The Determinants of Media Bias in China

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Abstract

What is the political value of media control for government in an autocracy? To address this question, we study the content of 110 mainstream newspapers in mainland China from 1998 to 2010. Based on content analysis, we construct a measure of media bias, which has high predicting power of a newspaper being a strictly controlled party organ and of a newspaper's advertising revenues. We find that more-biased newspapers 1) cover more news on political leaders in an official way, while more heavily suppressing reports that are detrimental to the ideology of the ruling party; and 2) cover more news that is related to the accountability of local government officials, such as corruption, disasters, and accidents, while reporting less on sports, entertainment, and crimes. These results indicate that the Chinese government not only uses the media to maintain regime stability and enhance top-down policy implementation, but also uses the media as a public signaling device to monitor government officials and mitigate the distortion of information from bottom up. To investigate the determinants of the political bias of Chinese newspapers, we build a model of competing newspaper owners – Communist Party Committees – with both political and economic goals. Consistent with the model, our empirical findings point to three key factors that mitigate the political bias of Chinese newspapers: the growth of advertising market, the discrepancy in the valuation of political control between local and national governments, and the competition between local governments.

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1 Introduction

A burgeoning strand of economics research has investigated the role of free media in democracies.[1] The role of unfree media in autocracies, however, has hardly been systematically studied, because of the lack of available data and the opaque institutions regarding the media in autocracies. In this paper, we study the media in China, the largest autocracy in the world. We construct measures of media bias of more than 100 mainstream Chinese newspapers over the last decade to provide some first systematic description of media control in China. We then examine the determinants of media bias in China, in particular, how the development of advertising market and competition between governments affect the political bias in Chinese newspapers.

China has been widely viewed as among the countries with the most strictly controlled media. In 2013, Reporters Without Borders ranked China 175 of 180 countries in terms of the freedom of press, and not surprisingly the news of this ranking was censored in China. Scholars have widely recognized that the Chinese government manipulates the media to implement the Party line – a propaganda policy that aims to maintain the ideology of the Chinese Communist Party (CCP hereinafter) and the stability of the current political regime. In contrast to this strict media control, the last two decades have witnessed a drastic expansion of market value of Chinese media. The circulation of Chinese newspapers is the world's largest, with approximately 2100 newspapers selling 100 million copies every day; the Chinese advertising market is the world's third largest, only behind the U.S. and Japan. Moreover, since 1980, Chinese newspapers have featured increasingly diversified content and independent reporting. Numerous cases have shown that investigative journalists have implicated government officials, confronted powerful vested interests, and exposed major social abuses (e.g., Tong and Sparks 2009). A natural question arises: does the growth of the advertising market abate the importance of the political goal of Chinese media and enhance the role of media in improving accountability?

The Chinese newspaper industry inherits the hierarchical structure of CCP, whose highest and most powerful decision-making bodies – the Party Committee (PC hereinafter) – are ranked at four levels: national, provincial, prefecture, and county. Although the central CCP committee has the ultimate control over all newspapers, provincial governments, city authorities, and local government officials effectively control the newspapers under their supervision in terms of both financing and management (Zhao 1998; Li, 2003; Tong, 2007a). Because of this decentralized control system and the potential interest discrepancy between the local and central governments, the local Chinese governments may not strictly follow the Party line in their control of media. In particular, they may use newspapers under their

[1] See Prat and Stromberg 2013 for a recent survey and the references therein.

control to compete for political and economic benefits. This special feature of the Chinese institutions raises two questions: does discrepancy in preferences of local governments reduce the political bias of media, and how the competition between governments? And how does competition between governments affect media bias of the Chinese newspapers?

To approach the above questions, we assemble a unique data set that combines a comprehensive newspaper directory and the content of the general-interest newspapers in mainland China. In the newspaper directory, we exploit all available data sources to gather information about the owner, supervisor, content type, location, and periods of existence of all Chinese newspapers during the period between 1981 and 2011. In this sample period, the number of general-interest newspapers surged from about 200 in 1981 to more than 1000 at its peak in 2002, and then declined to about 800 nowadays. For the news content, we search key words over 48 million articles of 110 mainstream general-interest newspapers from 1998 to 2011, whose digital archives are provided by a Hongkong-based non-profit organization. Based on ownership and managerial autonomy, we classify all newspapers into three categories: 1) *Party Daily*, which is owned by a CCP committee and whose management is strictly supervised by CCP officials; 2) *Evening*, which is owned by a CCP committee but enjoys substantial managerial autonomy; and 3) *Subsidiary*, which is owned by other newspapers and enjoys substantial managerial autonomy.[2]

We construct a measure of media bias based on news content. Specifically, we identify the news reports that cover the following 9 content categories: mention of political leaders, citation of Xinhua,[3] controversial issues intensively covered by oppositional overseas Chinese media, corruption, disasters, accidents, sports, crimes, and entertainment. Using principal component analysis, we collapse these 9 dimensions of content differentiation into a single dimension – the first component, which explains about 40% of the variation in content. We find that this first component exhibits a very strong negative correlation with a newspaper's advertising revenues and an equally strong positive correlation with the probability of a newspaper being a Party Daily. At the regional level, we find that the first component strongly correlates with other measures of media freedom, such as the share of censored posts on social media. This strongly suggests that the most important dimension of content differentiation across Chinese newspapers is the trade-off between advertising revenues and political control, and that this is captured by the first component of our principal component analysis. Therefore, we use the value of the first component for a newspaper to indicate its position in the political versus commercial spectrum. We label this position media bias.

[2] The somewhat unusal classification of "Party Daily" and "Evening" follows the names of newspapers. "Party Dailies" are newspapers published during the day time and traditionally read in offices and workplace. "Evenings" are newspapers published in the evening and read at home.

[3] "Citation of Xinhua" is an article that cites Xinhua – the authoritative CPC news agency – as news source.

Specifically, in the $[0, 1]$ range, a newspaper is more biased if its normalized bias index is closer to one.

We analyze what the CCP is using media bias for, by analyzing what content is characteristic of more-biased media. First, the more-biased newspapers carry far more content characteristic of propaganda (e.g., more mentions of political leaders, more citation of Xinhua, less coverage of controversial issues) than other newspapers. This suggests that the CCP committees use these newspapers to implement the CCP's party line – ideological control and regime stability. Second, the more-biased newspapers carry more reports about corruptions and disasters. This seemingly surprising result is consistent with the view that the CCP uses investigative reporting to monitor local officials (e.g., Zhao, 2000; Shirk, 2011), a view that is expressed as the mass line in the CCP's propaganda policy. Third, the less-biased newspapers carry more content characteristic of commercial media worldwide (e.g., more reports on sports, crime, and entertainment).

In the empirical analysis, we mainly use our measure of newspaper bias to examine the determinants of media bias in China. We focus on three characteristics that may affect bias: (i) competition, (ii) preference heterogeneity across PCs; (iii) the size of the advertising market. We analyze changes in the exposure to media bias both through introducing new products (the extensive margin) and through positioning the existing products (the intensive margin). To guide the empirical analysis, we build a simple model, in which different CPC committees compete for both political and economic benefits. Empirically, we study the intensive margin of bias by regressing the bias of existing newspapers on their characteristics. We study the extensive margin of bias by running an ordered-probit regression of the number of a specific type of newspapers on prefecture characteristics, following a number of studies on industry organization (e.g., Bresnahan and Reiss, 1991; Genesove 2003). The main theoretical insights and empirical evidence are as follows.

The first set of results concern the impact of competition on newspaper bias. We find strong evidence that competition affects intensive margin bias, but the effect is not uniform for all newspapers. This intricate result, however, is consistent with the predictions of our theoretical model. One of our strong theoretical arguments is that competition should change media bias in a market through the extensive margin; we present some empirical evidence that is consistent with this argument.

Specifically, at the intensive margin, we study the effects of competition on newspaper bias through a reform in 2003, in which the central government closed down more than 80 percent of the county-level Party Dailies. Our model predicts that the exit of a Daily would increase differentiation among the remaining newspapers: Dailies will become more biased and Evenings less biased. Intuitively, after the exit of some Dailies, a remaining Daily faces less competition from close substitutes and thus the reduced demand elasticity, and the marginal economic benefit of reducing bias becomes smaller. The exit of a competing

Daily also increases an incumbent PC' incentive to further commercialize its Evening so as to differentiate it from its Daily. To capture the fall in competition from county Party Dailies due to the reform, we use the interaction of the number of county newspapers in 2002 and a reform dummy for years 2003 and afterwards. We find that the reform one average lowers the bias in the remaining papers. Consistent with theory, the effect differs between the remaining Party Dailies and the Evening and Subsidiary newspapers: the former became more biased while the latter became less biased. There are no pre-trends in the data and the most of the change in bias occurs within the first two years after the reform.

At the extensive margin, our model predicts earlier entry of commercial newspapers in areas with competing CPC committees. This effect arises because different levels of governments run newspapers that compete in the same advertising market. A competing entrant does not consider the business-stealing effect from its sibling incumbent newspapers, and thus has stronger incentive to enter the market. This intuition is analogous to the vertical externality of fiscal decisions in the studies of fiscal federalism. Empirically, we separately examine two kinds of markets: the capital cities of the provinces, which feature stiff competition between provincial and prefectural CPC committees; and the prefectures outside provincial capitals, which feature less competition.[4] The entry patterns of newspapers in both types of markets are consistent with the theoretical prediction.

We also calculate the threshold size of the advertising market for the entry of the first commercial newspaper. The threshold value is estimated to be approximately RMB 33 million in the non-capital prefectures and RMB 4 million in the capital cities. This result is consistent with the theoretical hypothesis that more competition induces entry of commercial newspapers at a lower threshold value of market size.

The second set of results concern the effects of preference heterogeneity across owners on newspaper bias. Our theory predicts that owners with higher valuation of media control will bias their papers more at the intensive margin, and enter the market earlier with Party Dailies and later with commercial newspapers. In the current empirical setting, owners – the PCs – are likely to have heterogeneous preferences over the political value of media bias. For example, regime stability is a key goal of the national CPC, and it has the nature of a public good. Thus, local newspapers may free-ride the provision of media content for regime stability from the central media and underprovide this kind of content. Moreover, many local events can affect regime stability at the national level, but the local PCs may not fully internalize the negative impact of these events and have less incentive to censor the coverage of these events. Preference heterogeneity among PCs in different regions may also reflect the differences in their historical roots or the local risks of political unrest. For instance, some

[4] In most newspaper markets of the non-capital prefectures, a prefectural CPC committee competed with several country-level CPC committees before the reform in 2003 and became a local monopolist after that.

regions are traditional CCP strongholds; some have a history of Western influence; and some may have strong ethnic tensions.

Empirically, we find strong evidence that higher-level PCs value control more. At the intensive margin, the newspapers run by higher-level PCs are significantly more biased than their lower-level counterparts, in the same market and year. At the extensive margin, higher-level PCs start Party Dailies earlier and commercial newspapers later than the lower-level competing PCs in the same market. We also find that newspaper bias at the intensive margin is significantly higher in CPC strongholds, the prefectures that were part of the CPC soviet in 1933 or were passed in the CPC Long March in 1933-1935, while the bias is significantly lower in the prefectures that were part of a Treaty Port controlled by Western powers during the period of 1840-1910. At the extensive margin, Dailies enter earlier and Evenings enter later in the prefectures where the value of political control is higher, by the above measures.

We use the regression of newspaper entry to estimate how a PC values the political cost of launching a commercial newspaper. A newspaper will enter the market when the additional profits exceed the political and economic costs of entry. Hence, the value of the advertising market at entry is an upper bound on the political cost. In the non-capital prefectures, this is approximately RMB 33 million, a fairly large amount compared to the revenues of local governments in China. We find that the estimated value of political cost differs across prefectures. For instance, this threshold is RMB 51 million in CPC strongholds and RMB 26 million in Treaty Ports.

The third set of results concern the effects of the size of the advertising market. Theoretically, we expect that a larger advertising market reduces the intensive margin of bias and increases the incentive of entry for all newspaper types. Empirically, we find that at the intensive margin, the political bias of newspapers is strongly negatively correlated with the size of the advertising market in the cross-section. However, there is no significant relationship between the bias and advertising over time, neither at the prefectural or national level. At the extensive margin, the entry of commercial newspapers is strongly correlated with the size of the advertising market, both in the cross-section and in the time series. These correlations, although not necessarily causal, show evidence consistent with our theoretical model, which highlights the tension between a PC's political and economic goals as a key determinant of media bias.

Our research makes several contributions to the literature of media economics. First, to the best of our knowledge, this paper is the first large-scale study on the newspaper bias in autocracies. The systematic empirical findings shed some light on the long-standing inquiry of what the government in an autocracy uses media for. Second, we construct a novel measure of media bias for newspapers in autocracies that we believe can be applied to newspapers in other empirical settings. Third, our findings point to two key factors that determine the extent of media bias in China: the growth of advertising market and the market structure.

The overall results of our study suggest that the growth of GDP and advertising market does not necessarily affect the bias of existing media, but it may affect the bias of media by inducing entry of newspapers and through the resulting changes in market structure.

This paper also contributes to the expanding literature on the political economics of China from a unique angle. It is often viewed as a puzzle that the rapid economic growth in China is achieved without substantial improvements in the market-based institutions. A number of studies have argued that the conflicts of interests between governments at different levels and the competition between regional governments are crucial for the development of market-based institutions and the reallocation of resources toward the more efficient private sectors.[5] We provide evidence along this line. The empirical findings show that the pro-government bias of Chinese newspapers is mitigated by two factors: the discrepancy in the valuation of political control between local and national CCP committees and the competition between different CCP committees. This suggests that competition between governments with a political hierarchy may improve the freedom of press, an important aspect of market-based institutions.

