

(For Online Publication) Empirical Appendix to Media Bias in China

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A1. Sample of Newspaper Content

The newspaper content that we use is collected from WiseNews during the 1999-2010 period. WiseNews is a daily updated information service provided by Wisers Information Limited in Hong Kong. It contains content from over 600 large newspapers, magazines, and websites from the Greater China region (Mainland China, Hong Kong, Macao and Taiwan) and the United States. A total of 289 newspapers published in Mainland China are available from 1999 to date. Among these publications, 269 newspapers match the newspaper directory that we constructed, and 117 of them are general interest newspapers that we use in this paper for content analysis. The data provider states that it selects important and influential papers from large cities. Geographically, the 117 papers are published in 22 provincial capital cities, 4 municipalities under the direct control of the central government (i.e., Beijing, Shanghai, Tianjin, Chongqing), and 9 economically well-developed prefectures.

The WiseNews sample is representative of newspaper markets in large metropolitan areas. We compare it with a sample of all general-interest newspapers that are published in the 27 provincial capital cities and the 4 municipalities directly under the central government and appear in the comprehensive newspaper directory we construct. Given that the WiseNews sample does not contain any county-level papers, we exclude county-level papers from this comparison sample. Table A1 below shows the shares of newspapers by the newspaper type (Party Daily, Party Evening, and Subsidiary) and by their administrative rank (central, province, and prefecture) in the WiseNews sample and in the sample of the newspaper directory. These shares are relatively similar across these samples. Along these dimensions, the WiseNews sample represents the newspaper markets in the provincial capital cities.

Table A1. Comparison of Newspaper Composition

	WiseNews (n=117)	Newspaper directory (n=206)
Type	Percent	Percent
Party Daily	34.19	27.67
Party Evening	10.26	8.74
Subsidiary	55.56	63.59
Total	100	100
Administrative rank		
Central	4.27	4.37
Province	60.68	63.11
Prefecture	35.04	32.52
Total	100	100

A2. Search Keywords

For all the nine content categories presented in the paper, we search the relevant key words in the digital archives of the newspapers in WiseNews from 1999 to 2010.

Total number of articles: To count the total number of articles by newspaper and year, we search for a string that is used in nearly all articles. The string we search for is : any digit from 0-9 or “日” (“day”) or “不” (“No”). The variables listed below except for Epoch Stories are expressed in percentage of the total articles (the ratio of the number of each category of articles to the total number of articles in a newspaper within one year multiplied by 100).

Key words relating to the Party Line

(1) **Leader Mentions** To count the number of articles mentioning political leaders, we collect the positions and names of 108 leaders in Political Bureau of the CCP Central Committee and the affiliated Commissions, leaders in State Council (central government) with rank equal to or above the Minister level, 816 provincial Governors and Party Secretaries (including vice titles), and 1187 prefectural Mayors and Party Secretaries (including vice titles) during the 1999- 2011 period. We then search for the combination of their names and positions from one year before to the last year of every leader’s official term. Finally, we record the total number of articles that mention these word strings at the newspaper-year level.

(2) **Xinhua Cites** We search for the string “新华社” (Xinhua News Agency) in WiseNews and record the total number of articles that mention it at the newspaper-year level.

(3) **Epoch Stories** We select the top 10 annual events listed by Xinhua News from 2001 to 2010 and the top 10 annual events listed by the Epoch Times from 2002 to 2010. The Epoch Times is published and circulated outside China and is regarded as the most anti-CCP newspaper. We search for key words related to these events in WiseNews and record the total number of relevant articles at the newspaper-year level. We then calculate the ratio of the number of articles covering top events listed by the Epoch Times to the total number of articles covering top events listed by either Xinhua News or the Epoch Times. The variable is defined by multiplying this ratio by 100.

Key words relating to the Mass Line

(4) **Corruption** The number of articles covering corruption is obtained by searching keywords that identify corruption cases but not corruption speeches by politicians and government officials. The strings we use include the key words "(腐败 或 贪污 或 受贿 或 金钱) and (双规 或 调查 或 审查 或 检察机关) and (免去 或 罢免 或 查处 或 惩处 或 撤消 或 撤除)." The corresponding English translation is ("(corruption or embezzle or bribed or money) and (dual-discipline – a word

specifically used by governments or CCP organs – or investigate or examine or prosecutor) and (replace or dismiss or prosecute or punish or revoke or rescind).

