Media Bias in China

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By Bei Qin, David Strömberg, and Yanhui Wu*

This paper examines whether and how market competition affected the political bias of government-owned newspapers in China from 1981 to 2011. We measure media bias based on coverage of government mouthpiece content (propaganda) relative to commercial content. We first find that a reform that forced newspaper exits (reduced competition) affected media bias by increasing product specialization, with some papers focusing on propaganda and others on commercial content. Second, lower-level governments produce less-biased content and launch commercial newspapers earlier, eroding higher-level governments' political goals. Third, bottom-up competition intensifies the politico-economic trade-off, leading to product proliferation and less audience exposure to propaganda. (JEL D72, L31, L82, O14, O17, P26, P31)

While freedom of the media is often regarded as a cornerstone of democracy, media control is an indispensable part of an autocratic system. Economists have shown that the political bias of media has important consequences in autocracies, such as the negative social effects of propaganda (Adena et al. 2015; Yanagizawa-Drott 2014) and the significant impact of media freedom on corruption (Brunetti and Weder 2003) and regime support (Enikolopov, Petrova, and Zhuravskaya 2011). To further understand media control and the effects of such control in autocracies, a central question arises: to what extent and why do the media deviate from the political bias imposed by the ruler? Despite its importance, this question has not yet been rigorously examined on the basis of large-scale data. The current paper addresses this question in the context of China, the largest autocracy and newspaper market in the world.

One striking feature of the Chinese media is the so-called "prosperity without freedom" (He 2007). In China, all general-interest newspapers are owned and

supervised by the highest political decision-making bodies: the Chinese Communist Party Committees (CCPCs). These newspapers are assigned the political task of implementing the Party-Line journalism, most notably, propaganda. Despite strict political control, Chinese newspapers operate in a vibrant advertising market that, in size, is behind only the United States. The pursuit of profits has not only given birth to a large number of commercial newspapers, but has also turned government mouthpieces into state-owned enterprises (SOEs). This phenomenon raises a fundamental question: is there a politico-economic trade-off in the Chinese media? In other words, can economic prosperity of the media be achieved without impairing the ruler's political goals?

Given the vibrant market, a second natural question emerges: does market competition have any effect on a newspaper's political bias in such a highly controlled environment, and if so, what is the nature of this effect? Because Chinese governments, from the national to the county level, directly own all general-interest newspapers, one may wonder in what sense competition exists. With the exception of several national newspapers, most Chinese newspapers are owned by local governments which have a high degree of autonomy in economic decisions, including how to run their newspapers (Zhao 1998; Xu 2011). Thus, competition occurs between newspaper owners who have individual profit motives and, likely, different valuations of media bias.

This paper examines the two questions above in three steps: (i) measuring the political bias of newspapers, (ii) estimating the causal effects of competition on this bias, and (iii) providing evidence on how market structure interplays with politics to affect media bias. Based on these answers, we finally address the question of what economic and social factors affect content allocation in the media and readers' exposure to media bias.

We focus our study on general-interest newspapers, including both government mouthpieces (Party papers) and unofficial commercialized newspapers (commercial papers). These newspapers account for the lion's share of readership. Our study is based on two datasets. First, we use the content of 117 general-interest newspapers published in urban areas of mainland China from 1999 to 2010. This database is provided by WiseNews, which contains the largest amount of digital content of Chinese newspapers during the sample period. Second, we compile a comprehensive directory of approximately 1,000 general-interest Chinese newspapers from 1981 to 2011.

Our media bias measure is intended to capture the major characteristics of news content that reflect a newspaper's adherence to the Chinese Communist Party (CCP) journalism on the one hand and the degree to which it caters to a general audience on the other. To this end, we classify a newspaper's coverage of nine topics capturing (i) mouthpiece coverage (mentions of political leaders or citations of the CCP's authoritative news agency), (ii) politically sensitive or negative information (reporting on corruption, disasters, and accidents and controversial issues that are intensively covered by oppositional overseas Chinese media), and (iii) commercially oriented content (crime, sports, and entertainment).

To generate a single-dimensional measure of media bias, we use principal component analysis (PCA) to consolidate the nine types of content above. At the provincial level, the resulting bias index is strongly positively correlated with the intensity

of internet censorship reported in Bamman, O'Connor, and Smith (2012) and also with the share of government accounts on Chinese social media estimated by Qin, Strömberg, and Wu (2017). At the individual newspaper level, a clear pattern of product differentiation emerges: some newspapers focus on propaganda content, while others focus on commercial content. The bias index exhibits a strong positive correlation with the newspaper being a Party paper (as opposed to a commercial paper) and a strong negative correlation with advertising revenue. Within the same newspaper market and year, a one-standard-deviation increase in the bias index is associated with a 33 percent fall in advertising revenues.

The results above suggest that advertisers (readers) are elastic to politically biased content.[1] In a democracy with press freedom and private media, such an elastic demand will naturally induce competing media to cater to the audience's preferences, thus taming the influence of political forces. In China, however, the government's political strategy may cripple the functioning of the market. As observed in China, one political strategy is to alleviate the tension between political and economic goals through product differentiation. Specifically, a CCPC can produce one highly biased Party paper that exclusively focuses on political goals and one less-biased commercial paper that largely focuses on economic goals.

We build a simple model to rationalize this strategy and, further, to show that it is less effective in the presence of competition. Consider a market in which the same CCPC owns two newspapers: a Party paper with high bias and a commercial paper with low bias. Reducing the bias of the Party paper increases its audience at the expense of its sibling commercial paper but has no effect on the CCPC's aggregate profits. Meanwhile, reducing the bias of the commercial paper does not incur a large political cost because the readers of the Party paper are not affected by the bias reduction. In this way, the existence of a commercial paper entirely relieves the Party paper of economic concerns, and the existence of the Party paper reduces the commercial paper's political concerns. Such a strategy is analogous to the market-segmentation strategy used by profit-maximizing firms to extract the surplus from consumers who differ in their willingness to pay for different brands or quality.

Suppose that another CCPC introduces a competing paper whose bias is located between that of the existing Party and commercial papers. Now, reducing the Party paper's bias will steal audience from the competing paper and thus increase the owner's aggregate profits. Hence, the Party paper will consider both political and economic goals; its owner's incentive to differentiate products decreases. This effect occurs when some readers flow across newspapers of different types.

To test the theoretical argument above, we explore a drastic reform in which the Chinese central government closed more than 80 percent of the county-level Party Dailies in 2003 for reasons that were exogenous to the newspapers' decisions. The exit of these papers reduced the number of competing newspapers in the prefectural markets where prefectural and county CCPCs ran different newspapers. Given the strong evidence that lower-level newspapers are less biased, these

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[1] The readership of a newspaper is arguably the most important determinant of its advertising revenue. But we are not able to estimate the elasticity of advertising revenues with respect to readership because reliable circulation data for Chinese newspapers are not available.

county Party Dailies were likely to be less (or more) biased than the prefectural Party (or commercial) papers. Using a difference-in-differences approach, we find that closing these lower-level Party papers significantly increased the differentiation in the political bias of the higher-level Party and commercial papers, as predicted by the theory. The estimation is robust to scrutiny for the existence of a pre-trend and a number of potential confounding factors. In addition, the estimated effects are considerable. For example, the reform caused articles citing the CCP mouthpiece news agency to fall by 6.2 percent in commercial papers and articles mentioning top leaders to increase by 8.3 percent in Party papers. This result shows that competition significantly affects the political bias of the media in China. Particularly, the newspapers owned by lower-level CCPCs impair higher-level CCPCs' strategy of control through product differentiation.

More generally, we find evidence that lower-level CCPCs erode the political goals of higher-level CCPCs. Within the same market, year, and newspaper type, newspapers owned by lower-level CCPCs are less biased. In 22 of 26 provincial-capital markets where provincial and prefectural CCPCs compete, the lower-level CCPC started the first commercial paper. The entry of a commercial paper produces a political cost by reducing the audience of the preexisting Party paper and thus the reach of its propaganda.[2] We argue that it is likely that the lower-level CCPC cares less about the political cost of reduced bias exposure because this cost, such as political unrest, has geographic spillovers that are not fully internalized by the lower-level CCPC. Consistent with this argument, we find that in a sample of 265 prefectures, lower valuation of political control for historical reasons such as exposure to Western powers or influence of the CCP ideology facilitates the entry of commercial papers and hinders the entry of Party papers.

Our findings on the effect of competition on newspaper bias and the entry patterns of different types of newspapers demonstrate that newspaper markets in China are neither segregated across levels of government nor segmented across Party-commercial newspaper types. Thus, hierarchical competition between CCPCs acts as a driving force to reduce Chinese readers' exposure to political bias. Economic prosperity cannot be achieved without conflicting with political goals.

This paper advances economic research on the media. In a democracy with press freedom, why profit-maximizing media are politically biased is an intriguing question that has attracted substantial research interest.[3] In an autocracy with strict media control, the question of interest is reversed: what drives state-owned media to deviate from the political bias imposed by the rulers? One influential answer to this question is that autocratic governments regulate the media to trade off political control (censorship) against the use of bottom-up information for monitoring or surveillance (e.g., Egorov, Guriev, and Sonin 2009; Lorentzen 2014; King, Pan, and Roberts 2013; Qin, Strömberg, and Wu 2017). The present paper stresses another trade-off: the politico-economic trade-off, which is fundamental in theoretical studies of media capture and control (e.g., Besley and Prat 2006; Gehlbach and Sonin 2014).

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[2] Our content classification shows that Party and commercial papers differ primarily in the mouthpiece versus commercial content. They do not differ significantly in the coverage of corruption, accidents, and disasters, as will be discussed later.

[3] See Prat and Strömberg (2013); Gentzkow, Shapiro, and Stone (2016); and Puglisi and Snyder (2016) for recent surveys and the references therein.

Our research provides some of the first rigorous evidence on this trade-off. We measure, identify, and analyze the politico-economic trade-off in Chinese newspapers, illustrating that economic development and the resulting market competition play an important role in shaping media bias, even in a strictly controlled environment.

Our research also contributes to the study of market structure and media bias (e.g., Baldasty 1992; Gentzkow, Glaeser, and Goldin 2006; Gentzkow and Shapiro 2006, 2010; Gentzkow, Shapiro, and Sinkinson 2014; Galvis, Snyder, and Song 2016). Economically, we show that media ownership can change the effects of market competition on media bias through product differentiation. This result relates to Gabszewicz, Laussel, and Sonnac (2001) and Mullainathan and Shleifer (2005). Politically, we highlight that competition between local governments in a decentralized or federalist system can limit the supply of media bias.

Finally, this paper fits into studies of government-controlled firms, which are common in developing countries. Because of their political goals (such as protecting national security, maintaining fiscal revenues, or sustaining high employment), these firms are economically inefficient (e.g., Shleifer and Vishny 1994; Boycko, Shleifer, and Vishny 1996). In China, resolving the politico-economic conflict is regarded as crucial for SOE performance and economic reform (e.g., Cao, Qian, and Weingast 1999; Lin and Tan 1999; Bai, Lu, and Tao 2006; Hsieh and Song 2015). The media bias index that we construct provides a direct measure of the politico-economic trade-off and can be used as an outcome when studying the political control of the economy. For instance, we show that our media bias measure, aggregated at the provincial level, is strongly correlated with a pro-market competency index across regions in China (Fan and Wang 2009).