2 Background and Data

In this section, we describe the data and the main variables. More details can be found in the Appendix. We also provide a brief description of the institutional background to aid the understanding of the data. Some issues covered here will be discussed in more detail in the section of empirical analysis.

Political control of the media in China is exercised mainly through ownership and licensing, the appointment and supervision of top personnel, and propaganda and censorship. The newspaper licenses are issued by the State Administration for Press and Publication (SPPA), which is supervised by the Propaganda Department of the CCP committees. All Chinese newspapers are required to have a total or dominant state ownership. They must also be affiliated with a government supervisor that is responsible for licensing, the appointment of top personnel, and the monitoring of important editorial matter. Eligible supervisors include the PCs committees at different administrative levels, CCP divisions, government departments, and occasionally government-affiliated mass organizations. To control the content of newspapers, the Chinese governments frequently issue propaganda directives, inject publications of articles from Xinhua News Agency and People's Daily into newspapers, and use ad hoc pre-publication censorship and post-publication monitoring.

[5] See Xu 2012 for a recent survey and the references therein.

The general-interest newspapers, which are the focus of our study, account for a lion share of the readership of newspapers in China. By regulation, only a PC can obtain a license of general-interest newspaper. Based on their ownership and managerial autonomy, the general-interest newspapers are classified into three categories: Party Dailies, Party Evenings, and Subsidiaries. This classification is practically straightforward, because Chinese newspapers come in variants indicated by their names that can be easily identified as "Daily", "Evening," and "Metro." A Daily is an "official" newspaper directly owned by a PC, and its editorial policy is required to strictly follow the CCP Party line. All CCP and government departments, government-affiliated organizations, and large state-owned firms are required to subscribe Dailies run by all the PCs that have the power over them.[6] All Dailies are mostly subscribed to with public money and for consumption in offices, classrooms, and factory workshops. The Evening and Metro newspapers, mainly introduced after the economic reforms in the 1980s, are less strictly controlled in terms of both editorial policies and managerial autonomy. Being more oriented to the general audience, they carry more entertaining news and heavily rely on street vendors for circulation. Apart from differing in publication time (Evenings in the afternoon and Metros in the morning), the Evening and Metro newspapers are similar in content, circulation, and management. For simplicity, we label these two types of newspapers as "Evening" in contrast with "Daily." In the 1990s, the general-interest newspapers were allowed to own subsidiary newspapers, many of which are in the category of Evening and Metro newspapers. We call these subsidiary newspapers, either Evenings or Metros, as "Subsidiaries." The subsidiaries have the highest degree of editorial and managerial autonomy because of their ownership structure.

2.1 Newspaper Directory

We construct a detailed directory of all mainland Chinese newspapers from 1981 to 2010, based on four data sources: (ii) the Comprehensive Chinese Newspaper Directory (2003, 2006, 2010), published by SPPA – the authority that issues licenses for publishing newspapers; (ii) the Annual China Journalism Yearbooks (1982-2010), published by the Chinese Academy of Social Science; (iii) the China Newspaper Industry Yearbooks (2004-2010), 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. The directory contains information about location, publication periods (start, suspending, and termination dates), owner, supervisor, and type of readership (general or specialized) of each newspaper. For major newspapers in certain years, we observe their annual circulation and advertising revenues.

[6] For example, suppose C-County belongs to B-Prefecture, which in turn belongs to A-Province. Then, a government department in the ABC county must subscribe the Dailies run by the C-County PC, the B-Prefecture PC, the A-Province, and the People's Daily which is run by the central PC.

To the best of our knowledge, our directory is the most comprehensive one compared to any other existing data.

Historical development We use our directory to illustrate the evolution of the newspaper market in China. Figure 1 shows the number of general-interest newspapers in China from 1981 to 2011. Figure 2 demonstrates the broken-down of newspaper types by the level of PC.

After 1949, all mass media came under the strict control of the CCP.[7] During a long period, "Party journalism" dominated the news consumption of Chinese.[8] In 1981, the start year of our sample period, there were 242 general interest newspapers, among which 230 were Party Dailies. These Dailies were mostly operated by PCs at the central and provincial levels; only a few were operated by lower-level PCs. Following the economic and social reforms in 1978, both the consumer demand for informative media and the advertiser demand for advertising outlets grew in tandem with incomes and literacy rates. Meanwhile, the governments gradually reduced subsidies to newspapers and encouraged commercial financing of media. These policy changes spurred the Evenings to produce more consumer-orientated content. Although small in numbers, they soon attracted a large readership and became the top advertising earners.

In 1992, after Deng Xiaoping's Southern Tour, the open endorsement of the market economy by political leadership stimulated a boom in advertising and media industries.[9] During the 1990s, the most fundamental reform concerning media commercialization was permitting Subsidiary newspapers of existing Party newspapers. Without any funding from governments, many Subsidiaries absorbed non-state capital – typically funding from mass organizations and state-owned-enterprises – in addition to funding from their parent newspapers. As seen in Figure 2, the increased trend in the number of subsidiaries after this first vertical line – the year 1992 of Deng's Tour – is clearly visible. This trend is particularly pronounced at the provincial level. In the 2000s, the market trend has been towards consolidation. In 2003, most county level newspapers lost their licenses, because of a drastic

[7] A small number of commercial newspapers and radio stations were allowed to continue into the early 1950. There numbers dropped from 58 in March 1950 to 25 in August 1951 to zero in 1952.

[8] In the late 1950s and early 1960s, recognizing the need for newspapers as a form of popular culture and entertainment for the urban population, the CCP permitted some regional committees in central cities to launch 13 evening dailies. Also responsible for propagating Party policies and directives, these "Party Evening Papers" were more readership-oriented, with contents more diversified and closer to everyday urban life. During the Cultural Revolution, all 13 evening papers were forced to close because their orientation were viewed as incompatible with the ideology of the time. In the early 1980s, these 13 Evening papers all resumed publication.

[9] In 1993, advertising revenues in the whole country reached 13.4 billion Yuan, a 98% percent increase over 1992.

policy change imposed by the central government. In Figure 2, the number of county-level newspapers dropped after the second vertical line – the year 2003 – from 325 in 2002 to 75 in 2004.

2.2 News Content

We analyze news content to investigate the extent and goals of political influence over Chinese newspapers. Our analysis is based on the digital texts of the Chinese newspapers that are available in WiseNews, a Hong Kong-based newspaper data provider. We focus on 110 mainstream general-interest newspapers in Mainland China from 2000 to date. Among these 110 newspapers, 39 are Party Dailies, 28 are Evenings, and 43 are Subsidiaries (See Table 1). Geographically, these newspapers cover 26 out of 31 provinces in Mainland China. In terms of government affiliation, ownership, and the type of readership, the WiseNews sample largely represents the whole newspaper industry in China. However, WiseNews only contains newspapers located in capital cities and major prefectural areas. The newspapers included in the sample varied slightly over time; see Table 2.

Chinese newspapers aim at two goals: the political and the economic goals. According to the CCP's propaganda policy and research on Chinese journalism (see Zhao 1998), the newspapers' political goal consists of two lines: the Party line that stands for top-down communication and the Mass line that stands for bottom-up communication. We call the economic goal the "Bottom Line". The "Party Line" and the "Bottom Line" content categories defined below are closely related to the existing literature on media bias. The "Mass Line" is of interest in its own right because it is related to investigative journalism and accountability. Based on key word searches and article counts, we then construct a series of content measures that reflect the three lines. All the measures are for each newspaper on a yearly basis. The detailed description of the key words for each measure can be found in Appendix 2.

Top-down Communication: the Party Line Chinese newspapers are required to implement a Party Line to transmit information about propaganda and policy implementation from the upper-level to lower-level governments. Along this top-down Party Line, newspapers routinely cover top CCP leaders' policy directives, visits and works. News content is highly positive, e.g. covering the achievements of individual factories, counties or persons. The Xinhua news agency is a key instrument to produce news stories and enforce these propaganda objectives. We use three types of content to measure a newspaper's implementation of the Party Line. The first is the number of articles that mentions the names of 2,111 top political leaders at the central (108 individuals), provincial (816 individuals) and prefectural (1187 individuals) levels.

In total, we find 1.58 million articles covering these leaders, among which 0.6 million articles cover central leaders, 0.6 million cover provincial leaders, and 0.38 million cover prefectural leaders. The variable we will use in the analysis is the total number of articles mentioning political leaders at any level, divided by the total number of articles by this paper in WiseNews and multiplied by 100. We call this variable LeaderMentions. As seen from Table 3, this variable has a mean of 11 percent and a standard deviation of 12 percent.

Our second measure involves the articles that cite the Xinhua News agency. We find 3.4 million articles in total. We define the variable Xinhua Cites to be the percent of all articles that mention Xinhua News Agency. By newspaper and year, on average, 24 percent of the articles cite Xinhua News Agency, with a standard deviation of 15 percent; see Table 3. Our third measure captures the omission of negative and inclusion of positive news. We calculate the coverage of the annual top 10 news events listed by two extreme media outlets – Xinhua News and Epoch Times. The latter is an overseas-based Chinese newspaper that is sponsored by anti-CCP organizations and its circulation is banned in China. In total, we found around 473,000 articles covering the Epoch Times top stories and 1.1 million articles covering the Xinhua top stories. Our measure is calculated as the percent of articles covering the annual top 10 events listed by the Epoch Times of articles covering any top story listed by the Xinhua News or the Epoch Times. The mean is 24 percent and a standard deviation is 14 percent; see Table 3.

The above three content categories are natural proxies for pro-incumbent politician bias, and closely related to existing measures of media bias. The share news stories covering a politicians from a party is a common measure of media bias favoring that party; see for example D'Alessio and Allen (2000), and Durante and Knight (2009). Coverage of positive news is another common measure of bias favoring incumbent politicians. For example, Larcinese et al. (2007) find that newspapers that typically endorse Democratic politicians systematically give more coverage to high unemployment when the incumbent president is Republican. The share articles citing Xinhua is similar in spirit to Groseclose and Milyo's (2005) bias measure based on the share newspaper articles citing Democratic or Republican think tanks.

Bottom-up Communication: the Mass Line According to the CCP propaganda policy, newspapers should also serve the bottom-up goal of providing intelligence to top leaders – the so-called Mass line – in addition to following the Party line. Along this Mass Line, media should inform the top leadership of people's concerns and the performance of lower-level bureaucrats (Zhao 1998). The objective is to mitigate the problem of inadequate and unreliable communication within the state bureaucracy and among self-interest government officials. A classic example of a breakdown of this function is the failure of media to report about

the failing crops during the Great Leap Forward, resulting in the great famine and severe political instability. In recent years, the mass line is manifested in the so-called "supervision by public opinion," which permits the media to report on corruption and wrongdoings of Party officials and government agencies. Although this is a stated objective, this type of reporting might be suppressed because it reflects badly on the CCP, violating the "Party Line". We construct three content measures for the "Mass Line": coverage of corruption stories, disasters and accidents.

In total, we find around 24,000 newspaper articles that cover corruption cases. We use the share of these articles among the total number of articles. These articles almost exclusively involve low-level officials.[10] Among all the corruption cases, we identified 13 cases of prominent political leaders (out of our 2111 leader sample) being caught in corruption scandals. The newspapers' role in these scandals is not crystal clear. Most likely, they are writing about leaders who are already politically dead, or at least under attack from within the CCP. In sum, there are quite a few news stories about corruption. However, the corruption coverage could be characterized by "swatting flies and dead tigers".

The other two measures involve the coverage of accidents and disasters. Accidents and disasters are negative news that often reflects badly on the political leadership. For example, in July 2011, two high-speed trains collided in Wenzhou, Zhejiang province, killing 40 people. The first government response was to quickly conclude rescue operations and order the burial of the derailed cars. Facing strong criticism in Chinese media, the government issued directives to restrict media coverage, which was met with limited compliance. The Ministry of Railways announced that three high ranking railway officials were fired immediately after the crash under charges of corruption.[11] Similar stories can be found in critical coverage of floods caused by poorly-managed drainage systems.

We obtain data on the occurrence of disasters/accidents in China from the EM-DAT database by the Center for Research on the Epidemiology of Disasters in Brussels. The data contains information on the type of disaster/accidents, the date and location, and the number killed and affected. We study disasters striking China 1998-2010 killing more than 30 people. We identify newspaper coverage of 226 such disasters/accidents.[12] Among them, 129

[10] For example, "An officer from a poor county in Shanxi province has collected bribes worth over 20 million Yuan" or "The vice deputy director of Shunyi Municipal Bureau of Land and Resources was sentenced to prison because of taking bribes".

[11] See Branigan, Tania (2011-07-25). "Chinese anger over alleged cover-up of high-speed rail crash". London: Guardian Media Group. http://www.guardian.co.uk/world/2011/jul/25/chinese-rail-crash-cover-up-claims

[12] In total, there are 238 such disasters/accidents, but there are some cases cannot be identified. For most of these cases, the geographic information was too imprecise to implement the search. In two cases, the number of articles exceeded 100,000, which is the limit on the reported articles in WiseNews. We dropped these.The full list and the keywords will be provided in the online Appendix 2.

accidents are caused by human errors, which makes reporting on these events more sensitive and also more relevant to the monitoring function of media. We find a total of 100,474 stories covering these disasters/accidents, 82,509 about the disasters and 17,965 about the accidents. We define the variable Disasters as the share of the number of articles covering the 97 natural disasters among the total number of articles, the variable Accidents as the share of the number of articles covering the 129 accidents among the total number of articles.

