Pollution, Promotion, and Political Showcase

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ABSTRACT

This paper explores the strategic behavior of provincial leaders in response to the visits by central government leaders in China by examining changes in air quality during such visits. I find that a prefecture's PM2.5 levels tend to decrease during the president's visits but increase during the premier's visits. This result is consistent with anecdotal evidence that provincial leaders improve air quality to leave a positive impression on the president, but as the premier is primarily responsible for economic affairs, provincial leaders ramp up production facing the premier's visits, resulting in excessive air pollution. Such variations are also correlated with provincial leaders' personal characteristics and connections with the visitors. Meanwhile, provincial leaders do not compensate for economic losses by increasing production following the president's visits, nor do they sharply reduce pollution after the premier's visits. This strategic behavior is not strongly associated with a prefecture's share of the workforce in the secondary sector or its yearly average PM2.5 level. Furthermore, the effect of visits is significant on PM2.5 levels but not on PM10 levels in many cases. Since PM10 has more natural sources than PM2.5, this result supports the possibility of human manipulation of air quality. Finally, I conclude that acting strategically during the visits by central government leaders has a positive but insignificant impact on a politician's promotion.

[1] An updated version may be found on my website: https://sites.google.com/view/weihong-li-econ/research-projects

1. Introduction

China's air pollution tends to be markedly lower during major international and national events, such as the Asia-Pacific Economic Cooperation (APEC) meetings, the Asian Games, and the National Day Parade (Lin et al., 2017; Liu et al., 2017; Zhang et al., 2018; Fu et al., 2020; Ma et al., 2020). This suggests that Chinese politicians may strategically manipulate air pollution, likely to improve local image and bolster their own reputations. At the same time, since politicians' promotions heavily depend on evaluations from higher authorities in authoritarian countries like China, it is common for lower-ranking officials to engage in "political showcase"—exerting considerable effort to please their superiors, striving to present their most favorable image and showcase their highest capabilities. Sometimes these lower-ranking officials resort to deceitful means. For example, when the ex-premier Zhu Rongji was inspecting Nanling County, Anhui Province, in 1998, local officials moved grain from depots in other regions to their own to create the illusion of abundant grain stores and impress the inspector.[2] Combining these two phenomena, it is reasonable to hypothesize that, in pursuit of recognition and promotion, regional officials in China often act strategically during the visits from central government leaders by manipulating local air quality.

However, it is a challenge to examine politicians' strategic behavior driven by the desire for promotion through observing air pollution levels, as there are two possible explanations for the actions taken to improve air quality. First, clear blue skies can leave a positive impression on visiting leaders, making regional officials more likely to be promoted. Second, the Chinese government declared a war on air pollution in March 2014, and since then, severe air pollution may result in regional officials being held accountable and punished by higher authorities. Therefore, regional officials' strategic behavior can also be attributed to the fear of punishment. I address this issue by studying the period from March 2003 to March 2013, which allows me to rule out the second possibility and focus solely on regional officials' motivation for promotion.

The second challenge is that, although people typically expect air pollution levels to go down in response to the visits, this might not always have been the case during the period from March 2003 to March 2013. Before the war on air pollution was announced, the primary goal of

[2] http://cpc.people.com.cn/pinglun/n/2013/0608/c78779-21785265.html

Chinese government was developing the economy. Consequently, regional officials may also strategically increase production facing leaders' visits, which almost always results in higher air pollution levels. Given that multiple leaders inspect the country each year, and the premier is mainly responsible for economic affairs, I hypothesize that regional officials would boost production and air pollution in response to visits by the premier, and lower air pollution during visits by other leaders. This hypothesis is grounded in the studies of Milgrom and Roberts (1988) and Milgrom (1988), which suggest that politicians tend to commit influence activities—investing extra effort into tasks that are more noticeable to the evaluators of their promotions or behaving according to the evaluators' personal preferences. To test my hypothesis, rather than considering all central government leaders' visits as a whole, I generate variables that differentiate between the visits of various leaders.

In this paper, I present evidence that the visits of the president and premier have a remarkable impact on the strategic behavior of provincial leaders in China, after implementing a difference-in-differences (DID) strategy to prefecture-level divisions. First, controlling for meteorological factors, economic prosperity, and other notable events, I notice that, on average, PM2.5 levels rise by 4.707% during the premier's visits. Second, I incorporate provincial leaders' personal characteristics and connections with the visitors into the model, and find that PM2.5 levels generally decrease during the president's visits but increase during the premier's visits, which confirms my hypotheses. To be more specific, in prefectures where the provincial leaders have not received a graduate education, PM2.5 levels sharply decrease during the president's visits. Meanwhile, prefectures with provincial leaders who are later charged with corruption are more likely to significantly reduce PM2.5 levels during the president's visits. Furthermore, in prefectures led by provincial leaders who make little progress in economic development, in prefectures without female provincial leaders, and in prefectures where provincial leaders lack personal connections with the premier, I observe a notable increase in PM2.5 levels during the premier's visits. Additionally, prefectures with provincial leaders nearing the end of their tenure are more inclined to experience significantly higher PM2.5 levels during the premier's visits compared to those without.

