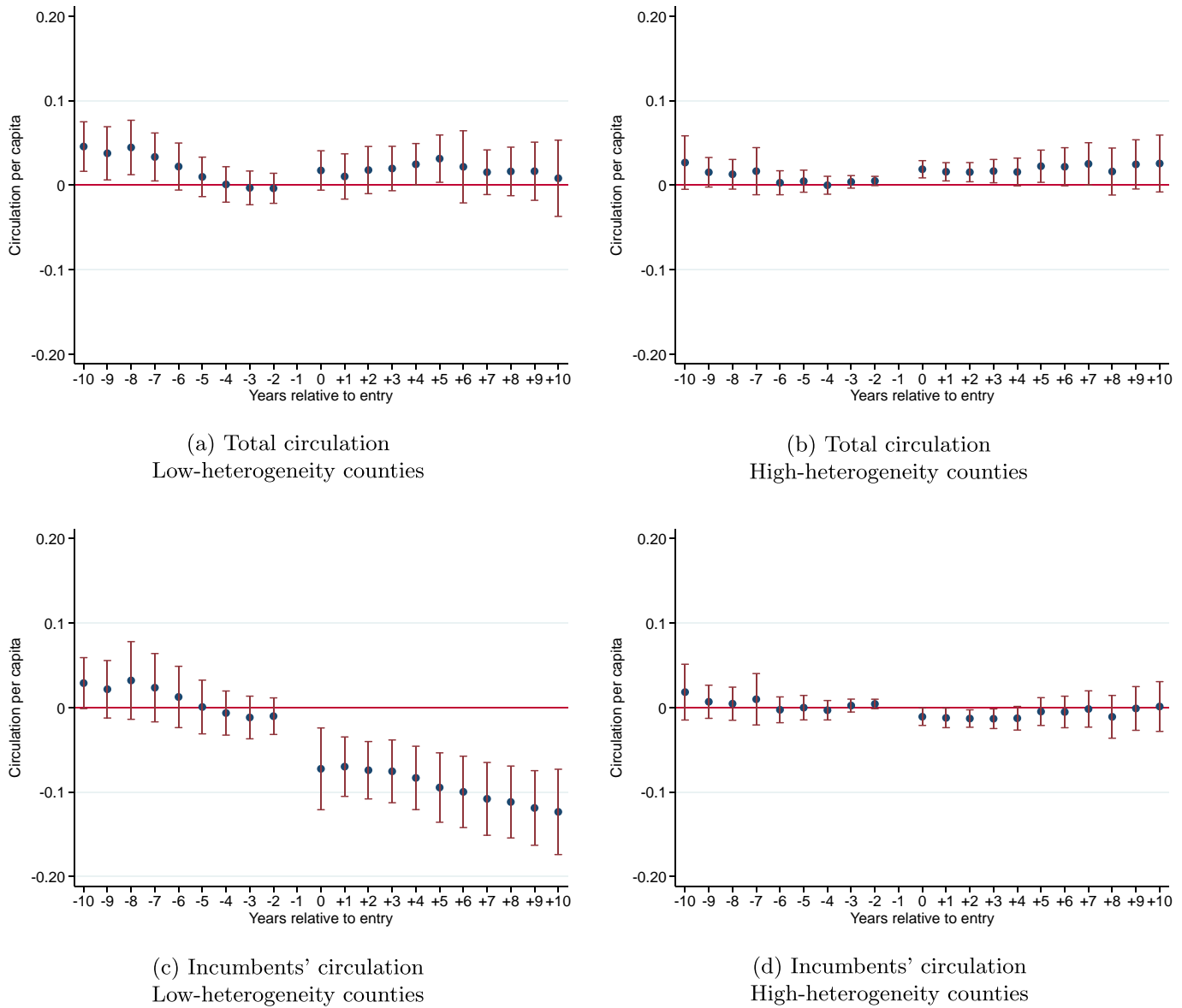
#### 4.2.3. Results

According to my simple theoretical framework, the business-stealing effect should be especially strong in low-heterogeneity counties during the Fifth Republic period (characterized by nonpartisan reporting). In Fig. 6, focusing on the 1960–2014 period, I investigate the effect of entry on circulation separately for low- and high-heterogeneity counties. It clearly shows that the business-stealing effect is much more significant in low than in high-heterogeneity places. In low-heterogeneity counties, there is no market expansion after an entry (Fig. 6a). There is a negative impact on the circulation of incumbent newspapers at the time of entry, and this impact becomes stronger in the years following the entry. Eight years after the entry, we observe a 10-percentage-point decrease in the circulation of incumbent newspapers per eligible voter, which corresponds to a 44% decrease.<sup>36</sup> The business-stealing effect is much smaller in high-heterogeneity counties. First, in these counties, there is a small market expansion following the entry: the total county circulation per eligible voter increases by 1.6 percentage points (Fig. 6b).