Audience-oriented Information: the Bottom Line In both China and other countries, one type of news content featuring soft, entertaining, and sensational information is particularly welcomed by a large audience in the market. This content, which we call the Bottom Line, however, is regarded by CPC officials as "Spiritual Pollution," because it distracts newspapers from their political goals.[13] Therefore, we measure the Bottom Line of a newspaper to capture its deviation from the Party newspapers and its inclination towards commercialization. Specifically, we search for articles that are typical of tabloids: sport reports, entertainment news, and crime stories. We find 1.1 million articles covering sport stories or an average share of 6.4 percent, 2.1 million articles covering entertainment or an average share of 12 percent, and 88,700 stories of crime or 0.5 percent by newspaper and year.

3 Measuring Bias

We use the 9 content categories described in the previous section to construct a single-dimensional index of how strongly the content of a newspaper reflects its political goal, as opposed to its economic goal. We define this index as the political bias of a newspaper or newspaper bias for short. As will be seen below, our measure of newspaper bias draws a parallel to several existing methods.

One method to measure media bias is to identify content that is characteristic of agents with known ideologies. For example, Gentzkow and Shapiro (2010) regress the ideological position of U.S. House congressmen on word frequencies in their speeches. They then use the estimated word coefficients to compute the expected bias of newspapers based on word frequencies in their articles. Another method to measure ideology is to use a principal component analysis and interpret the dimensions. For example, the bias (or ideology) of the congressmen in the above study was in turn measured using a principal component analysis of all their roll-call votes and then interpreting the first dimension as left-right ideology (Nominate Scores).

[13] See e.g. Zhao (1998), p. 131.

In our empirical setting, we first perform a principal component analysis of the 9 content categories. Because news availability may vary by prefecture and year, we analyze the residuals from a regression of content categories on prefecture by year fixed effects. The result is shown in Table 4. The first component explains 38 percent of the variation in news coverage. Leader mentions has the strongest positive factor loading, followed by Xinhua News citations and corruption stories. Entertainment, crime and coverage of Epoch Times top stories have the strongest negative factor loadings. Then, we correlate the first dimension to advertising revenues and the probability of being a party Daily. This is essentially using the first method, since we have a strong prior that Party Dailies are highly biased and newspapers with high advertising revenues are less biased. In particular, we regress the log advertising revenues and a dummy variable of being a Party Daily on the coverage shares of the 9 content categories, controlling for prefecture-by-year fixed effects. We then use the estimated coefficients of the content categories to compute the expected log advertising revenue and the probability of being a Party Daily, respectively. These predicted values are plotted against the first principal component in Figure 3. It is clear that the first principle component is negatively related with the predicted advertising revenue and positively related with the predicted probability of being a Party daily. Table 5 shows similar results in regression analysis. Column II shows that the first principal component is hugely significant in explaining low advertising revenues. Column III adds prefecture-by-year fixed effects. Column IV replaces the first principal component with the nine individual content categories. This only increases the R-squared from .78 to .80. In other words, the first principal component fits the data almost as well as the an unconstrained linear combination of content categories. Columns V and VI make the same point for the probability of being a Party Daily.

Moreover, out measure of bias is strongly related to other measures of political control, such as censoring of social media. Figure 4 plots the average bias among newspapers in a province against the share deleted posts on Sina Weibo. Sina Weibo was China's by far largest micro blog, with over 300 million registered users.[14] The plot controls for the year fixed effects, the types of newspaper, and the administrative levels, since our sample do not contain the same mix of Party Dailies, Evenings, and Subsidiaries across provinces. Obviously, there exists a strong positive relationship between the newspaper bias we construct and the intensity of censorship in Sina Weibo. As an example, the two provinces Qinghai and Ningxia, which deleted more than 40% of the posts on Sina Weibo, also have the most-biased newspapers.

We assign the measure of newspaper bias to the 110 newspapers in our sample. Figure 5 shows the distribution of bias by newspaper type. Table 6 shows the top 10 and the bottom 10 papers in terms of the bias measure. The most-biased papers are the Provincial Party

[14]Bamman, O'Connor and Smith (2012) estimate the share censored posts by Chinese province.

Dailies in Qinghai and Xingxia, the two provinces mentioned above that censor information in social media most intensively. The newspapers with the lowest bias are Subsidiaries and Evenings from large metropolitan areas. Guangzhou Daily is the only exceptional Daily that has a below-median measure of bias. Despite being a Daily, this newspaper, has the largest advertising revenues in China. However, in 2004, the chairman and editor-in-chief of Guangzhou Daily, Yuanjiang Li, a famous newsman who led the newspaper to the tide of commercialization, was prosecuted as "corrupt" and jailed for a 12-year term.[15]

4 What Is Media Bias Used for?

In this section, we study what type of news content is characteristic of the more-biased papers to learn about what political control is used for. Table 7 shows the raw data of news content by newspaper type: Party Dailies, Evenings, and Subsidiaries.

As shown in the first three columns of the top panel, Party Dailies mention top political leaders in 23 percent of their articles, a portion that is vastly greater than those of Party Evenings (7 percent) and Subsidiaries (5 percent). Party Dailies cite Xinhua News in 35 percent of their articles, again substantially more than Party Evenings (24 percent) or Subsidiaries (17 percent). Party Dailies also cover less of the top stories listed by Epoch Times, as opposed to those listed by Xinhua. These results suggest that Party Dailies seem perform the top-down, "Party Line", function more actively than the other two types of newspapers. The three columns of the middle panel are related to the bottom-up, "Mass Line", role of newspapers. Party Dailies report more on corruption and disasters than Evenings and Subsidiaries. The columns in the bottom panel capture the bottom line categories. Evenings and Subsidiaries cover 20% more stories about sports and entertainment than Party Dailies and double the coverage of crimes in Party Dailies.

The above differences across the three types of newspapers could potentially be contaminated by a selection problem: the composition of Dailies, Evenings and Subsidiaries in our sample may differ in different places. Dailies in our sample, for example, could be predominantly from places with more corruption and this results in more coverage of corruption in Dailies. To count for this potential problem, we control for prefecture-by-year fixed effects in the principal component analysis and the regression analysis.

We use regressions to show the correlation between the various news contents and the newspaper's political incentive (measured by being a Party Daily) as well as the commercial

[15] According to Zhao (2008, P116), Yuanjiang Li fell from favor because of critical reporting on local affairs and defying the orders of Guangzhou municipal party officials, "he had violated the basic rule of the game: no matter how successful he had become as a press baron of national status, he remained a functionary of the local party committee he belonged to."

incentive (measured by the advertising revenue). Table 8 shows the results and Figure 6 plots the corresponding t-statistics of the Party Daily and Advertising revenue in the 9 regressions, respectively, against the factor loadings in the principal component analysis. All these methods give the same answer as our previous inspection of the raw data of news content.

We find little evidence that increasing commercialization provides more information relevant for holding lower-level officials accountable. In contrast, our evidence suggests that the more-commercial newspapers cover less corruption and perhaps disasters. It seems that more commercialization has led to less accountability at local levels, less bias at the national level, and more sensationalism (sports, crime, entertainment).

Discussion Our findings lead to a number of theoretical questions that are not yet answered. We find massive evidence that newspapers are being using for top-down "Party Line" communication. A striking difference emerges between the Party Dailies and the commercial newspapers in their coverage of leaders, citing of Xinhua, and coverage of positive news. The provision of the positive information is largely to ensure regime stability or to enhance policy implementation. However, existing economic theories of media in authoritarian states (e.g. Besley and Prat 2006) all focus on the aspect of hiding bad news. To the best of our knowledge, we are not aware of any formal theory that models the use of propaganda to ensure regime stability, or the need for rulers to use mass communication in policy implementation.

Whether or not more-biased papers would report more or less on corruptions is theoretically unclear and empirically debated. Corruption may undermine the image of the CCP and should be less covered by biased media. On the other hand, recent theories suggest that authoritarian rulers may encourage investigative reporting to monitor lower-level officials (Egorov et al., 2009, Lorentzen, 2013). This is in line with claims that the Chinese party leadership has promoted a media watchdog role to reassert control over a dysfunctional bureaucracy (Zhao, 2000). However, others argue that investigative reporting is driven by the more independent commercial newspapers (Liebman, 2011). In our current study, we find evidence that biased newspapers are being used to monitoring lower level officials.

We find that newspapers play essentially no role in monitoring higher level politicians. We find around 50,000 stories covering corruption, but only 13 cases involving leaders at prefecture level or above. The latter is in line with existing theories of media capture (e.g. Besley and Prat 2006).

The other part of the Mass-Line is to act as an intelligence device for the rulers, and to write about the concerns of people. Information problems are pervasive in authoritarian states. We lack understanding of whether the media can mitigate these problems, and, why

if so? Do journalists face different incentives than government bureaucrats in, say, law enforcement? Does it matter that media makes information public? One could imagine that media would simply report corruption to higher level politicians and publish it (in fact, journalists in China also has this role).

From the above discussion, it is tempting to conclude that the commercialization of Chinese newspaper industry has reduced accountability of lower level officials, enhanced accountability at higher levels (more negative Epoch times news), and reduced news use for regime stability and policy implementation. However, although the average bias among newspapers has fallen, the total amount of biased news increased tremendously because of the entry of a large number of highly biased Party Daily newspapers. Hence, the economic reforms and the resulting increase in advertising revenue significantly enhanced the reach of biased news and the ability of the CCP to use media to implement its political goals. It is not until the late 1990s that the entry of less biased papers dominated.

5 What Determines the Extent of Bias?

In this section, we analyze the degree of political bias in the Chinese newspaper market. The changes of bias can be driven by the entry of newspapers or by changing the content of existing newspapers. We define the former as the extensive margin and the latter the intensive margin..

5.1 Theory

The empirical section analyzes entry and bias decision, with a focus on the effect of competition on bias. This effect is not theoretically obvious. The Chinese Communist Party Committees who run newspaper have dual goals and multiple products. Will competition induce a stronger emphasis on the economic goal or the political goal? Perhaps competition increases demand elasticity, resulting in more consumer focus and less bias. But is likely to more affect close substitutes, such as two Dailies. Competition may also affect incentives to differentiate newspapers.

A number of papers have discussed how media bias relates to competition and the size of the advertising market, typically through their effect on the demand elasticity and the desire to differentiate media products. The size of the advertising market may reduce media bias because it increases its cost in terms of lost profit (Besley and Prat, 2006). Competition may increase bias because it increases the benefit to differentiate products to avoid price competition under subscription finance (Mullainathan and Shleifer, 2005). On the other hand, when

media are advertising financed, competition may lead to less differentiation (Gabscewicz et al. ,2002). Finally, competition may decreases bias because more feedback exposes lying media. Most of these papers do not model the decision of governments to bias media. Besley and Prat (2006) do consider government influence over the media, with an emphasis on the impact of media freedom on government accountability in democracies. Other models of media manipulation in dictatorships. Egorov, Guriev, and Sonin (2009), argue that media freedom can be useful to dictators because it allows them to control the bureaucracy. Similarly, Lorentzen (2013) argue that watchdog journalism may help autocratic regimes remain in power by improving governance.

Our model is closely related in structure to the models of the bias of profit maximizing media, in particular Mullainathan and Shleifer (2005), because we aim to explain media bias choice. But, in the Chinese setting, media are owned by the government and do not simply maximize profits. Similar to Egorov, Guriev and Sonin (2009), we analyze the degree of bias in an authoritarian state. Another departure of our paper from the existing studies is that we also model the choice of starting a newspaper. This introduces a new channel through which both the size of the advertising market and potential competition affects the effective media bias.

To structure the discussion of these issues, we develop a simple Hotelling location model where Party Committees can start newspapers at a cost and decide on their bias. The model is in the Appendix. Here, we briefly present the model and its key insights. The setup of the model is the following.