I also explore other engaging questions associated with Chinese politicians' political showcases. To corroborate that the variations of PM2.5 levels during central government leaders'

visits are caused by human manipulation, I examine the effect of visits on PM10 levels. This is because PM2.5 primarily originates from anthropogenic activities such as industrial emissions, vehicle emissions, and coal burning (Wang et al., 2013), whereas PM10 has more natural sources, including pollen, mold, and windblown dust (USEPA, 2024), which makes PM10 levels more difficult for politicians to be manipulated. I find that the role of central government leaders' visits is no longer significant in many cases, providing further evidence of strategic behavior and human manipulation of air quality.

On the one hand, impressing visitors by reducing pollution, which is likely the result of shutting down local production, could lead to economic losses. On the other hand, showcasing the ability to improve economic well-being through increasing production and air pollution may pose serious health risks to residents and generate considerable social costs. In order to investigate what usually happens before and after central government leaders' visits, as well as whether provincial leaders compensate for the losses after central government leaders' visits, I add lags and leads terms for variables denoting visits to the model. The regression results indicate that manipulation begins before the visits and persists afterward in numerous situations, and provincial leaders do not compensate for the economic and social costs resulting from their political showcases.

Moreover, it is natural to attribute the difficulty of manipulating air quality to a prefecture's level of industrial development, as shutting down or ramping up production in the secondary sector might be the most direct way to influence local air pollution. To test how provincial leaders manage to manipulate air pollution, I introduce the percentages of employment in the primary, secondary, and tertiary industries to the analysis. It turns out that none of these three variables is substantially correlated with provincial leaders' strategic behavior, showing that the whole manipulation process may involve various industries. In addition, this strategic behavior is not related to a prefecture's yearly average PM2.5 levels.

Last, because provincial leaders are assumed to act strategically in order to be promoted, I test whether they achieve their career goals by running regressions based on a probit model. The results suggest that manipulating air pollution exerts a positive but insignificant effect on promotion.

My paper contributes to relevant literature in the following aspects. First, it complements studies on the strategic behavior of politicians in response to regulations, monitoring, visits, or inspections from higher authorities (Grainger and Schreiber, 2019; Zou, 2021; Greenstone et al., 2022; Fang et al., 2023). Greenstone et al. (2022) analyze Chinese politicians' strategic underreporting of air pollution before the introduction of automatic air pollution monitoring. Grainger and Schreiber (2019) assess the strategic choices of U.S. state governments in locating air quality monitors. Zou (2021) illustrates U.S. officials' strategic reduction of air pollution in response to a cyclical air quality monitoring schedule, and their motivation is to avoid regulatory penalties for violating air quality standards. In comparison, my paper explores Chinese officials' strategic behavior triggered by the desire to please central government leaders and secure promotions. Fang et al. (2023) evaluate Chinese politicians' strategic behavior facing inspections for meeting compulsory educational targets, which are crucial for politicians' future promotions. Nevertheless, the strategic actions in my paper are not related to completing the tasks or objectives assigned by central government. In the meantime, while other studies do not delve into individual-level heterogeneity, I attribute the strategic behavior of provincial leaders to personal factors, such as education, corruption, gender, economic achievement, years in office, and connections with visitors.

Second, my research adds value to the existing literature on career concerns and promotion of Chinese politicians. While previous studies declare that career concerns could lead to desirable economic growth (Li and Zhou, 2005), increase in land sales revenue (Hsu et al., 2017), and dropouts of rural girls from middle school (Fang et al., 2023), I provide evidence that the aspiration for promotion may induce the strategic manipulation of air quality during higher authorities' visits, which results in uncompensated social and economic costs. Besides, despite extensive research into the determinants of political career advancement (Dittmer, 1995; Maskin et al., 2000; Chen et al., 2005; Li and Zhou, 2005; Xu, 2011; Shih et al., 2012; Jia et al., 2015; Doyon and Keller, 2019; Francois et al., 2023), I detect that only age and practical experience are critical factors in the promotion of provincial leaders. Most importantly, pleasing central government leaders during their visits does not facilitate promotion.

