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Abstract

Does economic development promote media freedom? Do higher advertising revenues tend to make media outlets independent of political groups' influence? Using data on the 19th century American newspapers, I show that in places with higher advertising revenues, newspapers were more likely to be independent from political parties. Similar results hold when local advertising rates are instrumented by regulations on outdoor advertising and newspaper distribution. I also show that newly created newspapers were more likely to enter the market as independents in markets with higher advertising rates.

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1 Introduction

Media sponsored by influence groups often report distorted information to their audience. Independent media, though not unbiased, tend to provide more objective coverage,¹ promote electoral accountability, reduce corruption, and restrict managerial diversion.² How can such independent media emerge? According to both theoretical models (Besley and Prat, 2006, Gentzkow et al., 2006, Petrova 2009) and historical accounts (Baldasty, 2002, Smythe 2002, Starr 2004), the growth of an advertising market is an important factor for the development of independent media. So far, however, there is no systematic empirical evidence to validate this claim. Hamilton (2004) and Gentzkow et al. (2006)³ provide an empirical analysis of newspapers in the 19th century United States which shows that there were more independent newspapers in places with faster population growth; this could be taken as suggestive evidence in favor of the hypothesis.

In this paper, I use data on American newspapers in 1880-85 to show that the growth of an advertising market promotes media independence from political influence groups. Several theoretical explanations underpin this argument. First, as shown formally in Besley and Prat (2006) and Gentzkow et al. (2006), if the profitability of advertising is high, then it is costly for media outlets to distort their news coverage in the direction desired by a subsidizing group. Any deviation from the coverage that maximizes the audience means the loss of the audience and the loss of corresponding advertising revenues. Second, market expansion increases variety, and independent media can fill the gap that had not been served by sponsored media.⁴ Third, there might be the private benefit of control for media editors that is associated with the possibility of expressing their own opinion (Djankov et al. 2003). Higher revenues from advertising together with these benefits could outweigh the loss of subsidies from political parties. Fourth, as argued in Gabszewicz et al. (2001, 2002), the growth of advertising allows media outlets to choose the same politically neutral reporting because price competition becomes relatively less important for their profits.

¹Djankov et al. (2003), Besley and Prat (2006), Reuter and Zitzewitz (2006).

²Empirical accounts include Dyck et al., 2009, Snyder and Strömberg, 2008, Brunetti and Weder, 2003, Gentzkow et al., 2006, Reinikka and Svensson, 2006, Dyck et al., 2008, just to mention a few.

³Hamilton (2004) provides an empirical analysis of the political affiliation of newspapers in the largest U.S. cities to show that there were more independent newspapers in more populous cities and in cities with smaller foreign-born and African-American populations. Gentzkow et al. (2006) show that there is a correlation between the change in population of big cities and the change in the share of readership of independent newspapers in these cities.

⁴See e.g. Chen and Riordan (2007) for a formal model which is related to this argument.

However, there are theoretical reasons why this argument may not always hold. First, as discussed in Petrova (2009), if consumers do not pay too much attention to media slant, then it might be profitable for a special interest group or a political party to pay higher subsidies to media outlets if their advertising revenues go up, because this implies that their audience grows. Second, as shown in Gehlbach and Sonin (2008), the growth of advertising creates an incentive for the government to use non-market strategies to capture the media and, correspondingly, to nationalize the associated profits.

Empirically, I test whether there is a positive relationship between the growth of the advertising market and the growth of independent media. I also look at whether the relationship might be interpreted as causal, and through what mechanism the effect was working. I analyze data on American newspapers during 1880-85. During that time, the majority of newspapers were affiliated with a major political party, but some were independent. As discussed in the background section, the main difference between partisan newspapers (newspapers affiliated with the Democratic or Republican party) and independent newspapers was not the size of the bias but rather the extent of control a party had over the newspaper's news coverage. Editors of independent newspapers could print whatever they wanted, while editors of partisan newspapers were restricted in their decisions.

This paper makes several contributions to the literature. First, it presents empirical evidence of the link between the development of advertising markets and the growth of independent newspapers. I show that even in specifications with newspaper fixed effects, there is a significant positive correlation between local advertising rates and independent affiliation of a newspaper. To avoid the problem that advertising rates could be chosen as a result of strategic interaction among the newspapers in a market, I also look at the entry of new newspapers. I find that new newspapers were more likely to be independent in the markets with higher advertising rates per reader and thus higher profitability of advertising.

Second, the paper presents evidence in favor of a causal relationship between local advertising rates and newspapers' independence. A potential endogeneity problem with previous specifications is that some unobserved time-varying parameter may shift both the demand for independent newspapers and local advertising rates. Also, there may be a reverse causality problem, because independent newspapers could charge higher advertising rates. I address these problems by using instrumental variable estimation. For the state of Massachusetts, I report the results using local regulation of outdoor advertising, and of newspaper and handbill distribution, as instruments for local advertising rates. These restrictions were triggered after the 1873 scandal involving the advertisement of a patent medicine, "S T 1860 X," which was painted on a rock near Niagara Falls (Taylor and Chang, 1995), an

event plausibly orthogonal to the development of an independent press in Massachusetts. The results are consistent with results for the fixed-effect estimations and the results for newly created newspapers.

Third, I present evidence that economic development was not the only cause of the development of an independent press, as some authors have suggested.⁵ The structure of political power in a city played an important role. In particular, in county seats (administrative capitals of counties, which often had their own legislative body) where there were more opportunities for political parties to influence local newspapers, there were fewer independent newspapers, despite the fact that the county seats were, on average, more populous, more developed, and had higher advertising rates than other cities in the same county. Other evidence in favor of a political channel comes from variation over time. I find that new newspapers were significantly more likely to be partisan if they were created during 1880 and 1884, the years of presidential elections, during which parties presumably had more incentives to support partisan newspapers.⁶ These results suggest that the growth of advertising markets and economic development do not guarantee freedom of the press, because of the existence of political factors.

I also look at the circulation of different kinds of newspapers to find out which theoretical explanations for the relationship between advertising and independence are consistent with the data. For daily newspapers, it seems plausible that independent ones attracted a larger audience, and that this was the main incentive to be independent.⁷ However, I find that for the subsample of weekly newspapers, independent newspapers had a smaller circulation than partisan papers, constituting approximately 90 percent of the sample. These findings are consistent with either the variety or the private-benefits-of-control explanation. Note that it is important to look at weeklies, not only at dailies, because they played an important role in exposing corruption and promoting progressive era legislation during the "muckraking" era (Dyck et al., 2009). Overall, it seems that for different groups of newspapers, different mechanisms underpin the relationship between the development of an advertising market and the growth of independent newspapers.

I focus on the 19th century United States for several reasons. First, the newspaper market was very dynamic then: newspapers entered and exited the market every year, and advertising rates exhibited significant variation over time and space. This allows me to use state, county, city, newspaper, and year fixed effects in my estimation. Second, at that time newspapers had self-reported political affiliations (Republican, Democratic, Independent), which provides a convenient proxy for the control by political parties. The background section of the paper

⁵E.g. Baldasty, 2002, Gentzkow et al., 2006, Hamilton, 2004.

⁶This idea was discussed in Kaplan (2002), though no empirical tests were provided to validate the claim.

⁷As discussed in Baldasty (1992), Gentzkow et al. (2006), and Hamilton (2004)

discusses different mechanisms that the parties used to exercise such control. Third, a major advertising agency published newspaper’s advertising rates and political affiliations during this time period, so there are data that can be used to test the outlined hypotheses. Fourth, during this time period an unexpected event triggered a wave of local regulations on advertising, which permits the use of instrumental variable analysis. Finally, the institutional environment in the United States in the 1880s (the “Gilded Age”) was similar to that of many modern middle-income countries with weak institutions, like Russia or Mexico (Shleifer and Treisman 2004). Thus, the results of this paper are not necessarily specific to the unique path of political development of the late 19th century United States, but may be extended, with caution, to media systems in developing countries in our time.

The rest of the paper is organized as follows. Section 2 is a brief overview of the related literature; Section 3 presents basic background information on American newspapers in the 19th century and their relationships with political parties; Section 4 contains the empirical results; and Section 5 concludes.

2 Literature

Recent literature highlights the fact that independent media is important for the quality of governance. Free and competitive media promote accountability of elected politicians (Lacrine et al., 2007, Puglisi and Snyder, 2008), while uninformative media prevent accountability mechanisms from working (Besley and Prat, 2006, Besley and Burgess, 2002, Strömberg 2004a, Strömberg 2004b). Similarly, countries with little media freedom are more prone to corruption (Brunetti and Weder 2003, Ahrend 2002), have a lower level of social spending (Petrova 2008), and have a less efficient bureaucracy (Egorov et al. 2009). Moreover, independent media outlets are important in order to prevent corrupt and incompetent governments from staying in power. For example, McMillan and Zoido (2004) show that in Peru a small independent TV channel created the opportunity for country’s citizens to overthrow the corrupt government.

Media also play an important role in policy outcomes. Several new studies that use experimental and instrumental variable approaches have shown that media effects are significant, and are not confined to reinforcement of existing preferences, in contrast to earlier findings of political communication literature.⁸ Gerber et al. (2009) conducted a randomized experiment, providing individuals with a free subscription to *The Washington Times* or *The Washington Post*. They find a substantial effect on voting behavior: those who received *The Washington*

⁸E.g. Lazarsfeld et al. 1944, Berelson et al. 1954, Converse 1966.

Post were 8% more likely to vote for Democratic candidates. Using a quasi-natural experiment, DellaVigna and Kaplan (2007) use the idiosyncratic diffusion of Fox News before the 2000 U.S. elections to show that it made voters in the affected counties more likely to vote for Republican candidates. In a similar spirit, Enikolopov et al. (2009) use the geographic variation in the availability of NTV, a formerly independent TV channel in Russia, to identify its impact on voting in 1999 Russian Parliamentary elections. They find that NTV had a positive effect on the vote for the opposition party, which was supported by the channel, and a negative effect on the vote for the pro-government party. Likewise, George and Waldfogel (2006) analyze the penetration of *the New York Times* in local U.S. newspaper markets the 1990s to show that it decreased turnout in local elections.

There are also studies showing that media may influence public policy. Strömberg (2004a) finds that in the United States in the 1930s, radio diffusion in a county was positively correlated with the level of public expenditures in the region. Similarly, Einsee and Strömberg (2007) show that during the last 35 years, the amount of media coverage, instrumented by external newsworthy events such as the Olympic Games, determined U.S. disaster relief. Using a cross-sectional approach, Besley and Burgess (2002) find that state governments in India are more responsive to declines in food production and crop flood damage in those places where newspaper circulation is higher. In a similar spirit, Reinikka and Svensson (2005) show that public spending on education in Uganda was higher in schools whose funding arrangements were covered by local newspapers. Alternatively, using data on the different fit between newspaper markets and political districts, Snyder and Strömberg (2008) find that in the United States the amount of press coverage of local politics has an impact on both policy outcomes and politicians' behavior.

In this paper, I use data on the growth of independent newspapers in the United States in the 19th century. In the literature, one of the most common explanations for this growth is that improving economic conditions stimulated the change from partisan to independent media (Baldasty 1992, Gentzkow et al. 2006, Hamilton 2004, Starr 2004, Smythe 2003). There are also other explanations: for example, Lippmann (1931) and Park (1925) write about the "natural," "not wholly rational" transition from politically biased news towards more objective reporting, which all media systems necessarily experience. Others argue that such a transition could happen because of various social or technological changes: increased egalitarianism (Schudson 1978), increased literacy (Mott 1941), innovations in printing (Douglas 1999), or in telegraphy (Thompson 1947).

3 Historical background

In the second half of the 19th century, most American newspapers were partisan, i.e. they were officially affiliated with either the Republican or the Democratic party.⁹ For a newspaper, affiliation with a political party had both benefits and costs. The benefits included direct and indirect subsidies from political parties and better access to political information.¹⁰ The costs were restrictions on the content of the newspaper, i.e. a lack of control and the inability to address a broad audience with different political preferences.¹¹ Parties required their affiliated newspapers to support all of their official decisions, prohibited them from covering conflicting points of views, and overall restricted their content.¹²

Several mechanisms for subsidizing newspapers were available to political parties. It is difficult to find evidence of direct sponsorship, though some authors suggest that direct subsidies were used (Baldasty, 1992, Lee, 1923, Mott, 1941). Parties widely used budget money to sponsor newspapers with which they were affiliated.¹³ By law, all new local laws, ordinances, and regulations must be published in local newspapers, and the newspapers were paid from budgets for publications. These newspapers were chosen by the members of city councils or boards of aldermen – that is, by people usually affiliated with political parties.¹⁴ Ordinances often explicitly required chosen newspapers to represent the interests of one of the two major parties. For example, Ithaca’s charter of 1897 stated “ordinances... should be published in at least two official newspapers... The members of the common council... should designate, in writing, a paper fairly representing the political party to which they respectively belong.”¹⁵ The amount of money distributed through this channel was fairly large. An ordinance of the city of Brooklyn, N.Y., for example, required that this amount be capped at \$100,000, paid to four official partisan newspapers, for publishing new municipal acts and ordinances.¹⁶ This corresponds to approximately \$1.5 million in 2000 dollars.