Market Demand. We assume that there is a continuum of consumers with ideology blisspoints, x_i, which is uniformly distributed on $[0, 1]$. A position closer to zero means a stronger political preference for CCP ideology, while a position closer to one means a stronger commercial preference. A consumer with x_i derives his or her utility from a newspaper, n, with its position x_n:

$$u\left(x_i, x_n\right) = \frac{1}{2} - \left|x_i - x_n\right|.$$

Here, the utility of consuming a newspaper depends on the match between the newspaper's position and the consumer's own preferred position, as in Mullainathan and Shleifer (2005). While some consumers prefer newspapers with more commercial positioning, some other consumers, for instance CCP cadres or employees in public sectors and state-owned enterprises, prefer newspapers with more political positioning. We further assume that consumers read only one newspaper, the one that delivers them the highest level and positive utility. For expositional simplicity, we assume that $x_n \in [0, \frac{1}{2}]$. Then, the market demand of a newspaper at x_n is

$$X\left(x_n\right) = \frac{1}{2} + x_n.$$

Objective Function. The key players are CCP committees, which we refer to as PC in this section. A PC has both economic and political goals. A newspaper will earn a profit $X(x_n)\overline{R}$, where $\overline{R}$ is a parameter indicating the total value of the local advertising market.[16] A PC has the political goal to use media to maintain regime stability, facilitate policy implementation, or build the public image for politicians. In the previous section, we showed that bias is used to promote the party line and to monitor lower-level officials. In addition both to suppress negative news (Epoch Times top news). This involves publishing some material that is not highly demanded by consumers and hiding material that is. We define a newspaper's political bias as $b(x_n) = \frac{1}{2} - x_n$, where $\frac{1}{2}$ is the profit-maximizing position of a monopolistic newspaper. Given that we assume that the CCP's ideological blisspoint is $x_n = 0$, this bias captures the tension between the CCP's blisspoint and the profit-maximizing position: a PC gets a maximum value of $\frac{1}{2}$ from the political bias, but this value is destroyed as more commercial content appears in its newspaper. Let N be all newspapers in a market, and N^{PC} the set of papers run by a PC. Taking into account all the above elements, a PC aims to maximize the following objective function:

$$U^{PC}(x_n) = \underbrace{\sum_{n \in N^{PC}} X_n(x_n)\overline{R}}_{\text{revenue}} + \alpha^{PC} \underbrace{\sum_{n \in N} X_n(x_n) b(x_n)}_{\text{bias exposure}}.$$

The first part of this function is simply the sum of profits from all newspapers owned by the PC. The second part is the PC's valuation of the political bias exposed to readership. This means that politicians are not simply trying to conceal information; they use media are a communication tool and get higher utility with a biased newspaper than without any newspaper. In contrast to the existing literature, which focuses the role of media bias as concealing information, this assumption of the value of bias fits better the empirical setting and is particularly important for the analysis of entry decision. The parameter α^{PC} measures the valuation of the political goal, which may differ across PCs because of the CCP's hierarchical structure or some historical reasons. Note that $n \in N$ in the second summation, because we assume that the effect of political bias is a public good across PCs within the same market. This assumption captures an important feature of media as an information product, but it can be easily relaxed.

Action Choice. A PC maximizes its objective functions by choosing actions at two margins. At the intensive margin, it chooses the position x_n of the newspaper n; at the

[16] For a newspaper, Advertising is the main source of revenue for Chinese newspapers. Subscription prices were regulated by category (Daily, Evening, Subsidiary) until 2005, and remain low. As price competition is not an important feature of the Chinese newspaper market, we abstract from it by assuming that the price is zero.

extensive margin, it chooses the entry of a newspaper after paying a fixed cost. We will analyze how these action choices of a PC respond to the size of advertising market $\overline{R}$, the valuation of political bias α^{PC}, and its competing PCs' entry decisions. We abstract from price competition between products because the subscription prices of newspapers are highly regulated and remain at a very low level.

In the model, politicians receive positive utility from readers being exposed to biased news.

Intensive Margin Bias We first explore a PC's decision of how to bias its papers, when it have one or two papers. We call this the *intensive margin bias*.

H1. **(Monopolist bias decisions)** When a monopolistic PC produces only one newspaper, the bias of the newspaper increases in the PC's valuation of bias α^{PC} and decreases in the size of advertising market $\overline{R}$. When the PC produces two newspapers, it will differentiate the two newspapers with one highly biased and the other more commercialized.

The first part of H1 is very simple and intuitive. It derives from the basic trade-of between the political and economic goals. Exposing the stock of readers to more bias brings political benefits, the valuation of which is increasing in α. At the same time, it reduces demand and hence advertising revenues and and propaganda reach. This cost is increasing in R and the demand elasticity with respect to bias.

The second (differentiation) part of H1 is driven by the PC's dual goals. A newspaper owner who only cares about profits would have no incentive to have two differentiated newspapers, but an owner with two goals will specialize one paper towards each goal. An Evening paper that is too similar to the Daily steals its audience and reduces effectiveness in achieving the political goal without improving aggregate profits. Hence the existence of a sibling Daily causes the PC to distance its Evening paper from the position of the Daily.

Demand elasticity and incentives to differentiate are two key features of bias determination. The effect of competition depends how it influences these. The next hypothesis explains how.

H2. **(Impact of exit of Dailies)** The exit of a competing Daily increases product differentiation among remaining papers: the Daily becomes more political biased; the Evening becomes less political biased.

The entry of a Daily will increase demand elasticity and hence lower bias in remaining Dailies. The reason is that Dailies are close substitutes. For Evenings, the exit of a competing

newspaper close to its sibling Daily increases incentives to differentiate from its position. Before the exit, less differentiation meant that the Evening would steal audience also from the competing Daily and total demand increased. Hence, competition from a Daily reduces bias in other Dailies and increases bias in other PC:s Evenings.

Extensive Margin Bias We now discuss the decision of Party Committees to start Dailies and Evenings. We call this *extensive margin bias*. In this analysis, we only allow for two formats with maximum and minimum bias. It is possible to analyze entry and bias choice simultaneously, but this only adds complexity to the analysis without additional insights.

We treat prefectures in provincial capital cities separately. These cities are the main markets of the provincial papers. The average population of these markets are about the size of a small European country, such as Sweden. Empirically, GDP and population in this prefecture explains better provincial paper advertising revenues than provincial level GDP and population. Further, it seems a priori unlikely that the provincial paper will devote much space to local issues in cities outside of the capital, and local advertisers in other cities are likely to find the provincial papers an expensive an imprecise vehicle to reach their consumers. For these reasons, in the capital cities, we model competition between the prefecture and province PCs. In other prefectures, we model competition between prefecture PCs and county PCs who can only start Dailies. Hypothesis H3 concerns the capital cities.

H3. **(Duopoly entry decision in capital cities)** Consider a market with two PCs, $H-PC$ and the $L-PC$, such that $\alpha^H > \alpha^L$ and both PCs can introduce a Daily and an Evening. The newspapers will enter the market in one of the two following patterns. In the first pattern, the sequence of entry is: the $H-PC$ first enters with a Daily; then the $L-PC$ enters with a Daily followed by an Evening; finally, the H-PC enters with an Evening. In the second pattern, the sequence of entry is: the $H-PC$ first enters with a Daily; then the $L-PC$ enters with an Evening; the $H-PC$ enters with an Evening; and finally the $L-PC$ enters with a Daily..

The first newspaper will be highly biased newspaper since the advertising market is small at the time of first entry. Starting the first paper yields a double dividend of economic and political benefits, and the PC who values the latter most starts first. The Evening paper creates economic benefits at a political cost, and the Party Committee who cares least about the latter enters with an Evening first.

We now turn to the situation outside the provincial capital cities.

H4. **(Duopoly entry decision in non-capital prefectures)** Consider a market with two PCs such that $\alpha^H > \alpha^L$, and the $H-PC$ can introduce a Daily and an Evening

while the $L-PC$ can only introduce a Daily. For the $H-PC$, the entry of its Daily is earlier if $\overline{R}$ and/or α^H are greater, and the entry of its Evening is earlier if $\overline{R}$ is larger but if α^H is smaller; for the $L-PC$, the entry of its Daily is earlier if $\overline{R}$ is larger.

The intuition is the same as above, Dailies create political benefits and Evenings destroy them. Party Committees who care the most about the political value enters earlier with a Daily and later with an Evening. The entry of the L Daily does not depend on α^L because it always enters after the H Daily and does not provide any additional political value (under the assumption that the political value is a public good).

There are also a couple of other insights from the model that are worth mentioning. One is that competition reduces bias through early entry of Evenings. The reason is a business stealing externality. Compare the decision of L to start an Evening paper as a monopolist or under competition. When this decision becomes relevant, there is a Daily in the market. In the competition case, this Daily will belong to H. Consequently, L will have stronger incentives to start the Evening since it will steal audience from H's Daily rather than its own Daily.

Another insight is that exposure to bias will U-shaped with respect to R, the size of the advertising market. This happens even though the average bias across existing newspapers (intensive margin) is monotonically falling in R. The reason is extensive margin effects: higher advertising revenue initially induces entry highly of biased newspapers. The first newspapers that enter will be highly biased, and yield both economic and political value to the Party Committees. As the size of the advertising market grows, these paper are started and exposure to bias increases.

Empirically, we can test joint predictions regarding newspaper bias and entry decisions. PCs with higher α will bias their newspapers more, enter early with Dailies and late with Evenings. For example, suppose that our content analysis shows that provincial papers are more biased in the same market and year, than prefecture level papers. Then we should expect provincial Dailies to be started before prefecture Dailies and prefecture Evenings to be started before provincial Evenings.

5.2 Competition and bias: the 2003 reform

There is not much empirical evidence on the determinants of bias. Gentzkow and Shapiro (2010) find that most of the ideological positioning of newspapers (bias) can be explained by local demand rather than owner influence. Despite the large theoretical interest, there is also not much empirical work on how competition affects bias, in part because of the hurdle of identification.

In this section, we investigate the effect of competition on bias (H2), using a reform aimed at closing down county-level newspapers. With the stated purpose of reducing the fiscal burden of local governments, the central government withdrew the licenses of most county-level newspapers in 2003, forcing them to close down. A few exemptions were made: county-level newspapers started by the party before 1949; papers published by county-level, autonomous, ethnic minority administrations or in ethnic minority languages; papers in counties with a population of at least half a million, a GDP of 10 billion Yuan, a volume of consumer goods sales of 3 billion Yuan and over, and where the advertising revenue of the party organ was in excess of 4 million Yuan.[17]

The dramatic effect of this reform on the total number of general interest newspapers over the whole country was shown earlier. The effect was also large in the prefectures where we have newspaper content data. As can be seen in Figure 7, there were nearly 60 county Dailies in the WiseNews prefectures in 2002, but this number had dropped to below 10 by 2004. The reform caused a large increase in the number of monopoly and duopoly markets, significantly reducing competition for the newspapers in our sample.

We will estimate the effect of the reduced competition on the bias of newspapers remaining in the market. For example, in the prefecture Shenzhen, there were four competing Party Committees in 2002: three county level and one prefecture level. Our sample includes four prefecture-level papers: one Party Daily, one Party Evening, and three subsidiaries. By 2004, all county level newspapers in this prefecture were closed down. We are looking at the effect of this closing down on the content of the remaining four papers.

To identify the causal effect of competition on political control, we will only use the variation in competitiveness generated by the 2003 reform. For this reason, we create a variable, *Reform,* defined as the interaction of the number of county-level newspapers in this prefecture in 2002 and an indicator variable for the year being 2003 or later. This variable measures the fall in the number of newspapers a prefecture would have due to the reform if all county papers that existed in 2002 were closed down. For a prefecture with three county papers in 2002, such as Shenzhen, this variable would be zero before 2003 and then three in 2003 and thereafter.

Table 9 shows the main results. We regress our bias index, by newspaper and year on the Reform variable. The first two columns show the average effect of the reform across all newspapers. The reform is negatively related to bias, but only significantly so in the first column. The last two columns show the differential effect of the reform across newspaper types. The coefficient on Party Dailies is positive and significant whereas the coefficient on Evenings and Subsidiaries is negative and significant. The last two columns also show an F-test for the effects on Evenings and Subsidiaries.

[17] For a description, see Zhao (2008).

Our identifying assumption is that of a common trend in bias across prefectures with different numbers of county level newspapers, absent of the 2003 reform. We cannot test this assumption directly. However, we can test for pre-trends in the data. Table 10 adds a placebo reform in 2002. The variable Reform 2002 is constructed by leading the "Reform" variable one year. The Reform 2002 variable is insignificant, as are the its interactions with newspaper type.

In the same table, we analyze the dynamic effects of the reform, by lagging the reform variable by one year. It seems that around half of the changes in political control were implemented already in 2003 and the remaining in 2004, although because of multicollinearity, many of these coefficients are insignificant.

To sum up, we find evidence that less competition from county Dailies increased the differentiation among the remaining papers. Remaining Dailies become more biased in markets where the 2003 reform reduced competition more, because there were more pre-existing county Dailies. The remaining Evenings and Subsidiaries became less biased in markets where the reform reduced competition more.

5.3 The Broader Picture

We now study entry and bias decisions more broadly. We will now use our theory and data to investigate a set of important and interesting questions. The empirical results in this section are less well identified.

5.3.1 Intensive Margin Bias, R and α

To investigate whether a trade-off between political and economic goals matters for newspaper bias, we need to find proxies for the size of the advertising market, R, and the value that party committees put on political control, α. Ideally, we would also like to find a measure of demand elasticity with respect to bias. To proxy the size of the advertising market, R, we multiply prefecture level GDP by the national ratio of GDP to newspaper advertising revenues.

The political value of newspaper bias, α, may differ across levels of government. It seems likely that some political gains from bias, such as regime stability, are of a public good nature within the CCP, with positive externalities across PCs. The higher the level of PC, the more of these externalities are internalized. In contrast, the economic gains are private and fully internalized by the PCs. Hence, higher-level PCs may have a higher α.

This value may also differ for cultural and historical reasons. In some areas of China, the CCP has traditionally been strong. We define a variable called *CCPstronghold*, which equals the share counties touched by the Long March 1933-1935 or that were a part of a CCP Soviet

in 1933. Other areas have a more pro-business or western tradition. We define the variable TreatyPorts for prefectures conceded by the Qing dynasty to Western powers 1840 to 1910. In these prefectures, Westerners established municipal authorities, factories, schools, police and judiciaries. Finally, we include the variable with the number of newspapers in 1895 to capture a history of having newspapers irrespective of cultural inclination, distance to Beijing and latitude.

Table 11 shows the results from regressing our newspaper bias index on these variables. The first column shows the cross-sectional correlations, including only year fixed effects. Newspapers in areas with larger advertising revenues have lower bias. Areas that previously were Treaty Ports have lower bias while newspaper in historical CCP strongholds have higher bias. It is interesting that bias can be predicted based on these factors, but these are just suggestive cross sectional correlations and we do not want to interpret these as causal effects. These cross-sectional correlation could arise e.g. because of underlying cultural differences affecting both variables. The second column adds prefecture fixed effects.