<sup>34</sup> For instance, the ratio between the 90th and 10th percentile of the income distribution is equal to 14.6 for these four regions, vs. 11.7 on average in other regions. The exact ranking of regions varies slightly with the inequality indicator (interdecile ratios, inverted Pareto coefficients, Gini indexes, etc.), but these four regions are the only regions which systematically belong to the top five high-inequality regions (whatever the indicator).

<sup>35</sup> Online Appendix Fig. D.2 shows for each year the number of counties with net newspaper entry and the number of counties with net newspaper exit, separately for low- and high-heterogeneity counties.

<sup>36</sup> Between 1960 and 2014, the average circulation of incumbent newspapers per eligible voter the year before an entry is 22.55%.



**Fig. 6.** Impact of newspaper entry on newspapers' circulation (1960–2014), by heterogeneity (controlling for demographics). **Notes:** The figures show coefficients from a regression of circulation on a vector of year dummies going from  $-10$  to  $+10$  with the events of entry taking place in  $j = 0$  (see Eq. (1) for details). In the two upper figures (6a and 6b), the dependent variable is the total county circulation per eligible voter. In the two bottom figures (c and d), the dependent variable is the circulation of incumbent newspapers per eligible voter. Figs. 6a and 6c show the effect of an entry on circulation in low-heterogeneity counties. Figs. 6b and 6d show this effect in high-heterogeneity counties. Models include year and county fixed effects and demographic controls. Error bars are  $\pm 2$  standard errors. Standard errors are clustered by events. Time period is 1960–2014.

Second, the incumbent newspapers' circulation only decreases by 1.9 percentage points at the time of the entry (Fig. 6d).

Next, I study how the impact of an entry on the size of the newsroom, revenues and expenditures varies with heterogeneity. For the sake of simplicity and readability, I regroup my indicator variables for the years before and after entries into three indicator variables: pre-entry ( $\mathbf{1}_{entry_{ct}^{pre-entry}} = 1$  in the 2nd and 1st pre-entry year), short-run entry ( $\mathbf{1}_{entry_{ct}^{short-run}} = 1$  in the entry year, the 1st, 2nd, 3rd and 4th post-entry year) and long-run entry ( $\mathbf{1}_{entry_{ct}^{long-run}} = 1$  in the 5th post-entry year and all subsequent years). The base period is the years before the entry, excluding the pre-entry period (i.e. from  $t - 3$  backwards). I interact these indicator variables with

the heterogeneity indicator variable. More precisely, my empirical specification is (abstracting from the exit terms)

$$\begin{aligned}
 y_{cnt} = & \beta_{pre-entry} \mathbf{1}_{entry_{ct}^{pre-entry}} + \theta_{pre-entry} \mathbf{1}_{entry_{ct}^{pre-entry}} * Low\ heterogeneity_c \\
 & + \beta_{short-run} \mathbf{1}_{entry_{ct}^{short-run}} + \theta_{short-run} \mathbf{1}_{entry_{ct}^{short-run}} * LowHeterogeneity_c \\
 & + \beta_{long-run} \mathbf{1}_{entry_{ct}^{long-run}} + \theta_{long-run} \mathbf{1}_{entry_{ct}^{long-run}} * Low\ heterogeneity_c \\
 & + \Gamma Low\ heterogeneity_c + \mathbf{X}_{ct} \delta + \mathbf{X}_{ct} * Low\ heterogeneity_c \sigma \\
 & + \eta_t + \rho_n + \varepsilon_{cnt}
 \end{aligned} \tag{5}$$

where  $Low\ heterogeneity_c$  is the low-heterogeneity indicator variable equal to one for low-heterogeneity counties and to zero

**Table 6**  
The effect of entry on incumbent newspapers' newsrooms, revenues and expenses, by Heterogeneity (newspaper-level analysis).