⁹Ayer (1881-1886), Mott (1941), Kaplan (2002), Schudson 1978, Smythe (2003).

¹⁰Starr (2004), Kaplan (2002).

¹¹Baldasty (1992), Kaplan (2002), Smythe (2003).

¹²For example, after *the Free Press*, an official Democratic newspaper in Detroit, refused to support Horace Greeley, an official Democratic candidate in the 1872 Presidential race, its editor had to raise capital and buy out a conflicting owner’s share, because the newspaper was threatened with losing its status as a party organ (Kaplan 2002).

¹³Baldasty (1992), Kaplan (2002).

¹⁴For the references, see the list of analyzed charters of laws and ordinances in Table A1.

¹⁵Source: Charters and Ordinances, City of Ithaca, New York. Ithaca, N.Y. 1897.

¹⁶Source: Laws as contained in an Act to revise and combine in a single act all existing special and local laws affecting public interests in the City of Brooklyn. Albany, N.Y., 1888.

The mechanism just described was more prevalent in county capitals, also called county seats.¹⁷ As discussed in Baldasty (1992), county seats were especially prone to newspaper patronage, because they could reward newspapers in cash through county-level printing contracts.

There were also indirect perks that partisan newspapers, unlike independent newspapers, enjoyed. Political parties facilitated gathering political information and news reporting for affiliated newspapers. All partisan newspapers could gain access to state congressional hearings and to the party's caucuses (which was problematic for independent newspapers).¹⁸ Newspapers affiliated with parties used party officials as a primary source for their information.¹⁹

Finally, the party members were obliged to support the local partisan newspapers, even if the price was relatively high. Party officials insisted that subscribing to a partisan newspaper was a necessary duty of any devoted party member (Kaplan, 2002). The political parties generated the audience for these newspapers and, in turn, enjoyed their enthusiastic support.

In sum, partisan newspapers – newspapers, officially associated with political parties, – were different from independent newspapers. As a result, the presence (or absence) of political affiliation implied a particular organizational structure of a newspaper, its news coverage, and the way it was.²⁰

4 Empirical evidence

4.1 Argument and hypotheses

In this paper the argument is that higher profits from advertising allow newspapers to break their affiliation with political parties and to declare themselves independent. Several theoretical models are related to this idea. Some authors suggest that higher advertising revenue per capita increases the benefits of being independent while costs

¹⁷County seats were administrative centers of counties, with the authority to enact and enforce county-level ordinances.

¹⁸Starr (2004).

¹⁹Kaplan (2002), Starr (2004).

²⁰Partisan newspapers were different in their news coverage and the pattern of their endorsements (Kaplan 2002, Mott 1941, Smythe, 2003). For example, Kaplan (2002) conducted content analysis of different newspapers in Detroit in the second half of 19th century and found that Republican newspapers focused almost exclusively on Republican issues (endorsed Republican candidates, wrote about the dangers of the Ku-Klux-Klan and racism, criticized Democrats), while Democratic newspapers focused on Democratic issues (endorsed Democratic candidates, wrote about crimes committed by Blacks or corrupted Republican politicians, criticized Republicans in general).

remain constant; as a result, we should expect a positive relationship between the profitability of advertising and media independence. In Besley and Prat (2006) and Gentzkow et al. (2006), newspapers are less likely to be biased in favor of a government or an interest group if advertising revenues per reader are high because bias decreases a newspaper’s audience. In an earlier paper, Gabszewicz et al. (2001) show that an increase in advertising revenues per capita makes price competition less important, thus creating conditions for the centrist equilibrium in which both newspapers choose the same politically neutral ideology. Petrova (2009) presents a model in which the higher profitability of advertising moves two newspapers, under the influence of one or two interest groups, toward the ideal point of the consumers. However, this happens only if consumer’s demand is elastic with respect to media bias; otherwise, the relationship between the profitability of advertising and media bias becomes positive. In Gehlbach and Sonin (2008), the growth of advertising creates an incentive for the government to use non-market strategies to capture media outlets, because the government can nationalize the associated profits.²¹

The theoretical underpinnings of the relationship between advertising profitability and media independence depends on the assumptions of the corresponding models. However, it is not clear that these assumptions are realistic. Therefore, the question of the relative importance of advertising revenues for media independence is mostly an empirical one. The main goal of this paper is to conduct empirical tests of this argument.

Here, the main hypothesis is that the local profitability of advertising has increased the number of independent newspapers; i.e., it has created incentives for media outlets to become independent of political parties.

Hypothesis 1 *In places with higher advertising profitability, there was a greater likelihood that the newspaper was independent.*

If Hypothesis 1 is confirmed, then it is important to look at the entry of new newspapers into the market. Looking only at new entries allows us to solve a potential endogeneity problem arising because the newspapers in the same market can choose their advertising rates as best responses to each other’s strategy. For any causal mechanism to link advertising and newspaper independence, it should be applicable not only for newspapers that coexisted in the market at any given point of time, but also for new newspapers just entering the market. Also, for new newspapers that just entered the market, all potential costs and benefits discussed earlier should be of particular importance, not the ongoing decisions of established newspapers with their own reputations, historical

²¹Ellman and Germano (2009) approach the problem from a different perspective. In their model, advertisers themselves have preferences about news content, and the increase in advertising can lead to more or less pro-advertiser bias, depending on the extent of competition among newspapers and the ability of advertisers to use punishment cut-off strategies.

relationships with political parties (or their absence), and different potential costs of switching.

Hypothesis 1a *In places with higher advertising profitability, there was a higher probability that newly created newspapers chose to be partisan.*

In the above-mentioned theoretical models, the mechanism of advertising effects is based primarily on the assumption that the audience prefers less biased media outlets. Although it certainly depends on the market structure, on average independent newspapers, especially in one-newspaper markets, are expected to have a larger audience, because this is supposed to be a primary reason for their becoming independent.²²

Hypothesis 2 *Independent newspapers had larger circulation than partisan newspapers.*

4.2 Data description

The main source of the data is Ayer’s Directory of Newspapers 1881-1886, an annual catalog of newspapers and magazines that was published by the advertising agency Ayer and Sons Company.²³ For each newspaper, the directory reports the prevailing advertising rate that it charged. In addition, the directory provides information on the political affiliation of each newspaper, its circulation, the size of a newspaper page, the number of pages, periodicity, and geographical location (i.e., the main city, county, and state where the newspaper was distributed). Ayer’s purpose was to provide information to potential advertisers.²⁴ For each year of the catalog, which was published in August, there is information on newspapers that existed in the preceding year. In other words, the data on newspaper’s political affiliation available cover 1880 to 1885.

In the dataset, I include only those newspapers that were published at least once per week and with a clear political affiliation: Democratic, Republican, or Independent. I exclude magazines, scientific journals, travel almanacs, advertising catalogs, and religious newspapers. Overall, the dataset contains 24,168 observations on 7,319 newspapers in 3,444 cities in 1,599 counties. Table 1 presents the summary statistics for newspaper-level variables.

²²Note that the hypothesis that the audience prefers independent newspapers does not necessarily imply that independent newspapers have larger circulation. It could be that it is more profitable to be a partisan newspaper if there are enough independent newspapers already in the market. However, the situation was the opposite: partisan newspapers occupied the market, and independent newspapers entered the market in the late 19th century. So, this consideration cannot explain why independent newspapers would have the same circulation as partisan newspapers, although it could explain why independent newspapers would have smaller circulation than partisan newspapers.

²³Ayer’s directory stopped reporting advertising rates in 1887; from that point on it published subscription prices instead. Ayer’s catalogs were published from 1880 to 1985.

²⁴See Hower, 1939 for the history of the Ayer and Sons Company.

For each newspaper, I created dummy variables *Independent*, *Republican*, *Democratic*, equal to one if the political affiliation of the newspaper was Independent, Republican, or Democratic, respectively, and zero otherwise. I also use data on advertising rates (in dollars per 10 lines for one month), circulation (in distributed copies), year of establishment, and periodicity (weekly, daily, bi-weekly, tri-weekly etc). In the dataset, there are 2,243 Independent, 2,868 Democratic, and 2,698 Republican newspapers.

Plain advertising rates come from Ayer’s Newspaper Annuals, given as the prices of ten lines of advertising published for one month.

Because the demand for independent versus partisan newspapers may depend on the population’s political preferences, it is important to take them into account in the analysis. To control for changing political preferences, I use data on county-level electoral results in presidential and congressional elections from the Clubb et al. (2006) dataset provided by the Interuniversity Consortium for Political and Social Research (ICPSR). For each county and year, I have the percentage of votes for Republican, Democratic, and other party candidates, as well as the turnout from the most recent presidential and congressional elections. I also use data on county seat locations from the Sechrist (1986) dataset (ICPSR study 8159).

Finally, I rely on the Census data on population as reconstructed by Haines (2005): total county population (logged); share of urban population (computed as population in cities larger than 25,000, divided by total population); average wage in manufacture (logged); and average agricultural income per family (logged, and computed as total income in agricultural sector divided by the number of families in agriculture). For all Census variables for the years 1881-85 (that is, between the 1880 and 1890 censuses), I use linearly interpolated data. My data on city population come from Ayer’s catalog and is reported on the basis of detailed Census data or population estimates. This variable does not change from year to year. The summary statistics for city-level and county-level variables are presented in Table 2.

4.3 Market structure

For political newspapers, the market structure varied significantly across cities. Some were the only newspaper in a city; others were in duopolistic markets. Only 5% were in markets with more than 5 newspapers.²⁵

The market for newspapers operated primarily on the city level. Local newspapers used to write about local

²⁵In the entire sample, 4,087 were in a single newspaper city, 2,997 in a two-newspaper city, 1,513 in a city with three newspapers, 858 in cities with 4 or 5 newspapers, and 358 in cities with more than 5 newspapers.

news, and subscriptions – the primary source of distribution of smaller newspapers – was often available only to city residents. Only the weekend editions of high-circulation newspapers in Boston, New York, and Washington were distributed more broadly.²⁶ Overall, during that time period the newspapers located in different cities did not directly compete with each other.

The newspapers' political affiliations can be decomposed into entries (that is, new newspapers that enter the market), exits (old newspapers that exit the market), changes (newspapers that change their political affiliation), and mergers and acquisitions. I have data available for 10,204 newspapers, and for 7,319 of them I also have corresponding socioeconomic data from Census and electoral statistics. Overall, there are 2,992 entries, 2,834 exits for the year before 1886, and 515 changes. Note that the data do not reflect the fact that some entry and exits were caused by mergers and acquisitions, so the number of entries and exits in the sample may be somewhat overstated.²⁷

Two hundreds eighty newspapers went from being partisan to being independent and two hundreds fifty nine from being independent to being partisan. Thirty two newspapers even went from being Democratic to Republican and twenty five from being Republican to Democratic. Not all of these newspapers were located in the South, thus changing their political affiliation because of partisan realignment following the end of Reconstruction (in the South the number of switchers was 7 and 6, respectively). Some newspapers even changed their affiliation more than once.

The newspapers that changed their political affiliation mostly did so because of a poor financial situation. The regressions with a dummy for switching affiliations as a dependent variable show that the main determinant of switching was the newspaper's low circulation in the previous years. Also, newspapers were more likely to switch if they were located in counties with lower wages, were not in county seats, and were in more in more populous cities. Finally, independent newspapers were more likely to switch affiliations than partisan ones. These newspapers often started out as independents and then, after 1-2 years of operation, became affiliated with one of the two major political parties.

²⁶Kaplan (2002), Starr (2004), Ayer (1881-1886).

²⁷For example, there could be that a new newspaper called the *Chronicle Herald* was created and that two newspapers called the *Chronicle* and the *Herald* ceased to exist. This might constitute a merger, but we cannot be sure without historical evidence from other sources.