Third, this paper deepens the understanding of influence activities. While a large portion of the literature on influence activities is theoretical in nature (Milgrom and Roberts, 1988; Milgrom,

1988; Meyer et al., 1992; Schaefer, 1998; Alonso et al., 2008; Powell, 2015), this paper distinguishes itself by employing an empirical approach. De Janvry et al. (2023) empirically confirm that civil servants in rural townships of China devote more efforts toward tasks that are more important to their evaluators of promotion. However, due to the limitations of field experiments, their findings are based on entry-level officials in two provinces. My research stands out by investigating the strategic behavior of provincial leaders, who are ranked much higher in the hierarchical organization of Chinese politicians, and suggests that influence activities might be common across all levels of officials. With the help of satellite products, I gather air pollution data covering all prefecture-level divisions of China and extend these findings to a national level. Another distinction is that while each entry-level civil servant in the field experiment of De Janvry et al. (2023) has only one evaluator, the performance and promotion of provincial-level officials may be judged by multiple central government leaders (Jia et al., 2015). I conclude that in the latter scenario, officials are more prone to work toward the responsibilities and preferences of the evaluator who is directly observing officials' performance in front of them.

The rest of the paper is organized as follows. Section 2 introduces the institutional background. Section 3 presents the data sources. Section 4 explains the identification strategies and empirical results. Section 5 concludes the paper.

2. Background

Generally speaking, the promotion of prefecture-level officials is determined by province-level officials (Hsu et al., 2017), and the promotion of province-level officials is evaluated by central government officials (Jia et al., 2015). Members of the Politburo Standing Committee (PSC) have a substantial power in the process of selecting and appointing provincial leaders as future central government leaders (Jia et al., 2015). To assess the visits of central government leaders, I focus on the president and premier, the two highest-ranking PSC members[3]. They lead the most

[3] I initially included two additional central government leaders: the chairman of the Standing Committee of the National People's Congress (NPC) and the chairman of the National Committee of the Chinese People's Political Consultative Conference (CPPCC). Although they are considered the third and fourth most powerful figures in the Chinese government, I found that their visits have a negligible impact on provincial leaders' strategic behavior, so I

powerful political institutions in China, the PSC and the State Council, respectively. Nearly all current province-level officials will go on to work for the PSC, the State Council, the Standing Committee of the National People's Congress (NPC), or the National Committee of the Chinese People's Political Consultative Conference (CPPCC) after being promoted to the central government.

The literature reveals a wide range of variables that may be linked to politicians' strategic behavior. First, provincial officials in China are required to retire at the age of 65 unless they receive a promotion to a higher position. While the regulation is not rigorously enforced (Li and Zhou, 2005), it serves as a reminder that their political careers are nearing an end. Consequently, I infer that provincial leaders should become more eager to showcase themselves to the central government leaders after turning 65. Second, the tenure for provincial officials is 5 years (Li and Zhou, 2005), and they can serve only one consecutive term in the same position. I hence hypothesize that provincial leaders would be more willing to impress central government leaders during the 5^{th} and 10^{th} years of their tenures, as well as during the second term.

Third, while Li and Zhou (2005) assert that educational attainment contributes to the promotion of officials under 65, Doyon and Keller (2019) claim that its role is not significant. I thereby test whether educational level can explain the strategic behavior largely driven by the desire for promotion. Fourth, because the Chinese government initiated a stringent anti-corruption campaign in late 2012 and many provincial leaders in this study were later accused of corruption, I explore how provincial leaders' misconduct is associated with their strategic behavior. Admittedly, the government is not able to identify all of the corrupt officials, and some cases might be related to the CCP's political rivalries (Hsu et al., 2017). Fifth, there is ongoing controversy over whether a politician's promotion can be attributed to economic achievement during his term (Maskin et al., 2000; Chen et al., 2005; Li and Zhou, 2005; Xu, 2011; Shih et al., 2012), so I examine the relationship between strategic behavior and the region's annual economic growth rate.

Finally, the importance of connections for promotion and advancement has been probed not only in the political arena but also in other fields. For example, being alumni, provincial

excluded them from the paper. I also assume that the visits of central government leaders who ranked below them would similarly have a negligible impact.

compatriots, or political allies is crucial for building connections among Chinese politicians (Dittmer, 1995; Shih et al., 2012; Francois et al., 2023). Connections based on shared geographical origins increase scholars' probability of being elected as Chinese Academy of Sciences and Chinese Academy of Engineering fellows, the highest honor for Chinese scientists (Fisman et al., 2018).