	Journalists		Total revenues		Sales revenues		Ad revenues		Expenditures	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Pre-entry ( $t - 2, t - 1$ )	-0.17 (0.14)	0.21 (0.30)	-0.15 (0.18)	0.09 (0.25)	-0.15 (0.19)	0.30 (0.30)	-0.20 (0.17)	0.00 (0.26)	-0.21 (0.18)	-0.20 (0.30)
Pre-entry * Low heterogeneity ( $t - 2, t - 1$ )		-0.42 (0.34)		-0.26 (0.31)		-0.54 (0.35)		-0.25 (0.31)		0.01 (0.35)
Short run Impact of Entry ( $t, t + 1, t + 2, t + 3, t + 4$ )	-0.35** (0.14)	0.22 (0.30)	-0.38** (0.16)	0.22 (0.32)	-0.35** (0.16)	0.41 (0.35)	-0.35** (0.15)	0.34 (0.30)	-0.43*** (0.15)	0.05 (0.34)
Short run * Low heterogeneity Impact of entry ( $t, t + 1, t + 2, t + 3, t + 4$ )		-0.71** (0.34)		-0.78** (0.37)		-0.99** (0.39)		-0.92** (0.35)		-0.62 (0.38)
Long run Impact of entry ( $t + 5, \text{onwards}$ )	-0.32** (0.15)	-0.28 (0.34)	-0.18 (0.14)	0.02 (0.40)	-0.07 (0.14)	0.11 (0.41)	-0.10 (0.14)	0.23 (0.40)	-0.18 (0.14)	-0.03 (0.43)
Long run * Low heterogeneity Impact of entry ( $t + 5, \text{onwards}$ )		-0.03 (0.37)		-0.22 (0.43)		-0.21 (0.45)		-0.38 (0.43)		-0.16 (0.45)
Low heterogeneity		-3.34 (2.56)		1.23 (6.10)		-0.30 (6.11)		0.63 (5.48)		2.01 (5.19)
Newspaper FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls * Heterogeneity	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R-sq	0.50	0.53	0.53	0.55	0.55	0.57	0.55	0.57	0.57	0.59
Observations	11,487	11,487	7534	7534	6560	6560	6667	6667	6594	6594
Clusters (county)	87	87	87	87	87	87	87	87	87	87

**Notes:** Standard errors in parentheses are clustered by county. Time period is 1960–2014. Models are estimated using OLS estimations. The dependent variables are in logarithm. All variables (except for the number of journalists) are in thousand (constant 2014) euros. Models include year and newspaper fixed effects, and demographic controls in all the columns, as well as demographic controls interacted with the heterogeneity indicator variable in even columns. Variables are described in more details in the text.

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

otherwise. I allow the demographic covariates  $X_{ct}$  to have a different impact in low- and high-heterogeneity counties.

In Table 6, I estimate Eq. (5) with different dependent variables at the newspaper level: the number of journalists (columns 1 and 2), total revenues (columns 3 and 4), revenues from sales (columns 5 and 6), revenues from advertising (columns 7 and 8), and total expenditures (columns 9 and 10). Odd columns present the results without accounting for heterogeneity. Consistently with the results of Table 4, I find that the entry of a newspaper has a negative impact on incumbent newspapers' number of journalists, revenues and expenditures following the shock (with no pre-trends). After 5 years, the negative effect is only statistically significant for the number of journalists (with a 32% drop), but the sign of the coefficients goes in the expected direction for all the other variables of interest.

In the even columns, I investigate the extent to which the effect varies depending on heterogeneity. For all the variables, it appears clearly that the negative effect of an entry is entirely driven by low-heterogeneity areas. While there is no impact of an entry on the number of journalists in high-heterogeneity counties, this number decreases by around 50% in low-heterogeneity counties. This is consistent with the first testable prediction of my simple theoretical framework, when I proxy newspaper quality by the number of journalists: under low heterogeneity in the willingness-to-pay for quality, the entry of a newspaper leads to a decrease in the quality of newspapers. Note however that the interaction is not statistically significant in the long run (after five years).

Finally, in the online Appendix Section C.2, I investigate whether in the nonpartisan reporting period, other dimensions of heterogeneity come into play. I show that newspapers with a more protective governance suffer more from increased competition in terms of revenues, but not when we consider the number of journalists.

Overall in this section, we have explored the mechanisms through which increased media competition negatively impacts newspapers' circulation, revenues, and production of information. In the next section we investigate whether, through this negative effect on information provision, media competition also affects political participation.

### 5. Newspaper competition and electoral turnout

In this section, I first consider whether electoral turnout varies with newspaper competition. Given that I have shown that the negative impact of competition on information provision is stronger in counties with more homogeneous populations, I next investigate whether the turnout effect is also larger in these counties.