4.4 Methodology and empirical results

Advertising and media independence, fixed effects

Hypothesis 1 predicts a positive relationship between the local profitability of advertising and newspapers' independence. To test this hypothesis, I estimate the following fixed effects model:

$$\Pr(ind_{it} = 1) = \beta_0 + \beta_1 A_{it} + X_{it}\beta_2 + \gamma_c + \delta_t + \epsilon_{it} \quad (1)$$

Here A_{it} is some proxy for the local profitability of advertising, computed for the newspaper i in year t . X_{it} is a vector of controls for newspaper i in year t , γ_c is a county dummy variable, and δ_t is a time dummy variable. Control variables X_{it} consists of time-varying county characteristics, including income, county population, electoral returns in the last presidential and congressional elections, and city-specific variables, including city population and a dummy for the city being a county seat. To estimate equation (1), I use a linear probability model.²⁸

I use local circulation-adjusted advertising rates (the ratio of the newspaper's advertising rate to its circulation) to construct a proxy for the profitability of advertising, A_{it} . For the benchmark model, I use an average circulation-adjusted advertising rate computed for a city. Circulations are logged because otherwise the distribution of the corresponding variable would be substantially skewed to the left.

Table 3 contains the results of my estimation of equation (1). The coefficient for A in column 1, which is significant, implies that a single standard deviation increase in the local profitability of advertising made local newspapers 2.4 percentage points (p.p.) more likely to be independent in a given year. This effect seems small, but if multiplied over time as local advertising rates grow, it can explain a significant part of the massive transformation of newspapers in the United States in 1870-1920 from mainly partisan to main independent. For example, the in-sample calculations imply that within-county growth of advertising rates explains 32% of the growth of independent newspapers from 1881 to 1886.²⁹

²⁸However, the results of estimating the fixed-effect conditional logit are consistent with the results of fixed-effects OLS, as discussed in the robustness check section.

²⁹To compute this number, for the regression sample I first calculate the growth of average circulation-adjusted A – after controlling for county fixed effects – between 1881 and 1886 (the actual number is 1.90%). Then, I express this difference in terms of within-county standard deviations of A (68% of one standard deviation of A). Next, the implied growth for independent newspapers is computed, using the coefficient estimate from column 1 in Table 5 (0.62%), and compared with the observed in-sample growth (1.89%). I conclude that the growth in adjusted advertising rates explains 32% of the total growth of independent newspapers based on within-sample

Column 2 presents the results of estimating model (1) with newspaper fixed effects.³⁰ The coefficient implies that the marginal effect is similar in magnitude to the effect in columns 1.

The main drawback of the specifications discussed so far is potential endogeneity, because independent newspapers, on average, might have higher advertising revenue per reader than partisan newspapers.³¹ Also, in the same market (city) advertising rates of newspapers may be best responses to each other's advertising price. One way to solve this problem is to compute local profitability of advertising using the circulation-adjusted advertising rate of all newspapers in the city except this one. Column 3 reports this specification. Using this method, the effect of a single standard deviation change in A is slightly less than the magnitudes shown in the previous columns.³²

Another potential solution would be to predict average circulation-adjusted advertising rates in this city by the average adjusted advertising rates in other cities in a county, or in other counties in a state. The idea is that advertising rates in this city should be positively correlated with advertising rates in other cities in a county because of common trends, but that advertising rates in other markets could not be a basis for a best response for newspapers in this market.³³ The results using other cities in a county are presented in column 4. The magnitude of the effect is quite large as compared with all of the previous estimates. The results of the corresponding OLS regression for the same sample are shown in column 5. Similarly, column 6 shows IV estimation in which the advertising rate is predicted by advertising rates in other counties in a state; column 7 shows the corresponding OLS specification. The directions and magnitudes of the effects are similar. In both column 5 and column 7, the effect in the OLS estimation is almost half that of the corresponding IV estimation.³⁴

estimates. The low rate of average growth of advertising rates between 1881 and 1886 could be explained, among other things, by the financial crisis of 1884.

³⁰The specifications that include newspaper fixed effects focus on switching between partisan and independent political affiliation. Therefore, this paper also is related to the literature on the choice of formats, format switching, and the costs of repositioning. Sweeting (2007) estimates the costs of switching in the radio industry. Berry and Waldfogel (2001) and Sweeting (2006) analyze how the ownership of radio stations affects variety and listenership.

³¹Statistically, however, there is no significant relationship between newspaper's own circulation-adjusted advertising rate and newspaper's political affiliation (see the results in Table 17).

³²One potential explanation is larger measurement error in this specification. If the regressions in columns 2 and 3 are weighted by the number of observations per city used to compute A , then the effects of advertising equal 3.7 p.p. and 3.2 p.p., instead of 3.0 p.p. and 2.2 p.p., correspondingly.

³³This method follows Nevo (2001) and Chintagunta et al. (2006), who use advertising prices in other markets as instruments for advertising price in a given market, to avoid the endogeneity problem of within-market estimates.

³⁴A probable explanation for this discrepancy is measurement error.

The coefficients on average wage and average agricultural income are mostly negative but not significant. This could imply that the effect of advertising emerges simply because of collinearity between these variables and the profitability of advertising. However, these coefficients both remain negative, even if the profitability of advertising is excluded from the regression (results not reported). So, it is unlikely that the collinearity of advertising rates and average income variables drives all of the results. Most likely, the income variables are negative and insignificant in this context because we control for county fixed effects that capture most of the cross-county income differences. Once county and state fixed effects are excluded (see column 8), the controls for average agricultural income and county census population become positive and significant, more in line with the general intuition of Gentzkow et al. (2006). In column 8, the coefficient for advertising remains positive and significant, and has approximately the same magnitude as the corresponding coefficient in columns 1-3. In all specifications except the last one, the joint p-value for the F-statistics of voting variables is higher than 0.2, so it is unlikely that changes in the political preferences of a population drove an increase in newspaper independence.

Overall, the results of Table 3 can be summarized as follows: local profitability of advertising had a significant positive effect on the probability that a given newspaper was independent. A single standard deviation change in the local profitability of advertising led to a 2.2 p.p. to 5.8 p.p. increase in the probability of being independent, depending on the specification. These results are consistent with Hypothesis 1.

Advertising and media independence, entry of new newspapers

To test Hypothesis 1a, I estimate equation (1) for the subsample of new newspapers. The hypothesis is that new newspapers were more likely to choose being independent in counties with higher local advertising profitability. Table 4 shows the results of this analysis.³⁵ Column 1 presents a baseline model with the average circulation-adjusted advertising rate computed for all newspapers in a county excluding this particular newspaper. The magnitude of the effect is similar to those obtained before: a 2.7 p.p. increase in the probability of starting as an independent newspaper following a one standard deviation increase in the local circulation-adjusted advertising rate. Column 2 has similar results with the average circulation-adjusted advertising rate being computed for all newspapers in a county. Column 3 shows that the effect remains positive and significant even if we take the lag of local advertising profitability rather than its present value, but the magnitude of the effect decreases to 1.9 p.p.

³⁵Note that the number of observations per county does not permit me to estimate a specification with county fixed effects, so state effects are used instead, and the average profitability of advertising is computed on the county level.

Overall, the results shown in Table 4 imply that in places with higher local advertising rates, new newspapers were more likely to enter the market as independents. A single standard deviation change in the local profitability of advertising led to 1.9 p.p. to 5.8 p.p. increase in the probability of being independent, depending on the specification. The results are consistent with Hypothesis 1.

4.4.1 *Advertising and media independence, IV estimation*

One potential drawback of the results in Table 3 is that newspaper independence may be driven by some time-varying unobserved heterogeneity on the county or city level, e.g. unobserved change in political preferences of people who were becoming richer. To deal with this, I present evidence that this was not the case for Massachusetts. My evidence is based on instrumental variable estimation, in which different regulations related to advertising instrument for the profitability of advertising on the city level.

For this part of the analysis, I collected data on local ordinances regulating outdoor advertising and newspaper and handbill distribution. For each city for which I was able to find data,³⁶ I recorded whether it had legal restrictions on these activities in a given year. I only use sources that indicate when a particular piece of legislation was adopted. (My list of sources is given in Table A1.) Most of these regulations stated that outdoor advertising or handbill distribution required permission of the mayor or city council, or that there be a license for outdoor advertising. Some also regulated the size of advertising placards and their position on the street, or whether the distribution of newspapers, circulars, or advertising handbills in the streets was allowed.

Why would these regulations affect the local profitability of advertising? Outdoor advertising was the main competitor of newspaper advertising, so any restriction on outdoor advertising should increase the attractiveness of newspaper advertising for all newspapers, both partisan and independent alike. In contrast, the restrictions on handbill and newspaper distribution should decrease the profitability of newspaper advertising for all newspapers. Table 5, which shows raw correlations between the main variables, confirms this intuition about the signs of these coefficients.

The exclusion restriction can be violated if the regulations that encourage newspaper advertising were adopted as a response to lobbying from independent newspapers which benefited most from these regulations. There are at least two arguments against this story, though. First, a wave of these ordinances was triggered by a scandal involving the advertisement of a patent medicine, "S T 1860 X," which was painted on a rock near Niagara Falls (Taylor

³⁶I mostly use Widener Library and the Rare Manuscript Collection of the Law School Library at Harvard University.

and Chang, 1995) – an event plausibly orthogonal to the development of an independent press in Massachusetts. Second, it is not clear whether the partisan newspapers had any incentives to lobby against outdoor advertising regulations and for newspaper distribution regulations, which were harmful for them as well.³⁷

Table 6 presents the results of first stage estimation.³⁸ The last row shows that the instruments used are quite strong: the F-statistics for instruments is never less than 16.07. The coefficients for both types of advertising regulations have the predicted sign: they are jointly significant at least at the 5% level and are individually significant in all columns except column 6.³⁹

Table 7 shows the results of the estimation of equation (1) with IV and OLS for the same sample. I use as instruments either the two regulations together or each regulation separately. A single standard deviation increase in local advertising profitability raises the probability that the newspaper was independent by 44 p.p. to 73 p.p. for the different estimates. The IV coefficients are larger than the OLS coefficients, probably because of measurement error. The results of the Hansen over-identification test for the specification with two instruments (reported in the last row of Table 7) suggest that the instruments used are valid. Note that for the sample with Boston, the standard deviation of circulation-adjusted advertising rates is approximately 7 times larger than the corresponding standard deviation computed for the sample without Boston.⁴⁰ This difference can explain the discrepancy between these results and those in Table 3. In columns 5-8, which show the results without Boston, the effects of one standard deviation change in A are reduced to 6.0 p.p. to 9.6 p.p. for the different estimates, are much closer to the numbers in Table 3.⁴¹

³⁷If we assume that preferences of partisan newspapers were aligned in this respect, which was probably true, this implies that in places with more partisan newspapers and better connections with local politicians, these regulations – profitable for all newspapers – should be adopted earlier, not later than in places with more independent newspapers. This line of reasoning is similar to Kroszner and Strahan (1999) and Benmelech and Moskowitz (2008), who argue that regulations were adopted (cancelled) earlier in places where there were powerful interests that supported (opposed) these regulations.

³⁸Results are reported separately for the sample with and without Boston newspapers (Boston is an outlier in this exercise).

³⁹The absolute value of the point estimate for the regulation of handbill distribution is larger than the point estimate for the regulation of outdoor advertising. It implies that the regulation of handbill distribution, which in fact restricted newspaper distribution, was relatively more important for newspaper advertising than for the regulation of outdoor advertising, its competitor.

⁴⁰Numerical values are 0.105 without Boston and 0.706 with Boston.

⁴¹In column 8 the coefficient for advertising in the specification with only one instrument computed for the sample without Boston is positive but not significant, but it is still larger than its standard error. This probably happens because of the smaller sample (128 data points without Boston newspapers vs. 179 points with Boston newspapers). I also checked the alternative specification, in which the main variable of interest is the local advertising rate not adjusted by circulation, and logged circulation is included as a control (results not reported). In that specification, the coefficient for local average advertising rates is positive and significant at the 10%

Overall, the results of IV estimation reported in Table 7 provide evidence of a causal relationship between the local profitability of advertising and the newspaper's independence, which is consistent with Hypothesis 1.

4.4.2 *Newspapers and parties: a political channel*

This paper not only presents evidence in favor of an economic explanation of the commercialization of the news and the development of independent press but also is consistent with political economy considerations behind this development. It implies that a model focused only on economic development⁴² cannot explain the whole story. The data are consistent with the hypothesis that political parties had some control over the partisan newspapers.