The rest of the paper proceeds as follows. The next section describes the institutional background. Section II explains how we measure the political bias of Chinese newspapers. Section III develops the theoretical framework. Sections IV and V present the empirical analysis of media bias, with the former focusing on the effect of competition and the latter on market dynamics. Section VI concludes. A formal model, a detailed description of the data, and additional Tables and Figures (indexed with the prefix "A" throughout) can be found in the online Appendix.

I. Institutional Background

This section describes the main features of the Chinese newspaper industry, drawing heavily on a directory of all Chinese newspapers during the 1981–2011 period. We do not include newspapers before 1981 because most newspapers were closed during the Chinese Cultural Revolution (1966–1976). We construct the directory from four sources: (i) the *Chinese Newspaper Directory* (2003, 2006, 2010), published by the State Administration for Press and Publication, the authority that issues newspaper licenses; (ii) the *Annual China Journalism Yearbooks* (1982–2011), published by the Chinese Academy of Social Science; (iii) the *China Newspaper Industry Yearbooks* (2004–2011), published by a Beijing-based research institute; and (iv) an eight-volume collection of the front pages of major newspapers on the date of first publication. For each newspaper, we track information about the location of its headquarters, publication periods, direct ownership, financing sources, government supervisor, administrative ranking within

the Chinese government hierarchy, and type of readership (general or specialized). To the best of our knowledge, our newspaper directory is the most comprehensive among existing data sources.

A. *Ownership and Control*

All Chinese newspapers are required to be completely or primarily owned by the state. They must be affiliated with a government supervisor who is responsible for licensing, appointing top personnel, and monitoring important editorial matters. Most importantly, only a CCPC is eligible to obtain a license for a general-interest newspaper.

The ownership structure of Chinese newspapers parallels the four-level hierarchy of the CCPC system: nation, province, prefecture, and county. The control of non-national newspapers is decentralized to local CCPCs. As a direct owner, a local CCPC monitors the newspapers under its administration and has the right to claim and distribute their residuals. With a few exceptions, the business operation of a lower-level newspaper is independent of its higher-level counterparts.

Per regulation, general-interest newspapers come in variants that are indicated by their names (i) Daily, (ii) Evening, and (iii) Metro and similar names. A Daily is a CCPC's official mouthpiece. Its editorial policy is strictly controlled by the corresponding CCPC Propaganda Department. By contrast, "Evenings" and "Metros" are less controlled in terms of both editorial policies and managerial autonomy. They differ in publication time: Evenings in the afternoon and Metros in the morning. In the 1990s, general-interest newspapers were permitted to produce subsidiary newspapers that were typically named Metros or Evenings. These subsidiary newspapers carried more consumer-oriented content and actively absorbed non-state capital. In sum, we classify newspapers into three different categories based on ownership and name: (i) Party Dailies (CCPC mouthpieces), (ii) Party Evenings (both Evenings and Metros that are directly owned by CCPCs), and (iii) Subsidiaries (Evenings and Metros owned by parent newspapers).

B. *Political and Economic Goals*

All general-interest newspapers have explicit political goals. The foremost political goal is to implement the CCP's Party Line, a media policy that aims to mobilize political actions and sustain regime stability. To this end, newspapers must carry out the tasks of propagating the CCP's ideology and leadership, informing cadres and the public of Party decisions and government policies, and suppressing news that may negatively affect regime stability (Zhao 1998). To implement these tasks, the CCP propaganda departments regularly issue directives and convene meetings to direct editorial policies. Failure to adhere to the Party Line leads not only to the withdrawal of circulating newspapers and suspension of licenses but also to the dismissal of editors and the demotion of related government officials (He 2007).

A less-known political role of the Chinese media is the so-called Mass Line, through which the media provide intelligence to top leaders about public sentiment and the performance of bureaucrats (Zhao 1998). Under the slogan "supervision

by public opinion," the Mass Line permits media to report on corruption and wrongdoing by lower-level Party officials and government agencies.

Chinese newspapers, including Party Dailies, also have the economic goal of earning profits. As early as 1979, the state granted permission to the People's Daily (the foremost CCP mouthpiece) and several provincial newspapers to earn advertising revenues and seek profits. This profit-seeking goal was authorized by regulators in 1988. Since then, general-interest newspapers have been regarded as quasi-SOEs and have operated under the slogan "supervised by politicians and managed by entrepreneurs." It was estimated that at the end of the 1990s, advertising revenues accounted for at least 70 percent of the overall income of the mainstream newspapers (Man 2001).

One reason for Chinese newspapers to maintain dual politico-economic goals is to have newspapers implement the Party Line using money they make themselves (Chen and Lee 1998). Newspaper profits are also important financial sources for local governments. First, newspapers' profits can contribute to local governments' fiscal budgets through the elimination of subsidies, taxation, and residuals. During the 1990s and 2000s, a large number of newspapers, including some Party Dailies, were among the top taxpayers in their localities. Second, lucrative newspapers provide opportunities for local politicians to seek rents. Finally, given the performance metrics for promotion used by the central government, local politicians may care more about hard measures such as GDP growth and fiscal revenues and less about soft measures such as promoting the CCP ideology and sustaining regime stability.

C. *Market Structure*

Historical Evolution (1981–2011).—Figure 1 depicts the evolution of general-interest newspapers. In 1981, there were 242 papers, 230 of which were Party Dailies. The number of Party Dailies increased continuously during the 1980s and 1990s. Spurred by the policy of self-financing and the rapid expansion of advertising, Party Evenings flocked into the market in the 1980s, and then Subsidiaries followed suit. The development of newspapers was clearly affected by the economic reforms involving SOEs. As indicated by the first vertical line in Figure 1, the number of Subsidiaries increased substantially after 1992, a landmark year of Chinese SOE reform.

Product Differentiation.—Starting in the early 1950s, the Chinese government aimed to achieve its political goals by monopolizing the market with Party Dailies. Although Party Dailies were subscribed to mainly by government units, mass organizations and SOEs, and civil servants and CCP members, their readership varied substantially across regions and over time. In the 1980s, Party Dailies dominated the newspaper industry and were widely read. Many provincial and prefectural Party Dailies doubled or even tripled their volume to meet readers' demand for diverse information; one indicator was that they established non-government circulation networks including street vendors to reach a wider readership (Wu 2004). According to a survey of major newspapers in nine economically developed provinces, the leading Party Dailies consistently sold over 500,000 copies per day
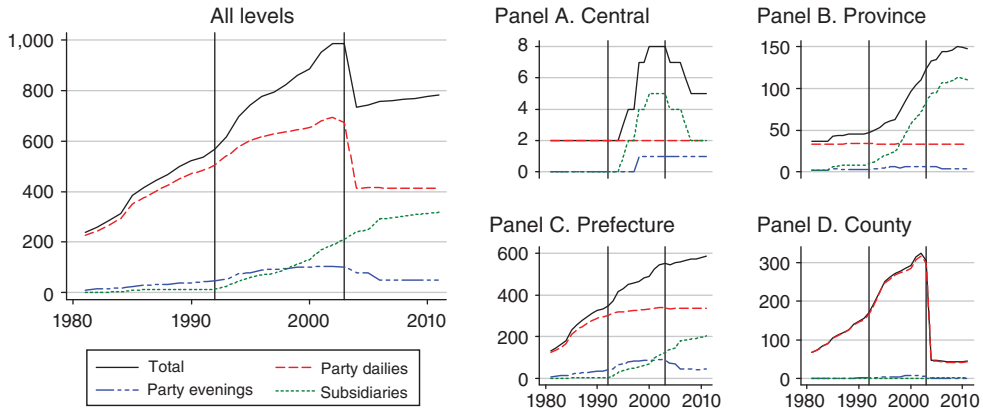
FIGURE 1. GENERAL-INTEREST NEWSPAPERS DURING THE 1981–2011 PERIOD

Notes: The first vertical line indicates 1992, which is a landmark year of Chinese economic reform; the second vertical line indicates 2003, when the central government withdrew the licenses of most county-level newspapers.

Source: Chinese newspaper directory data constructed by the authors.

and earned revenues comparable to the most profitable SOEs (Yang and Sun 2001). Concerned about Party Dailies' strong incentives to pursue economic benefits, some CCPCs launched Evenings to differentiate their products: a Party Daily for political goals and a Party Evening for economic goals.

Market Competition.—During the 1980s and early 1990s, the massive entry of Evenings substantially eroded the market share and readership of Party Dailies. Within the same market, the advertising revenue ratio between Party Dailies and Party Evenings was between 1:2.5 and 1:3.1 in the early 1990s (Chen and Guo 1999). In terms of circulation among general-interest newspapers, the share of Party Dailies fell from 70 percent in 1986 to 37 percent in 1996, while the share of commercial papers increased correspondingly (Chen and Lee 1998). The decline of Party Dailies was most notable in the provincial market, where multiple CCPCs competed. It was reported that the average circulation of provincial Party Dailies dropped continuously from 386,400 in 1984 to 239,100 in 1999 (Yang and Sun 2001). In response to the shrinkage of Party Dailies, provincial CCPCs allowed Party Dailies to introduce Subsidiaries that were completely commercialized. This change drove the boom in commercial newspapers after the mid-1990s.

Provincial Capital Cities.—The Chinese newspaper industry consists of a large number of independent local markets at the province and prefecture levels. The most active markets are the provincial capital cities, most of which are metropolises with a population of more than 5 million. In these markets, two owners—the provincial CCPC and the CCPC of the corresponding capital city—run different sets of newspapers to compete for readership and advertising revenues. For example, in Chengdu, the capital city of Sichuan Province, the Chengdu CCPC owns a Party

Daily, an Evening, and a Subsidiary, and the Sichuan provincial CCPC owns a Party Daily and a Subsidiary. The two Party Dailies compete for low-ranked government units and civil servants. Meanwhile, the Party Dailies and commercial papers compete for individual subscribers such as CCP members and SOE employees. Fierce competition occurs among the commercial papers which are close substitutes for general readers.

Non-Capital Prefectures.—Another important type of market is the approximately 300 non-capital prefectures, most of which have a population of over one million. In this market, the local CCPC operates a Party Daily and a commercial paper (either Evening or Subsidiary). Before 2003, in many prefectures, county-level CCPCs also ran Party Dailies. In 2003, the central government withdrew the licenses of more than 80 percent of these county-level newspapers, which caused a drastic drop in the number of Party Dailies (see the second vertical line in Figure 1). We will explore this 2003 reform to estimate the effect of competition on media bias.

II. Measurement of Bias

Measuring media bias for a wide range of newspapers over a long period is genuinely difficult. Topics of interest can vary across newspapers with different target audiences. Use of language may change over time. Existing methods use the typical ideologies of think tanks that a media outlet quotes (Groseclose and Milyo 2005), "partisan" words (Gentzkow and Shapiro 2010), or the sentiments of words (Tetlock 2007). However, these measures do not apply to the Chinese media because words that express opposition to or negative sentiment toward the official ideology are strongly suppressed. One potential alternative is to measure the intensity and style of a newspaper's coverage of certain events. However, this approach could cause serious measurement problems when the selection of events is asymmetric across newspaper types or unstable over time. Moreover, a scientific method should be transparent to implement and easy to replicate. Weighing the pros and cons of various approaches, we construct an issue-based measure of media bias by exploiting topics that are common to newspapers and stable over time.