#### 5.1. Specification and identification strategy

I match my panel data on newspaper competition with mayoral election results from 1947 to 2014 and track the impact of a change in competition on turnout. Let  $w$  index cities,  $c$  index counties and  $t \in \{1, \dots, 12\}$  index election years (one time unit representing six

**Table 7**  
The effect of a change in the number of newspapers on voter turnout.

	Baseline		Falsification test	
	(1) Turnout	(2) Turnout	(3) Previous election	(4) Previous election
Number of newspapers	-0.003 <sup>***</sup> (0.001)	0.001 (0.002)	0.000 (0.002)	-0.003 (0.003)
Number of newspapers * Low heterogeneity		-0.006 <sup>**</sup> (0.003)		0.004 (0.003)
Region-year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Controls * Heterogeneity	No	Yes	No	Yes
R-sq	0.19	0.19	0.26	0.26
Observations	5923	5923	4304	4304
Clusters (county)	87	87	87	87
Mean DepVar	-0.019	-0.019	-0.018	-0.018
Sd DepVar	0.070	0.070	0.069	0.069

**Notes:** Standard errors in parentheses are clustered by county. Time period is 1947–2014. Models are estimated in first differences. All specifications include election-region fixed effects and demographic controls. In columns 1 and 2, the dependent variable is turnout. In columns 3 and 4, I perform a falsification test: the dependent variable is turnout at the previous election.

- \* p < 0.10.
- \*\* p < 0.05.
- \*\*\* p < 0.01.

calendar years). The outcome of interest,  $y_{wct}$ , is voter turnout in city  $w$  in county  $c$  at time  $t$ . The key independent variable of interest is  $N_{wct}$ , the number of newspapers in city  $w$  in county  $c$  at time  $t$ . Since turnout varies at the city level while the number of newspapers varies at the county level (if two cities are in the same county, they have the same number of newspapers), I cluster the standard errors at the county level.

I assume that

$$turnout_{wct} = \alpha_1 N_{wct} + \alpha_2 N_{wct} * Low\ heterogeneity_c + \alpha_3 Low\ heterogeneity_c + X'_{wt} \delta_1 + X'_{wt} * Low\ heterogeneity_c \delta_2 + \rho_w + \mu_{rt} + \varepsilon_{wct}$$

where  $\rho_w$  is a city fixed effect,  $\mu_{rt}$  is an election-region fixed effect,  $X'_{wt}$  is a vector of observable characteristics at the city level,  $\delta_1$  and  $\delta_2$  are vectors of parameters and  $\varepsilon_{wct}$  is a city-county-year shock.  $Low\ heterogeneity_c$  is the low-heterogeneity indicator variable equal to one for low-heterogeneity counties and to zero otherwise.

Similarly to what is done in [Gentzkow et al. \(2011\)](#), I estimate the model in first differences. My estimation equation is then

$$\Delta turnout_{wct} = \alpha_1 \Delta N_{wct} + \alpha_2 \Delta N_{wct} * Low\ heterogeneity_c + \Delta X'_{wt} \delta_1 + \Delta X'_{wt} * Low\ heterogeneity_c \delta_2 + \Delta \mu_{rt} + \varepsilon_{wct} \tag{6}$$

where  $\Delta$  is a first-difference operator. The vector  $X'_{wt}$  includes the same controls as before. Controls are defined at the city level.

## 5.2. Main results

[Table 7](#) presents the results. In the first two columns, I show the effect of an additional newspaper on local turnout. Column 1 presents this effect without considering heterogeneity. I find that one additional newspaper decreases turnout by approximately 0.3 percentage points. In column 2, it can clearly be seen that this negative effect is driven by low-heterogeneity counties. I find no statistically significant impact of a change in the number of newspapers on

turnout at elections in high-heterogeneity counties.<sup>37</sup> On the contrary, when I focus on low-heterogeneity counties, I find that the effect of an entrant on the market is minus 0.6 percentage points and is statistically significant at the five-percent level.

The average turnout rate at local elections is 67%. [Online Appendix Fig. D.1](#) shows how it varies between 1947 and 2014. It oscillates between 70% and 77% during the period 1947–1977 and since then has been declining. In the 2014 election it was equal to 60%. Related to the 17-percentage-point decrease in turnout between 1947 and 2014, the 0.6-percentage-point negative effect of a typical entry is thus of importance. Note moreover that this negative turnout effect is only due to the introduction of an additional local newspaper. If I extrapolate my results to other medias, this suggests that the large increase in media competition during recent decades can potentially explain a significant fraction of the historical decline in turnout.

My identification relies on changes in the number of newspapers over time. As a result it is correct as long as the timing of these changes is random. In columns 3 and 4, I undertake a falsification test using the timing of the changes which seems to confirm that it is indeed the case. I estimate the impact of a future change in the news market on current turnout. The coefficients I obtain are all non-significant. This suggests that changes in the number of newspapers are not driven by election results and brings confidence in interpreting the coefficients of the first two columns as causal effects.