(5) & (6) Disaster & accident stories. We obtain disaster data from EM-DAT, an international disaster database. We select 226 disasters with more than 30 fatalities that took place in China from 1998 to 2011. The search uses keywords that identify each disaster, and the search is limited to a time window from two days before to 40 days after an event. Among these 226 disasters, we distinguish between natural disasters (97 cases) and accidents (non-natural disasters, 129 cases). Accidents include transportation accidents and industrial accidents.

Key words relating to the Bottom Line

(7) Sports The keyword strings we use are "体育比赛 or 运动会 or 足球 or 篮球 or 乒乓球 or 羽毛球 or ((游泳 or 蛙泳 or 蝶泳 or 仰泳 or 自由泳) and 比赛) or 排球 or (田径 and 比赛) or 长跑 or 短跑 or 冬泳 or 保龄球 or 网球 or 台球 or 桌球". ("sports competition or Games or football or basketball or Ping-Pong or Badminton or ((swimming or breaststroke or butterfly or backstroke or crawl) and competition) or volleyball or ('track and field' and competition) or marathon or sprint or winter swimming or bowling or tennis or billiards or table tennis").

(8) Entertainment The keyword strings we use are "电影 or 电视 or 话剧 or 戏剧 or 戏曲 or 主演 or 演员 or 歌手 or 歌星 or 影星 or 音乐剧 or 演唱会 or 演奏会 or ((流行 or 主流 or 摇滚 or 民俗 or 民族) and 音乐) or 唱片 or 歌迷会 or 影迷会". ("movie or television or drama or opera or play or starring or actor or singer or singing star or movie star or musical or concert or symphony or ((popular or mains stream or rock or folk or minority) and music) or CDs or fan club").

(9) Crime The keyword strings we use are "歹徒 or 行凶 or 凶犯 or 罪犯 or 杀人 or 强奸 or 抢劫 or 黑社会". ("scoundrel or attack or murderer or criminal or killer or rape or rob or gangster").

A3. Additional Empirical Results

A3.1 Principal Components Analysis (PCA)

Table A2. Components and Factor Loadings of PCA

Component	Eigenvalue	Proportion	Variable	Comp1	Comp2
Comp1	3.211	0.3568	Leader mentions	0.4947	0.0126
Comp2	1.421	0.1578	Xinhua Cites	0.4235	0.1013
Comp3	1.090	0.1211	Epoch Stories	-0.2557	0.3857
Comp4	0.826	0.0917	Corruption	0.2951	0.3269
Comp5	0.709	0.0788	Disasters	0.2986	0.3684
Comp6	0.682	0.0758	Accident	0.0691	0.6363
Comp7	0.481	0.0535	Sports	-0.2346	0.2926
Comp8	0.350	0.0389	Entertainment	-0.3773	0.0365
Comp9	0.230	0.0255	Crime	-0.3636	0.3261

Notes: The PCA uses the residuals from a regression of content categories on prefecture by year fixed effects. The last columns report the factor loading of each variable for the 1st and 2nd components.