First, the results in Table 3 and 4 imply that the newspapers in county seats, cities which were richer and provided more opportunities for political patronage, were less likely to be independent. On average, county seats were more developed and more populous cities than non-county seats, and they should have more independent newspapers, according to the results of Gentzkow et al. (2006) and Hamilton (2004). However, it was easier for political parties to subsidize partisan newspapers in these places (Baldasty 1992). The corresponding coefficients in Table 3 and Table 4 imply that the effect of being located in a county seat is similar in magnitude to the effect of a single standard deviation change in A .⁴³

The second piece of evidence comes from the year fixed effects. To save space, most of the tables in the paper do not show year fixed effects, but they are presented in Table 8. As we can see, the years in which the newspapers were less likely to be independent were 1880 and 1884, both Presidential elections years, when it was more important for political parties to have partisan newspapers. The pure economic story would say that independent newspapers should grow faster following years of economic growth. The real growth of the American economy was faster in 1880-81 than in later years. In 1879, real GDP in 2000 dollars was equal to \$156.9; in 1880 it was \$169.9; in 1881 it was \$191.1. From 1882 to 1885, it gradually increased from \$201.3 to \$204.1.⁴⁴ The years of fastest economic growth, therefore, were 1880 and 1881. At the same time, there were significantly fewer independent newspapers in 1880 and 1884, which is more consistent with a political story.

Overall, this evidence might explain why the growth of the advertising market need not guarantee the growth of level.

⁴²E.g. Besley and Prat (2006), Gabsewitz et al. (2001, 2002), Gentzkow et al. (2006), Hamilton (2004).

⁴³These two variables together explain 81.5% of within-county variation in newspaper independence in specification (1) in Table 3 (62.1% in specification (1) in Table 4 for the entry of newly created newspapers).

⁴⁴Source: Louis D. Johnston and Samuel H. Williamson, "What Was the U.S. GDP Then?" MeasuringWorth, 2008.

press independence. If politicians' incentives to intervene in media markets are strong enough, they will undermine the positive effect of economic development on media freedom. The theoretical underpinnings of this effect are analyzed in Gehlbach and Sonin (2008) and Petrova (2009)

Circulation and media independence

Hypothesis 2 implies that the politically centrist newspapers, or independent newspapers, had a larger audience than those with a political affiliation. To test this hypothesis, I estimate the following equation:

$$circ_{it} = \beta_0 + \beta_1 ind_{it} + X_{it}\beta_3 + \gamma_c + \delta_t + \epsilon_{it} \quad (2)$$

where $circ_{it}$ is the circulation of a newspaper i in year t , logged, and ind_{it} is the dummy for being an independent newspaper. The vector of controls includes the same county-level and city-level variables as in previous models.

Table 9 reports the results for model (2), for the entire sample of newspapers and separately for the daily newspapers only. Columns 1-4 show the results of the OLS estimates with county fixed effects. Column 1 shows that for the sample of all newspapers, circulation was not significantly associated with political affiliation. However, actually columns 2 and 3 show that the effect of being independent was negative and significant for weekly newspapers, and positive and significant for daily newspapers. The latter result is consistent with Hypothesis 2, while the result for weeklies implies that, on average, weekly independent newspapers had lower circulation than partisan weeklies. Column 4 shows that for dailies in cities with more than 10000 population the positive effect of being independent was even stronger. This explains why scholars writing on the subject⁴⁵ claimed that independent newspapers had larger circulations, because they looked only at dailies in the biggest cities like New York, Boston, and Philadelphia.

Note that the specifications in columns 1-4 do not allow for including controls in the most flexible way, but it might be that the relationship between the circulation and control variables is non-linear. One way to solve this problem is to use a matching estimator, which compares the circulation of an independent newspaper with the circulation of a partisan newspaper located close to the first newspaper in a parameter space.⁴⁶ Column 5 and column 6 show the results of this estimation. As one can see that for all newspapers the effect of being independent

⁴⁵Baldasty (1992), Douglas (1999), Starr (2004).

⁴⁶I use nearest neighbor matching procedure of Abadie et al. (2004).

is negative and significant, while for dailies the corresponding effect is positive and significant. So, these results are consistent with the previous findings.⁴⁷

Overall, the results of Table 9 suggest that among dailies, independent newspapers, on average, had larger circulation, and this was why they chose to be independent, as discussed in Baldasty (1992), Gentzkow et al. (2006), and Starr (2004). However, the same was not true for weeklies, for whom the effect of being an independent newspaper was negative and significant. Some other mechanism, either market expansion and variety or the existence of private benefits of control, can explain the relationship between the growth of advertising and the growth of independent newspapers for weeklies.

4.5 Alternative explanations and robustness checks

Non-linear relationship between advertising rates and circulation

Throughout the paper, I used advertising rate adjusted by circulation as the key independent variable. The theoretical justification for this choice of a functional form is that corresponding models use advertising revenue per reader as the main variable of interest (Besley and Prat, 2006, Gabszewicz et al., 2001, Gentzkow et al., 2006, Petrova, 2009). However, if the underlying relationship between advertising revenues and circulation is non-linear, then some of the results could be driven by the relationship between circulation and independence. I checked if the results of the paper, summarized in Table 3 and Table 7, still hold if the main variable of interest is an unadjusted local average advertising rate and if we control for logged circulation. In all specifications, the sign of the variable of interest remains positive, and the level of significance remains the same or increases. Columns 1 and 2 of Table 10 present the results of another robustness check with newspaper fixed effects and average advertising rate computed for all newspapers excluding this one, and controlling either for logged circulation or for a polynomial function of circulation raised from 1/2 to 1/5 degree. As we can see, the results are similar.

Third variable explanation

The results in Table 3 show that independent newspapers flourished in counties with the fastest growth of

⁴⁷One problem with Table 9 is that it ignores the market structure. In the markets with more than one newspaper, the market structure and the population's distribution of preferences could play a role. Note that all specifications in Table 9 control for the number of newspapers in a city, as a proxy for competition. I also test Hypothesis 2 in monopolistic markets, for the subsample of newspapers located in one-newspaper cities. The results (not reported) show that being independent had a positive effect on a newspaper's circulation in one-newspaper cities for dailies, but this effect becomes negative and insignificant for weeklies.

advertising rates. However, besides the direct effect of advertising, there may be some other explanations for these results. The coefficients for local advertising rates may imply the existence of some third variable that simultaneously causes advertising rates and media independence to grow. County or city fixed effects do not solve this problem. The main answer to a pure third variable explanation is the IV results for Massachusetts that are reported in Table 7. For robustness checks, though, I conduct other tests as well.

First, I control for all available important city/county characteristics interacted with year dummies. I also include base year circulation interacted with year dummies. The corresponding results are presented in columns 3 and 4 of Table 10. As we can see, the coefficients for circulation-adjusted advertising rates remain positive and significant at the 5% level, even if all control variables⁴⁸ are interacted with year dummies.⁴⁹

Second, I use the matching technique, conditional on observables. In particular, I divide the whole sample into two large groups: newspapers located in cities with average advertising rates above and below the median value in a state. I use nearest neighbor covariate matching (Abadie et al. 2004), and exact matching by state and year, so the matching algorithm finds the nearest neighbor in the same state. The results of this exercise, shown in Table 11, are consistent with Table 3.

Changing political preferences

One alternative explanation of the results in Table 3 is that in counties with the fastest growth of advertising rates, political preferences were becoming more centrist; and, as a result, people increasingly preferred reading independent newspapers. This should not necessarily be reflected in the electoral returns, which are included as controls.

To address this issue, I use the data on roll call votes as a proxy for the preferences of the electorate.⁵⁰ In theory, roll call votes in Congress reflect the individual preferences of the members of Congress, the preferences of their party and special interest groups, and the preferences of their constituency. If we assume that the preferences of parties and special interest groups remained relatively constant over these 6 years and, more importantly, geographically, then changes in the pattern of roll call votes corresponded to changes in the preferences of their constituency, plus some noise. As a measure of the preferences of the members of Congress, I use NOMINATE data from Poole and

⁴⁸The exception is electoral controls, which exhibit natural variation over time.

⁴⁹However, the effects of a single standard deviation increase in circulation-adjusted advertising rate are quantitatively lower than the corresponding numbers in column 4 of Table 5 (from 2.2 p.p. in Table 3 to approximately 1.7 p.p. in Table 10). This could be the case because the results of columns 3-4 in Table 10 are estimated using a different sample.

⁵⁰I am grateful to Jim Snyder for this suggestion.

Rosenthal (1997) who estimate the parameters of the spatial model of voting, including the ideal points, from the observed record of roll call votes.

According to Poole and Rosenthal, during the 1880s the first dimension of the NOMINATE score reflected the liberal-conservative, Republican-Democratic split, while the second dimension reflected the conflict between urban and rural interests, North vs. South and far West. In order to test the hypothesis that the preferences of constituencies were becoming more centrist in counties with the fastest growth of advertising rates and independent newspapers, I created a measure of legislator bias. This was computed as the absolute value of the deviation from the median for the corresponding dimension of the NOMINATE score. Table 12 shows the results of the estimation. Computed on the basis of the first dimension of NOMINATE, legislator bias was not significantly correlated with lower advertising rates or a lower fraction of independent newspapers. For the second dimension of NOMINATE, legislator bias was significantly *higher* in districts with a larger fraction of independent newspapers. This is not consistent with the hypothesis that legislators were becoming more centrist in such districts. Also, legislator bias was significantly lower in districts with a larger fraction of Democratic newspapers.

I also checked whether the results of Table 3 were not significantly affected by the inclusion of NOMINATE scores as control variables (columns 1 and 2 of Table 16). I find that the results are generally consistent, although the level of significance of advertising variables changes in a couple of the specifications. Overall, the evidence in Table 12 is inconsistent with the hypothesis that the preferences of the constituency, proxied by the NOMINATE scores, were becoming more centrist in counties with the fastest growth of both circulation-adjusted advertising rates and independent newspapers.

Migration and African-Americans

Another potential explanation for the results in Table 3 is migration. It could be that the counties with faster profitability growth in advertising and, correspondingly, faster population growth were counties with a larger inflow of immigrants who were not interested in partisan politics and preferred to read independent newspapers. Table 13 shows how aggregate newspaper characteristics and voting outcomes in a county depended on the fraction of foreign-born individuals in the total population. Immigration was not associated with a higher local advertising rate or a higher fraction of independent newspapers. The fraction of Republican newspapers was larger in places with more immigrants, consistent with the fact that the Republican party represented the interests of a foreign-born constituency during that time period.⁵¹ Similarly, there is no indication that the changes in the fraction of

⁵¹Note that these results are consistent with the findings of McCarty, Poole and Rosenthal (2006) that immigrants increase, not

African-Americans in the population caused advertising rates and independent newspapers to grow (Table 14). The coefficients for African American population in the models with advertising rate or independent newspapers as dependent variables (columns 1-3 in Table 14) have different signs and are insignificant. Overall, the results in Tables 13 and 14 are inconsistent with the proposed alternative explanation.⁵²

I also checked the results of Table 3 for robustness to the inclusion of the fraction of immigrants or the fraction of African-Americans in the regressions (results not reported). In that exercise, the coefficients for A were approximately the same magnitude and remained significant at the 1% significance level.

Changing political competition

It could also be the case that changing political competition in a county can explain the coevolution of advertising rates and the independence of local newspapers. For example, an increase in political competition can increase the demand for independent newspapers as voters, in order to be able to make an informed choice, increasingly will prefer to have less biased information about politicians from different parties. At the same time, advertising rates might go up as places with growing political competition might be growing economically as well. Alternatively, growing political competition might increase the competition between newspapers; this, in turn, could drive local advertising rates down. At the same time, the number of independent newspapers also might decline as the parties become more interested in influencing newspapers.

To test these alternative explanations, I use data on vote margins as a proxy for political competition in a county. Vote margins are computed as the absolute value of differences between the vote for Democrats and Republicans in a county. Smaller vote margins, by assumption, correspond to more political competition. Table 15 presents the results of estimating model (1) with vote margins added as a control. These results are consistent with the findings of Table 3.

Other robustness checks

In addition to specification (1), we may want to take into account the size of the audience for independent newspapers. Newspapers with a larger audience could be more influential. Therefore, all specifications in Table 3 can be estimated with weights proportional to the newspapers' circulation. The results of this estimation (not reported) are consistent with Table 3: coefficients for all measures of A remain significant at the 1% level, and the marginal effects of a single standard deviation change in A remain similar in magnitude. Also, I estimate the

decrease, the polarization of the electorate for the later period.

⁵²Note that these results are consistent with the findings of Hamilton (2004).

same set of specifications using the share of circulation of independent newspapers as a dependent variable. All observations in this exercise are weighted with frequency weights. The results remain consistent with Table 3, and the coefficients for all measures of A retain their sign and level of significance. Finally, I estimate the effect of circulation-adjusted local advertising rates in a collapsed dataset in which the unit of observation is city-year, and the share of circulation of independent newspapers is a dependent variable. These results are consistent with the basic specifications in Table 3.