In practice, we first define issues and then search for related keywords in the digital archives of WiseNews, a Hong Kong-based data provider of newspaper content. We restrict our sample to the 1999–2010 period because before that, only partial content from a few newspapers was available. Table 1 reports the basic information about this sample. During the sample period, the WiseNews database contains 117 general-interest newspapers published in mainland China, but the number of newspapers varies slightly over the years (see panel A). As summarized in panel B, the sample contains 40 Party Dailies, 12 Evenings, and 65 Subsidiaries; in terms of administrative rank, 5 are national, 71 provincial, and 41 prefectural. Geographically, these newspapers cover major prefectural areas in 26 of the 31 provinces in mainland China. In short, our sample largely represents the newspaper markets in urban areas, which comprise the majority of the readership in China. Details about the keywords and discussion of the sample selection are provided in online Appendix Sections A1 and A2.

TABLE 1—DESCRIPTIVE STATISTICS OF THE WISENEWS DATA

Panel A. Number of general-interest newspapers in WiseNews, by year

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Freq.	8	76	82	79	84	88	78	76	81	115	88	57

Source: WiseNews

Panel B. Number of general-interest newspapers in WiseNews, by type and administrative rank

Administrative rank	Party dailies	Party evenings	Subsidiaries	Total
Central	2	1	2	5
Province	22	4	45	71
Prefecture	16	7	18	41
Total	40	12	65	117

Source: WiseNews and Chinese Newspaper Directory constructed by the authors

Panel C. Summary statistics

Overall

Variables	Observations	Mean	SD	Min	Max
Leader mentions	912	10.98	11.66	0.00	83.48
Xinhua cites	912	23.02	15.16	0.00	86.07
Epoch stories	905	23.29	14.17	0.00	57.36
Corruption	912	0.16	0.10	0.00	0.75
Disasters	912	0.50	0.69	0.00	9.12
Accidents	912	0.12	0.11	0.00	0.88
Sport	912	6.45	2.90	0.00	30.63
Crime	912	0.53	0.36	0.00	2.41
Entertainment	912	12.48	4.88	2.48	34.16
Total number of articles	912	18,641	13,838	289	104,240

Mean	By rank			By type		
	Central	Province	Prefecture	Dailies	Evenings	Subsidiaries
Leader mentions	24.27	11.16	8.73	21.09	7.05	5.08
Xinhua cites	25.72	22.11	24.46	32.36	21.58	17.00
Epoch stories	19.29	22.99	24.48	20.30	22.27	25.59
Corruption	0.22	0.15	0.16	0.20	0.16	0.13
Disasters	0.76	0.48	0.48	0.61	0.40	0.44
Accidents	0.10	0.11	0.12	0.12	0.13	0.11
Sport	5.34	6.39	6.72	5.62	7.09	6.85
Crime	0.09	0.52	0.62	0.33	0.67	0.63
Entertainment	13.34	12.43	12.47	10.35	12.65	13.90

Note: All variables are at the newspaper-by-year level.

A. *Content Classification*

We classify nine content categories for three functions: Party Line, Mass Line, and Bottom Line.

The Party Line: Propaganda.—We code three types of content to capture a newspaper's adherence to the Party Line. First, we calculate the number of articles that mention the names of 2,111 political leaders during our sample period.[4] Second, we calculate the number of articles that are provided by or cite Xinhua News

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[4] Among these leaders, 108 individuals are at the central level, 816 at the provincial level, and 1,187 at the prefectural level.

Agency, which is a key instrument for the CCP to enforce its propaganda objectives. Third, we identify articles covering the top 10 annual news events listed by two extreme media outlets: *Xinhua News* and the *Epoch Times*. The latter is an overseas-based Chinese newspaper sponsored by anti-CCP organizations. We use the relative coverage of these two types of content to capture the omission of negative news relative to the inclusion of positive news.[5]

Note that the three categories above have implications for political accountability. Propaganda engineered by the CCP has been shown to negatively affect political accountability, to the extent one believes that propaganda can misinform people or cause the misinterpretation of information (Bai et al. 2015; Cantoni et al. 2017; Ou and Xiong 2017). Moreover, a newspaper's coverage of the *Epoch Times* top stories often contains negative information relevant to accountability. These content measures also closely relate to existing measures of media bias.[6]

The Mass Line: Monitoring.—As discussed in Section IB, Chinese newspapers are required to report the public's concerns about local policymakers and outcomes to improve their accountability to higher-level politicians. We identify three types of reports in this respect: reports on corruption, disasters, and accidents. Significant disasters and accidents, particularly those caused by human error or wrongdoing, are often regarded as reflecting the incompetence of government officials. We extract data on the occurrence of disasters and accidents in China that involve more than 30 fatalities from the EM-DAT database of the Center for Research on the Epidemiology of Disasters in Brussels. During the sample period, we identify 226 such events. We then search for articles that cover these disasters and accidents within a certain time frame around their occurrence.

The Bottom Line: Entertainment.—We measure three typical types of soft journalism that are demanded by general readers: sports, entertainment (e.g., movies and music), and crime stories. They are the most-searched-for topics on Baidu, the leading search engine in China.

B. *Summary Statistics*

Based on the content categories above, we define nine variables: *Leader Mentions*, *Xinhua Cites*, *Epoch Stories*, *Corruption*, *Disasters*, *Accidents*, *Sports*, *Entertainment*, and *Crime*. These variables are measured based on the proportion of articles belonging to a content category to the total number of articles, except for *Epoch Stories*, which is measured by the ratio of the number of articles that cover the top events listed by the *Epoch Times* to the number of articles that cover the top events listed by either *Xinhua News* or the *Epoch Times*.

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[5] Because the Epoch Times started to list its top ten news events in 2002, we use the 2002 data to fill in the missing observations for this measure from 1999 to 2001.

[6] For instance, news stories that cover politicians from a specific party are commonly used to measure media bias favoring that party (e.g., D'Alessio and Allen 2000; Durante and Knight 2012). The articles that cite Xinhua News are in the spirit of Groseclose and Milyo (2005), who use articles that cite think tanks to measure media bias. Coverage of positive news is another common measure of bias that favors incumbent politicians (Larcinese, Puglisi, and Snyder 2011).

The first half of panel C in Table 1 presents the summary statistics of these nine variables at the newspaper-by-year level. Concerning the Party Line, 1.86 million articles (10.98 percent of all articles) mention a political leader, and 3.9 million articles (23.2 percent) mention *Xinhua News*. We find 0.5 million articles covering the *Epoch Times*' top stories and 1.2 million articles covering Xinhua top stories.[7] Regarding the Mass Line, 26,909 articles cover corruption cases that are not part of government officials' speeches or anti-corruption activities.[8] We find 84,156 stories about disasters and 19,796 stories about accidents. Bottom Line stories include 1.1 million articles on sports, 2.12 million articles on entertainment, and 89,711 articles on crime.

The second half of Panel C breaks down the summary statistics by newspapers' administrative rank and type. Notably, central newspapers mention political leaders twice (or three times) as often as provincial (or prefectural) newspapers. This result is consistent with the expectation that central newspapers are more politically controlled. Interestingly, central newspapers report more on corruption and disasters than local papers, suggesting that they implement Mass-Line journalism more intensively.

Across newspaper types, compared to Party Dailies, Evenings and Subsidiaries mention political leaders and cite *Xinhua News* far less and cover significantly more crime and *Epoch Times* top stories. Somewhat surprisingly, Party Dailies report more on corruption and disasters, which indicates their goals to implement the Mass Line. Notably, Party Dailies produce a significant amount of soft journalism, for instance, more than 10 percent of entertainment stories. This result suggests that some Party Dailies care about general readership and is competitive with commercial papers.

C. *PCA as a Measure of Bias*

We aim to compress the nine content categories described above into one scalar to capture how strongly a newspaper's content reflects its political goals, as opposed to its economic goals. This aim can be accomplished in several ways. First, one can use the similarity between a newspaper's content and a known focus on a particular goal, as in Groseclose and Milyo (2005) and Gentzkow and Shapiro (2010). Given that Party Dailies are the primary carriers of political goals, a newspaper with a content mix that is characteristic of Party Dailies is likely to target its content toward political goals. Thus, a measure of the weight placed on political goals could be the probability that a newspaper is a Party Daily as predicted by its coverage of the nine categories. Second, similarly, a measure of the weight placed on economic goals by a newspaper could be its expected advertising revenues as predicted by its mix of coverage. Third, if the politico-economic trade-off is indeed a primary dimension of product differentiation, PCA should identify it. This last approach is analogous to NOMINATE scores, which are used to measure the left-right dimension in the US Congress.

We use all three methods. First, we regress a dummy indicator for a newspaper being a Party Daily on the content variables, controlling for prefecture-by-year fixed effects. From this regression, we compute the probability that a newspaper

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[7] The mean of the variable Epoch Stories reported in panel C of Table 1 is the average of the ratio across observations instead of the ratio of the average.

[8] These articles on corruption are mostly related to low-level officials. We only identify 13 cases concerning prominent political leaders.
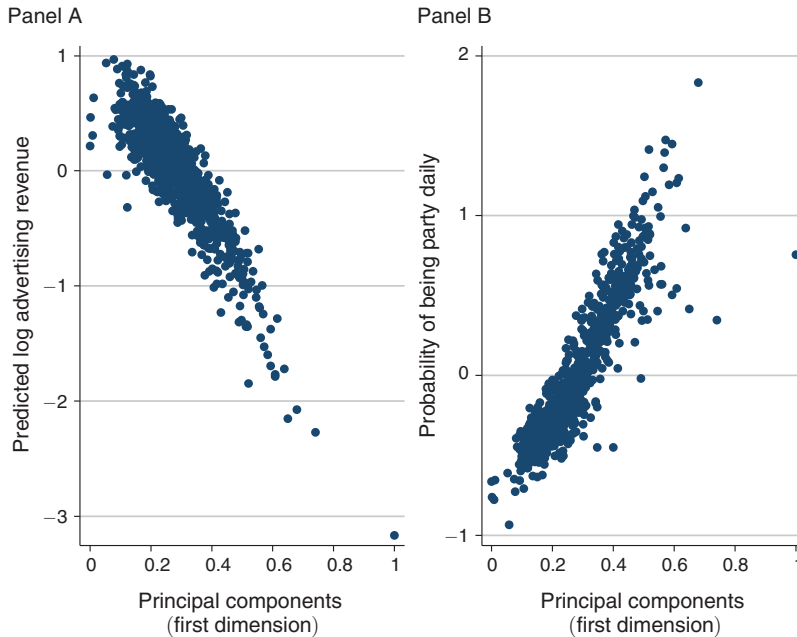
FIGURE 2. EXPECTED ADVERTISING REVENUE AND PROBABILITY TO BE PARTY DAILY VERSUS PCA FIRST COMPONENT

is a Party Daily based on its content alone. Second, we regress the logarithm of a newspaper's advertising revenues on the nine content variables, again controlling for prefecture-by-year fixed effects. We use this regression to compute a newspaper's expected advertising revenue based on its content alone. Finally, we employ PCA to capture the most important variations in our nine content categories. Online Appendix Table A2 reports the components and factor loadings of the PCA. Most notably, the first component accounts for approximately 36 percent of the variations.