Notably, there is no time-series correlation between bias and the size of the advertising market. Prefectures with a larger economic growth over the past decade have not experienced a fall in newspaper bias. The aggregate numbers tell a similar story. During the 2000s, there was a tremendous increase in the size of the advertising market, growing from 25 to 40 RMB Billion. Despite this, we see no trend in newspaper bias.

The final column shows the variables related to the extensive margin bias: Party Committee level and newspaper type. The regression includes prefecture by year fixed effects, so it is effectively comparing the bias of different newspapers in the same market and year. Lower level Party Committees run less biased newspapers. Central level papers are most biased, followed by provincial and prefecture level newspapers. This indicates that higher-level governments care more about political effects, i.e. have higher α's. Party Dailies are significantly more biased than Evenings, which are more biased than Subsidiaries although not significantly so.

To sum up, higher-level PCs have significantly more-biased newspapers. Newspaper types also matter strongly, with Dailies being more biased than Evenings, which in turn are more biased than Subsidiaries. These effects are reasonably well identified using regressions with prefecture-by-year fixed effects. In the time-series, we know from the previous section that bias in existing papers responds to competition. We now found that it is not strongly correlated with changes in the size of the advertising market. In the cross-section, bias is related to the size of the advertising market, whether the prefecture is a CCP stronghold or was a Treaty Port. These coefficients do not have a causal interpretation. It could, for example, be that CCP strongholds were different than other areas before being touched by the long march, for example, having an ex ante proximity to Communist ideas, and that bias is different for these reasons. However, the CCP stronghold and Treaty Port variables are

still useful in predicting what areas would have higher bias, given similar sized advertising markets. We will use this in the entry analysis below, because bias decisions are linked to entry decisions. For this purpose, we compute the expected political value of bias as the sum of the Treaty Port and CCPstronghold variables, multiplied by their coefficients in Column I.

5.3.2 Extensive Margin Bias

Newspaper entry is very important for bias exposure. The lions share of the variation in bias is explained by the newspaper type and level of government. A total of 57% of the variance in bias is due to newspaper type alone (Party Daily, Evening, Subsidiary), and 70% of the variance is due to the newspaper type and the level of government. One possible explanation for the fact that so much of the variation in bias is explained by newspaper type is that the institutional arrangements that follow with newspaper types are very important. In addition, newspaper entry also affects intensive margin bias through competition.

Sequence of entry in capital cities We now analyze the sequence of newspaper entry in the 27 provincial capital city prefectures that are not provincial level cities (the latter excludes Beijing, Chongqing, Shanghai and Tianing). The capital cities are the main markets of the prefecture PCs of those cities, as well as the PC of that province. Both PCs can start Dailies, Evenings and Subsidiaries.

We now investigate hypothesis H3 regarding entry sequencing. Our intensive margin analysis indicate that provincial PCs care more about the political effects of bias than the prefectural PCs. Hypothesis H3 then implies that in the same market, the provincial PC should enter first, with a Daily, and the prefectural PC should be the first to launch an Evening. The intuition is the following. Entry with a highly controlled Party Daily yields a double dividend of profits and political influence, and the party committee who cares most about political influence will enter first. Entry with an Evening yields increasing profits but destroys political influence, because the Evening steals audience from the Daily. Hence, the Party committee who cares least about political influence will enter with an Evening first.

Tables 12 and 13 shows the market configuration by year and transition matrix in the 27 provincial capital city prefectures that are not provincial level cities. The market configuration is described by four variables indicating whether there exists a Provincial Daily, Provincial Evening or Subsidiary, Prefecture Daily, and Prefecture Evening or Subsidiary). For example, 1000 mean that the only paper is a Provincial Party Daily, while 1001 means that the market has a Provincial level Daily and at least one Prefecture level Evening or Subsidiary.

This entry sequence holds in 25 provincial capital city markets out of 27. In 1981, at the start of our sample period, all markets had a Provincial Daily. In seven prefectures, this paper had no competition (1000), in seven prefectures it was competing with a Prefecture level Evening or Subsidiary (1001) and in eleven prefectures, it was competing with a Prefecture level Daily. In two prefectures, Guangzhou and Kunming, the provincial level also had an Evening or Subsidiary. These cities had well-developed newspaper markets even before 1950. For example, in the Guangzhou prefecture, Yangcheng Evening News (provincial level) was founded in 1950s and resumed its publication after the cultural revolution.

Table 13 shows the transition matrix. All seven markets who started out with a monopoly Provincial Daily saw the entry of a Prefecture Evening or Subsidiary (1000 to 1001). This was followed by the entry of a Provincial Evening or Subsidiary (1001 to 1101) and then Prefecture Daily (1101 to 1111). Those who started out with Party Dailies by both levels, first saw an entry of a Prefecture and then a Province Evening or Subsidiary.

Entry Outside Capital Cities We now turn to the other markets, where prefecture PCs compete with county PCs who can start Dailies. Here H4 proposes that advertising market size (R) should drive entry of all newspaper types, while PCs with high political valuation of bias (α) should start prefecture Dailies early (at low levels of R) and start prefecture Evenings late (at high levels of R). The political valuation of bias of county PCs should not affect entry.

We analyze entry in these market using ordered probit regression on the number of newspapers. This approach also allows us to estimate threshold entry levels of advertising market size (similar to e.g. Brenahan and Reis, 1991). The analysis covers the years 1987–1991 and 1994-2010, because we only have prefecture level GDP for those years. The average number of prefectures per year is 213.

We first analyze the entry of Evenings and Subsidiaries in these markets. The first column of Table14 shows the results from an ordered probit regression of the number of Evenings and Subsidiaries in a prefecture and year on the (log) value of the advertising market and the expected political value based on the Treaty Port and CCPstronghold variables from the bias regressions in Table 11. The following column shows the result from a regression that includes year and prefecture fixed effects and hence exclude time-constant prefecture characteristics. The following four columns show the analogous regressions for prefecture and county Party Daily newspapers.

The advertising market size is positively related to the number of prefecture Evening and Subsidiary papers and the number of county Dailies, both in the cross section and in the time series. In contrast, advertising market size is not related to the entry of Party Dailies. It thus seems that growing advertising markets influence newspaper bias at the extensive

margin, albeit not at the intensive margin.

The size of the coefficient on log Advertising revenue implies that a one percent increase in the size of the advertising market is associated with a .23 percent increase in the probability of having at least one Evening or Subsidiary paper. In 1990, 95% of the prefectures had no Evening or Subsidiary paper. This fell to 40% in 2010. The estimates in column III implies that the growing advertising market should have implied a fall by 75%, which is larger than the actual 55%. In a related study, Genovese (2000) studies how the number of newspaper firms in US cities 1940-1980 depend on the population in the county of the newspaper. His estimated coefficient on log population is around 1. Our estimates are around .9 on the same scale and so are very comparable.[18]

In prefectures where we expect that the political value of bias is high, because they were historically CCP strongholds and were not Treaty Ports, Party Dailies enter early and Evenings and Subsidiaries enter late. This is consistent with the hypothesis that Party Dailies create political value and Evenings and Subsidiaries destroy it. H4 asserted that the entry of county Dailies should not be affected by the expected political value. At the time of entry, there already exists a prefecture Daily. The county Daily will steal some of its audience and there will be no net effect on bias exposure. In the data, entry is insignificantly negatively related.

In sum, there is strong evidence that the size of the advertising market drives entry of commercial newspaper and county Dailies. A high valuation of bias, is correlated with early entry of prefecture Dailies and late entry of prefecture Evenings. We expected no correlation with entry of county Dailies. The estimated effect for the county Dailies is negative and insignificant.

5.4 Value of Newspaper Bias

We can also use the entry model to learn about the decision makers valuation of the political damage caused by the Evenings. According to the model, the Evening enters when the increased advertising profits just cover the cost of entry plus the political cost of less bias exposure. The increased advertising revenue is net of loss of sales incurred in Party Daily (what Shaked and Sutton, 1991, call the expansion effect). In our data, Evenings and Subsidiaries have around 5 times higher advertising revenues than Dailies, in the same market. This means that the expansion effect can be at most 5/6 of the market. Hence 5/6 of the advertising market at entry is an upper bound on the PCs valuation of the political damage caused by the Evening.

The threshold advertising market size at which newspapers enter can be computed from

[18] We use a log10-scale, so our coefficients should be divided by ln(10)=2.3 to be comparable.

the ordered probit regression. The estimation gives thresholds $\widehat{\gamma}$ and coefficients $\widehat{\beta}$ such that, for example, the PC i in year t has no Evening or Subsidiary paper if

$$\widehat{\beta}_1 R_{it} + X'_{it}\widehat{\beta} + u_{it} < \widehat{\gamma}_0,$$

where u_{it} is distributed as a standard normal. We compute thresholds in the advertising market size,

$$\widehat{\overline{R}}_{it} = \left(\widehat{\gamma}_0 - X'_i\widehat{\beta}\right)/\widehat{\beta}_1.$$

In general, these thresholds vary across time and prefectures because the variables in X_{it} do. For example, entry thresholds fall after the policy changes in 1992. We report the sample average thresholds,e.g., for having at least one Evening or Subsidiary.

These values are shown in Table 15. Outside of the provincial capitals, the first commercial paper enters when the newspaper advertising market is worth around RMB 33 million. This means that, to the PCs, the average value the political damage caused by entering with an Evening paper at 33*5/6=27 RMB million. This is a small fraction of total income, around 0.1%, as well as of local government budgets. Still, it is a huge amount compared to individual incomes, and also ten times larger, relative to income, than total lobbying contributions to all members of the US Congress. For incentives from newspaper advertising revenue to matter, there must be a considerable difference between private and national CCP incentives.

The threshold for entry of the second Evening or Subsidiary is ten times as high, at RMB 310 million. The likely reason is that the expansion in total demand by adding an additional commercial paper is not very high. An alternative explanation could be that having more newspapers lowers advertising prices, so that the value of the advertising market is less than proportional to GDP as the second commercial paper enters. However, this is an unlikely explanation since all papers have the same ultimate owner.

We can also estimate how much more the PCs in CCP strongholds value the political cost caused by the Evenings entering. We compute thresholds using the political value when the CCP variable is increased by one The average of these thresholds for entering with a first paper is then increased to RMB 51 million. In Treaty Ports, the threshold is lowered to RMB 26 million. This means that PC members in CCP strongholds value the political cost caused by the Evenings around 80% higher than other areas, whereas Treaty Port prefectures value them around 25% lower.

Finally, the model suggest that a market stealing externality would induce early entry of Evenings in the provincial capital cities. Our estimates suggest that Evenings enter in these markets at much lower advertising revenues. However, these estimates are imprecise as they are based on a much smaller sample. We tried including the number of county level papers

in the regressions. However, these do not seem to matter for entry, perhaps because they are restricted to the Daily format.

5.5 Trends

We will now display the trends in newspaper bias implied by newspaper entry, assuming that the bias is constant within newspaper type and level of government. This will give an idea of the magnitudes in our estimated effects. It also makes some sense since most of the variation in bias in our sample period is explained by the extensive margin of newspaper bias. We will also show the effect of competition on bias as this is the only time-varying factor that we found to explain variation in intensive margin bias.

Figure 8 shows the development of newspaper bias implied by newspaper entries and exits. The implied change in our newspaper bias index is .08, which corresponds to a fall in the number of articles covering top leaders from 20 to 12.5 percent. This is the unweighted average across newspapers. The red line weights each newspaper by its expected advertising revenue, based on the prefecture level population, GDP, type of newspaper and administrative level. This is our best estimate of the readership of each newspaper. Because there are more Evenings and Subsidiaries areas with high advertising revenues, the weighted average is lower, and the fall in the bias is slightly larger measured this way.

The final line shows the average exposure to newspaper bias across readers, rather than the average bias across newspapers. As expected, this has an inverted U-shape. It increases initially because many highly biased Party Dailies are started. From the late 1990s, the decline in the negative trend in average bias dominates and bias exposure falls.

Figure 9 shows the effect of competition on average bias (weighted by expected advertising revenues). Based on our estimates from the reform in 2003, increasing competition from Dailies have increased newspaper bias. To balance the picture, we also show the estimated effect of competing Evenings and Subsidiaries (using OLS). This effect is of similar size (per newspaper) and opposite sign of the effect of the Party Dailies.

6 Conclusions

In autocracies, the governments often strictly control the media and steer them to bias towards the governments. What do autocratic governments use biased media for? In this paper, we present evidence on this inquiry in the setting of China, a country with the largest population and increasing economic significance. We find that, consistent with a popular view that Chinese media are propaganda machines, the mainstream Chinese newspapers carry out a task to facilitate the top-down communication within the government. More-

over, we find that the political control of newspapers in China is used to monitor corruption among local bureaucrats and as an intelligence device for political leaders. This bottom-up communication within governments is less known and has very different implications for political accountability than the top-down communication. Enhancing top-down communication tends to decrease the political accountability at the national level, while enhancing bottom-up communication is useful for improving local accountability. We also find that a large number of Chinese newspapers, mostly owned and managed by local governments, are used to reap the economic benefits caused by the rapidly expanding advertising market.