As an additional check supporting a causal interpretation of my findings, I use pre-trends. If the relationship between  $\Delta N_{wct}$  and  $\Delta y_{wct}$  comes only from a causal effect,  $\Delta N_{wct}$  cannot be correlated with past values of  $\Delta y_{wct}$ . On the contrary, if the observed relationship is driven by omitted components,  $\Delta N_{wct}$  and past val-

<sup>37</sup> According to the very simple theoretical framework I present in [Section 4.2.1](#) above, one may expect turnout to increase with entry in high-heterogeneity counties. Empirically, all counties in the top four high-inequality regions are classified as high-heterogeneity counties. The empirical evidence obtained in column 2 suggests that even high-heterogeneity counties thereby defined are not that heterogeneous in France. Or to put it another way, the findings of [Table 7](#) suggest that in practice, most counties in France are “low-heterogeneity” in the sense that the business-stealing effect dominates.

ues of  $\Delta y_{wct}$  may be correlated. In the online Appendix Fig. E.4, I show that there are no significant trends either before or after the event.

### 5.2.1. Magnitude of the effects

My estimates suggest that increasing newspaper competition by introducing an additional newspaper to a county decreases mayoral turnout per eligible voter by about 0.3 percentage points on average, and 0.6 percentage points in low-heterogeneity counties. The average share of individuals reading at least one newspaper is 70%. Following the logic of Gerber and Green's (2000) intent-to-treat calculation (see also Gentszkow et al., 2011), my point estimate in low-heterogeneity county corresponds to a  $(0.6/0.70) = 0.86$ -percentage-point effect.

To get a better sense of what the magnitude of my estimates implies, I also compute the corresponding persuasion rate (DellaVigna and Kaplan, 2007; DellaVigna and Gentszkow, 2010). The persuasion rate captures the effect of the persuasion treatment on the relevant behavior, adjusting for exposure to the message and for the size of the population still to be convinced. In my case, everyone is exposed the same way to newspapers so I do not need to adjust for exposure to the message. The change in behavior is from voting to not voting, so the set of potentially affected individuals is the set of those who turn out, which represents on average 67% of the population. The 0.7% of eligible voters who do not vote as a result of an increase in newspaper competition therefore implies a negative persuasion rate of  $(0.7/0.67) = 0.9\%$ .

These estimates are lower bounds. The entry of a newspaper indeed raises the share of individuals reading at least one newspaper by about 8 to 12 percentage points. While the "intensive" margin of newspaper competition – through the decrease in the quality of the information provided to readers – has a negative effect on the probability of voting, this "extensive" margin – the increase in the number of readers – may have the opposite effect, since previously non-informed citizens now have access to a source of information. I am not capturing here the positive effect of the extensive margin of entry; however, whereas the focus of the literature has been on the extensive persuasion rate – media access leads to higher turnout at elections – I show that the intensive margin of the media – the change in media quality – can reverse the extensive effect.

Abstracting from the change in the share of hard versus soft news in newspapers, I finally compute the number of citizens who change their behavior from voting to not voting due to a decrease of one in the number of journalists. Depending on the specifications, the entry of a newspaper leads to a decrease of about 9 to 25 journalists. As I underline above, the treatment effect of the entry of a newspaper is a .86-percentage-point decrease in turnout, which represents on average 3000 voters in a county. In other words, each newspaper cost cut of one journalist results in about 120 to 333 citizens failing to vote.

### 5.2.2. Interaction with market structure

Finally, Table 8 shows how my estimated effects vary with the extent of market competition. Following Gentszkow et al. (2011) and Drago et al. (2014), I estimate my main model (6) by including a set of interactions between  $\Delta N_{wct}$  and indicator variables for the number of preexisting newspapers. There is no statistically significant impact of entry in counties with only one newspaper. But an increase in competition leads to a large decline in turnout in low-heterogeneity counties with two newspapers. The fact that the negative impact of newspaper entry increases with the number of preexisting newspapers in low-heterogeneity counties is not surprising: the higher the number of newspapers before entry, the higher the probably that the news market was already covered.

**Table 8**

The effect of a change in the number of newspapers on voter turnout depending on the market structure.