These three methods produce similar results. Figure 2 depicts a linear and almost perfect correlation of the PCA first component with the predicted probability that a newspaper is a Party Daily and with the expected advertising revenues. Figure 3 plots the *t*-statistic on each content category against the factor loadings of the first component. The content categories with positive factor loadings are all individually positively correlated with the probability of being a Party Daily and negatively correlated with advertising revenues, and vice versa for those with negative loadings. The content categories all line up along one dimension; it is not the case that some categories are important for predicting advertising revenues and others are important for predicting whether a paper is a Party Daily. As a result, the PCA first component predicts advertising revenues almost as well as the unconstrained nine content categories. Quantitatively, in the same market and year, increasing political bias by one standard deviation is associated with a 33 percent decrease in advertising revenues.[9]

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[9] We regress log advertising revenues on bias, controlling for prefecture-by-year and administrative-level fixed effects. The estimated bias coefficient is -3.44 with a standard error of 0.79.
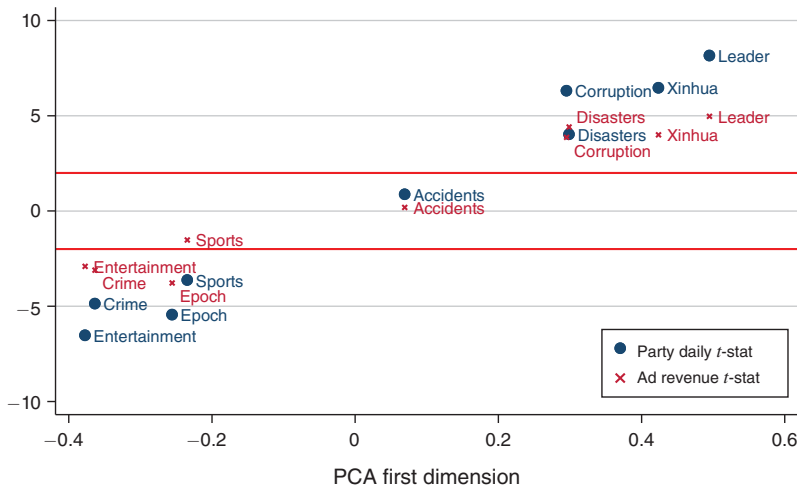
FIGURE 3. CONTENT LOADINGS IN THREE BIAS MEASURES

Notes: The *y*-axis is the *t*-statistic for the coefficient of the Party Daily dummy variable (or negation of advertising revenue) in a regression with each content variable being the dependent variable, controlling for prefecture-by-year fixed effects. This is plotted against the factor loading for each content variable.

Each individual factor loading is also sensible. For the Party Line, the *Leader Mentions* variable has the strongest positive factor loading, followed by *Xinhua Cites*, while *Epoch Stories* has a sizable negative factor loading. All three Bottom Line measures, namely, *Entertainment*, *Crime*, and *Sports*, have strong negative loadings. Concerning the Mass Line measures, *Corruption* and *Disasters* have strong positive factor loadings, while the loading of *Accidents* is modest.

To further assess the credibility of the PCA first component as a measure of media bias, we examine it for individual newspapers. Table A3 lists the top ten and bottom ten papers in terms of our bias measure. In addition to People's Daily, the most-biased papers include nine provincial Party Dailies, among which eight are from inland provinces where the media are believed to be less open than the media in coastal provinces. The least-biased newspapers are Subsidiaries from large metropolitan areas, which are viewed as breeding the most commercial and free media in China. Still, there exists a large variation in the bias measure within each type of newspaper. A number of Party Dailies are less biased than some Evenings and Subsidiaries, as shown in Figure A1. Interestingly, based on our measure, the least-biased Party Daily is *Guangzhou Daily*, which is well known as the largest advertising earner among all Chinese newspapers since 1993.

Furthermore, we calculate the average value of the bias measure for all newspapers within a province. Panel A of Figure 4 demonstrates that this measure of average bias has a strong negative correlation with the index of regional competency constructed by Fan and Wang (2009), which is based largely on the degree of government involvement in the economy (e.g., the share of SOEs) and the role of markets in resource allocation. The bias measure is also strongly
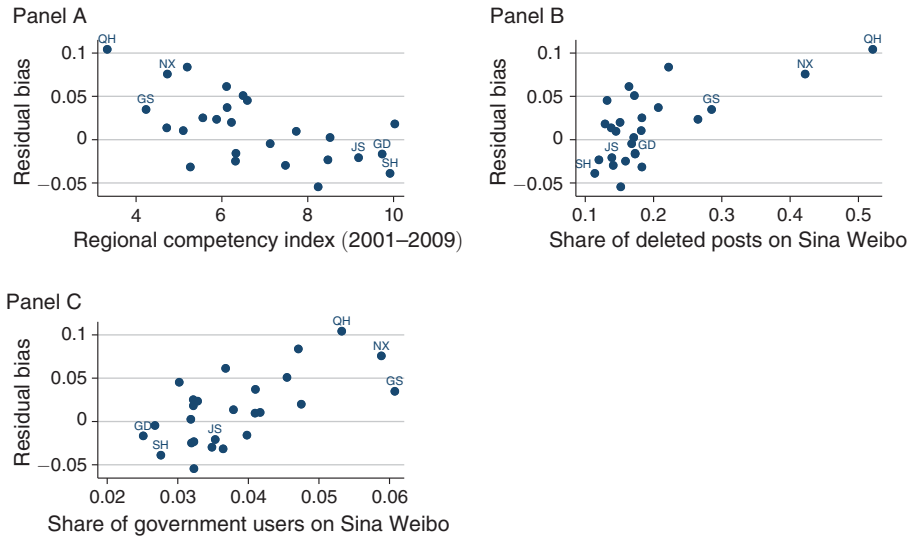
FIGURE 4. CORRELATIONS BETWEEN NEWSPAPER BIAS AND OTHER MEASURES OF POLITICAL CONTROL

positively correlated with the share of deleted posts (Bamman, O'Connor, and Smith 2012) and the share of government accounts (Qin, Strömberg, and Wu 2017) on Sina Weibo, the most prominent online public platform in China. See panels B and C of Figure 4, respectively. In these figures, three provinces that are believed to have the most-developed media markets—Shanghai (SH), Guangdong (GD), and Jiangsu (JS)—have a low level of bias and are associated with a high level of regional competency and small shares of deleted posts and government accounts. An opposite pattern is observed in three least-developed media markets: Qinghai (QH), Ningxia (NX), and Gansu (GS).

D. *Summary*

We consider a newspaper to be politically biased when it directs content toward the CCP's political goals. In this sense, the PCA first component is an appropriate measure of media bias. We conclude this section by highlighting several results. First, we find a strong pattern of product differentiation among newspapers along the politico-economic dimension. Second, we find that in the same market and year, increasing political bias is associated with a substantial decrease in advertising revenues. Third, commercial newspapers act much less as government mouthpieces. For example, while Party Dailies mention Party Leaders in 21 percent of their articles, Subsidiaries only mention them in 5 percent of their articles. Fourth, commercial papers do not cover more information relevant to accountability, such as corruption. This difference implies that the massive entry of commercial newspapers in the 1990s (recall Figure 1) is likely to reduce readers' exposure to propaganda, but not to increase the amount of information on corruption and negative outcomes that is relevant to holding politicians accountable.

III. Theoretical Framework

This section provides a structured discussion of how competition between local governments affects media bias and newspaper entry. We sketch the theoretical framework, leaving the formal model to the online Appendix. The framework has three important features: (i) consumers have heterogeneous preferences for media bias (propaganda) as opposed to non-political commercial content;[10] (ii) the ownership of newspapers is decentralized to local governments (CCPCs), which have the autonomy to distribute profits and decide the level of bias and the entry of newspapers under their administration; and (iii) local governments have dual politico-economic goals—they care about (1) exposing the audience to biased content and (2) pursuing profits.

These three features match the empirical setting described in Section II. They define a problem analogous to a product-positioning problem in the IO literature, except feature (iii), which implies that a local government itself has a preference for the characteristic of a product (media bias) in addition to monetary payoffs.

Regarding feature (iii), we assume that the political valuation of media bias differs across local governments. One microfounded explanation is that the political value created by bias exposure, such as regime stability, is a public good that can be used non-exclusively by other CCPCs in an area. Furthermore, political effects such as social unrest or protests are likely to have geographic spillovers. Thus, a lower-level CCPC that internalizes these spillovers less will value the political goal of bias exposure less than a higher-level CCPC.[11]

To facilitate the analysis, we make two further assumptions. First, a newspaper's profit consists of advertising revenues, which are determined by the size of its readership. This assumption is reasonable because subscription and retail prices of Chinese newspapers are fixed by regulation, and revenues from circulation only account for a small fraction of a newspaper's total revenues. Second, readers are single-homing and consume either one or no newspaper. As long as consumers are not perfect multi-homing in the sense that they consume all available papers in exactly the same way, the basic results presented below hold, as shown in the online Appendix.

A. *Product Differentiation and Competition*

We first analyze a single CCPC's choice of media bias. In the online Appendix, we formulate this problem as a location choice on a Hotelling line.[12] Higher bias delivers greater political value to the CCPC. However, readers with a taste for commercial content pay an "ideology travel" cost when consuming a biased newspaper, and a sufficiently high cost will deter commercial readers from buying a biased newspaper. This generates a trade-off between the level of bias and the size of readership.

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[10] This is similar to the setup in Mullainathan and Shleifer's (2005) theory of media bias. In the Chinese newspaper setting, it is well supported by case studies (Zhao 1998) and readership survey evidence (Stockmann 2012); see the online Appendix for further explanation.

[11] It is similar to the argument that local governments do not fully internalize the benefits of national security (e.g., Oates 1972; Inman and Rubinfeld 1997).

[12] The Hotelling line is between $[-1/2, 1/2]$. A location closer to $1/2$ means a higher level of bias (more propaganda), and a location closer to $-1/2$ means a lower level of bias (more commercial content).

The elasticity of demand with respect to media bias creates a politico-economic trade-off. A newspaper without readers delivers neither profits nor political value. When choosing a lower level of bias, the CCPC bears a higher political cost because the audience is exposed to less bias. However, the size of the audience expands, which increases both profits and the reach of bias. Thus, the optimal level of bias increases in the political valuation of bias but decreases in the size of the advertising market.

In this setup, the "ideology travel cost" allows the CCPC to segment the market using two papers. Consider the case that is empirically most relevant: a monopolistic CCPC owns two newspapers. The CCPC will never produce two identical papers. We call the more biased paper the Party paper and the other the commercial paper. The CCPC has no economic incentive to reduce the bias of the Party paper because such a reduction steals audience from its sibling commercial paper but has no effect on its aggregate profits. Consequently, the bias of the Party paper is optimally set to maximize the political effect of bias exposure. Meanwhile, reducing the bias of the commercial paper does not incur a high political cost because readers of the Party paper are not affected. Thus, the commercial paper entirely relieves the Party paper of commercial concerns, and the Party paper mitigates the political concerns of the commercial paper. Note that unless consumers are perfectly segmented into two markets without any switching between them, the commercial paper will cause a political cost for the CCPC, as it will still steal audience from the Party paper.