A3.2 Media Bias of Individual Newspapers and by Newspaper Type

Figure A1. Density Distribution of Newspaper bias by Newspaper Type

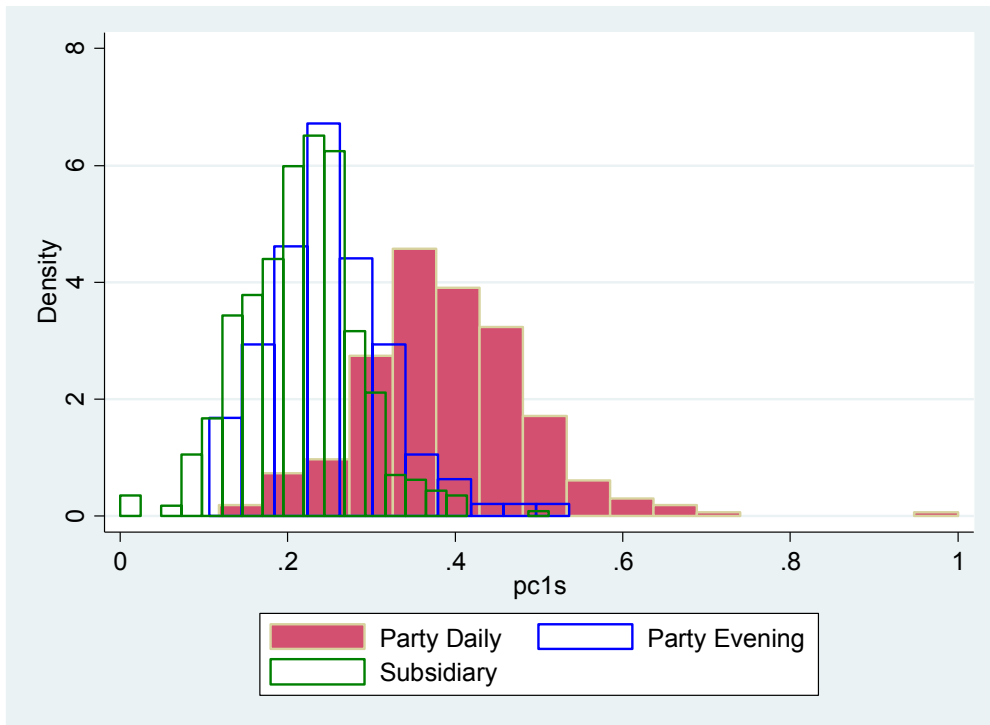


Table A3. Media Bias by Newspaper

Rank	Bias	Newspaper	Type	Rank	Province	Prefecture
1	0.593	QINGHAIDAILY	Party Daily	province	Qinghai	Xining
2	0.523	NINGXIADAILY	Party Daily	province	Ningxia	Yinchuan
3	0.520	GANSUDAILY	Party Daily	province	Gansu	Lanzhou
4	0.504	ANHUIDAILY	Party Daily	province	Anhui	Hefei
5	0.477	SHANXIDAILY	Party Daily	province	Shanxi	Taiyuan
6	0.476	YUNNANDAILY	Party Daily	province	Yunnan	Kunming
7	0.475	PEOPLESAILY	Party Daily	central	Beijing	Beijing
8	0.469	SICHUANDAILY	Party Daily	province	Sichuan	Chengdu
9	0.467	JIANGXIDAILY	Party Daily	province	Jiangxi	Nanchang
10	0.460	GUANGXIDAILY	Party Daily	province	Guangxi	Nanning
107	0.162	YANZHAOEVENINGNEWS	Subsidiary	prefecture	Hebei	Shijiazhuang
108	0.162	WUHANMORNINGPOST	Subsidiary	prefecture	Hubei	Wuhan
109	0.146	WUHANEVENINGNEWS	Subsidiary	prefecture	Hubei	Wuhan
110	0.142	MIRROR	Subsidiary	province	Beijing	Beijing
111	0.140	LIAOSHENEVENINGNEWS	Subsidiary	province	Liaoning	Shenyang
112	0.137	BEIJINGEVENINGNEWS	Subsidiary	province	Beijing	Beijing
113	0.128	THEFIRST	Subsidiary	province	Beijing	Beijing
114	0.124	YANGCHENGEVENINGNEWS	Subsidiary	province	Guangdong	Foshan
115	0.109	YOUTHXPRESS	Subsidiary	central	Beijing	Beijing
116	0.100	YANGCHENGEVENINGNEWS	Subsidiary	province	Guangdong	Dongguan
117	0.004	BEIJINGDAILYMESSENGER	Subsidiary	province	Beijing	Beijing

Data Source: Chinese newspaper directory data constructed by the authors and WiseNews.

A3.3 Robustness Check of the Effects of the 2003 Reform (Section 5.2)

Table A4. Robustness Check of the Effects of the 2003 Reform

Dependent variable: newspaper bias

VARIABLES	I	II	III	IV
Reform 2003	0.036*** (0.008)	0.031*** (0.007)	0.036*** (0.010)	
Commercial Paper *	-0.044*** (0.006)	-0.042*** (0.006)	-0.040*** (0.007)	-0.050*** (0.005)
Reform 2003 outside main sample	-0.025** (0.010)	-0.018* (0.010)	-0.024** (0.011)	
Commercial Paper * Reform 2003 outside main sample	0.026** (0.010)	0.022** (0.011)	0.022** (0.011)	0.029*** (0.010)
Observations	872	813	845	872
R-squared	0.852	0.847	0.847	0.909
Controls	Basic	Basic	Extended	Basic Newspaper and Prefecture- by-Year
Fixed Effects Commercial	Newspaper and Year 0.038	Newspaper and Year 0.013	Newspaper and Year 0.341	

Notes: Basic controls include GDP, population, industrial share of GDP, real FDI. Extended controls include the basic controls and the interaction of the reform dummy with the predicted number of county papers in 2002. Column I reproduces the baseline estimation reported in the paper. Column II reports the regression excluding two prefectures (Wuhan and Hefei). Column III includes an extended set of controls. Column IV includes prefecture-by-year fixed effects. Standard errors clustered by prefecture in parentheses. *** p<0.01, ** p<0.05, * p<0.1

A3.4 Reform Effect on the Coverage of County/Village Political Leaders (Section 5.2)

We test the possibility that after the reform, higher-level Party Dailies were mandated to report more on county-level political leaders. We find that 1.6% of the articles mention the two top political positions (Party Secretary and government chief) at the county and village levels. In comparison, 5.2% of the articles mention the equivalent positions at the prefecture, province, or national levels. Table A5 below reports the regression results, using the specification in Column 4 of Table 2 in the paper.