	(1)	(2)
$\geq 1$ Newspaper	−0.005 (0.004)	−0.009 (0.007)
$\geq 1$ Newspaper *Low heterogeneity		0.005 (0.008)
$\geq 2$ Newspapers	0.002 (0.005)	0.013***,*** (0.005)
$\geq 2$ Newspapers *Low heterogeneity		−0.015** (0.007)
$\geq 3$ Newspapers	0.003 (0.004)	−0.004 (0.005)
$\geq 3$ Newspapers *Low heterogeneity		0.010 (0.007)
$\geq 4$ Newspapers	−0.004 (0.006)	−0.013 (0.010)
$\geq 4$ Newspapers *Low heterogeneity		0.014 (0.012)
$\geq 5$ Newspapers	0.001 (0.004)	0.021** (0.010)
$\geq 5$ Newspapers *Low heterogeneity		−0.025** (0.010)
Region-year FE	Yes	Yes
Controls	Yes	Yes
Controls * Heterogeneity	No	Yes
R-sq	0.19	0.19
Observations	5923	5923
Clusters (county)	87	87
Mean DepVar	−0.019	−0.019
Sd DepVar	0.070	0.070

**Notes:** Standard errors in parentheses are clustered by county. Time period is 1947–2014. Models are estimated in first differences. All specifications include election-region fixed effects and demographic controls.

\*  $p < 0.10$ .

\*\*  $p < 0.05$ .

\*\*\*  $p < 0.01$ .

## 6. Discussion and interpretation of the results

### 6.1. Alternative mechanisms

Clearly I have not established that my simple theoretical framework built upon models of vertical product differentiation is the only framework that could generate a negative correlation between newspaper competition and a decrease in turnout at elections. Other theories may rationalize this finding. But I believe that it is difficult to find an alternative theory for the result regarding the effect of the interaction between the market structure and the extent of heterogeneity in the willingness-to-pay for quality.

The issue of a dumbing-down of news content has been raised both for newspapers and television. Zaller (1999) points out that increased market pressure is sometimes associated with cutbacks in reporting and editorial quality which lead to a race to the bottom (see also Arnold, 2002). Focusing on television, Popkin (2007) highlights that competition changes content; he shows that in the 1990s, network news covered less legislation than in the 1970s while celebrity coverage increased (see also Hamilton, 2004; Jones, 2010).<sup>38</sup> How to explain such a race to the bottom in quality selections? The argument

<sup>38</sup> Angelucci and Cagé (2019) and Angelucci et al. (2017) exploit historical data to examine how, respectively, the introduction of advertising on television in France and the introduction of television in the United States affected newspaper content. They document a decline in quality following increased competition.

I develop in this paper is that under low heterogeneity, competition leads to the division of the readership into smaller groups which reduces the revenues available to each newspaper to produce a high-quality paper. This simple theoretical framework rationalizes the observed decrease in the quality of competing newspapers compared to the monopolist in low-heterogeneity counties.

An alternative argument is that the race to the bottom may simply reflect a general decline in preferences for hard news compared to soft news. I can rationalize this argument easily in the extension of my simple theoretical framework in which I divide newspaper content into hard news and soft news (online Appendix Section F.1.5). In this framework, under the assumption that the average willingness-to-pay for high-quality soft news is higher than the average willingness-to-pay for high-quality hard news, everything else being equal, newspapers choose to produce more soft news than hard news. This argument may explain part of the historical decline in hard news coverage, but not the impact of the market structure on the share of hard news, since the monopolist and the duopolists react in the same way to a change in the average willingness-to-pay. On the contrary, my simple theoretical framework can account for the decrease in the share of hard news under increased competition.

A second argument that is often put forward in existing literature is the role played by advertising (see e.g. Hamilton, 2004). Recent papers in the field model the market for news as a two-sided market and study how advertising affects content (see e.g. Ellman and Germano, 2009; Angelucci and Cagé, 2019; Shiller et al., 2017). Taking into account different values advertisers may place on different readers is beyond the scope of this paper. However, as with a general decline in preferences for hard news, advertising cannot account for the impact of the market structure on the share of hard news.

Finally, the observed race to the bottom in quality selections has been linked to the move from nonprofit to profit-driven news organizations (see e.g. Jones, 2010; Cagé, 2015).<sup>39</sup> According to Hamilton (2004), “media companies once covered public affairs in part because this brought prestige to the firm’s owners (...). Now that newspapers and television channels are part of large publicly traded firms, the focus on profits demanded by shareholders means less attention to public affairs reporting.” In my simple theoretical framework, I assume that newspapers are profit maximizing. This assumption is driven both by the move from nonprofit to profit-driven news organizations in the United States and by the evidence from France where news organizations, especially local daily newspapers, are profit-maximizing firms. Having said that, assuming that newspapers are benevolent and operate under a positive-profit constraint will lead to similar predictions under low heterogeneity.