Our empirical findings point to three key factors that mitigate the political bias of Chinese newspapers: the growth of advertising market, the discrepancy in the valuation of political control between local and national governments, and the competition between local governments. Combined with the evidence on the uses of media, these results have several implications about the trends in media bias and the consequences of media control in China. First, the growth of advertising market per se does not improve the role of media in providing accountability. Our evidence shows that the political bias of the existing newspapers remained stable in the last decade, despite the dramatic growth of advertising markets. In the sufficiently developed advertising markets, the entry of commercial newspapers reduces readers' exposure to biased newspapers, but these commercial newspapers play a limited role in improving national accountability and may decrease local accountability. Second, the information problem and preference discrepancy within the political system that controls the media are crucial for the development of less-biased media. Because of the information asymmetries between the upper-level governments and the lower-level governments, the central government in China has to use a decentralized system to control the media, which leaves local governments substantial autonomy to control the local media. When local governments or government officials have different preferences than the central government, the political control of media is loosened and the media are less biased. The preference discrepancy between governments has its historical roots, but may be affected by education, income growth, and exposure to democracies. Third, competition between governments may facilitate the entry of less-biased newspapers and thus reduce the overall media bias in a market. But the effect of competition on existing newspapers can be intricate, depending on whether newspapers compete for political benefits or for economic benefits.

Some insights from the current study are not only pertinent to the media in China, but also relevant to the provision of public goods in other political systems. Media bias, as a political output, has the nature of a public good. For example, a central government launches a propaganda campaign and produces media bias for regime stability. A local government, as part of the incumbent political system, can benefit from this media bias without paying additional costs. Therefore, the problem of selecting a media bias policy in an authoritarian decentralized regime is similar the problem of selecting policy for a public

good with externality, such as pollution, in a federal system. The local governments will not fully internalize the externality of such a public good and under supply this good. In addition, the competition between multiple local governments for private benefits such as advertising revenues leads to over-use of this revenue source. This is similar to a vertical fiscal externality (Wilson, 1999). Our study shows evidence on both aspects of inefficiency (from the perspective of the central government) in the provision of a public good in a decentralized system: lower-level CPC committees provide less media bias and competition induces entry of commercial media.

The above argument suggests that a public good with externality should be provided by a centralized system. However, there are information and efficiency arguments in favor of decentralization. For example, Local governments are "closer to the people" in their jurisdiction and have an information advantage. There are other reasons to adapt media bias to local considerations, such as ethnic and other tensions. We have shown that local preference heterogeneity matters for media bias. Competition between different CPC committees may also lead to greater efficiency and innovation (see e.g. Gordon, 1983, for an analogous argument regarding federations).

How can a national authoritarian government handle the trade-off between centralization and decentralization in the provision of public good, such as media bias? Our study suggests that this can be achieved in either of two ways: the central governments could run newspapers by themselves and mandate outcomes (a "quantity" control), or by subsidizing (i.e. through matching grants) local CPC committees to start Party Dailies or to produce biased content (a "price" control). As pointed by Weitzman(1974), quantity control will be preferred when the central leaders' benefits are almost kinked at the optimum level of bias, there is a high degree of risk aversion and the center cannot afford being even slightly off the mark, while the cost of producing bias is close to linear. This is a pretty accurate characterization of media bias, with highly non-linear political benefits and close to linear costs, in term of lost advertising revenue.

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Figure 1. General interest newspapers 1981-2011, Aggregate Data