There are several points that warrant particular emphasis. First, Chinese government officials typically serve in their positions for life, with few switching careers mid-way. The vast majority are either promoted or retain their previous rank, and only a very small number are demoted or imprisoned due to serious scandals or crimes. Second, I consider the individual-level heterogeneity of provincial-level officials but not that of prefecture-level officials, because the promotion of prefecture-level officials is not directly determined by central government leaders. Third, since central government leaders work and reside in Beijing most of the time, officials of Beijing should be less likely to behave strategically compared to those of other prefectures. Therefore, I drop Beijing from this study.

3. Data

3.1 PM2.5 and PM10 Data

In order to get a credible measure of China's daily PM2.5 levels and avoid potential data manipulation, I download the hourly PM2.5 data from product M2T1NXAER of the Modern-Era Retrospective Analysis for Research and Application version 2 (MERRA-2), released by the National Aeronautics and Space Administration (NASA) of the United States. I then collapse the hourly data to the daily level and use R language to conduct zonal statistics operation. This process yields China's daily PM2.5 observations from March 16, 2003, to March 13, 2013, for all 366 prefecture-level divisions. Similarly, with the help of product M2I3NVAER, I obtain China's daily PM10 data at the prefecture level for the same period.

3.2 Meteorological Data

There are several meteorological factors that can substantially affect PM2.5 levels (Chen et al., 2020; Li et al., 2015). For the purpose of accurately capturing the role of visits in local air

quality, I retrieve daily average windspeed, air temperature, relative humidity, surface pressure, sunshine hours, and precipitation data from the China Meteorological Data Sharing Service System affiliated to China National Environmental Monitoring Center. This data has been collected from monitoring stations since 1951. I then process the data using the Inverse Distance Weighting (IDW) method, as explained in the Appendix, to ensure it covers all prefecture-level divisions in this research.

3.3 Visits of Central Government Leaders

I mainly check the websites of the following institutions for the daily activities of the president and premier from 2003 to 2013: the State Council, each province or prefecture's government, China Central Television, People's Daily, China Youth Daily, Xinhua News, Guangming News, Enorth News, Sohu News, and Sina News. These sources include government agencies, state media, and influential commercial media that provide the most reliable information needed for my research.

I usually consult multiple sources for every visit to estimate the most accurate schedule of the central government leaders. However, there are situations where measurement errors may still occur. For instance, one website reports that a central government leader went to Prefecture A on February 18 and Prefecture C on February 20, and the second website summarizes that the same leader visited Prefecture A, B, and C from February 18 to 20. As there is no source mentioning when the leader visited Prefecture B, I presume that the date is February 19.

Second, even if the news clearly states that a central government leader travelled to Prefecture D on February 21, there still exists certain possibility that he went there on the evening of February 20 or stayed until the morning of February 22. Meanwhile, if Prefecture D did not own an airport, then the visitor should have also been to a nearby prefecture with an airport. In these cases, I rely solely on the dates and cities that appear on the news, which reflect the official itinerary, regardless of other possible situations. Although it is not feasible to eliminate all measurement errors, I construct the dataset based on the most logical judgment.

3.4 Personal Information of Provincial Leaders

To understand whether and how provincial leaders' strategic responses may be explained by their personal characteristics, background, and connections with visitors, it is necessary to collect

detailed information on these politicians' birthplaces, ages, educational levels, alma maters, work experience, tenures, misconduct, and factions. I adopt such information from Jiang (2018)'s Chinese Political Elite Database (CPED), which covers the biographies of all full and alternate members of the CCP Central Committee (1997-2012) as well as provincial party secretaries and governors (1995-2015). It is noteworthy to point out that while my research is conducted at the daily level, the start and end dates of the tenures are not provided beyond the month and year by CPED. Instead, it assumes that the days are always the first day of the month. This method is understandable because politicians' CVs only include years and months. I also correct some minor errors and update the dataset, as it was originally constructed in 2018. My revisions are informed by the politicians' CVs and related reports found on the websites of the CCP Organization Department, Economic Daily, Xinhua News, Sohu News, and Sina News.

There are mainly two factions in China. The "Shanghai Clique" consists of officials who worked under former president Jiang Zemin when he was the party secretary of Shanghai, as well as those associated with these officials. The "League Faction" refers to politicians with work experience at the Communist Youth League under the leadership of former president Hu Jintao (Jia, 2017). Although it is difficult to determine to which faction a politician belongs, as these factions are formed secretly and their existence is often implied by anecdotal evidence, I define a person as a member of the Shanghai Clique if he has worked for the CCP Shanghai Municipal Committee or the Shanghai Municipal People's Government. I then classify a politician as a member of the League Faction if he has held positions at the Communist Youth League. I compare my list with that on the Reuters' Connected China app and find that they are almost identical.