I also estimate model (1) with a dummy for Democratic or Republican newspapers as the dependent variable, to be sure that the effect of advertising works differently for partisan newspapers. The effect of the local advertising rate on the probability of being a Democratic newspaper is negative and significant. A similar effect for Republican newspapers is also negative, but stops being significant after the inclusion of newspaper fixed effects. These results suggest that the growth in local advertising rates stimulated the growth of independent newspapers, but not that of partisan newspapers.

In addition, I tested whether the relationship between local advertising rates and a newspaper's independence still holds for data collapsed by city, because otherwise the results could be attributable to complex patterns of correlation between newspapers interacting within the same market. The results are consistent with Table 3.

Unfortunately, I was not able to find education or literacy data on a county level for that time period. In the ICPSR dataset, Census data for literacy are available on a state level only for 1880 and 1900. Moreover, the Census of 1880 reports if people over age ten could read, while the Census of 1900 reports the percentage of literate males over age 21, so it is not clear how to construct a single variable capturing literacy in 1880-1900. However, I checked that my results are robust to the inclusion of state \times year fixed effects. This would imply that my results are also robust to the inclusion of any state-level literacy index based on interpolation of the 1880 and 1900 variables.

Finally, I checked whether my results still hold when Southern states are excluded. The coefficients for advertising rates remain positive and significant and are similar in magnitude even for the specification with newspaper fixed effects. This suggests that my results are not driven by some kind of sample selection. However, if only Southern states are included in the sample, then only coefficients in specifications with newspaper fixed effects remain positive and significant. The weaker results for Southern states may be explained by their peculiar political structure and the lack of political competition. Independent newspapers in the South in fact could be sponsored by a non-dominant party and, therefore, be similar to partisan newspapers in the North.

5 Conclusion

In the middle of the 19th century, most U.S. newspapers were partisan, just like many media outlets all over the world in the beginning of the 21st century. Sponsored by political parties, they represented the interests of the politicians in their news and editorials. However, between 1865 and 1920, however, U.S. newspapers experienced a great transformation, from being overwhelmingly partisan to being mostly independent. What accounts for this transformation? And, which conditions made it possible? These questions have no unambiguous answer in the literature.

Although economic arguments have been discussed, there have been few attempts to find systematic empirical evidence for the claim that market conditions, and in particular the growth of newspaper advertising, explain the political independence of the media. In this paper, I present such evidence using data on American newspapers in the 1880s. Newspapers' independence was positively related to the local profitability of advertising. In the areas with a faster growing advertising market, newspapers were more likely to be independent. The effect of advertising worked both through the entry of new newspapers and through changes in the affiliation of existing newspapers. The results of IV estimation suggest that the direction of causality goes from the profitability of advertising to independence, not vice versa.

Additionally, the circulation of independent daily newspapers was, on average, higher than the circulation of similar partisan newspapers. This suggests that formal independence was economically profitable for dailies. For weeklies, though, the circulation of independent newspapers was lower than the circulation of similar partisan newspapers. Probably some alternative mechanism, such as the effect of market expansion or the existence of private benefits of control, can explain the effect of the profitability of advertising in this case.

Why was newspaper independence important, after all? Dyck et al. (2008) show that publications in "muck-raking" magazines restricted the relative importance of special interest groups for policymakers, thus promoting the adoption of progressive era legislation. Gentzkow et al. (2006) perform a content analysis for news on major corruption scandals; they show that the content of newspapers was becoming less biased and more objective as the number of independent newspapers was increasing and the extent of corruption was decreasing. The theoretical results of Strömberg (2004a and 2004b) suggest why this could be the case. The growth of advertising markets increased the relative importance of large groups of the population for media outlets. Media outlets all over the country were more likely to break their ties with parties and become, at least formally, independent. Indepen-

dent media outlets on average provided more objective coverage for larger groups of population. As a result, the preferences of ordinary citizens, who became more informed about politics, mattered more for policymakers.

The results in this paper suggest that the expansion of advertising markets gave newspapers an opportunity to become independent of political influence in their decision making. These results might also hold for modern developing countries and have implications for policymaking there. It is not clear whether these historical results could easily be extended for specific modern countries. Further empirical and experimental research is needed to determine whether these results hold as well for other times and places.

Finally, my results also imply that the ongoing financial crisis, and an associated decrease in advertising revenues, create a threat for media independence. Another direction for future research is to look at whether newspapers are becoming more partisan in their content during this crisis, either in the United States or in other countries.

References

- Abadie, Alberto, David Drukker, Jane Leber Herr & Guido W. Imbens. 2004. "Implementing Matching Estimators for Average Treatment Effects in Stata." *Stata Journal* 4(3):290–311.
- Ahrend, Rudiger. 2002. "Press Freedom, Human Capital and Corruption." DELTA Working Papers 2002-11.
- Ayer, N. W. & Son's. 1881-886. *American Newspaper Annual*. N.W. Ayer and Son.
- Baldasty, Gerald J. 1992. *The Commercialization of News in the Nineteenth Century*. University of Wisconsin Press.
- Baron, David. 2006. "Persistent Media Bias." *Journal of Public Economics* 90(1-2):1–36.
- Benmelech, Effi & Tobias J. Moskowitz. forthcoming. "The Political Economy of Financial Regulation: Evidence from U.S. State Usury Laws in the 18th and 19th Century." *Journal of Finance* . forthcoming i.
- Berry, Steven T. & Joel Waldfogel. 2001. "Do Mergers Increase Product Variety? Evidence From Radio Broadcasting." *The Quarterly Journal of Economics* 116(3):1009–1025.
- Besley, Timothy & Andrea Prat. 2006. "Handcuffs for the Grabbing Hand: Media Capture and Government Accountability." *American Economic Review* 96(3):720–736.
- Besley, Timothy & Robin Burgess. 2001. "Political Agency, Government Responsiveness and the Role of the Media." *European Economic Review* 45(4-6):629–640.
- Besley, Timothy & Robin Burgess. 2002. "The Political Economy of Government Responsiveness: Theory and Evidence from India." *Quarterly Journal of Economics* 117(4):1415–1452.
- Brunetti, Aymo & Beatrice Weder. 2003. "A Free Press is Bad News for Corruption." *Journal of Public Economics* 87(7-8):1801–1824.
- Chintagunta, Pradeep K., Vrinda Kadiyali & Naufel J. Vilcassim. 2006. "Endogeneity and Simultaneity in Competitive Pricing and Advertising: A Logit Demand Analysis." *Journal of Business* 79(6):2761–2788.

- Clubb, Jerome M., and Flanigan William H. & Nancy H. Zingale. 2006. "Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840-1972." ICPSR08611-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.
- d'Aspremont, Claude, Jean J. Gabszewicz & Jacques-François Thisse. 1979. "On Hotelling's "Stability in Competition"." *Econometrica* 47(5):1145–50.
- DellaVigna, Stefano & Ethan Kaplan. 2007. "The Fox News Effect: Media Bias and Voting." *Quarterly Journal of Economics* 122(3):807–860.
- Djankov, Simeon, Caralee McLiesh, Tatiana Nenova & Andrei Shleifer. 2003. "Who Owns the Media?" *Journal of Law and Economics* 46(2):341–382.
- Douglas, George H. 1999. *The Golden Age of the Newspaper*. Greenwood Press.
- Dyck, Alexander, Natalya Volchkova & Luigi Zingales. 2008. "The Corporate Governance Role of the Media: Evidence from Russia." *Journal of Finance* 63(3):1093–1135.
- Dyck, I. J. Alexander, David A. Moss & Luigi Zingales. 2008. "Media versus Special Interests." NBER Working Paper.
- Egorov, Georgy, Sergei Guriev & Konstantin Sonin. forthcoming. "Media Freedom, Bureaucratic Incentives, and the Resource Curse." *American Political Science Review*. NES Working Paper.
- Eisensee, Thomas & David Strömberg. 2007. "News Floods, News Droughts, and U.S. Disaster Relief." *Quarterly Journal of Economics* 122(2):693–728.
- Ellman, Matthew & Fabrizio Germano. 2009. "What Do the Papers Sell?" *Economic Journal* 119:680–704. UPF Economics and Business Working Paper No. 800.
- Enikolopov, Ruben, Maria Petrova & Ekaterina Zhuravskaya. 2008. "Media and Political Persuasion: Evidence from Russia." NES Working Paper.
- Gabszewicz, Jean J., Dider Laussel & Nathalie Sonnac. 2001. "Press Advertising and the Accent of the Pensée Unique." *European Economic Review* 45:641–651.

- Gehlbach, Scott & Konstantin Sonin. 2008. "Government Control of the Media." Working Paper.
- Gentzkow, Matthew, Edward L. Glaeser & Claudia Goldin. 2006. The Rise of the Fourth Estate: How Newspapers Became Informative and Why it Mattered. In *Corruption and Reform: Lessons from America's Economic History*, ed. E. L. Glaeser & C. Goldin. NBER.
- Gentzkow, Matthew & Jesse M. Shapiro. 2006. "Media Bias and Reputation." *Journal of Political Economy* 114(2):280–316.
- Gentzkow, Matthew & Jesse M. Shapiro. 2007. "What Drives Media Slant? Evidence from U.S. Daily Newspapers." Working paper.
- George, Lisa M. & Joel Waldfogel. 2006. "The New York Times and the Market for Local Newspapers." *American Economic Review* 96(1):435–447.
- Gerber, Alan, Dean Karlan & Daniel Bergan. 2008. "Does the Media Matter? A Field Experiment Measuring the Effect of Newspapers on Voting Behavior and Political Opinions." *American Economic Journal: Applied Economics* forthcoming.
- Haines, Michael R. 2005. "Historical, Demographic, Economic, and Social data: the United States, 1790-2000." ICPSR02896-v2. Hamilton, NY: Colgate University/Ann Arbor: MI: Inter-university Consortium for Political and Social Research.
- Hamilton, James T. 2004. *All the News That's Fit to Sell: How the Market Transforms Information into News*. Princeton University Press.
- Hower, Ralph M. 1939. *The history of an advertising agency: N. W. Ayer & Son at work, 1869-1939*. Harvard University Press.
- Kaplan, Richard L. 2002. *Politics and the American Press: the Rise of Objectivity, 1865-1920*. Cambridge University Press.
- King, Gary, James Honaker, Anne Joseph & Kenneth Scheve. 2001. "Analyzing Incomplete Political Science Data: An Alternative Algorithm for Multiple Imputation." *American Political Science Review* 95(1):49–69.

- Kroszner, Randall & Philip Strahan. 1999. "What Drives Deregulation? Economics and Politics of the Relaxation of Bank Branching Restrictions." *Quarterly Journal of Economics* 114:1437–67.
- Lee, James Melvin. 1923. *History of American Journalism*. Garden City Publishing Company.
- Lippmann, Walter. 1931. "Two Revolutions in the American Press." *Yale Review* 20(3):433–441.
- McMillan, John & Pablo Zoido. 2004. "How to Subvert Democracy: Montesinos in Peru." *Journal of Economic Perspectives* 18(4):69–92.
- Mott, Frank Luther. 1941. *American Journalism: A History of Newspapers in the United States Through 250 Years, 1690-1940*. MacMillan.
- Mullainathan, Sendhil & Andrei Shleifer. 2005. "The Market for News." *American Economic Review* 95(4):1031–1053.
- Nevo, Aviv. 2001. "Measuring Market Power in the Ready-to-Eat Cereal Industry." *Econometrica* 69:307–42.
- Park, Robert E. 1925. *The city: suggestions for the investigation of human behavior in the urban environment*. University of Chicago Press chapter The natural history of the newspaper.
- Petrova, Maria. 2008. "Inequality and Media Capture." *Journal of Public Economics* 92 (1-2):183–212.
- Petrova, Maria. 2009. "Mass Media and Special Interest Groups." Working Paper.
- Pool, Keith T. & Howard Rosenthal. 1997. *Congress: A Political-Economic History of Roll Call Voting*. Oxford University Press.
- Reinikka, Ritva & Jakob Svensson. 2005. "Fighting Corruption to Improve Schooling: Evidence from a Newspaper Campaign in Uganda." *Journal of the European Economic Association* 3(2-3):259–267.
- Reuter, Jonathan & Eric Zitzewitz. 2006. "Do Ads Influence Editors? Advertising and Bias in the Financial Media." *Quarterly Journal of Economics* 121(1):197–227.
- Schudson, Michael. 1978. *Discovering the News: A Social History of American Newspapers*. Basic Books.
- Sechrist, Robert P. 1984. "Basic Geographic and Historic Data for interfacing ICPSR datasets, 1620-1983 [United States]." ICPSR8159. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