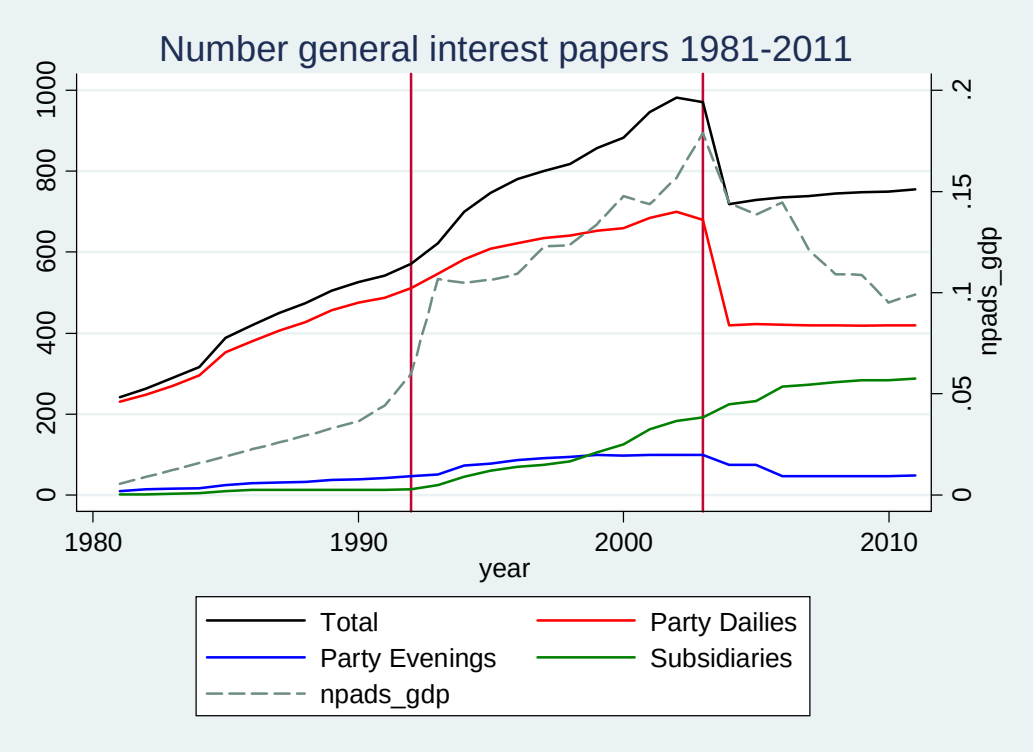


Figure 2. General interest newspapers 1981-2011, by administrative level,

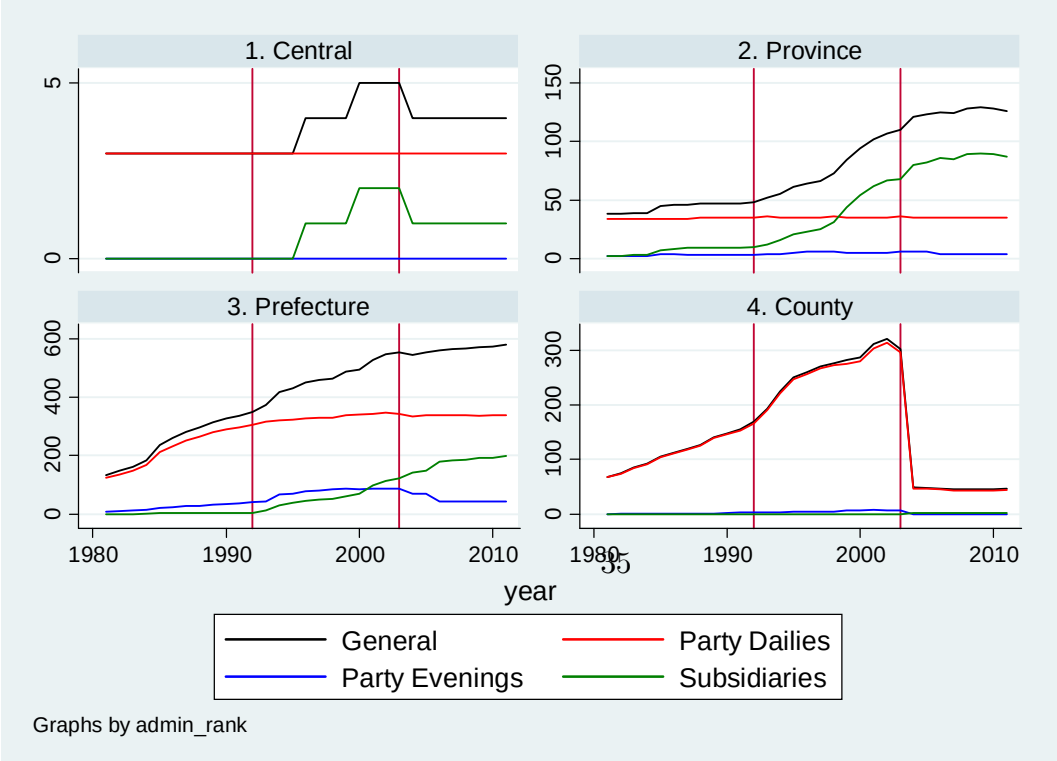


Figure 3. Interpretation of first principal component

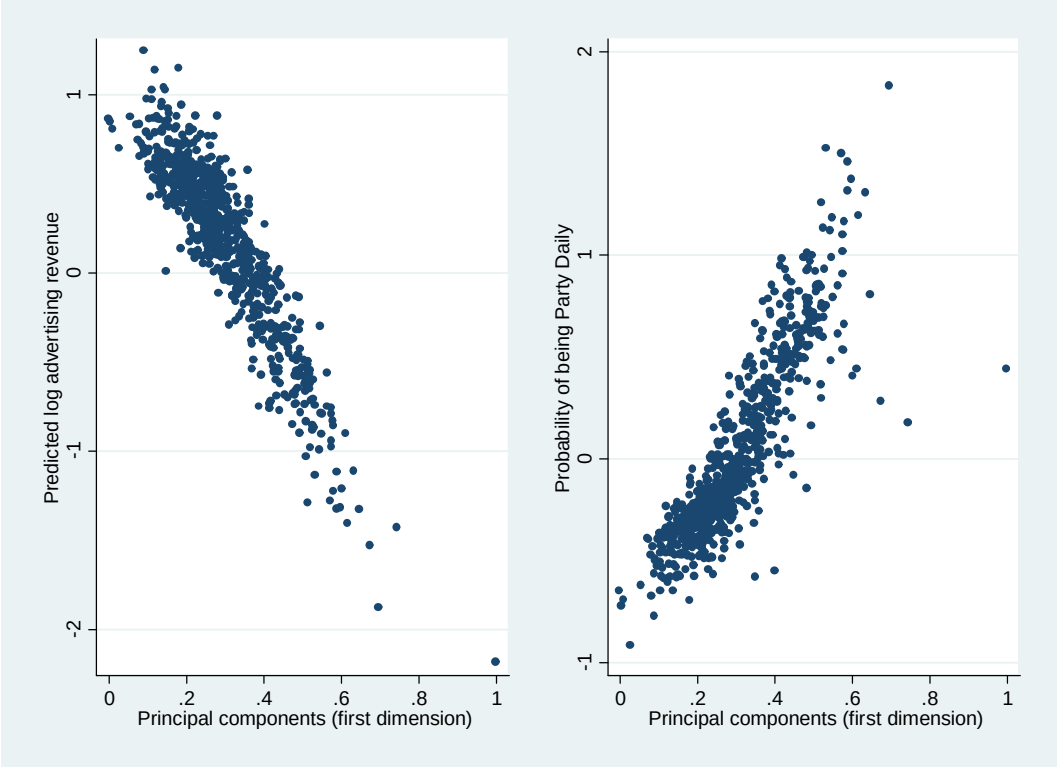


Figure 4. Newspaper Bias and Censorship of Social Media

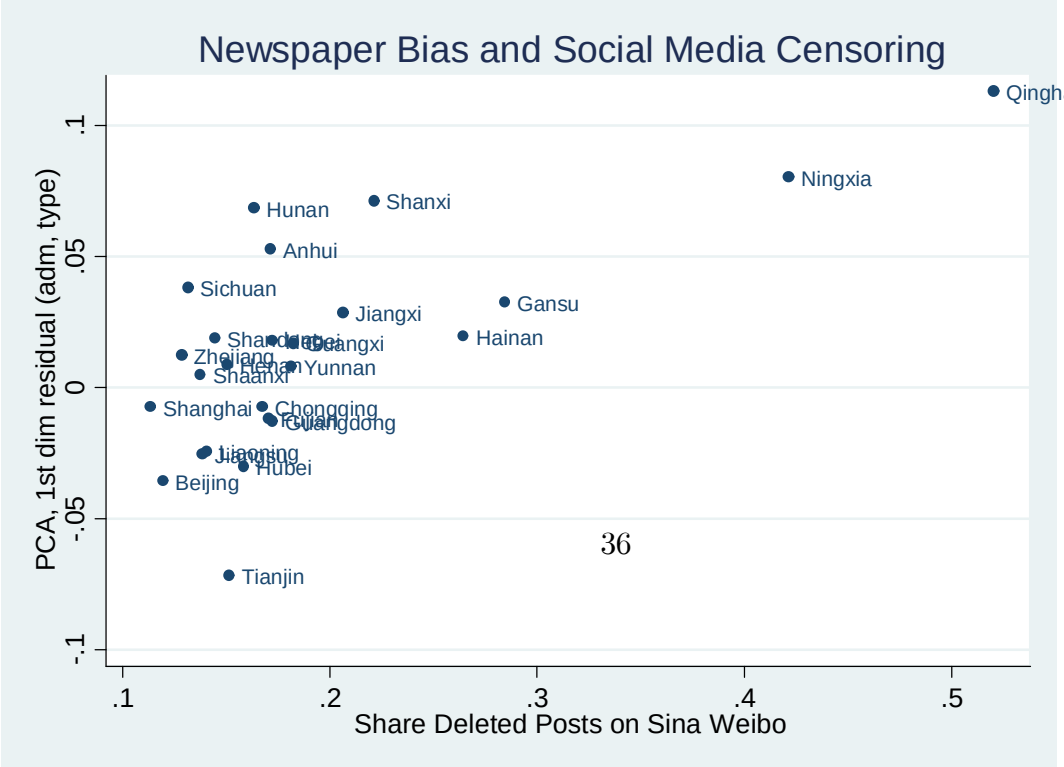


Figure 5. Newspaper Bias by Newspaper Type

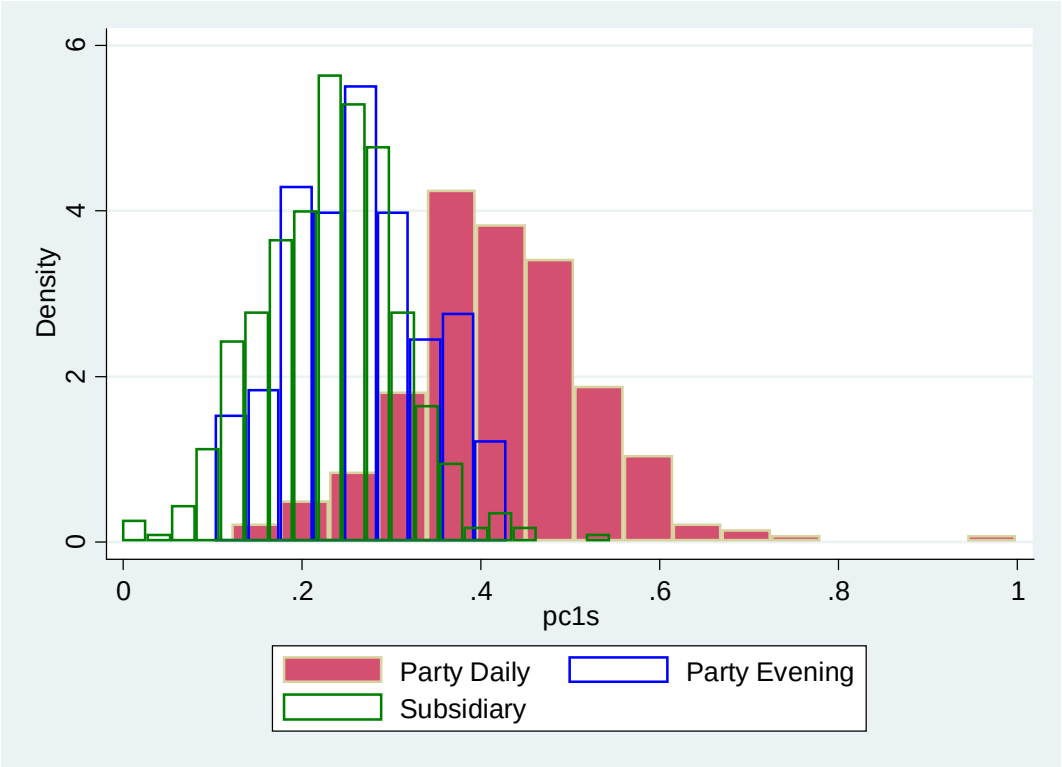


Figure 6. Content loadings in three bias measures

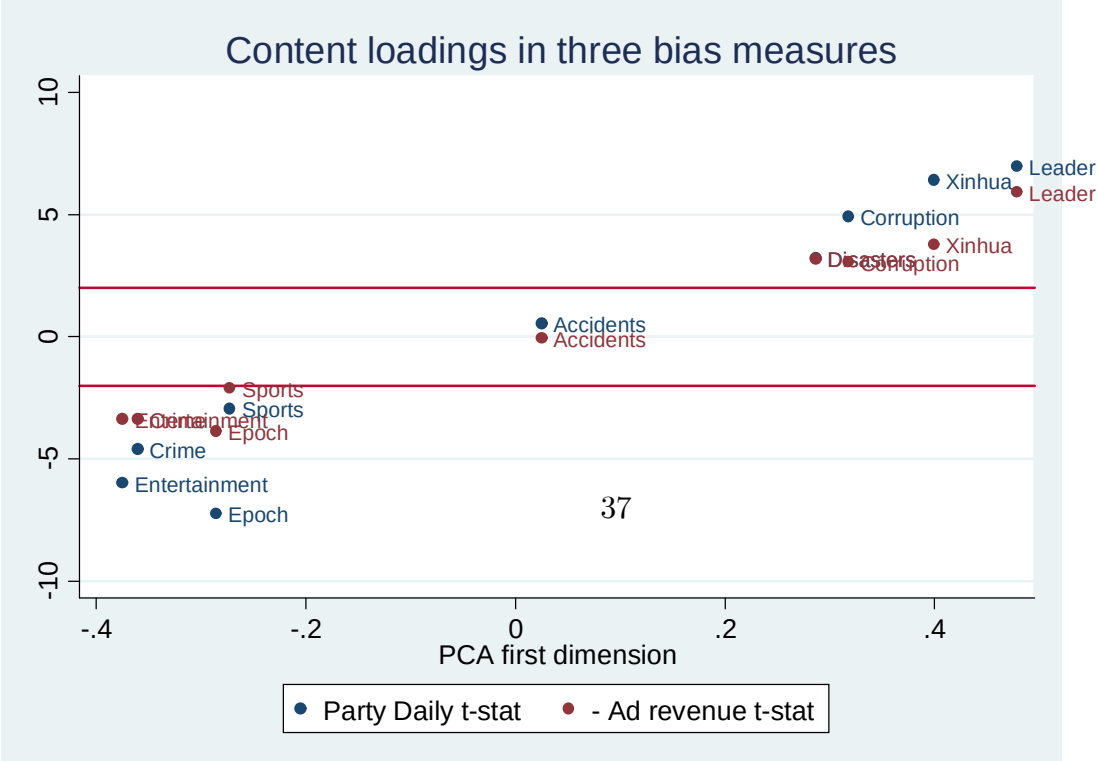


Figure 7. Effect of 2003 reform

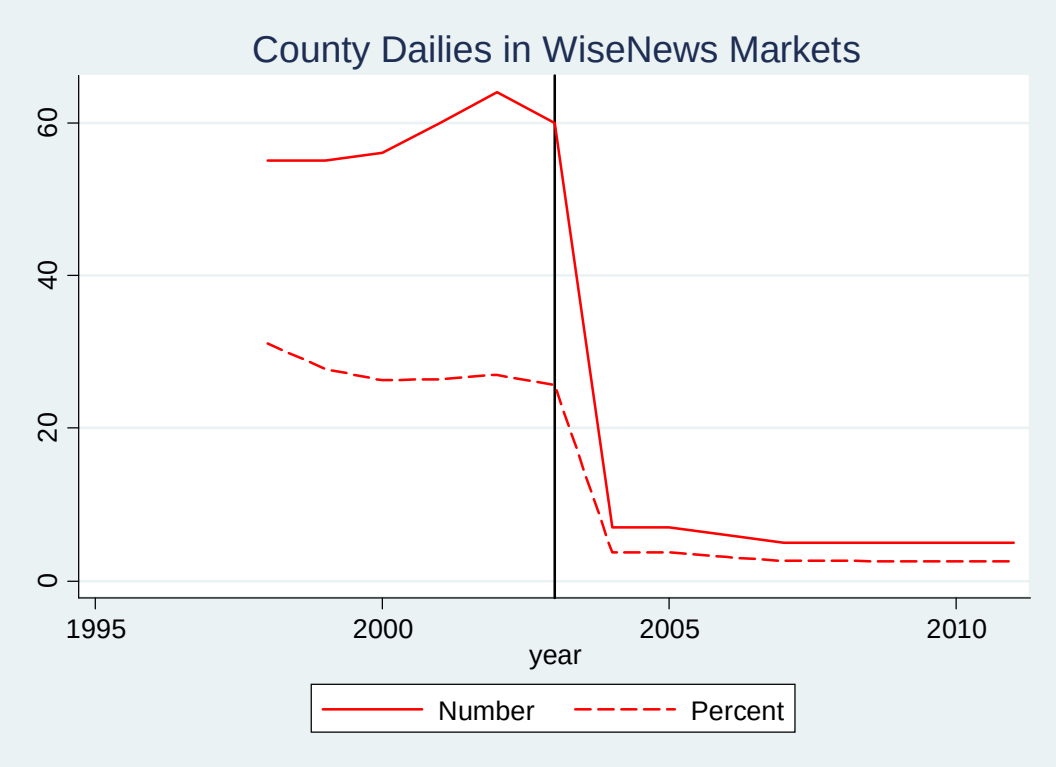


Figure 8. Trend in newspaper bias implied by entry and exits

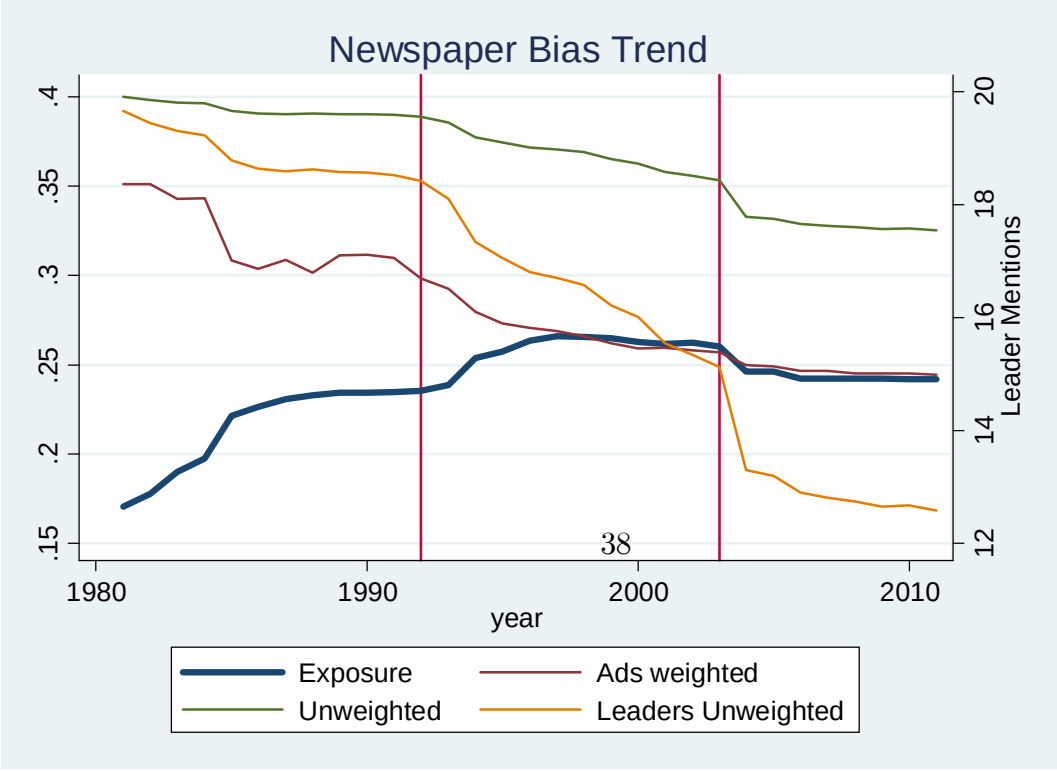


Figure 9. Effects of competition on bias

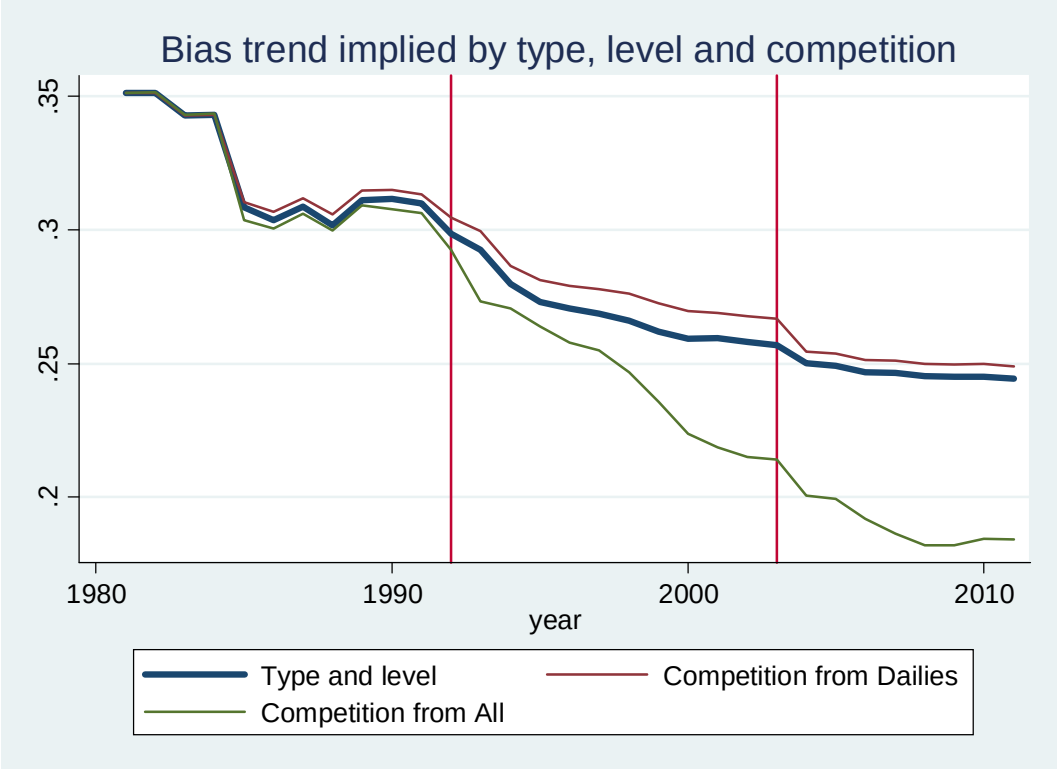


Table 1. Number general interest newspapers in WiseNews

	daily	evening	metro	Total
parent newspaper	**2**	**16**	**40**	58
party	**37**	**12**	**3**	52
Total	39	28	43	110