Now, we discuss how competition hinders the market-segmentation strategy by adding a new paper owned by another CCPC to the two-paper scenario above. Empirically, we examine how the exit of county-level Party Dailies affected the bias of prefectural papers. Given the strong evidence that lower-level Party papers are less biased than their higher-level counterparts, we assume that this competing paper is medium-biased, located between the bias positions of the (prefectural) Party and commercial papers. In this case, when reducing its bias, the Party paper steals audience from the medium-biased paper of another owner. Thus, the Party paper cares about both bias exposure and economic profits. Similarly, the commercial paper has an incentive to move closer to its medium-biased competitor to mitigate the business-stealing effect. Therefore, the presence of a medium-biased competitor reduces the incumbent CCPC's incentive for product differentiation; its exit causes the opposite consequence. The following proposition summarizes the analysis above.

PROPOSITION 1 (Product Differentiation): *Consider a CCPC with a politico-economic goal that chooses the degree of bias of its newspapers.*

a. *When the advertising market is sufficiently large, the CCPC will run two differentiated newspapers: a highly biased Party paper targeting exclusively political goals and a low-biased commercial paper targeting primarily economic goals.*

b. *The exit of a paper owned by another CCPC that is positioned between the Party and commercial papers will increase the differentiation between the two existing papers.*

    c. Newspaper bias weakly decreases with the size of the advertising market and weakly increases with the political valuation of media bias.

B. *Newspaper Entry and Market Dynamics*

In this section, we analyze the entry decisions of a higher-level CCPC (H) and a lower-level CCPC (L), where H has a higher political valuation of media bias than L. The two CCPCs noncooperatively decide whether to launch a newspaper and what type of newspaper to launch.

It is well known that equilibria are not tractable in a continuous Hotelling model when competing locations are more than two (e.g., Lerner and Singer 1937). To keep the analysis tractable, we assume that a newspaper's bias is a binary choice between two fixed positions: a Party paper with high bias and a Commercial paper with low bias. Given these fixed positions, consumers will be divided into three categories based on their preference ordering: (i) a share d_p are *Party Cadres* who prefer a Party paper to a Commercial paper to no newspaper; (ii) a share d_c are *Commercial Audience* who prefer a Commercial paper to no paper to a Party paper; and importantly (iii) a share d_s are *Switchers* who prefer a Commercial paper to Party paper to no newspaper.

Newspapers enter as the advertising market grows. As the first entrant, a Party paper will yield both political and economic benefits while a Commercial paper will yield only economic benefits. Because the size of the advertising market is initially small, the first paper in the market will be a Party paper. Because H values political benefits more, it will enter the market earlier. The demand for this paper is $d_p + d_s$ since both Party Cadres and Switchers read it.

If H were to next introduce a Commercial paper, it would benefit economically from market expansion, d_c, but at a political cost of reducing the reach of the Party paper's bias because Switchers (d_s) will move to the Commercial paper. If instead, L launches a Commercial paper, the same economic benefits and political costs occur, but L cares less about the political cost and gains the economic benefit of stealing Switchers from H's Party paper. Thus, L will launch a Commercial paper before H.

An alternative is that L launches a Party paper before any Commercial paper. In this case, the political cost and economic benefits for both H and L to subsequently launch a Commercial paper are symmetric, and L will introduce the Commercial paper earlier because it cares less about the political cost. Reasoning along this line yields the following results.

PROPOSITION 2 (Vertical Competition and Market Entry): *Suppose that a CCPC with higher valuation of media bias ($\mathbf{H}$) and a CCPC with lower valuation of media bias ($\mathbf{L}$) coexist in a market. Both $\mathbf{H}$ and $\mathbf{L}$ can produce a Party and/or a commercial paper.*

    a. The first paper in the market will be H-Party.

    b. The first commercial paper in the market will be L-Commercial.

    c. Competition between the CCPCs facilitates the entry of commercial papers.

    d. There are two equilibrium newspaper entry sequences: {H-Party, L-Party, L-Commercial, H-Commercial} and {H-Party, L-Commercial, H-Commercial, L-Party}.

Point *c* above is worth noting. Competition between CCPCs facilitates the entry of commercial papers for two reasons. First, market stealing increases the economic benefits of launching a commercial paper. This implies that *L-Commercial* will enter the market at a lower level of advertising revenue than if it were a monopolist. Second, the existence of *L-Commercial* will spur the entry of *H-Commercial*, because the political cost of having a commercial paper in the market has already been inflicted.

The results above apply to provincial capital cities in which the provincial and prefectural CCPCs produce both types of newspapers. In non-capital prefectures, it is typical that the lower-level (county) CCPC is allowed to produce only a Party paper. In this setting, the following result can be obtained.

PROPOSITION 3 (Politico-Economic Factors and Market Entry): *Suppose that a CCPC with higher valuation of media bias (**H**) and a CCPC with lower valuation of media bias (**L**) coexist in a market and that **H** can produce both Party and commercial papers while **L** can only produce a Party paper. Then, the political valuation of media bias will facilitate the entry of H-Party and hinder the entry of H-Commercial but have no effect on the entry of L-Party.*

The economic mechanisms that drive these results are similar to those underlying Proposition 2. Because the first paper in the market receives a double dividend of both political and economic benefits, the entry of *H-Party* is facilitated by a higher political valuation of media bias. By attracting *Switchers* from *H-Party*, *H-Commercial* imposes a political cost on its owner; its entry is hindered by a higher valuation of this political cost. The last result is simply the consequence of the public good nature of the political value of media bias.

Propositions 1–3 hinge on the assumed demand structure under which a commercial paper steals audience from a Party paper and thus incurs a political cost of reducing exposure to the bias produced by the Party paper. These results will not hold if the markets are completely segregated across newspaper formats so that there are no Switchers or there is perfect multi-homing so that all switchers read both the Party and commercial papers whenever available. Empirical evidence consistent with these propositions rejects the conjectures of complete market segregation and perfect multi-homing, as we will show in the next sections.

IV. Competition and Bias

In this section, we estimate the causal effects of competition on media bias across newspaper types and administrative levels by exploiting a reform that led to the drastic exit of most county-level newspapers. The empirical setting is 36 prefectural markets that have newspaper archives available in WiseNews. In the 1980s and

1990s, a large number of prefecture- and county-level newspapers entered these markets. Per regulation, the prices of newspapers were fixed. Newspapers competed mostly through readership, which determined advertising revenues.

A. *Background*

Because digital archives of county newspapers are not available, we are unable to characterize their content. Interviews with industry experts suggest that many county-level newspapers, despite being restricted to Party Dailies, were competitive with their prefectural counterparts. Under the slogan "Party papers in nature, Evening papers in practice," they imitated the style of commercial papers and covered more county-specific events (Zhang and Zhou 2004). In early 2000, nearly one-half of the county Dailies in coastal provinces earned sizable advertising revenues.[13]

Closing-County-Dailies Reform.—In 2003, the central government withdrew the licenses of more than 80 percent of the county-level newspapers. As stated in the policy directive "Further Actions to Curb Forced Subscription of Newspapers and Reduce Financial Burden on Farmers," the purposes of this reform were to reduce the fiscal burden on local governments and to curb massive protests by farmers, who were mandated by county governments to subscribe to their newspapers. The implementation of this reform resulted in a sharp decline in the number of county papers from 325 in 2002 to 75 in 2004 (recall Figure 1).[14] Within the markets analyzed in this study, there were nearly 60 county Dailies in 2002 but fewer than 10 in 2004. Among the closed newspapers, many operated in well-developed counties with populations more than 1 million and were profitable.

Mapping between Theory and Empirics.—The theoretical setup in Section III is that an upper-level CCPC owns two newspapers (one Party paper and one commercial paper), which compete with the Party paper owned by a lower-level CCPC. Upon the exit of the lower-level paper, the upper-level CCPC becomes a monopolist, and its incentive to differentiate the two papers increases. The actual empirical setting is more complicated. Among the 36 markets in the sample, 8 non-provincial-capital prefectures match the model precisely; after the reform, the prefectural CCPC monopolized the market with two types of newspapers. Another 8 provincial-capital markets also resemble the model in one market segment. In these markets, there existed only one provincial Party paper but several commercial papers owned by either the provincial or prefectural CCPC. Normally, prefectural papers are less biased than provincial papers. Thus, before the reform, the three most-biased (and most substitutable) newspapers were: the Provincial Party Daily, the County Daily, and the Provincial Commercial paper. Therefore, the logic of the model applies: the

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[13] Reported by the Association of Chinese County Newspapers, in 2002, 96 county Party Dailies earned an annual advertising revenue more than RMB 1 million Yuan, and 38 of them earned more than 4 million Yuan (*Chinese Journalism Yearbook*, 2003, pp. 84–91.)

[14] Exceptions included newspapers that were launched before 1949; those published by county level, autonomous, ethnic minority administrations or in ethnic minority languages; and those in counties with an exceptionally large population.

exit of county Party papers increases the provincial government's incentive to differentiate its products. We define these 16 markets as the main sample.

In the remaining markets, there were two owners after the county papers were closed: the provincial and prefectural CCPCs, each running a Party Daily and multiple commercial papers. A typical ordering of these papers in terms of bias, from high to low, is as follows: provincial Party Daily, prefectural Party Daily, provincial commercial paper, and prefectural commercial paper. The exit of county papers, whose bias was likely to lie between the Party Dailies and the commercial papers, arguably affected the product differentiation to some extent, but these markets bore less resemblance to the model. Thus, we define them as being outside the main sample. We will estimate the effects of the reform in both the main sample (containing 286 newspaper-year observations) and the full sample (872 observations).

B. *Estimation*

The 2003 reform generates a variation that allows us to estimate the effect of the reduced competition on newspaper bias. Specifically, we create a variable, *Reform_*2003, which is the interaction between (i) the number of county-level newspapers in a prefecture in 2002 and (ii) an indicator variable for the year 2003 or later. This interaction term measures the decline in the number of newspapers if all county papers existing in 2002 were closed due to the reform.

Consider the example of the Shenzhen prefecture. In 2002, four CCPCs were competing in the market: one prefectural CCPC and three county CCPCs. The WiseNews sample includes four prefectural papers: one Party Daily, one Evening, and two Subsidiaries. By 2004, all three county newspapers were closed. Thus, the *Reform_*2003 variable is 0 before 2003 and 3 in 2003 and thereafter.

We estimate the effect of the reform using the following difference-in-differences (DID) specification:

$$(1) \quad bias_{ijt} = \delta_i + \delta_t + \beta_1 Reform\_2003_{jt} + \beta_2 Reform\_2003_{jt} \times Commercial_i$$

$$+ X'_{jt}\gamma + \epsilon_{ijt}.$$

The variable $bias_{ijt}$ is our measure of newspaper bias for newspaper i in prefecture j at year t. The variables δ_i and δ_t are newspaper and year fixed effects. The variable $Commercial_i$ is a dummy for the newspaper being a commercial paper (either Party Evening or Subsidiary). The time-varying controls X_{jt} include a set of variables (all in logarithm) at the prefecture level: population, GDP, total employment, and real foreign direct investment (FDI). Standard errors are clustered by prefectures.