- Sherman, Sydney A. 1900. "Advertising in the United States." *Publications of the American Statistical Association* 7(52):1–44.
- Shleifer, Andrei & Daniel Treisman. 2005. "A Normal Country: Russia After Communism." *Journal of Economic Perspectives* 19(1):151–174.
- Smythe, Ted Curtis. 2003. *The Gilded Age Press, 1865-1900*. Praeger.
- Snyder, James M. & David Strömberg. 2008. "Press Coverage and Political Accountability." NBER Working Paper.
- Snyder, James M. & Riccardo Puglisi. 2008. "Media Coverage of Political Scandals." Working Paper.
- Snyder, James M., Riccardo Puglisi & Valentino Lacrinese. 2007. "Partisan Bias in Economic News: Evodence on Agenda-Setting Behavior of U.S. Newspapers." Working Paper.
- Starr, Paul. 2004. *The Creation of the Media: Political Origins of Modern Communications*. Basic Books.
- Strömberg, David. 2004a. "Mass Media Competition, Political Competition, and Public Policy." *Review of Economic Studies* 71(1):265–284.
- Strömberg, David. 2004b. "Radio's Impact on Public Spending." *Quarterly Journal of Economics* 119(1):189–221.
- Sweeting, Andrew. 2006. "Coordination, Differentiation, and the Timing of Radio Commercials." *Journal of Economics & Management Strategy* 15(4):909–942.
- Sweeting, Andrew. 2008. "The Strategic Timing Incentives of Commercial Radio Stations: An Empirical Analysis Using Multiple Equilibria." NBER Working Paper.
- Taylor, Charles R. & Weih Chang. 1995. "The History of Outdoor Advertising Regulation in the United States." *Journal of Macromarketing* 15(1):47–59.
- Thompson, Robert Luther. 1947. *Wiring a Continent: The History of the Telegraph Industry in the United States, 1832-66*. Princeton University Press.
- Waldfogel, Joel & Lisa George. 2006. "The New York Times and the Market for Local Newspapers." *American Economic Review* 96(1):435–477.

Note: Tables 10-17 are intended to be published as on-line appendix.

Table 1 . Summary statistics for newspaper variables.

<i>Variable</i>	<i>Observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Min</i>	<i>Max</i>
Independent newspaper (dummy)	24168	.249	.432	0	1
Republican newspaper (dummy)	24168	.3765	.4842	0	1
Democratic newspaper (dummy)	24168	.3768	.4843	0	1
Advertising rate (plain)	24039	2.816	3.350	.5	93.6
Circulation-adjusted advertising rate	22639	.388	.334	.063	7.927
Circulation (logged)	22749	6.885	.723	3.912	12.038
Daily newspaper (dummy)	24161	.097	.296	0	1
Year of establishment	18464	1868.6	15.36	1773	1885

Sources: Ayer's directory of newspapers 1881-1886.

Table 2. Summary statistics for city- and county-level variables. All newspaper variables are collapsed by city or county in corresponding panels

Panel A. City-level variables

<i>Variable</i>	<i>Observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Min</i>	<i>Max</i>
City population	14918	7.255	1.157	4.143	13.650
County seat (dummy)	14918	0.480	0.500	0	1
Circulation-adjusted advertising rate	14918	0.352	0.161	0.067	3.851
Fraction of independent newspapers	14918	0.276	0.414	0	1
Fraction of Republican newspapers	14918	0.359	0.406	0	1
Fraction of Democratic newspapers	14918	0.365	0.414	0	1
Number of newspapers	14918	1.518	0.996	1	22

Panel B. County-level variables

<i>Variable</i>	<i>Observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Min</i>	<i>Max</i>
Total population, county	10265	25653.7	44837.8	214	967046
Urban population, county	10265	0.028	0.129	0	1
Fraction of African-American population	10265	0.145	0.225	0	1.352
Fraction of foreign-born population	10265	0.129	0.177	0	2.826
Vote for Democratic candidates, Congress elections	9941	49.544	22.868	0	100
Vote for Republican candidates, Congress elections	9939	39.577	22.844	0	100
Vote for Greenback candidates, Congress elections	9947	2.660	8.974	0	83.3
Vote for other candidates, Congress elections	9957	2.770	8.694	0	98.1
Turnout, Congress elections	9880	68.233	22.207	0	607.4
Vote for Democratic candidates, Congress elections	10026	50.091	16.849	0	100
Vote for Republican candidates, Presidential elections	10026	46.034	16.208	0	95.7
Vote for Greenback candidates, Presidential elections	10026	2.765	5.559	0	50.6
Vote for other candidates, Presidential elections	10026	1.099	3.191	0	62
Turnout, Presidential elections	9979	74.845	18.598	10.600	371
Nominate score, 1 st dimension	12839	-0.095	0.417	-0.757	0.828
Nominate score, 2 nd dimension	12839	0.045	0.143	-0.417	0.389
Legislator Bias, based on 1 st dimension of Nominate score	12839	0.369	0.250	0	1.082
Legislator Bias, based on 2 nd dimension of Nominate score	12839	0.569	0.398	0	1.217
Fraction of independent newspapers	11272	0.210	0.300	0	1
Fraction of Republican newspapers	11272	0.331	0.350	0	1
Fraction of Democratic newspapers	11272	0.459	0.401	0	1
Fraction of daily newspapers	11270	0.072	0.196	0	1
Local average circulation-adjusted advertising rate	10786	0.385	0.188	0.076	2.822
Local average advertising rate	11242	2.616	1.547	0.500	26.885
Number of newspapers in county	11272	2.887	2.577	1	41

Source: Ayer's directory of newspapers 1881-1886; "Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840-1972", ICPSR study 8611; "Historical, Demographic, Economic, and Social Data: The United States, 1790-2000", Census data reconstructed by Michael Haines; ICPSR study 2896; Poole and Rosenthal D-NOMINATE data for from <http://www.voteview.com>. City population is taken from Ayer's directory (which reproduced it from Census 1880). Maximum city population is larger than maximum county population (panel B) as these two variables come from different sources and treat New York City differently.

Note: Some turnout figures are higher than 100% probably because of election fraud (turnout figures of that period are discussed e.g. in Argersinger, P. H. (1985) "New Perspectives on Election Fraud in the Gilded Age." Political Science Quarterly, 100, pp. 669-87). For all election returns, observations with error code 999.9% were replaced with missing values.

Table 3. Profitability of advertising and newspaper circulation. Basic results.

	<i>Dummy for independent newspaper</i>							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local circulation-adjusted advertising rate (A)	0.0770** [0.0371]	0.0946*** [0.0291]	0.0668*** [0.0213]	0.217*** [0.0437]	0.104** [0.0490]	0.221*** [0.0832]	0.105*** [0.0262]	0.0849*** [0.0266]
Method of computing A	Average A for all newspapers in a city	Average A for all newspapers in a city	Average A for all newspapers in a city, excluding this newspaper	Average A for all newspapers in a city, instrumented by average A in other cities in a county	Average A for all newspapers in a city, computed for the same sample as IV regression in previous column	Average A for all newspapers in a city, instrumented by average A in other cities in a county	Average A for all newspapers in a city, computed for the same sample as IV regression in previous column	Average A for all newspapers in a city
Effect of one standard deviation change in A (in %)	2.02	3.03	2.21	5.70	2.74	5.81	2.77	2.23
Fixed effects	County, Year	Newspaper, Year	Newspaper, Year	County, Year	County, Year	State, Year	State, Year	Year
Log (county population)	0.018 [0.063]	0.03 [0.075]	0.036 [0.076]	-0.036 [0.107]	-0.030 [0.085]	0.0879*** [0.009]	0.0946*** [0.017]	0.070*** [0.016]
Log (average wage in manufacture)	-0.034 [0.022]	-0.028 [0.024]	-0.030 [0.024]	-0.040 [0.042]	-0.039 [0.034]	-0.0358*** [0.005]	-0.0357*** [0.011]	-0.044*** [0.010]
Log (average agricultural income per family)	-0.032 [0.041]	-0.031 [0.048]	-0.034 [0.049]	-0.010 [0.070]	-0.017 [0.054]	0.011 [0.008]	0.010 [0.016]	0.030** [0.013]
Dummy for city being a county seat	-0.218*** [0.018]			-0.225*** [0.009]	-0.228*** [0.018]	-0.160*** [0.007]	-0.165*** [0.013]	-0.177*** [0.013]
Log (city population)	-0.106*** [0.012]			-0.110*** [0.005]	-0.107*** [0.012]	-0.056*** [0.005]	-0.0514*** [0.008]	-0.041*** [0.007]
Number of newspapers in A city (proxy for competition)	0.009 [0.007]	0.001 [0.003]	0.0006 [0.004]	0.0042 [0.004]	0.009 [0.008]	-0.009** [0.00448]	-0.0021 [0.003]	0.0001 [0.003]
F-statistics for electoral controls	1.262	0.757	0.785	2.82	0.813	2.57	2.62	7.737
Observations	24168	15224	15224	16323	16323	24168	24168	24168
R-squared	0.35	0.92	0.92	0.05	0.31	0.14	0.15	0.12
N of cities	3444	1472	1472	2602	2602	3444	3444	3444

Standard errors in brackets. Standard errors are clustered by city level. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: Electoral controls include percentage of votes for Republicans, Democrats, Greenbacks, and other parties in the most recent presidential and congressional elections, and voter turnout in these elections. Data on population and income are from U.S. Census 1880 and 1890, interpolated for 1881-1886. Newspaper data and data on city population are from Ayer's American Newspaper Annual (1881-1886). Electoral data are from Clubb et. al. (2006) dataset at ISPSR. Only Republican, Democratic, or independent newspapers are included in the sample. Data on county seats are from ICPSR 8159 dataset, constructed by R. Sechrist. In column (5) with IV specification χ^2 statistics for electoral variables is reported instead of F-statistics. In all specifications, coefficients for circulation-adjusted advertising rates computed with fixed effect logit (not reported here) have the same or greater level of significance.

Note that the coefficient for city population is negative and highly significant, in contrast to findings of Gentzkow et al. (2006) and Hamilton (2004), that is, larger city population is negatively correlated with newspaper independence, once year fixed effects and county fixed effects are taken into account. Further tests (results not reported) imply, however, that this negative effect emerges when county fixed effects and income controls are included. In other words, the effect of city population is negative for within-county variation in newspaper independence, but is positive for between-county variation, if no fixed effects or electoral controls are included. The difference between the results of Gentzkow et al. (2006) and Hamilton (2004) and mine can be explained by the fact that they do not use them.

Table 4. Local advertising rates and entry of independent newspapers. Only newly created newspapers are included in the sample.

	<i>Dummy for independent newspaper</i>		
	(1)	(2)	(3)
Local circulation-adjusted advertising rate (A)	0.0920** [0.037]	0.139*** [0.047]	0.091** [0.046]
Method of computing A	Average A for all newspapers in a county, excluding this newspaper	Average A for all newspapers in a county	Average A for all newspapers in a county, lagged 1 year
Effect of one standard deviation change for given measure of A (in %)	2.84	3.41	2.32
Fixed effects	State x Year	State x Year	State x Year
Log (county population)	0.034 [0.030]	0.017 [0.025]	0.042 [0.028]
Log (average wage in manufacture)	0.040 [0.026]	0.0445* [0.023]	0.043* [0.023]
Log (average agricultural income per family)	-0.087*** [0.019]	-0.069*** [0.015]	-0.067*** [0.017]
Dummy for city being a county seat	-0.146*** [0.022]	-0.125*** [0.019]	-0.137*** [0.020]
Log (city population)	-0.046*** [0.012]	-0.037*** [0.010]	-0.039*** [0.010]
Number of newspapers in a city (proxy for competition)	-0.005 [0.006]	-0.007 [0.005]	-0.007 [0.005]
F-statistics for electoral controls	2.645	3.074	2.836
Observations	2704	3310	3023
R-squared	0.189	0.174	0.175
N of cities	1764	2143	1968

Standard errors in brackets. Standard errors are clustered by city. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: Electoral controls include percentage of votes for Republicans, Democrats, Greenbacks, and other parties in the most recent presidential and congressional elections, and voter turnout in these elections. Newspaper data and data on city population are from Ayer's American Newspaper Annual (1881-1886). Data on income and population are from U.S. Census 1880 and 1890 (reconstructed by Haines in 2005), interpolated for 1881-1886. Electoral data are from Clubb et. al. (2006) dataset at ISPSR. Data on county seats are from ICPSR 8159 dataset, constructed by R. Sechrist. Only newly created Republican, Democratic, or independent newspapers are included in the sample.