Table A5. Dependent variable: share of articles mentioning top positions

VARIABLES	Prefecture/Province/Nation	County/Village
Reform 2003	1.315** (0.611)	-0.070 (0.365)
Commercial Paper * Reform 2003	-1.533** (0.570)	0.111 (0.355)
Observations	283	283
R-squared	0.888	0.740
Controls	Yes	Yes
Fixed Effects	Newspaper and Year	Newspaper and Year
Commercial	0.212	0.401

Notes: Controls include GDP, population, industrial share of GDP, real FDI, the number university students, the number employees, and total government expenditure. Standard errors clustered by prefecture in parentheses. *** p<0.01, ** p<0.05, * p<0.1

A3.5 Magnitudes and Interpretation (Section 5.3)

Table A6. Effects of the 2003 Reform on Individual Content Categories

	I	II	III	IV	V	VI	VII	VIII	IX	X
Dependent Variable	Newspaper bias	Leader Mentions	Xinhua Cites	Epoch Stories	Corruption	Disasters	Accidents	Sports	Entertainment	Crime
Reform 2003	0.095*** (0.022)	8.230** (3.106)	1.042 (6.576)	-20.495** (7.634)	-0.014 (0.039)	-0.015 (0.084)	0.025 (0.037)	-0.650 (0.867)	-2.268 (1.391)	-0.016 (0.111)
Commercial Paper * Reform 2003	-0.124*** (0.017)	-9.132** (3.396)	-7.281 (5.394)	19.883** (8.142)	-0.012 (0.041)	-0.020 (0.080)	-0.025 (0.029)	0.243 (0.506)	2.575* (1.353)	0.099 (0.091)
Observations	283	283	283	283	283	283	283	283	283	283
R-squared	0.838	0.825	0.857	0.776	0.621	0.775	0.472	0.618	0.856	0.702
Commercial	-0.029	-0.902	-6.238	-0.612	-0.027	-0.034	0.001	-0.407	0.307	0.083
Commercial p-val	0.006	0.110	0.059	0.807	0.124	0.529	0.970	0.559	0.393	0.121
Mean	0.280	9.713	26.978	23.948	0.156	0.469	0.126	6.704	11.719	0.635
Std. Dev.	0.102	10.887	16.982	14.491	0.097	0.517	0.126	2.904	4.750	0.401
Commercial-Party difference	-0.156	-14.782	-17.635	1.678	-0.050	-0.107	0.013	0.484	2.808	0.410

Notes: To capture the average reform effects, the reform-variable coefficients are multiplied by 2.7, the average number of county papers in areas with positive numbers of county papers in 2002. All regressions include newspaper- and year-fixed effects, as well as our set of basic controls: GDP, population, industrial share of GDP, real FDI, number university students, number employees, total government expenditure. Standard errors clustered by prefecture in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

A3.6 Case Study of Leader Mentions (Section 6.1)

One concern regarding the result that lower-level newspapers are less biased (in terms of our bias measure) than higher-level newspapers is that, in our keyword search, we focus on only several top provincial and prefectural political positions, such as Party Secretaries and Governors/Mayors, whereas for national leaders, we include a larger set of positions. This is not very likely to be an important concern because at the local level, most important Party and government functional positions are taken by the Vice Party Secretaries and Vice Governors/Mayors. To further assess this, we manually read all articles published during three randomly-selected days in six newspapers: one Party Daily and one commercial paper at each of the three administrative levels.

In particular, we choose four local newspapers from Hubei province in 2009: the Hubei Daily (province Daily), the Changjiang Daily (prefecture Daily), the Chutian Metropolis Daily (province Subsidiary), and the Wuhan Morning Post (prefecture Subsidiary). At the national level, we choose the Guangming Daily (central Daily) and the China Youth Daily (central Evening). We study the content of these two national newspapers in 2007 because the WiseNews data do not include national newspapers in 2009, and we want to avoid 2008 when the Summer Olympics was held in China. We randomly select three days of publications from the year except for holidays and weekends, when the coverage of politicians may be less than usual.