3.5 Others

It is not reasonable to analyze air pollution without taking economic growth into account. To rule out the possibility that GDP data may have been manipulated by the Chinese government (Wallace, 2016), I turn to nighttime light intensity data as they have been proved to be a reliable proxy for economic prosperity worldwide (Donaldson and Storeygard, 2016). The yearly prefecture-level data are built on DMSP-OLS Nighttime Lights Time Series and a composition of monthly NPP-VIIRS NTL Time Series (Chen et al., 2021), and are available from 2000 to 2020. It is essential to highlight that including economic growth as a control does not jeopardize

my identification of the manipulation of air pollution, as my data for PM2.5 and PM10 are daily, whereas the data for economic growth are yearly.

While high-magnitude earthquakes can reduce regional air pollution as a result of the collapses of factories and shutdown of industrial production, they might also increase PM2.5 levels as burning coal and woods is needed to get rid of power outage. At the same time, top political leaders from the central government tend to visit earthquake-stricken areas to comfort local residents and guide rescue operations. To eliminate the impact of confounding factors, I summarize the earthquakes that resulted in the death of at least 100 victims due to their considerable influence on production and end up controlling for 5 cities affected by the 2003 Bachu Earthquake, 2008 Wenchuan Earthquake, and 2010 Yushu Earthquake. The information is collected from the websites of China Central Television and Xinhua News.

As mentioned previously, the Chinese government has historically improved air quality during international and national events. I hence gather the dates and locations of the 2005 and 2009 National Games of China, the 2008 Beijing Olympics and Paralympics, the 2009 and 2011 FISU World University Games, the 2010 World Expo, the 2010 Asian Games, and a series of important meetings and conferences, such as the Annual Meetings of the New Champions held by the World Economic Forum. This information is available on the websites of the State Council, China Central Television, People's Daily, Xinhua News, Enorth News, Sohu News, and Sina News.

Last, I collect the percentages of the workforce employed in the primary, secondary, and tertiary sectors from China's 2010 Population Census, which records the country's cross-sectional employment statistics for 2009. Since China publishes Population Census every 10 years, the 2010 Census is the only one that contains the information I need.

4. Identification Strategies and Empirical Results

4.1 Impact of Central Government Leaders' Visits on PM2.5

I first study the influence of central government leaders' visits on PM2.5 levels by applying the following estimation equation:

$$PM2.5_{i,t} = \alpha_0 + \alpha_1 President_{i,t} + \alpha_2 Premier_{i,t} + \alpha_3 Event_{i,t} + \alpha_4 Earthquake_{i,t} + \alpha_5 Nightlight_{i,t} + \alpha_6 Meteorology_{i,t} + \alpha_7 Year_t + \alpha_8 Date_t + \alpha_9 Day_t + \alpha_{10} Prefecture_i + \mu_{i,t} \quad (1)$$

where $PM2.5_{i,t}$ measures the daily PM2.5 level in prefecture *i* at time *t*, $Nightlight_{i,t}$ approximates yearly GDP growth, $Meteorology_{i,t}$ represents a series of meteorological variables involving daily average windspeed, air temperature, relative humidity, surface pressure, sunshine hours, and precipitation, and $Year_t$ captures the year fixed effects. $Date_t$ is a set of 365 dummy variables showing the day numbers. To avoid collinearity, one of the 366 days is dropped. Day_t includes 6 dummy variables referring to the days of the week, with one of the 7 days of a week omitted to fix collinearity. $Prefecture_i$ represents prefecture-level fixed effects that control for prefecture-specific and time-invariant factors. $\mu_{i,t}$ is the error term.

The dummy variables $President_{i,t}$ and $Premier_{i,t}$ denote the visits of the president and premier, respectively. Each variable is equal to 1 if the corresponding central government leader was visiting prefecture *i* at time *t*. $Event_{i,t}$ indicates notable events and is equal to 1 if such an event took place in prefecture *i* at time *t*. $Earthquake_{i,t}$ denotes earthquakes that caused severe casualties, as described in subsection 3.5. This dummy variable is assigned a value of 1 if prefecture *i* was hit by a severe earthquake within the past 30 days at time *t*, as I assume that 30 days after the earthquakes, the community' daily life and production should have been restored.