Table 5. Raw correlations, local advertising rates and advertising regulations. Massachusetts, 1881-1886

	Circulation- adjusted advertising rate	Regulation of outdoor advertising	Regulation of handbill distribution	City population (logged)	County seat (dummy)	Average wage (logged)	Average agricultural income (logged)	Independent newspaper	Republican newspaper	Democratic newspaper
Circulation-adjusted advertising rate, local average	1.0000									
Regulation of outdoor advertising	0.5601	1.0000								
Regulation of handbill distribution	-0.6032	-0.5721	1.0000							
City population (logged)	0.8921	0.4828	-0.6551	1						
County seat (dummy)	0.2887	-0.1641	-0.229	0.5268	1					
Average wage (logged)	-0.6079	-0.5899	0.4987	-0.6779	0.0782	1				
Average agricultural income (logged)	0.6132	0.6021	-0.5432	0.6168	-0.0825	-0.937	1			
Independent newspaper	0.1931	-0.0266	-0.1334	0.1442	0.1833	0.0636	-0.0729	1		
Republican newspaper	-0.2311	-0.0459	0.069	-0.2223	-0.1949	0.1089	-0.099	-0.6412	1	
Democratic newspaper	0.0512	0.0858	0.0729	0.0976	0.0194	-0.2042	0.2033	-0.3985	-0.4482	1

Table 6. First stage regression. Local advertising rates and advertising regulations. Massachusetts, 1881-1886.

	<i>Circulation-adjusted advertising rate, local average</i>					
	Including Boston newspapers			Excluding Boston newspapers		
Regulation of outdoor advertising	0.146*** [0.0292]		0.0514* [0.0304]	0.152*** [0.0296]		0.0556 [0.0356]
Regulation of handbill distribution		-0.247*** [0.0573]	-0.195** [0.0751]		-0.237*** [0.0573]	-0.182** [0.0808]
Vote for Democrats, congressional elections	-0.0110*** [0.00357]	-0.0154*** [0.00346]	-0.0140*** [0.00370]	-0.00231 [0.00824]	-0.00287 [0.00714]	-0.00269 [0.00733]
Vote for Republicans, congressional elections	-0.0129*** [0.00370]	-0.0144*** [0.00348]	-0.0139*** [0.00355]	-0.0268 [0.0445]	-0.0469 [0.0375]	-0.0403 [0.0401]
Vote for Greenbacks, congressional elections	-0.0592*** [0.00519]	-0.0619*** [0.00459]	-0.0605*** [0.00475]	-0.0327 [0.0367]	-0.0446 [0.0332]	-0.041 [0.0339]
Vote for other candidates, congressional elections	-0.0584*** [0.00470]	-0.0558*** [0.00398]	-0.0562*** [0.00412]	-0.043 [0.0374]	-0.0514 [0.0325]	-0.0489 [0.0335]
Voter turnout, congressional elections	0.132*** [0.0145]	0.120*** [0.0141]	0.124*** [0.0144]	0.0906 [0.0979]	0.116 [0.0834]	0.109 [0.0861]
Vote for Democrats, presidential elections	2.617*** [0.236]	1.253*** [0.245]	1.628*** [0.358]	3.136 [4.836]	4.575 [3.973]	4.019 [4.201]
Vote for Republicans, presidential elections	2.529*** [0.233]	1.146*** [0.249]	1.523*** [0.365]	3.06 [4.695]	4.398 [3.848]	3.874 [4.068]
Vote for Greenbacks, presidential elections	2.595*** [0.232]	1.282*** [0.237]	1.645*** [0.346]	3.074 [4.697]	4.481 [3.863]	3.941 [4.083]
Vote for other candidates, presidential elections	2.619*** [0.240]	1.108*** [0.273]	1.514*** [0.398]	3.103 [4.759]	4.321 [3.896]	3.829 [4.111]
Voter turnout, presidential elections	-0.226*** [0.0174]	-0.263*** [0.0208]	-0.259*** [0.0222]	-0.164 [0.207]	-0.296 [0.183]	-0.26 [0.194]
City population, logged	0.0819 [0.0727]	-0.162 [0.124]	-0.127 [0.135]	0.0695 [0.0733]	-0.163 [0.126]	-0.124 [0.142]
County-seat	-0.0256 [0.0897]	0.222 [0.146]	0.195 [0.153]	-0.0115 [0.0902]	0.217 [0.147]	0.188 [0.158]
Average wage in manufacture, logged	0.954*** [0.0815]	0.959*** [0.0786]	0.957*** [0.0776]	0.758 [0.724]	1.128* [0.668]	1.006 [0.683]
Average agricultural income, logged	0.495*** [0.173]	0.421*** [0.135]	0.439*** [0.136]	0.0946 [0.715]	-0.374 [0.619]	-0.21 [0.666]
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179	179	179	128	128	128
R-squared	0.991	0.992	0.992	0.529	0.587	0.6
F-statistics for instruments	24.98	18.64	16.07	26.25	17.05	16.89

Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: Average circulation-adjusted advertising rate, a measure of A , is computed circulation-adjusted advertising rates for all newspapers in the city. List of sources for advertising regulation variables is presented in Table 4. Income variables are from U.S. Census 1880 and 1890, interpolated for 1881-1886. Data on city population and newspaper data are from Ayer's American Newspaper Annual (1881-1886), originally from the U.S. Census publication. Electoral data are from Clubb et. al. (2006) dataset at ISPSR. Data on county seats are from ICPSR 8159 dataset, constructed by R. Sechrist. Only Republican, Democratic, or independent newspapers are included in the sample.

The coefficient for city population is negative and insignificant, but being a county seat is highly significant and positive. One explanation is that city population is insignificant because of collinearity of city population and being a county seat, while another explanation suggests that publishing local ordinances in county seats decreased the space in the newspaper available for advertising, which drove advertising rates up. Basic collinearity diagnostics, however, rejects the presence of multicollinearity between a dummy for a county seat and a logged city population (VIF is less than 2 for both variables), so the second explanation seems to be more plausible.

Table 7. Local advertising profitability and independence of newspapers, city-level, Massachusetts. OLS and IV estimation

Instrumented variable: local circulation-adjusted advertising rate

Instruments: dummies for the presence of restrictions for outdoor advertising and handbill distribution, as regulated by local municipal ordinances

	<i>Dummy for independent newspaper</i>							
	Including Boston newspapers				Excluding Boston newspapers			
Instruments	OLS	IV	IV	IV	OLS	IV	IV	IV
		Outdoor advertising	Handbill distribution	Outdoor advertising, handbill distribution		Outdoor advertising	Handbill distribution	Outdoor advertising, handbill distribution
Local circulation-adjusted advertising rate	0.625** [0.253]	0.855** [0.335]	1.040*** [0.202]	0.995*** [0.144]	0.578* [0.293]	0.561 [0.426]	0.902*** [0.212]	0.813*** [0.155]
Effect of one standard deviation change for given measure of A (in %)	0.442	0.604	0.736	0.703	0.0616	0.0598	0.0962	0.0867
City controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County electoral and economic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179	179	179	179	128	128	128	128
R-squared	0.196	0.194	0.191	0.192	0.264	0.264	0.26	0.262
p-value of J-statistics for overidentifying restrictions				0.777				0.558

Standard errors in brackets. Standard errors are clustered by city. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: Average circulation-adjusted advertising rate, a measure of A , is computed circulation-adjusted advertising rates for all newspapers in the city. In columns (2) and (4), circulation-adjusted advertising rate in a city is instrumented by dummies for the presence of restrictions for outdoor advertising and handbill advertising, as regulated by local municipal ordinances. List of sources is presented in Table 4. City controls include log of city population and dummy for being county-seat. County controls include county population, log of average wage in manufacture, log of average agricultural income per family and 10 electoral controls (percentage of votes for Republicans, Democrats, Greenbacks, and other parties in the most recent presidential and congressional elections, and voter turnout in these elections). Data on county population and income are from U.S. Census 1880 and 1890, interpolated for 1881-1886. Data on city population and newspaper data are from Ayer's American Newspaper Annual (1881-1886). Electoral data are from Clubb et. al. (2006) dataset at ISPSR. Data on county seats are from ICPSR 8159 dataset, constructed by R. Sechrist. Only Republican, Democratic, or independent newspapers are included in the sample.

Table 8. Year Fixed Effects for Table 3.

	<i>Dummy for independent newspaper</i>				
	(1) Average A for all newspapers in a city	(2) Average A for all newspapers in a city	(3) Average A for all newspapers in a city	(4) Average A for all newspapers in a city, instrumented by average A in other cities in a county	(5) Average A for all newspapers in a city, computed for the same sample as IV regression in previous column
Method of computing A					
Dummy for year=1880	-0.0197** [0.009]	-0.0293*** [0.0077]	0.006 [0.012]	-0.021** [0.008]	-0.020** [0.008]
Dummy for year=1881	-0.008 [0.0079]		0.010 [0.010]	-0.001 [0.009]	-0.0008 [0.009]
Dummy for year=1882	-0.005 [0.006]	0.007 [0.0047]	0.009 [0.008]	0.0038 [0.008]	0.004 [0.008]
Dummy for year=1883		-0.011 [0.009]	0.011 [0.007]		
Dummy for year=1884	-0.0128*** [0.005]	-0.0252*** [0.0098]	-0.001 [0.006]	-0.015*** [0.005]	-0.015*** [0.005]
Dummy for year=1885	-0.007 [0.007]	-0.0037 [0.009]		-0.0016 [0.008]	0.0007 [0.008]

Standard errors in brackets. Standard errors are clustered by city level. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: this table contains only coefficient for time fixed effects. Other coefficients for corresponding regressions are presented in Table 3. The specifications reported are specifications (1),(3) and (6)-(8) from Table 3.

Table 9. Newspaper circulation and political affiliation of a newspaper.

(Baseline-partisan newspapers, Democratic or Republican)

	<i>Logged newspaper circulation</i>					
	OLS				Matching estimator	
	All newspapers	Weeklies only	Dailies only	Dailies only, for cities with population>10000	All newspapers	Dailies only
	(1)	(2)	(3)	(4)	(5)	(6)
Independent newspaper (dummy)	0.00105 [0.0206]	-0.0361** [0.0181]	0.189* [0.112]	0.264** [0.131]	-.074*** [.013]	.206*** [.061]
Fixed effects (exact match parameters)	County, Year	County, Year	County, Year	County, Year	County, Year	County, Year
Year of establishment	-0.00879*** [0.000668]	-0.00787*** [0.000665]	-0.0105*** [0.00249]	-0.0115*** [0.00252]	Yes	Yes
Log (county population)	0.435*** [0.123]	0.280*** [0.100]	0.643* [0.355]	0.44 [0.370]	Yes	Yes
Log (average wage in manufacture)	-0.0748 [0.0635]	-0.0231 [0.0549]	-0.372 [0.286]	-0.355 [0.293]	Yes	Yes
Log (average agricultural income per family)	-0.0416 [0.0389]	-0.0167 [0.0305]	-0.00444 [0.196]	0.114 [0.283]	Yes	Yes
Dummy for city being a county seat	0.150*** [0.0177]	0.167*** [0.0171]	-0.255 [0.157]	0.0196 [0.0508]	Yes	Yes
Log (city population)	0.239*** [0.0136]	0.216*** [0.0125]	0.676*** [0.0784]	0.417*** [0.0556]	Yes	Yes
Number of newspapers in a city (proxy for competition)	0.0192* [0.0110]	0.00959 [0.0101]	-0.0212* [0.0112]	-0.0276** [0.0117]	No	No
Observations	17698	16204	1332	887	17697	1332
R-squared (or percent of exact matches for matching)	0.706	0.675	0.837	0.71	61.9	52.65
N of cities	2799	2747	220	113	2799	220
F-statistics for electoral controls	1.435	0.976	0.405	0.632		

Standard errors in brackets. Standard errors are clustered by city. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: newspaper controls include a dummy variable for a daily newspaper and a number of pages in the newspaper. County controls include county population, fraction of urban population, and 10 electoral control variables, including percentage of votes for Republicans, Democrats, Greenbacks, and other parties in the most recent presidential and congressional elections, and voter turnout in these elections. Data on income and population are from U.S. Census 1880 and 1890 (reconstructed by Haines in 2005), interpolated for 1881-1886. Newspaper data are from Ayer's American Newspaper Annual (1881-1886). Electoral data are from Clubb et. al. (2006) dataset at ISPSR. Only Republican, Democratic or Independent newspapers are included in the sample.