### 6.1.1. Polarization and self-segregation

Importantly, one could argue that an increase in media competition may lead to changes in turnout at elections independently of any impact on the quality of information. The first channel through which this may happen is polarization and self-segregation. Through the implied fragmentation of the market, an increase in media competition may reduce common experiences and lead to the polarization of views among groups which avoid hearing information that might contradict their priors (Sunstein, 2002; Mullainathan and Shleifer, 2005; Sunstein, 2009). The widening of media choice and the elicited self-segregation of citizens can affect voter turnout in at least two ways. First, increased media choice leads to lower turnout among people who prefer soft news to hard news because it reduces their

exposure to hard news and their acquisition of political knowledge (Prior, 2007). This argument is relevant in the case of television where there are entertainment channels entirely dedicated to soft news; less so for local daily newspapers which always offer a mix of soft and hard news. Second, by confirming readers’ prior beliefs, increased media competition may lead to an increase in the polarization of voter preferences and through this channel to an increase in political participation. This theoretical prediction contradicts my empirical findings given that I document the fact that increased media competition leads to a decrease – not an increase – in participation.

### 6.1.2. Information overload

Finally, even if an increase in media competition were to increase the amount of information available to readers, it could nevertheless lead to a decrease in voter turnout through information overload. The burden of a heavy information load may indeed confuse readers and hamper decision-making (Dewatripont and Tirole, 2005). Anyhow, these theoretical arguments cannot rationalize the empirical findings of the paper. First, I establish that under low heterogeneity, competition leads to a decrease – not an increase – in the quantity of information provided by each competing newspaper. Whether or not summing information over competing newspapers leads to an increase or a decrease in the total amount of information available in a market is a complicated empirical issue that I do not tackle in this paper. But the existing empirical evidence shows that different media outlets tend to cover similar issues so if anything competition leads to a duplication rather than a proliferation of information.<sup>40</sup> Moreover, the availability of more media outlets does not imply that citizens consume more outlets. In particular, evidence from the consumption of local daily newspapers in France shows that consumers tend to single-home.

### 6.2. External validity

A final question is whether we should expect the patterns I have uncovered in the case of local daily newspapers and local elections in France to be repeated in other contexts. First, should these patterns hold in other countries? And second, should they still hold in the internet era? There are good reasons to think this could be the case.

#### 6.2.1. Consumers’ heterogeneity

To rationalize the negative impact of entry I propose a simple theoretical framework that suggests that the effect of the market structure on political participation operates through two main ingredients: newspapers operate under increasing returns to scale and they face heterogeneous consumers that differ in their willingness-to-pay for quality. The negative effect of competition on turnout should be expected when heterogeneity in consumers’ willingness-to-pay is low. The extent of heterogeneity can vary from country to country and specific patterns will differ depending on the context. The finding in Drago et al. (2014) of a positive effect of newspaper competition on electoral participation may be explained by high heterogeneity of Italian readership. More evidence is certainly in order and it will be interesting to interact the effect of market structure they obtain with a measure of heterogeneity to check whether it is indeed the case. Similarly, while Gentzkow et al. (2011) find no effect of newspaper competition on turnout at national elections, it would be of interest to test for the presence of an effect on local turnout and to study the interaction between the market structure and heterogeneity.

<sup>39</sup> It may also be that, as highlighted by Noam (2009), in media industries in which competition is weak, owners can afford to offer content based on their personal preferences, rather than on their readers’ preferences, which may include a sense of public service, i.e. more hard news. With increased competition, they may, on the contrary, have to cater to their readers’ taste for soft news.

<sup>40</sup> In their study of the production of online information in France in 2013, Cagé et al. (2017) show that only one third of the online content produced by news media is original. See also Boczkowski (2010).

### 6.2.2. Media bias

The choice of the vertical differentiation framework is driven by the fact that in recent years, local daily newspapers in France are to a very large extent independent. While this feature is characteristic of the local news market – national media tend to have a stronger slant – it is not specific to France. According to Hamilton (2004), nonpartisan reporting also dominates in American newspaper markets (see also Petrova, 2011). Furthermore, it is necessary to highlight the importance of local newspapers for local democracy. Even if some of my findings were not to hold for national media, improving our understanding of the determinants of local information is of interest per se. A decline in local journalism due to increased competition can indeed have far-reaching consequences for politics and the economy.<sup>41</sup>

### 6.2.3. Internet

With the internet – which some believe will allow voters to find all the information they need at the time of the elections – does the information provided in local daily newspapers still matter? There are various ways to tackle this issue. First, it is important to highlight that online news is still in its infancy (Gentzkow and Shapiro, 2015). Even if consumers continue to increase the time they spend consuming digital media, newspapers are still a critical part of the news landscape. As highlighted in a 2016 Pew Research Center survey, “the digital news era is still very much in its adolescence”. In the majority of countries, regional or local media carry on being prominent news sources both offline and online (Reuters Institute, 2017). Regarding the United States, according to the *State of the Media Report 2013* of the Pew Research Center, “papers in smaller markets (...) can remain the go-to source for local news and a strong vehicle for local advertisers.”