To reduce skewness, I express PM2.5, daily average windspeed, relative humidity, surface pressure, sunshine hours, precipitation, and nighttime light intensity in terms of natural logarithm. Because the data for nightlight, sunshine hours, and precipitation have values of 0 in numerous prefectures, I apply the inverse hyperbolic sine transformation to these variables (Bellemare and Wichman, 2020). I also cluster standard errors at the prefecture level to produce more solid results.

Table 1 presents the regression results.

Table 1. The Effect of Leaders' Visits on PM2.5 Levels on Average

VARIABLES	
President	-0.035
	(0.034)
Premier	0.046**
	(0.022)
Event	-0.033
	(0.032)
Nightlight	-0.009
	(0.010)
Earthquake	0.234**
	(0.117)
Observations	1,336,266
Number of prefectures	366
R-squared	0.186
Meteorology	YES
Year FE	YES
Date FE	YES
Day FE	YES
Prefecture FE	YES

Notes: Meteorology controls for a set of variables including daily average windspeed, air temperature, relative humidity, surface pressure, sunshine hours, and precipitation. Standard errors are clustered at the prefecture level. *: p<0.1; ** p<0.05; *** p<0.01.

Since many of the independent variables in this model are dummy variables, I interpret their coefficients by calculating the percentage changes in predicted PM2.5 when the dummy variables change from 0 to 1. For example, the percentage change in PM2.5 due to the president's visits is:

$$\frac{PM2.5_{\iota,t}|(\widehat{President}_{\iota,t}=1)-PM2.5_{\iota,t}|(\widehat{President}_{\iota,t}=0)}{PM2.5_{\iota,t}|(\widehat{President}_{\iota,t}=0)} = e^{\widehat{\alpha_1}} - 1$$

According to Table 1, while the premier's visits significantly boost local PM2.5 levels by 4.707%, the president's visits have a negative and insignificant influence on PM2.5 levels. National and international events insignificantly reduce air pollution, whereas earthquakes have a positive and significant effect. It is somewhat counterintuitive to find that nighttime light intensity is negatively associated with air pollution levels, although the relationship is not significant, which is possibly due to the strong influence of prefecture-level fixed effects or higher shares of employment in services in many prefectures.

4.2 Impact of Personal Characteristics on Strategic Behavior

To analyze the influence of individual-level heterogeneity, I implement the difference-in-differences (DID) strategy as follows:

$$PM2.5_{i,t} = \beta_0 + \beta_1 President_{i,t} + \beta_2 Premier_{i,t} + \beta_3 Event_{i,t} + \beta_4 Earthquake_{i,t} + \beta_5 Nightlight_{i,t} + \beta_6 Meteorology_{i,t} + \beta_7 Age_{i,t} + \beta_8 President_{i,t} \times Age_{i,t} + \beta_9 Premier_{i,t} \times Age_{i,t} + \beta_{10} Year_t + \beta_{11} Date_t + \beta_{12} Day_t + \beta_{13} Prefecture_i + \mu_{i,t} \quad (2)$$

where $Age_{i,t}$ is a dummy variable denoting the ages of provincial leaders. Both the provincial party secretary, head of provincial branch of the Communist Party, and the governor, head of the provincial government, are considered provincial political leaders. While provincial secretaries are ranked higher than governors, they both hold considerable control over regional policies (Jia et al., 2015). Therefore, $Age_{i,t}$ is equal to 1 if either of the provincial leaders overseeing the administration of prefecture *i* was 65 years old or above at time *t*.

With the aim of testing other personal characteristics that may correlate with provincial leaders' strategic behavior, I run this regression multiple times, replacing $Age_{i,t}$ with other variables one at a time. For instance, the dummy variable $Gender_{i,t}$ is equal to 1 if either of the provincial leaders of prefecture *i* at time *t* was a female. To assess the effect of reaching the end of tenure, I generate a dummy variable $Tenure_{i,t}$, which takes the value of 1 if either of the two provincial leaders of prefecture *i* was in the 5th or 10th year of the tenure at time *t*. The fourth variable $Term_{i,t}$ is equal to 1 if any one of the provincial leaders of prefecture *i* was in his second term at time *t*. Furthermore, $Graduate_{i,t}$ is a dummy variable indicating if any one of the two provincial leaders governing prefecture *i* had a graduate degree at time *t*, as most of provincial leaders hold a bachelor's degree at the minimum. Additionally, I estimate a politician's misconduct by building a dummy variable $Corruption_{i,t}$ and setting its value to 1 if any one of the provincial leaders of prefecture *i* at time *t* was later charged with corruption. Finally, I calculate prefecture *i*'s yearly economic growth $Growth_{i,t}$ by measuring the percentage change in nighttime light intensity from the previous year to the year of time *t*.