Table 10. Advertising and newspaper independence. Some robustness checks

	<i>Dummy for independent newspaper</i>			
Local average advertising rate (computed for other newspapers in a city)	0.00626**	0.00600**		
	[0.00259]	[0.00256]		
Local average circulation-adjusted advertising rate (computed for other newspapers in a city)			0.0534***	0.0534**
			[0.0197]	[0.0224]
County population (logged)	-0.00652	-0.0179	-0.0263	-0.0957
	[0.0761]	[0.0768]	[0.0714]	[0.0774]
Average wage in manufacture (logged)	-0.0106	-0.00763	-0.0152	-0.0213
	[0.0222]	[0.0222]	[0.0230]	[0.0272]
Average agricultural income (logged)	-0.011	-0.00308	0.035	0.0503
	[0.0482]	[0.0483]	[0.0504]	[0.0573]
Number of newspapers (proxy for competition)	0.00104	0.000613	0.000884	0.000631
	[0.00335]	[0.00322]	[0.00294]	[0.00316]
Additional controls included	Circulation, logged	Circulation to degrees 1/2 to 1/5 included	Base year circulation interacted with time dummies	Following variables, interacted with time dummies: base year circulation (logged), average agricultural income (logged), average wage in manufacture (logged), county population (logged), city population (logged), dummy for being county seat
Fixed Effects	Newspaper, Year	Newspaper, Year	Newspaper, Year	Newspaper, Year
Observations	15107	15107	10990	9854
R-squared	0.921	0.922	0.912	0.907
N of cities	1642	1642	1289	1159
F-statistics for electoral controls	0.911	0.913	1.304	1.106
Marginal effect	0.00199	0.0019	0.0168	0.0167

Robust standard errors in brackets. Standard errors are clustered by county

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 11. Advertising and independent newspapers. Matching results.

Dummy for independent newspaper

	OLS	Matching	OLS	Matching
Dummy for circulation-adjusted advertising rate being higher than median in a state	.051***	.046***	.006	.052***
Fixed effects (exact matching parameters for matching)	State, Year	State, Year	County, Year	County, Year
County and City Controls (matching parameters for matching)	Yes	Yes	Yes	Yes
Observations	22226	22226	22226	22226
R-squared	0.154		0.328	
Percent of exact matches		98.6		56.8

Table 12. Ideological bias of the members of Congress and county economic characteristics.
(test for alternative explanation)

	<i>Legislator's bias, based on 1st dimension of NOMINATE score</i>				<i>Legislator's bias, based on 2nd dimension of NOMINATE score</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fraction of independent newspapers	-0.046 [0.0645]				0.0660*** [0.0244]			
Circulation-adjusted advertising rate		-0.0719 [0.0647]				0.0484 [0.0294]		
Fraction of Democratic newspapers			0.0574 [0.0692]				-0.0654** [0.0276]	
Fraction of Republican newspapers				-0.0129 [0.0908]				-0.00401 [0.0333]
Fixed effects	Year, District	Year, District	Year, District	Year, District	Year, District	Year, District	Year, District	Year, District
Observations	1536	1536	1536	1536	1536	1536	1536	1536
R-squared	0.656	0.656	0.656	0.656	0.568	0.567	0.568	0.565
Number of districts	294	294	294	294	294	294	294	294

Robust standard errors in brackets. Standard errors are clustered by congressional district. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: dependent variable is absolute value of deviation of NOMINATE score for a member of Congress from its median, based on Poole and Rosenthal (1997) data. Data on county population and urban population are from U.S. Census 1880 and 1890 (reconstructed by Haines in 2005), interpolated for 1881-1886. Newspaper data are from Ayer's American Newspaper Annual (1881-1886). Data on county-congressional district correspondence are from Clubb et. al. (2006) dataset at ISPSR. To construct this table, newspaper-level data were collapsed by county.

Table 13. Migration and dynamic county characteristics.
(test for alternative explanation)

	<i>Independent newspapers in a county, fraction</i>	<i>Democratic newspapers in a county, fraction</i>	<i>Republican newspapers in a county, fraction</i>	<i>Local circulation-adjusted advertising rate</i>	<i>Log (County population)</i>
	(1)	(2)	(3)	(4)	(5)
Proportion of foreign-born population	-0.0494 [0.0787]	-0.126* [0.0761]	0.176* [0.100]	0.0248 [0.0298]	-1.096*** [0.133]
Fixed effects	County, Year	County, Year	County, Year	County, Year	County, Year
Observations	10265	10265	10265	9842	10265
R-squared	0.741	0.873	0.842	0.842	0.998
Number of counties	1947	1947	1947	1904	1947

Robust standard errors in brackets. Standard errors are clustered by county

* significant at 10%; ** significant at 5%; *** significant at 1%

Note: table presents results for aggregate county-level data. Data on foreign-born population and data on county population are from U.S. Census 1880 and 1890 (reconstructed by Haines in 2005), interpolated for 1881-1886. Newspaper data are from Ayer's American Newspaper Annual (1881-1886). Electoral data are from Clubb et. al. (2006) dataset at ISPSR. To construct this table, newspaper-level data was collapsed by county.

Table 14. African-American population and dynamic county characteristics.

(test for alternative explanation)

	<i>Independent newspapers in a county, fraction</i>	<i>Democratic newspapers in a county, fraction</i>	<i>Republican newspapers in a county, fraction</i>	<i>Local circulation-adjusted advertising rate</i>	<i>Log (County population)</i>
	(1)	(2)	(3)	(4)	(5)
Proportion of African-American population	0.0796 [0.217]	0.236 [0.225]	-0.316** [0.136]	-0.154 [0.338]	-1.469*** [0.152]
Fixed effects	County, Year	County, Year	County, Year	County, Year	County, Year
Observations	10265	10265	10265	9842	10265
R-squared	0.741	0.873	0.842	0.843	0.996
Number of counties	1947	1947	1947	1904	1947

Robust standard errors in brackets. Standard errors are clustered by county

* significant at 10%; ** significant at 5%; *** significant at 1%

Note: table presents results for aggregate county-level data. Data on African American population are from U.S. Census 1880 and 1890 (reconstructed by Haines in 2005), interpolated for 1881-1886. Newspaper data are from Ayer's American Newspaper Annual (1881-1886). Electoral data are from Clubb et. al. (2006) dataset at ISPSR. To construct this table, newspaper-level data was collapsed by county.

Table 15. Local advertising profitability and vote margins.

	<i>Dummy for independent newspaper</i>
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Local advertising circulation-adjusted Advertising rate (A)	0.0901** [0.0399]	0.0904*** [0.0237]	0.0936*** [0.0288]	0.0665*** [0.0219]
Method of computing A	Average A for all newspapers in a city	Average A for all newspapers in a city	Average A for all newspapers in a city	Average A for all newspapers in a city, excluding this newspaper
Effect of one standard deviation change for given measure of A (in %)	2.37	2.37	3.0	2.2
Vote margin in Congressional elections	-0.000309** [0.000139]	-0.000816*** [0.000228]	-0.000364** [0.000185]	-0.000360* [0.000185]
Fixed effects	County, Year	Year	Newspaper, Year	Newspaper, Year
County and city controls	Yes	Yes	Yes	Yes
Observations	24168	24168	15224	15224
R-squared	0.355	0.124	0.92	0.92
N of counties	1599	3444	1472	1472

Standard errors in brackets. Standard errors are clustered by county. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: Vote margins are computed as absolute value of difference between percentage of votes for Democratic party and percentage of vote for Republican party. County controls include county population, log average wage in manufacture, log average agricultural income, and 10 electoral control variables, including percentage of votes for Republicans, Democrats, Greenbacks, and other parties in the most recent presidential and congressional elections, and voter turnout in these elections. City controls include dummy for being a county seat and log of city population. Data on population are from U.S. Census 1880 and 1890, interpolated for 1881-1886. Newspaper data and data on city population are from Ayer's American Newspaper Annual (1881-1886). Electoral data are from Clubb et. al. (2006) dataset at ISPSR. Data on county seats are from ICPSR 8159 dataset, constructed by R. Sechrist. Only Republican, Democratic, or independent newspapers are included in the sample.

Table 16. Advertising and independent newspapers. More robustness checks.

	<i>Dummy for independent newspaper</i>			
Local average advertising rate (computed for other newspapers in a city)	0.0511**	0.0507**	0.0669***	0.0672***
	[0.0215]	[0.0213]	[0.0213]	[0.0213]
County population (logged)	0.0325	0.0319	0.0632	0.0171
	[0.0855]	[0.0868]	[0.0984]	[0.0816]
Average wage in manufacture (logged)	-0.0224	-0.0219	-0.0308	-0.0302
	[0.0258]	[0.0256]	[0.0241]	[0.0240]
Average agricultural income (logged)	-0.0341	-0.0306	-0.0347	-0.0323
	[0.0527]	[0.0526]	[0.0480]	[0.0492]
Number of newspapers (proxy for competition)	0.00077	0.000897	0.000688	0.00068
	[0.00391]	[0.00388]	[0.00372]	[0.00376]
Legislator bias (based on 1 st dimension of NOMINATE score)	0.00956			
	[0.0123]			
Legislator bias (based on 2 nd dimension of NOMINATE score)		0.051		
		[0.0314]		
Fraction of foreign-born population			0.0652	
			[0.216]	
Fraction of African-American population				-0.388
				[0.401]
Fixed effects	Newspaper, Year	Newspaper, Year	Newspaper, Year	Newspaper, Year
Observations	13546	13546	15224	15224
R-squared	0.917	0.917	0.92	0.92
N of cities	1396	1396	1472	1472
F-statistics for electoral controls	0.72	0.746	0.739	0.735

Table 17. Independent newspapers and their own circulation-adjusted advertising rate

	<i>Dummy for independent newspaper</i>		
Newspaper's own circulation-adjusted advertising rate	0.0179	0.0384**	-0.00076
	[0.0170]	[0.0156]	[0.0168]
County population (logged)	0.0386	0.0724***	0.0167
	[0.0657]	[0.0161]	[0.0675]
Average wage in manufacture (logged)	-0.0313	-0.0425***	-0.0148
	[0.0236]	[0.00987]	[0.0192]
Average agricultural income per family (logged)	-0.046	0.0318**	-0.0476
	[0.0429]	[0.0138]	[0.0388]
Dummy for county seat	-0.223***	-0.183***	
	[0.0182]	[0.0135]	
City population (logged)	-0.109***	-0.0441***	
	[0.0120]	[0.00749]	
Number of newspapers (proxy for competition)	0.0139*	0.00435	-0.0006
	[0.00797]	[0.00315]	[0.00359]
Fixed Effects	County, Year	Year	Newspaper, Year
Observations	22639	22639	25790
R-squared	0.373	0.126	0.922
N of cities	3444	3444	4092
F-statistics for electoral controls	1.171	6.973	0.97

Table A1. List of sources for data on local regulations of advertising

Charter and Revised Ordinances of the City of Beverly. Beverly, Mass., 1903
Charter and Revised Ordinances of the City of Brockton. Brockton, Mass., 1900
Charter and Ordinances of the City of Lowell. Lowell, Mass., 1883
Municipal Manual of the City of Somerville. Boston, 1892
City of Newton Revised Ordinances. Newton, Mass., 1894
Charter and Ordinances. Gloucester, Mass., 1901
Charter. Ordinances. Rules of the Board of Health and City Government of Malden. Boston, 1882
Municipal Register of the City of Haverhill. Haverhill, Mass., 1897
Charter of Laws relating to the City of Troy. Municipal Ordinances. Troy, N.Y., 1891
Ordinances and Rules and Orders of the City of New Bedford, New Bedford, 1884
Ordinances. Rules and Orders, and Laws Relating to City Affairs, 1889. Lawrence, Mass., 1890
Charter and Ordinances of the City of Waltham. Waltham, Free Press Book and Job Office, 1886
The City Charter as amended by subsequent legislation and the Ordinances of the City of Haverhill. Haverhill, Mass., 1880
Charter and Revised Ordinances of the City of Brockton. Brockton, Mass., 1900
City Charter and Revised Ordinances of the City of Fall River. Fall River, Mass., 1887
Laws as contained in an Act to revise and combine in a single act all existing special and local laws affecting public interests in the City of Brooklyn. Albany, N.Y., 1888
The charters of the city of Brooklyn : passed June 28, 1873. Brooklyn : Daily Union Print, 1873
The revised ordinances of 1885, of the city of Boston, as passed and approved December 14, 1885. Boston, Rockwell and Churchill, city printers, 1886
The revised ordinances of the city of Boston : as passed prior to December 31, 1882. Boston, Rockwell and Churchill, 1882
Charters and Ordinances, City of Ithaca, New York. Ithaca, N.Y. 1897