Furthermore, individuals are much more likely to search on the internet for soft news or information about product purchases than for hard news (Hamilton, 2004). Internet expands the overall audience for the national daily newspapers but not for the local daily newspapers. In France, I find that in hard copy sales, the top five daily newspapers account for 9% of the total circulation of daily newspapers. The top daily newspaper is a local newspaper – *Ouest France* – and accounts for 3.3% of this total circulation. The picture is different when I turn to websites. In terms of the number of visits to a website and, similarly, the number of pages viewed, the top five websites garner more than 53% of the total traffic, with 21% for the top paper, *Le Monde*. Moreover the most popular websites are websites of national daily newspapers.<sup>42</sup> The internet is a way for consumers around the country to gain access to national papers and national information (or entertainment), not to gain access to more local information.

Finally, especially for newspapers, the internet brings greater competition, raising the issue of the potential welfare losses that may arise from excessive competition and the duplication of costs. News sites – like newspapers – face fixed costs of content that depend on quality. Furthermore the internet increases the relative importance of these fixed costs: on the internet, the cost of paper and distribution approach zero. Obviously this does not mean that the advent of the internet has not affected the provision of information; with the notable exceptions of Seamans and Zhu (2017) and Cagé et al. (2017), there is little empirical evidence on how media outlets adjust their content in response to increased competition in an online world. But this means that the amount of information

provided by local newspapers is still an important determinant of local political participation in the digital era.

## 7. Conclusion

In this paper, I investigate empirically how an increase in the number of newspapers in a market affects the quantity and type of news provided and, ultimately, changes in political participation. Using a new dataset of French local daily newspapers and local elections between 1944 and 2014, I show that newspaper entry sharply reduces the circulation of incumbent newspapers. Furthermore, thanks to the unique journalist data I gather, I bring to light the consequences of such a decrease, namely a drop in the size of the newsroom. I also provide anecdotal evidence of a “switching effect”, with journalists moving from the incumbent newspaper’s newsroom to the entrant’s. The decrease in the number of journalists impact the content of newspapers whose size also goes down. Finally, I find that an increase in the number of local newspapers leads to a decrease in political participation at local elections.

Exploiting the long time span covered by my data, I discuss a number of mechanisms that may drive these empirical findings. In the post-war period, most local newspapers were the organs of political parties, and the negative impact of increased competition may work through captured newspapers supplying more biased news in a context of low potential advertising revenues. Consistently with this prediction, I show that during the Fourth Republic, the drop in circulation implied by entry is stronger for partisan than for independent newspapers.

The Fifth Republic marks the end of partisan reporting. Drawing from the literature on vertical product differentiation, I show that if the heterogeneity of consumers’ willingness-to-pay for a high-quality newspaper is low, an increase in the number of newspapers leads to a decrease in newspaper quality and, eventually, to voter participation at elections. The evidence I obtain is consistent with this intuition. In particular, I show that the business-stealing effect is particularly strong in low-heterogeneity counties, leading to a larger drop in the size of the newsroom and ultimately in electoral turnout.

The findings of this paper question the view that more media competition is necessarily socially efficient. They obviously do not imply that media competition is less desirable than media monopoly as the latter raises other important issues, in particular media capture (Besley and Prat, 2006) and monopoly rents. But they may have important policy implications. In my view, future research should study the relevance of policy interventions to compensate for the welfare losses that may arise from excessive competition under certain conditions. E.g. in some cases it might be desirable to encourage newspaper competitors to enter into a joint operating agreement and to combine business operations (which may require antitrust exemptions in the spirit of the American Newspaper Preservation Act (1970)). This can also involve the development of more favorable legal and fiscal status for media organizations (which in most countries are not allowed to benefit from nonprofit status), and support for news agencies that help to reduce the fixed cost of news production.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jpubeco.2019.104077>.

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<sup>41</sup> Rubado and Jennings (2019), in their study of newspapers in California, find that when there are fewer reporters who cover an area, fewer people run for mayor, and fewer people vote.

<sup>42</sup> Hamilton (2004) finds a similar picture for the United States: “in hard copy sales, the top 5 among America’s largest 100 newspapers account for 21.5 percent of the total circulation. In terms of linking activity, the top 5 websites of these newspapers garner 41.4 percent of the total traffic.”

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