Table 2. The Effect of Leaders' Visits on PM2.5 Levels Conditional on Personal Characteristics and Connections

VARIABLES	(1)	(2) *X=Age*	(3) *X=Gender*	(4) *X=Graduate*	(5) *X=Tenure*	(6) *X=Term*	(7) *X=Corruption*	(8) *X=Growth*	(9)
President	-0.035	-0.038	-0.039	-0.155**	-0.031	-0.057	0.017	-0.048	-0.030
	(0.034)	(0.033)	(0.036)	(0.069)	(0.037)	(0.036)	(0.038)	(0.038)	(0.056)
Premier	0.046**	0.037*	0.044**	0.075	0.024	0.042*	0.033	0.047**	0.054**
	(0.022)	(0.022)	(0.022)	(0.064)	(0.024)	(0.024)	(0.024)	(0.021)	(0.026)
President×X		0.163	0.133	0.141*	-0.049	0.160	-0.254***	0.106	
		(0.306)	(0.090)	(0.076)	(0.117)	(0.110)	(0.064)	(0.101)	
Premier×X		0.235*	0.174	-0.033	0.157***	0.025	0.068	-0.010	
		(0.128)	(0.149)	(0.066)	(0.057)	(0.075)	(0.061)	(0.062)	
President×PresidentConnect									-0.005
									(0.063)
Premier×PremierConnect									-0.030
									(0.047)
Observations	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266
R-squared	0.186	0.186	0.186	0.186	0.186	0.186	0.186	0.186	0.187
Number of prefectures	366	366	366	366	366	366	366	366	366

Notes: Each column reports a separate regression. Column 1 presents the results of the regression that does not consider any personal characteristics or connections. Column 2-8 present the results of the regressions that examine the effects of age, gender, educational level, years in office, number of terms, corruption, and economic growth, respectively. Column 9 presents the results of the regression that examines the effect of provincial leaders' connections with the visitors. Standard errors are clustered at the prefecture level. *: p<0.1; ** p<0.05; *** p<0.01.

Similar to the explanation in subsection 4.1, the regression results in columns (2)-(8) of Table 2 should be interpreted by calculating the percentage changes in PM2.5 resulting from central government leaders' visits. Take the president' visits as an example. The percentage change in PM2.5 caused by the president's visits is $e^{\widehat{\beta_1}} - 1$ in prefectures with $Age_{i,t} = 0$, and that is $e^{\widehat{\beta_1}+\widehat{\beta_8}} - 1$ in prefectures with $Age_{i,t} = 1$. I also test the statistical significance of $e^{\widehat{\beta_1}+\widehat{\beta_8}} - 1$.

The regression results suggest the following implications. First, in prefectures where no provincial leaders hold a graduate degree, PM2.5 levels noticeably decrease by 14.358% during the president's visits. It implies that politicians with lower educational attainment tend to act strategically by reducing pollution in response to the president's visits, plausibly because they presume that they have certain disadvantages in the promotion process. Besides, the fact that strategic behavior during the president's visits is associated with educational attainment aligns

with the president's emphasis on promoting leaders with higher levels of education and specialized knowledge[4].

Meanwhile, I observe that officials later accused of corruption are more inclined to improve air quality during the president's visits. On the one hand, it can be inferred that there exists consistency between cheating during leadership inspections and committing crimes of embezzlement and bribery in their daily work. On the other hand, it is possibly because politicians guilty of corruption internally desire to make up for their wrongdoings and avoid potential punishment by performing well in front of the superior. In addition, corrupt officials showcase themselves during visits by the president rather than the premier, which can be attributed to the president's speeches on punishing corruption and his actions to establish the National Bureau of Corruption Prevention during his term[5].

Third, facing the premier's visits, PM2.5 levels significantly increase by 4.498% in prefectures with two male provincial leaders. The findings show that male politicians, who are overrepresented in Chinese government, might have less favorable conditions regarding career advancement, which makes them more willing to strategically increase production during the premier's visits.

Fourth, provincial leaders in prefectures that made little progress in economic development are significantly more likely to scale up production during the premier's visits, as indicated by the variations in PM2.5 levels. There are two possible explanations. For one thing, politicians who failed to improve the economy may want to demonstrate their determination and competency to achieve more in the future. For another, performing well in front of the premier can help enhance personal images and compensate for poor economic achievements.