Our primary hypothesis is that the markets of the county Party Dailies and of the higher-level newspapers (both Party and commercial papers) are connected, such that the latter adjust their bias in response to the exit of the county papers. According to Proposition 1, the coefficient β_2 should be negative because the differentiation between Party and commercial papers is expected to increase in areas where competing papers owned by other CCPCs exit. We also expect β_1 to be positive and the sum of β_1 and β_2 to be negative, as Proposition 1 predicts that Party papers will become more biased while commercial papers will become less so.

TABLE 2—EFFECTS OF COMPETITION ON MEDIA BIAS (*Dependent Variable: Newspaper Bias*)

	(1)	(2)	(3)	(4)	(5)	(6)
Reform 2003	−0.002	−0.001	0.018	0.019	0.030	0.036
	(0.003)	(0.003)	(0.007)	(0.007)	(0.011)	(0.008)
Commercial paper × Reform 2003			−0.024	−0.024	−0.038	−0.044
			(0.006)	(0.007)	(0.007)	(0.006)
Reform 2003 outside main sample					−0.015	−0.025
					(0.012)	(0.010)
Commercial Paper × Reform 2003 outside main sample					0.018	0.026
					(0.009)	(0.010)
Observations	872	872	872	872	872	872
R^2	0.832	0.833	0.841	0.842	0.847	0.852
Controls	No	Yes	No	Yes	No	Yes
Fixed effects	Newspaper and Year	Newspaper and Year	Newspaper and Year	Newspaper and Year	Newspaper and Year	Newspaper and Year
Commercial			0.014	0.025	0.133	0.038

Notes: Commercial paper is a dummy for being a commercial paper as opposed to a Party paper. Reform 2003 is the interaction of the number of county papers in 2002 with a dummy for being in and after 2003. The main sample includes 16 markets that resemble the setup of the theoretical model. Controls include GDP, population, industrial share of GDP, and Real FDI. Standard errors are clustered by prefecture in parentheses.

Table 2 presents the main results. Columns 1, 3, and 5 display the regressions in which we include only newspaper and year fixed effects; the other columns add the controls of prefectural characteristics. The first two columns show the average effect of the reform across all newspapers. The estimated effect of the reform is small and insignificant in both specifications. The next two columns include the interaction term between the reform and a dummy for commercial newspapers as in (1). The main effect (on Party Dailies) is positive and significant at the 5 percent level, whereas the coefficient of the interaction term is negative and significant at the 1 percent level. The F-test of the zero sum of the main and interaction effects (see the bottom row) reveals that the estimated effect of the reform on the bias of commercial papers is significantly negative.

The last two columns extend specification (1) to estimate the effects both in and outside the main sample. We interact all variables, including the fixed effects, with a dummy for being outside the main sample. The regression including the controls (column 6) shows that the estimated effects in the main sample are statistically significant and quantitatively larger than those in the rest of the full sample. For example, the estimated coefficient on the reform dummy is 0.036 within the main sample and 0.011 (= 0.036 − 0.025) outside the main sample.

The results above demonstrate that competition matters for media bias in both the horizontal dimension (across newspaper types) and the vertical dimension (across levels of government). The results lend strong support to the theoretical mechanism that the exit of low-level Party Dailies increases upper-level CCPCs' incentive to differentiate their products so that each newspaper type is better targeted toward one goal, either political or economic. Before relating these results to the effects on specific news content, we examine their robustness. Our examination primarily draws on the results generated from the main sample, which matches the theory more closely.
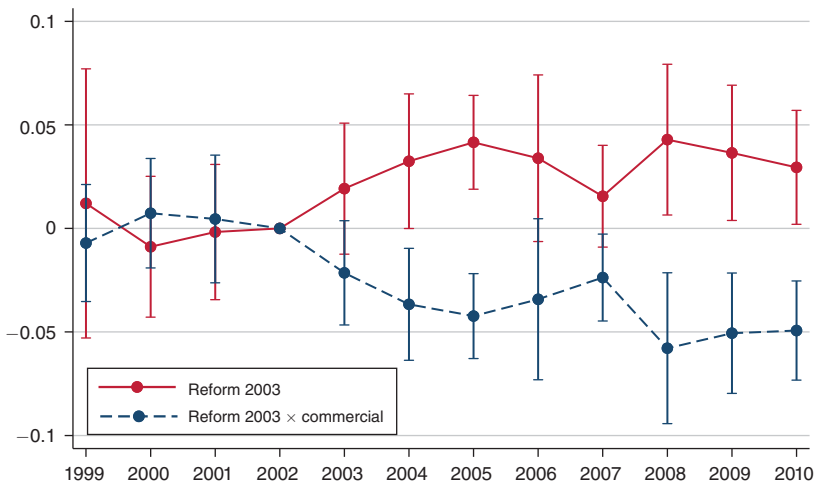
FIGURE 5. YEAR-BY-YEAR DYNAMIC EFFECTS OF THE 2003 REFORM

C. *Robustness*

Existence of Pre-Trend.—The key assumption for the DID identification above is that absent the 2003 reform, a common trend existed with regard to newspaper bias across prefectures with different numbers of county newspapers. Although this assumption is not directly testable, we can examine the existence of a pre-trend in the data. To this end, we replace the variable *Reform_2003* in the specification used in column 4 of Table 2 with a set of variables containing the number of county papers in 2002 interacted with a dummy variable for each individual year. Figure 5 plots, year-by-year, the estimated coefficients for Party papers (the upper line) and for commercial papers (the lower line) from the regression using the main sample. There is no visible trend before 2003, but the effect of the reform is notable immediately following the reform. The gap between the two types of newspapers increases continuously over the period of 2003–2005 and then remains stable for the rest of the sample period.

In Figure 6, we plot the average residual bias in the main sample for the Party and commercial papers in two types of markets: (i) "treatment" markets in which the number of county papers in 2002 is above the median level, and the competitive pressure is high; and (ii) comparison markets in which the number of county papers is below the median, and the competitive pressure is relatively low. The residual bias is computed from the regression in column 4 of Table 2. We normalize the bias in 2002 to 0 as a benchmark and calculate the bias in other years relative to this benchmark. Let *Party* (*Commercial*) *H* denote the Party (commercial) papers in the "treatment" markets, and *Party* (*Commercial*) *L* for those in the comparison markets. Although the results in Figure 6 are less precise, the dynamics of the plotted bias is similar to the pattern in Figure 5.

In terms of regression, we add a placebo reform in 2002 to the basic regression. As shown in Table 3, this placebo effect (the coefficients of *Reform_2002* and the interaction terms) is small and insignificant both within and outside the main sample.
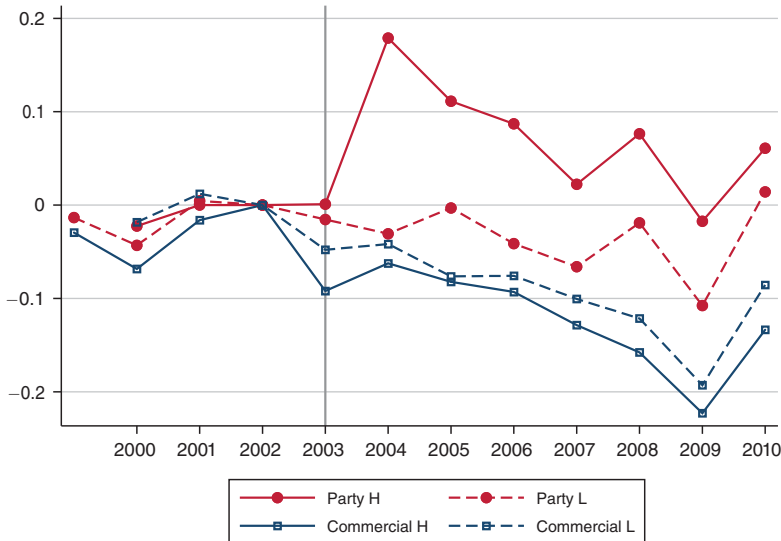
FIGURE 6. BIAS BY NEWSPAPER TYPE AND DEGREE OF REDUCED COMPETITION

Differential Trends in Prefectures.—One concern is that prefectures with many county papers would have experienced a different trend-shift than other prefectures after 2003, even without the reform. To test such a possibility, we predict the number of county papers in 2002 based on the controls in the regressions. We then interact this predicted variable with the reform dummy and define this interaction together with the previous controls of prefectural characteristics as extended controls. Including these extended controls has little impact on the estimated effects (column 3 of Table 3).[15]

Other Concurrent Impacts.—Our estimated effect of the 2003 reform may be contaminated if there were other concurrent policy or industrial changes that might have had a differentiated impact on prefectures with a different number of county papers in 2002. We read multiple volumes of the *Chinese Journalism Yearbook* and *Chinese Newspaper Yearbook*, which document significant media policy and industry changes. Except for the reform we explore, the only significant change in 2003 was the formation of newspaper groups in two provincial capital cities (Wuhan and Hefei). Excluding these two prefectures from the sample does not change any of the previous regression results; see column 2 of Table A4.

County-Level Content.—It is potentially possible that after a county paper was closed, the corresponding upper-level Party Daily was mandated to report more on county news, and this coverage was correlated with the content categories that contribute to our bias measure (e.g., Leader Mentions). This would mechanically lead to more material targeted toward the political goal and an increase in our bias

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[15] In the online Appendix, we also show that the inclusion of the extended controls does not change the estimates in Table 2 (see Column 3 of Table A4).

Table 3—Examination of the Existence of Pre-Trend

	Newspaper bias		
	(1)	(2)	(3)
Main effects (*effects in main sample*)			
Reform 2002	0.006	0.005	0.006
	(0.016)	(0.014)	(0.014)
Reform 2003	0.024	0.032	0.035
	(0.012)	(0.010)	(0.009)
Commercial paper × Reform 2002	−0.010	−0.007	−0.008
	(0.014)	(0.013)	(0.013)
Commercial paper × Reform 2003	−0.031	−0.038	−0.038
	(0.011)	(0.010)	(0.009)
Variables interacted with outside main sample dummy			
Reform 2002	−0.001	0.000	−0.000
	(0.016)	(0.015)	(0.015)
Reform 2003	−0.013	−0.021	−0.023
	(0.014)	(0.012)	(0.011)
Commercial paper × Reform 2002	0.007	0.005	0.006
	(0.015)	(0.014)	(0.014)
Commercial paper × Reform 2003	0.012	0.020	0.021
	(0.014)	(0.012)	(0.012)
Observations	872	872	845
R^2	0.847	0.852	0.852
Controls	No	Basic	Extended
Fixed effects	Newspaper and year	Newspaper and year	Newspaper and year

Notes: Reform 2002 and Reform 2003 are the interaction of the number of county papers in 2002 with a dummy for being in and after 2002/3. Commercial paper is a dummy for being a commercial paper as opposed to a Party paper. The main sample includes 16 markets that resemble the setup of the theoretical model. Basic controls include GDP, population, industrial share of GDP, and real FDI as in Table 2. Extended controls also include the interaction term between the predicted number of county Dailies in 2002 and the reform dummy variable. Standard errors are clustered by prefecture in parentheses.

measure. To test this, we calculate the share of articles that mentioned the two key political positions (Party secretary and government chiefs) at the county and village levels. Table A5 shows that the share of articles mentioning these bottom-level leaders is virtually unaffected by the reform, while the share of articles mentioning the higher-level leaders is significantly affected.