Table 2. Number general interest papers by year

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Freq	81	76	79	82	73	71	74	104	81	53	774

Table 3. Summary Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Leader Mentions	774	11.36	12.10	0	83.48
Xinhua Cites	774	23.95	15.35	0.102	86.07
Epoch Stories	774	23.55	14.49	0	51.62
Corruption	774	0.158	0.0930	0	0.621
Disasters	774	0.526	0.717	0	9.202
Accidents	774	0.112	0.104	0	0.876
Sport	774	6.445	2.856	0	21.01
Entertainment	774	12.64	4.900	2.618	34.16
Crime	774	0.523	0.349	0	1.985
Total number of articles	774	19,844	13,948	311	104,240

Table 4. Principal components analysis

Component	Eigenvalue	Proportion	Variable	Comp1
Comp1	3.38	0.38	Leader Mentions	0.48
Comp2	1.49	0.17	Xinhua cites	0.40
Comp3	1.07	0.12	Epoch Stories	-0.29
Comp4	0.80	0.09	Corruption	0.32
Comp5	0.67	0.07	Disasters	0.29
Comp6	0.61	0.07	Accident	0.03
Comp7	0.43	0.05	Sports	-0.27
Comp8	0.32	0.04	Entertainment	-0.37
Comp9	0.23	0.03	Crime	-0.36

Table 5. Advertising Revenue and Party Daily, WiseNews Sample

	Log Advertising Revenue				Party Daily	
	I	II	III	IV	V	VI
GDP per capita (log)	0.307***	0.208**				
	(0.085)	(0.080)				
Population (log)	0.438***	0.240***				
	(0.106)	(0.079)				
PCA first dimension		-2.831***	-3.639***		3.439***	
		(0.418)	(0.456)		(0.206)	
Observations	402	402	402	402	773	773
R-squared	0.366	0.547	0.784	0.804	0.697	0.754
Sample	WiseNews	WiseNews	WiseNews	WiseNews	WiseNews	WiseNews
Fixed Effects	Year and Level	Year and Level	Prefecture-by-Year and Level	Prefecture-by-Year and Level	Prefecture-by-Year	Prefecture-by-Year
Content categories				All		All

Robust standard errors clustered by newspaper in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Bias by Newspaper

Rank	Political Use	Newspaper name	Newspaper type	Level	Province	Prefecture
1	0.60	QINGHAIDAILY	Party Daily	province	Qinghai	Xining
2	0.56	GANSUDAILY	Party Daily	province	Gansu	Lanzhou
3	0.54	ANHUIDAILY	Party Daily	province	Anhui	Hefei
4	0.54	NINGXIADAILY	Party Daily	province	Ningxia	Yinchuan
5	0.51	PEOPLE'SDAILY	Party Daily	central	Beijing	Beijing
6	0.51	SHANXIDAILY	Party Daily	province	Shanxi	Taiyuan
7	0.50	SICHUANDAILY	Party Daily	province	Sichuan	Chengdu
8	0.50	YUNNANDAILY	Party Daily	province	Yunnan	Kunming
9	0.49	JIANGXIDAILY	Party Daily	province	Jiangxi	Nanchang
10	0.49	HUBEIDAILY	Party Daily	province	Hubei	Wuhan
100	0.19	DUSHISHIBAO	Party Evening	prefecture	Yunnan	Kunming
101	0.19	JINWANBAO	Party Evening	province	Tianjin	Tianjin
102	0.19	JINLINGEVENINGNEWS	Subsidiary	prefecture	Jiangsu	Nanjing
103	0.19	INFORMATIONTIMES	Subsidiary	prefecture	Guangdong	Guangzhou
104	0.16	WUHANMORNINGPOST	Subsidiary	prefecture	Hubei	Wuhan
105	0.15	WUHANEVENINGNEWS	Subsidiary	prefecture	Hubei	Wuhan
106	0.14	LIAOSHENEVENINGNEWS	Subsidiary	province	Liaoning	Shenyang
107	0.13	BEIJINGEVENINGNEWS	Subsidiary	province	Beijing	Beijing
108	0.12	THEFIRST	Subsidiary	province	Beijing	Beijing
109	0.12	YOUTHEXPRESS	Subsidiary	central	Beijing	Beijing
110	0.01	BEIJINGDAILYMESSENGER	Subsidiary	province	Beijing	Beijing

Table 7. Content by Newspaper Type

	I	II	III	IV
	Party Line			
	Leader Mentions	Xinhua Cites	Epoch Stories	Number Articles
Party Daily	23.04	34.75	20.67	16,460
Party Evening	7.08	24.00	22.93	20,328
Subsidiary	5.01	17.24	25.44	21,841
	Mass Line			
	Corruption	Disasters	Accidents	
Party Daily	0.20	0.67	0.12	
Party Evening	0.15	0.44	0.13	
Subsidiary	0.13	0.46	0.10	
	Bottom Line			
	Sports	Entertainment	Crime	
Party Daily	5.76	10.68	0.31	
Party Evening	6.91	12.97	0.70	
Subsidiary	6.77	13.78	0.62	

Table 8

Panel A: Content and Newspaper Type

VARIABLES	Leader Mentions	Xinhua Cites	Epoch Stories	Corruption	Disasters	Accidents	Sport	Entertainment	Crime
Party Daily	18.708***	14.954***	-5.011***	0.066***	0.238***	0.005	-1.144***	-2.934***	-0.340***
	(2.702)	(2.340)	(0.689)	(0.013)	(0.075)	(0.009)	(0.385)	(0.486)	(0.073)
Observations	774	774	774	774	774	774	774	774	774
R-squared	0.706	0.800	0.893	0.620	0.779	0.699	0.698	0.793	0.649

Panel B: Content and Advertising revenue

VARIABLES	Leader Mentions	Xinhua Cites	Epoch Stories	Corruption	Disasters	Accidents	Sport	Entertainment	Crime
Adv. Rev.	-14.883***	-8.604***	4.294***	-0.053***	-0.259***	0.001	1.048**	1.952***	0.248***
	(2.527)	(2.302)	(1.099)	(0.018)	(0.082)	(0.010)	(0.492)	(0.573)	(0.073)
Observations	403	403	403	403	403	403	403	403	403
R-squared	0.690	0.783	0.855	0.674	0.875	0.798	0.761	0.790	0.768

Standard errors clustered by prefecture in parenthesis: *** p<0.01, ** p<0.05, * p<0.1. All specifications control for prefecture-by-year fixed effects.

Table 9. Dependent variable: Newspaper Political Use Index

	I	II	III	IV
Reform	-0.005**	-0.004*	0.012**	0.014***
	(0.002)	(0.002)	(0.005)	(0.005)
Party Evening * Reform			-0.023***	-0.023***
			(0.005)	(0.005)
Subsidiary * Reform			-0.020***	-0.021***
			(0.005)	(0.005)
Observations	722	722	722	722
R-squared	0.845	0.850	0.850	0.856
Controls	No	Yes	No	Yes
Fixed Effects	Newspaper and Year	Newspaper and Year	Newspaper and Year	Newspaper and Year
Party Evening			0.017	0.025
Subsidiary			0.003	0.005

Standard errors clustered by prefecture in parenthesis: *** p<0.01, ** p<0.05, * p<0.1
Controls include GDP, population, wage, industrial share of GDP, real FDI, number university students, number employees, total government expenditures, number internet users.

Table 10. Dependent variable: : Newspaper Political Use Index

	I	II	III	IV
Reform 2002	-0.003	-0.002	-0.003	-0.003
	(0.006)	(0.006)	(0.006)	(0.006)
Reform	0.013**	0.015**	0.009*	0.009*
	(0.006)	(0.006)	(0.004)	(0.005)
Reform 2004			0.005	0.007
			(0.007)	(0.007)
Party Evening * Reform 2002	-0.003	-0.004	-0.003	-0.004
	(0.007)	(0.007)	(0.007)	(0.007)
Party Evening * Reform	-0.021***	-0.021***	-0.013***	-0.013***
	(0.007)	(0.007)	(0.004)	(0.004)
Party Evening * Reform 2004			-0.009	-0.010
			(0.008)	(0.008)
Subsidiary * Reform 2002	-0.002	-0.002	-0.002	-0.002
	(0.006)	(0.006)	(0.007)	(0.007)
Subsidiary * Reform	-0.019***	-0.020***	-0.013***	-0.013***
	(0.007)	(0.007)	(0.004)	(0.004)
Subsidiary * Reform 2004			-0.007	-0.007
			(0.006)	(0.006)
Observations	722	722	722	722
R-squared	0.851	0.856	0.851	0.856
Controls	No	Yes	No	Yes
Fixed Effects	Newspaper and Year	Newspaper and Year	Newspaper and Year	Newspaper and Year

Standard errors clustered by prefecture in parenthesis: *** p<0.01, ** p<0.05, * p<0.1
Controls include GDP, population, wage, industrial share of GDP, real FDI, number university students, numbe
employees, total government expenditures, number internet users.

Table 11. Dependent variable: Newspaper bias

	I	II	III
Province	-0.052***	-0.077***	-0.075***
	(0.015)	(0.011)	(0.014)
Prefecture	-0.095***	-0.131***	-0.129***
	(0.017)	(0.017)	(0.022)
Party Evening	-0.146***	-0.159***	-0.164***
	(0.017)	(0.015)	(0.018)
Subsidiary	-0.187***	-0.186***	-0.186***
	(0.015)	(0.016)	(0.020)
Newsp Ad Mkt (log10 RMB)	-0.042**	-0.019	
	(0.017)	(0.130)	
Treaty Port	-0.027**		
	(0.013)		
CCP stronghold	0.054***		
	(0.013)		
Number of papers 1895	-0.000		
	(0.001)		
Distance to Beijing	-0.000		
	(0.000)		
Latitude	-0.002**		
	(0.001)		
Longitude	-0.001		
	(0.001)		
Observations	774	774	774
R-squared	0.667	0.708	0.782
Fixed Effects	Year	Year and Prefecture	Year by Prefecture
Province = Prefecture	0.000	0.000	0.001
Evening = Subsidiary	0.021	0.096	0.233

Table 12. Market structure in provincial capitals (Prov D, Prov ES, Pref D, Pref ES)

year	1000	1001	1010	1011	1100	1101	1110	1111	Total
1981	7	7	11		1		1		27
1982	6	8	10	1	1		1		27
1983	5	9	9	1	1		2		27
1984	4	10	9	1	1		2		27
1985	3	10	5	4	1	1	1	2	27
1986	2	11	2	6	1	1	2	2	27
1987	2	11	1	6	1	1	3	2	27
1988	2	11	1	6	1	1	3	2	27
1989		13	1	6		1	4	2	27
1990		13	1	6		1	3	3	27
1991		13	1	6		1	3	3	27
1992		13	1	5		1	3	4	27
1993		12	1	4		2	1	7	27
1994		10	1	4		3	1	8	27
1995		8	1	3		5	1	9	27
1996		7		4		6	1	9	27
1997		7		3		6	1	10	27
1998		5		2		8	1	11	27
1999		3		1		7	1	15	27
2000		2				8	1	16	27
2001						10		17	27
2002						7	1	19	27
2003						8	1	18	27
2004						7	1	19	27
2005						8		19	27
2006						7		20	27
2007						7		20	27
2008						7		20	27
2009						7		20	27
2010						6		21	27
2011						6		21	27
Total	31	183	55	69	8	133	39	319	837

Table 13. Market structure transition matrix in provincial capitals

	1000	1001	1101	1010	1011	1100	1110	1111	Total
1000	24	7							31
1001		169	13					1	183
1101			118				2	7	127
1010				44	7		3	1	55
1011				47	62			7	69
1100						7	1		8
1110			1				32	6	39
1111			1					297	298
Total	24	176	133	44	69	7	38	319	810

Table 14. Dependent variable: Number of Newspapers

	I	II	III	IV	V	VI
Advertising Mkt (log)	1.980***	0.660**	0.327	0.030	1.538***	2.078***
	(0.238)	(0.271)	(0.231)	(0.076)	(0.205)	(0.624)
Number papers in 1895	0.087		0.234**		-0.037	
	(0.089)		(0.106)		(0.035)	
Expected political value	-7.250**		10.253**		-6.275	
	(3.537)		(4.048)		(3.963)	
Observations	4,677	4,677	4,677	4,677	3,333	3,333
R-squared		0.767		0.718		0.867
Sample	Non-capitals	Non-capitals	Non-capitals	Non-capitals	Before 2003	Before 2003
Fixed Effects	Year	Year and Pref	Year	Year and Pref	Year	Year and Pref
Dep Var	Pref ES	Pref ES	Pref PD	Pref PD	County PD	County PD

Table 15. Estimated value of advertising market at entry (RMB Million)

		I	II	III	IV	V	VI
Cut	1	33	51	26	4	1	17
Cut	2	313	489	249	124	345	47
Cut	3	1,224	1,913	975	1,198	7,227	125
Cut	4	3,095	4,838	2,465	4,163		215
Cut	5			0	23,945		384
Cut	6						884
Cut	7						1,079
Cut	8						1,408
Level		Pref	Pref	Pref	Prov	Pref	County
Capitals		No	No	No	Yes	Yes	
Type			CCP stronghold	TreatyPort	Prov	Pref	County Dailies