Table A7 below reports the share of articles that mention any politicians identified by our manual reading and the ratio of (1) the number of articles that mention the political leaders on the list of automatically-searched keywords to (2) the number of articles that mention any politicians identified by manual reading. As seen in the first column, compared to the prefecture newspapers, the share of articles that mention leaders is twice as high in provincial papers and four times higher in the central papers. This pattern is consistent with the result reported in the paper (Panel C of Table 1). Columns 2-4 show the ratio of the number of articles about politicians that we identify by our automatic keyword search to the number of articles that we identify by manually reading the newspaper. The differences across administrative levels are not systematic and too small to explain the average differences in the first column.

Table A7. Leader Mentions by administrative rank

	All Leaders	All Leaders	National Leaders	Local Leaders
	share of politician coverage	$\frac{\text{coverage of automatically-searched political leaders}}{\text{coverage of manually-identified politicians}}$ (%)		
Central	7.85	74.02	66.52	58.47
Provincial	4.73	67.65	55.56	72.01
Prefecture	1.85	84.86	54.84	60.00

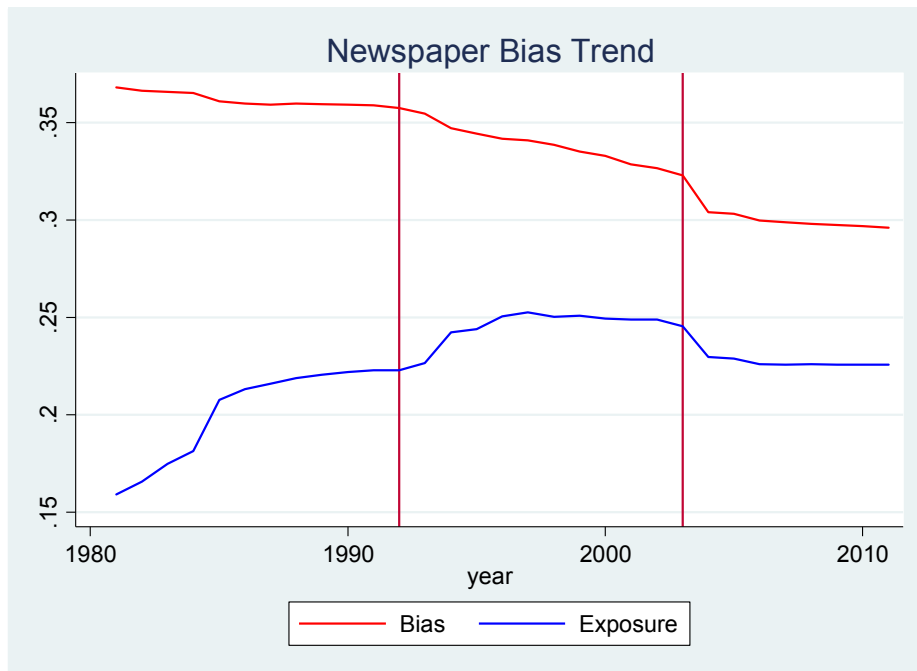
Notes: All leaders include both national and local leaders. The variable “share of politician coverage” is the share of articles that cover any of the manually-identified politicians in a newspaper. The variable “coverage of manually-identified politicians” is the number of articles that mention any politicians identified by our manual reading. The variable “coverage of automatically-searched political leaders” is the number of articles that mention any political leaders who appear in our keyword search list.

A3.7 Time Trend of Reader Exposure to Bias (Section 7)

Figure A2 below depicts both media bias and readers' exposure to bias, as implied by newspaper entry and exit from 1981 to 2011.¹ Because news content data are available only for the 1999-2010 period, we assume that the bias of newspapers is constant within the newspaper type and owners' administrative level. The red line indicates the average bias across newspapers. It demonstrates an obvious downward trend, particularly after 1990. The implied change in media bias from 1981 to 2011 is 0.08, which corresponds to a decline in the number of articles that cover political leaders from 20% in 1980 to 12.5% in 2011.

The blue line indicates our estimate of readers' average exposure to media bias. Within prefectures, this bias exposure is weighted by each newspaper's expected advertising revenue, whereas across prefectures, it is weighted by population.² The bias exposure initially increases because of the massive entry of Party papers, while it starts to decline in the late 1990s because of the influx of less-biased commercial newspapers. One implication of this trend is that, to the extent that advertising revenues subsidize the entry of highly biased newspapers, readers' exposure to media bias does not necessarily decrease with advertising revenues.

Figure A2. Trend in Newspaper Bias Implied by Entry and Exit



¹ Exit of general-interest newspapers in China was extremely rare during our sample years, except for those county-level Party Dailies that were closed in 2003.

² We calculate the weighted average based on the estimated advertising revenues rather than newspaper circulation because reliable circulation data for Chinese newspapers are not available.