Supply-Side Changes Associated with the Reform.—One might be concerned that after the reform, county Party papers merged with upper-level newspapers. However, this was rare in reality. In the main sample, there was no such case. In the full sample, there was only one merger case: in Guangzhou, a county paper named Panyu Daily was merged into the Guangzhou Daily group. The estimated effects are essentially unchanged when Guangzhou is excluded from the full sample.

Another possibility is that after the reform, the journalists who were previously employed by the county papers moved to the prefectural papers. In general, the mobility of journalists across newspapers was very low during the sample period. News reports showed that because the employment policy of Party Dailies was rigid

and commercial papers were unwilling to hire the journalists released by the closed county papers, these released journalists faced a difficult time finding new jobs (Yao 2003). Furthermore, to account for the opposite effects of the reform on Party and commercial papers, these two types of newspapers must have absorbed the released journalists in a highly selective way, which is unlikely in practice.

D. *Magnitude and Interpretation*

To further verify the effects of the reform and interpret the results, we illustrate the effects of the reform on the nine content categories from which our bias measure is constructed. Figure 7 plots the *t*-statistics of the reform effect (β_1) and the negation of the interaction effect ($-\beta_2$) from equation (1) against the PCA factor loadings within the main sample. Consistent with the previous regression result, the effects of the reform on the individual content categories line up along one dimension. Not surprisingly, we lose some degree of statistical precision by studying individual components. Nevertheless, the coefficients of three content categories are significant: two Party Line categories (Leader Mentions and Epoch Stories) and one Bottom Line category (Entertainment).

The magnitude of the estimated effects is sizable. In Table A6, we rescale the coefficients to measure the magnitude of the effects of the reform. For instance, we estimate that the reform increased Leader Mentions in Party papers by 8.23 percent and increased the difference in Leader Mentions between Party and commercial papers by 9.13 percent. Thus, the reform caused a decline in Leader Mentions by nearly 1 percent in commercial papers. Similarly, the reform is estimated to have reduced the share of articles in commercial papers that cite Xinhua News by 6.2 percent.

We also provide statistics that put the magnitude of these effects in perspective (the last three rows of Table A6). For example, political leaders are mentioned in 9.71 percent of the articles, while the average difference between Party and commercial papers is 14.78 percent. Hence, the estimated increase in the gap between Party and commercial papers (9.13) is approximately 62 percent of the average gap (14.78). Similar results hold for the aggregate bias measure.

V. Market Entry and Media Bias

The results in the previous section demonstrate that the markets of the newspapers run by lower and higher-level CCPCs are not segregated. Therefore, the entry decisions of these CCPCs are likely to be interdependent. In this section, we further explore whether the entry sequences are consistent with the theoretical predictions in Propositions 2 and 3. Before testing them, we provide descriptive evidence regarding what economic and political factors are correlated with the level of media bias.

A. *Factors Correlated with Media Bias*

We regress the bias measure on the newspaper type, the owner CCPC's administrative level, and regional characteristics. This regression is used simply to
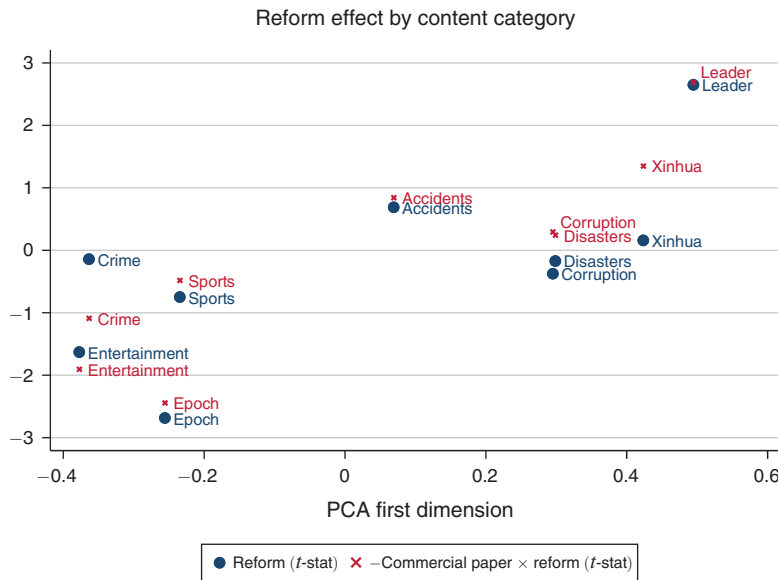
FIGURE 7. EFFECTS OF THE 2003 REFORM ON CONTENT CATEGORY VERSUS PCA FACTOR LOADINGS

characterize areas with high media bias without any causal claim. Specifically, we use two variables to capture regional differences in political valuation. The first is *CCP_Stronghold*, which is the share of counties in the newspaper's home prefecture that were passed through during the CCP Red Army Long March of 1933–1935 or that were part of a CCP Revolution Base (soviet) before 1949. The second is a dummy variable, *TreatyPorts*, which is equal to 1 if the newspaper's home prefecture was ever conceded to Western powers from 1840 to 1910 as constructed by Jia (2014). Historically, these Treaty Port areas had greater exposure to Western culture and a free press. We use a proxy for the size of the advertising market in a prefecture by scaling the prefecture-level GDP with the ratio of newspaper advertising revenues to GDP at the national level. We also include a prefecture's population, distance to Beijing, its latitude and longitude, and the number of newspapers in the prefecture in 1895.

Table 4 reports the results. The first column includes only year fixed effects; the second column includes year and prefecture fixed effects; and the third column includes year-by-prefecture fixed effects. A newspaper's administrative level strongly predicts its bias. In particular, prefectural papers are less biased than provincial papers, which in turn are significantly less biased than central papers.[16]

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[16] One concern is that we focus on only a few top political positions (e.g., Party secretaries and mayors) at the local level, while for national leaders we include some other positions. A small share of *Leader Mentions* and thus a smaller bias for local newspapers may be driven by the omission of other local leaders. To assess this possibility, we manually read all articles published on three randomly selected days in six newspapers: one Party Daily and one commercial paper at each of the three administrative levels. We find that the coverage of political leaders in both local and national newspapers focuses on the top positions for which we searched to a similar extent. See online Appendix Section A3.6 for further details.

TABLE 4—FACTORS CORRELATED WITH NEWSPAPER BIAS

	(1)	(2)	(3)
Province	−0.106	−0.117	−0.116
	(0.009)	(0.005)	(0.006)
Prefecture	−0.148	−0.167	−0.165
	(0.011)	(0.010)	(0.013)
Party evening	−0.124	−0.131	−0.131
	(0.013)	(0.012)	(0.016)
Subsidiary	−0.176	−0.173	−0.173
	(0.011)	(0.012)	(0.015)
Newspaper Ad Mkt (log10 RMB 2011)	−0.036	−0.018	
	(0.014)	(0.090)	
Treaty port	−0.025		
	(0.010)		
Long march	0.049		
	(0.010)		
Observations	905	905	905
R^2	0.672	0.708	0.781
Fixed effects	Year	Year and Prefecture	Year by Prefecture
Province = Prefecture (p-value)	0.000	0.000	0.000
Evening = Subsidiary (p-value)	0.000	0.001	0.007

Notes: The unit of analysis is newspaper by year. The regression in column 1 controls for distance to Beijing, latitude, and longitude. The last two rows report the p-value of the F-test. Standard errors clustered by prefecture in parentheses.

Newspapers in areas with greater advertising revenues are less biased. However, when the prefecture fixed effects are included, the coefficient is reduced by one-half and is statistically insignificant.

As expected, newspapers in historical CCP strongholds are more biased, whereas newspapers in historical Treaty Port areas are less biased. Later, we will use the predicted bias based on the variables *CCP_Stronghold* and *TreatyPorts* to measure the political valuation of media bias in each prefecture. We call this variable *Expected_Political_Value*. According to column 1 of Table 4, $Expected\_Political\_Value = -0.025 \times TreatyPorts + 0.049 \times Long\_March$.

B. *Sequence of Newspaper Entry*

We have found that the markets of newspapers across administrative levels are not segmented and that lower-level newspapers are less biased. These findings have implications for the predicted sequence of newspaper entry, as spelled out by Proposition 2. An examination of these predictions provides further evidence to test whether competition from lower-level governments erodes the political goals of higher-level governments, notably through the entry of commercial newspapers.

To this end, we analyze the sequence of newspaper entry during the 1981–2011 period in 27 provincial capital cities, excluding 4 provincial cities (i.e., Beijing, Chongqing, Shanghai, and Tianjin). In these 27 markets, a provincial CCPC and a prefectural CCPC compete with both Party and commercial newspapers. All markets are classified by the patterns of newspaper entry, as displayed in Table 5.

To simplify the notation, we use four letters (P, C, p, c) to represent what newspapers are in the market, whereby the letter indicates whether the newspaper is a Party or commercial paper, and the case indicates whether the paper is run by an upper- or lower-level CCPC. For example, the first row of Table 5 shows that in two markets, we observe the existence of a provincial Party paper (P) in 1981, followed by the entry of a prefectural commercial paper (c), a provincial commercial paper (C), and a prefectural Party paper (p) by 2011. The second row shows that in another five markets, we observe the entry sequence P, c, C, but no entry of a prefectural Party paper (p). In all the other markets, the entry of the first paper is not observed.

Based on Table 5, we investigate the four theoretical predictions in Proposition 2. The "Theoretical prediction" columns show whether an entry sequence is consistent with the specific prediction (T for True and F for False). The theory predicts two equilibrium sequences. The last column indicates the equilibrium sequence (1 or 2) with which the entry sequence is consistent. To show how likely the observed outcomes are to occur by chance, in the last row, we calculate the probability for the observed entry sequences under the assumptions of random and independent entry. Under these two assumptions, if the probability of observing the predicted outcome in one market is p, then the probability of observing the predicted outcome in k of n markets is binomially distributed.

Proposition 2a predicts that the first paper in the market will be an upper-level (provincial) Party paper because the provincial CCPC values bias more. In all seven markets in which the entry of the first paper is observed, this prediction is true. If the entry is random, conditional on the first paper being a Party paper, the probability that it will be a provincial Party paper in all seven cases is less than 0.01. However, such an observed outcome could occur for various reasons. We examine some more specific predictions of the model.

Proposition 2b predicts that the first commercial paper will be launched by the lower-level (prefectural) CCPC. This prediction is key to understanding whether lower-level governments erode the political goals of higher-level governments. It is testable in 26 markets, and the entry pattern in 22 markets is as predicted.[17] Under random entry, the probability of such an outcome is 2 in 10,000.

The prediction above relies on the premise that the markets for commercial and Party papers are connected, such that commercial papers steals business from preexisting Party papers. This business-stealing mechanism differs in the two entry sequences. In the first case, when there is only one provincial Party paper in the market, the prefectural CCPC has both economic and political incentives to start the first commercial paper to steal business from the provincial CCPC. Hence, it is not surprising that we observe market configuration Pc in 14 cases but PC in only one case. In the second case, both CCPCs have preexisting Party papers, and launching a commercial paper will steal business not only from the competing CCPC but also from the sibling Party paper. The prediction of a transition from Pp to Ppc arises only if the prefectural CCPC values the political cost resulting from business stealing less. Empirically, the predicted market development is observed in 8 of 10 markets. The probability of such an outcome under random entry is 0.04.

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[17] The first six rows of Table 5 contain a total of 22 markets that are all consistent with this prediction (T in column 2b). The three rows (with F in column 2b) contain the 4 markets that violate the prediction.

TABLE 5—ENTRY SEQUENCES IN 27 PROVINCIAL CAPITAL CITIES

Markets	Newspapers in market				Theoretical prediction				Equilibrium sequence
	1	2	3	4	2a	2b	2c	2d	
2	*P*	*Pc*	*PCc*	*PCpc*	T	T	T	T	1
5	*P*	*Pc*	*PCc*		T	T	T	T	1
5		*Pc*	*PCc*	*PCpc*		T	T	T	1
1		*Pc*	*PCc*			T	T	T	1
1		*Pc*		*PCpc*		T			1
8		*Pp*	*Ppc*	*PCpc*		T		T	2
1		*Pp*		*PCpc*					2
1		*PC*	*PCp*	*PCpc*		F		F	
1			*PCp*	*PCpc*		F		F	
2		*Pp*	*PCp*	*PCpc*		F		F	
Prob/Random					0.008	0.0002	0.0001	2e-07	

Notes: Newspaper types are indicated by letters: *P* for provincial Party Daily, *p* for prefectural Party Daily, *C* for provincial commercial paper, and *c* for prefectural commercial paper. There are two equilibrium sequences predicted by the theory; 1 (or 2) means the entry sequence is consistent with prediction 1 (or 2). In the Theoretical prediction columns, T means consistency with the specific theoretical prediction, while F means inconsistency. The last row reports the probability of the observed outcome under random entry.

Proposition 2c states that competition between CCPCs facilitates the entry of commercial papers. In other words, the existence of a lower-level commercial paper will spur the entry of an upper-level commercial paper. In a market with a provincial Party paper, after the entry of a prefectural commercial paper, we expect to observe the immediate entry of a provincial commercial paper instead of the entry of a prefectural Party paper. This prediction holds in all 13 markets where we observe the next newspaper after configuration *Pc* (the transition from *Pc* to *PCc* in the first four rows). The probability of this outcome under random entry is approximately 1 in 10,000.

Finally, Proposition 2d characterizes the two possible equilibrium entry sequences of all four newspaper formats. We only observe the entire entry sequence in two markets (the first row), which is consistent with the first equilibrium sequence. However, conditional on the first paper being a provincial Party paper, 2 of 6 possible entry sequences are consistent with the theory, and 21 of the 25 observed entry sequences are in alignment with either equilibrium. Under random entry, the conditional probability of observing this outcome is 2 in 10 million.

Four markets contradict the theoretical predictions. In two markets, Guangzhou and Kunming, the provincial CCPCs already had a commercial paper in 1981, and prefectural commercial newspapers entered afterward. One likely reason is that these two markets were well developed even before our sample period. For example, in Guangzhou, the provincial Party Evening was a nationally well-known newspaper in the 1950s. The other two inconsistencies are Nanjing and Hangzhou, where a provincial commercial paper entered the market earlier than its prefectural counterpart.

Overall, the results above conform to our argument that lower-level CCPCs value political goals less than higher-level CCPCs and thus have greater incentives to launch less-biased newspapers. The results are also consistent with the previous finding of a negative correlation between newspaper bias and administrative rank. All these findings imply that the emergence of commercial papers run by lower-level governments is an important factor that reduces the audience's exposure to media bias.

C. *Politico-Economic Trade-Off and Market Entry*

We examine how economic and political factors affect the entry of newspapers (Proposition 3), using the sample of newspapers in the 256 non-capital prefectures. In these markets, newspapers are operated either by a monopolist prefectural CCPC or by a prefectural CCPC and a county CCPC (before 2003). Because information on prefecture-level GDP in 1992–1993 is not available, we use data from 1987–1991 and 1994–2011. A first observation shows that the entry of newspapers in these prefectural markets typically follows the sequence of "no newspaper—Party Dailies—an Evening or Subsidiary," which is a pattern that aligns the predictions implied by Proposition 3.

Formally, we regress the number of commercial and Party papers in each market on our measures of the size of advertising markets and expected political valuation defined in Section VA, controlling for the logarithm of population. Table 6 reports the results. The first three columns present the ordered-probit regressions for three dependent variables: the number of prefectural Party papers; the number of prefectural commercial papers; and the number of county Party papers. Note that, in column 3, we only include observations before 2003 because most county papers were closed in 2003. The last three columns are robustness checks in which we regress the same three dependent variables, using OLS estimation with controls of prefecture fixed effects.

Two main results emerge. First, the size of advertising markets is positively correlated with the number of newspapers in both the sample of prefecture-level commercial papers and the sample of county-level Party papers. However, the correlation is small and only marginally significant in the sample of the most-biased prefectural Party papers. These results imply that growth in advertising markets may have reduced readers' exposure to media bias through the entry of commercial newspapers. Second, the political valuation of media bias within a region is correlated positively with the entry of prefectural Party papers and negatively with the entry of prefectural commercial papers but is unrelated to the entry of county-level Party papers. This last result is also aligned with Proposition 3.

VI. Conclusion

Because of the prevalence of propaganda and the suppression of negative news, the Chinese media are commonly known to be politically biased. Some public intellectuals have lambasted the pervasive propaganda in the Chinese media as constraining the growth of rational and informed citizens (He 2007). Thus, it is of great importance to determine what factors drive the media to deviate from the bias imposed by the ruling party. Existing studies focus on a centralized solution: the central government may relax media control to utilize bottom-up information that is useful for monitoring or surveillance. The current paper shifts the focus to a decentralized solution: economic competition between local governments with different political valuations erodes the central government's goal of maintaining media bias.

We first develop a measure of the political bias of a newspaper based on its coverage of CCP mouthpiece information, politically sensitive or negative

TABLE 6—POLITICO-ECONOMIC FACTORS AND MARKET ENTRY IN NON-CAPITAL PREFECTURES

	Ordered probit			OLS		
Administrative level: Newspaper type:	Prefecture Party (1)	Prefecture Commercial (2)	County Party (3)	Prefecture Party (4)	Prefecture Commercial (5)	County Party (6)
Advertising Mkt (log10 RMB 2011)	0.250 (0.332)	1.727 (0.295)	1.592 (0.291)	0.014 (0.079)	0.385 (0.193)	1.607 (0.483)
Expected political value	10.883 (4.922)	−9.547 (3.762)	−3.174 (4.298)			
Fixed effects	Year	Year	Year	Year and Prefecture	Year and Prefecture	Year and Prefecture
Observations	4,590	4,590	2,671	4,590	4,590	2,671
R^2				0.664	0.735	0.857

Notes: The dependent variable in each column is the number of newspapers at the specified administrative level and of the specified type. The results of column 1 to 3 are obtained from ordered-probit regressions, and results of column 4 to 6 are from OLS regressions. The unit of observation is prefecture by year. In columns 1 and 4, the dependent variable is the number of Party Dailies at the prefecture level. In columns 2 and 5, the dependent variable is the number of Party Evenings and Subsidiary newspapers at the prefecture level. In columns 3 and 6, the dependent variable is the number of Party Dailies at the county level. Advertising Mkt is the predicted advertising revenue. Expected political value is the predicted media bias based on the variables—*TreatyPorts* and *CCP_Stronghold*—from the bias regressions in Table 4 and aggregated at the prefecture level. In all regressions, logarithm of population is controlled for. Standard errors are clustered by prefecture in parentheses.

information, and commercially oriented content. This bias measure demonstrates a strong positive correlation with the political valuation of media control (e.g., being a CCP mouthpiece and the intensity of censorship) and a strong negative correlation with economic valuation (e.g., newspaper advertising revenues and indices of market development). Using this measure of media bias, we find a large body of evidence that is consistent with the theoretical argument we propose: lower-level governments care less about the political value of media bias and produce less-biased newspapers; the resulting bottom-up competition impairs the higher-level governments' political goal of bias exposure.

Three insights emerge from this study. First, there exists a politico-economic trade-off in the production of media bias. The Chinese government attempts to use a product differentiation strategy to achieve dual politico-economic goals: Party papers focus on political goals, whereas commercial papers focus on economic goals. Empirically, we show that this strategy is not effective in resolving the dual-goal conflict because newspaper markets are connected across newspaper types and administrative levels. Most strikingly, we find that the exogenous exit of county-level Party papers decreased the bias of upper-level commercial papers but increased the bias of upper-level Party papers. Together with the entry pattern of commercial papers, this finding squares with the theoretical argument that the politico-economic goal cannot be achieved without conflict unless the markets of Party and commercial papers are completely segregated, or consumers are perfectly multi-homing.

The politico-economic trade-off in Chinese newspapers is rooted in the existence of consumers who discriminate against propaganda. Thus, injecting propaganda into the marketplace incurs an economic cost, analogous to Becker's (1957) theory of racial discrimination. This insight may be generalizable to developing countries in which the media, whether state-owned or privately owned, are regulated to produce

pro-government content that is disliked by the general audience. We demonstrate that even within an autocracy such as China, as long as the system creates enough incentives for media owners to pursue economic benefits, the cost of manufacturing media bias will escalate with market competition.

The second insight is that bottom-up competition within the government hierarchy erodes higher-level governments' political goals. Despite China's strict control of the media, the ownership of newspapers is decentralized to local governments. Lower-level governments are likely to care less about the political cost of reducing media bias because, as we theoretically propose, the value of media bias has externalities that are not entirely internalized by lower-level governments. Consistent with this idea, we find that lower-level governments tend to produce less-biased newspapers and introduce commercial papers earlier. Furthermore, the entry of commercial papers from the bottom-up should fuel market competition and induce higher-level governments to produce less-biased papers. This phenomenon is precisely what we empirically observe.

This insight may be generalized to other areas of the Chinese economy, particularly those where production has externalities across regions. For example, the political goals of some Chinese SOEs, such as maintaining social stability and protecting the environment, may generate externalities that are less internalized by lower-level governments. Our findings suggest that hierarchical competition is likely to hinder the attainment of these political goals.

Finally, the overall evidence points to the view that economic development reduces audience exposure to propaganda in China. We find that commercial papers act substantially less than Party papers as government mouthpieces. Moreover, the growth of advertising markets is significantly correlated with the increased entry of less-biased newspapers (commercial papers and county Party papers) but not with the entry of more-biased newspapers (higher-level Party papers). In Figure A2, we plot an average reader's exposure to newspaper bias, estimated by newspaper types and implied by newspaper entries and exits, from 1981 to 2011. This exposure exhibits an inverted-U shape: despite its initial increase caused by the entry of Party papers, the bias exposure decreased after the late 1990s because of the influx of less-biased commercial newspapers. This massive entry of commercial papers was associated with the gradual withdrawal of most Party papers from street vendors. From the government's perspective, the decline in audience exposure to Party papers means that propaganda through the market place has become ineffective. This provides a possible explanation for the Chinese government's extensive efforts to engineer propaganda on social media platforms, which are directly regulated by the central government (Qin, Strömberg, and Wu 2017).

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