Last, in prefectures with provincial leaders nearing the end of tenure, PM2.5 levels are remarkably higher than in those without during the premier's visits. The results show that politicians at a key moment for determining their eligibility for promotion are more eager to present themselves to the premier, who holds the highest rank in the civil service of the central government. The results are also consistent with the findings of Hsu et al. (2017) that politicians

[4] http://www.reformdata.org/2000/0427/4654.shtml
[5] https://news.cctv.com/china/20070914/101375.shtml
https://www.theguardian.com/world/2011/jul/01/chinese-president-corruption-communist-party

who have not yet been promoted toward the end of their terms are more motivated to achieve political accomplishments in hopes of securing a promotion as soon as possible.

In summary, evidence shows that by taking certain personal characteristics into account, provincial leaders are more liable to increase pollution during visits by the premier, who is in charge of economic affairs, and to lower pollution during visits by the president. Provincial leaders' strategic behavior toward different visitors is correlated with the specific roles and scopes of responsibility of the visitors, as well as the personal characteristics and needs of the provincial leaders.

4.3 Impact of Connections on Strategic Behavior

I then examine how connections with each visitor could affect provincial leaders' actions by employing the following specification:

$$\begin{aligned} PM2.5_{i,t} = {} & \Upsilon_0 + \Upsilon_1 President_{i,t} + \Upsilon_2 Premier_{i,t} + \Upsilon_3 Event_{i,t} + \Upsilon_4 Earthquake_{i,t} \\ & + \Upsilon_5 Nightlight_{i,t} + \Upsilon_6 Meteorology_{i,t} + \Upsilon_7 PresidentConnect_{i,t} \\ & + \Upsilon_8 PremierConnect_{i,t} + \Upsilon_9 President_{i,t} \times PresidentConnect_{i,t} \\ & + \Upsilon_{10} Premier_{i,t} \times PremierConnect_{i,t} + \Upsilon_{11} Year_t + \Upsilon_{12} Date_t + \Upsilon_{13} Day_t \\ & + \Upsilon_{14} Prefecture_i + \mu_{i,t} \end{aligned} \quad (3)$$

where $PresidentConnect_{i,t}$ and $PremierConnect_{i,t}$ measure provincial leaders' personal connections with the president and premier. Their values are set to 1 if the provincial secretary or governor of prefecture *i* at time *t* and the visitor are provincial compatriots, alumni, political allies, or former coworkers. To be more specific, two politicians are defined as provincial compatriots given the same province of birth. They are regarded as alumni if they received higher education at the same university. I consider a provincial leader and a central government leader as political allies if they belong to the same political faction, as explained in subsection 3.4. I further classify the two officials as former coworkers if they have experience working at the same institution simultaneously.

Regression results in column (9) of Table 2 reveal that during the premier's visits, PM2.5 levels significantly increase by 5.548% in prefectures where the provincial leaders have no connections with the premier. I conclude that the lack of personal connection prompts more

visible attempts to impress the premier. It is interesting to note that those without connections to the president do not behave strategically during the president's visits. This is likely because, being the head of government, the premier plays a vital role in the promotion of provincial leaders, and the premier might value personal relationships more than the president.

4.4 Impact of Central Government Leaders' Visits on PM10

After replacing the dependent variable in models (1) through (3) with $PM10_{i,t}$, which represents China's daily prefecture-level PM10 observations, I rerun these regressions and summarize the results in columns (1)-(9) of Table 3.

Table 3. The Effect of Leaders' Visits on PM10 Levels Conditional on Personal Characteristics and Connections

VARIABLES	(1)	(2) *X=Age*	(3) *X=Gender*	(4) *X=Graduate*	(5) *X=Tenure*	(6) *X=Term*	(7) *X=Corruption*	(8) *X=Growth*	(9)
President	0.015	0.016	0.017	-0.174**	0.018	-0.006	0.054	0.007	-0.009
	(0.038)	(0.036)	(0.039)	(0.078)	(0.038)	(0.039)	(0.040)	(0.041)	(0.055)
Premier	0.017	0.011	0.014	0.063	-0.007	0.018	-0.002	0.023	0.030
	(0.022)	(0.022)	(0.022)	(0.049)	(0.023)	(0.024)	(0.024)	(0.022)	(0.028)
President×X		0.008	-0.032	0.223**	-0.034	0.157*	-0.187**	0.069	
		(0.332)	(0.110)	(0.086)	(0.139)	(0.093)	(0.082)	(0.098)	
Premier×X		0.175	0.261**	-0.051	0.172***	-0.009	0.102	-0.055	
		(0.136)	(0.124)	(0.054)	(0.063)	(0.081)	(0.063)	(0.063)	
President×PresidentConnect									0.033
									(0.063)
Premier×PremierConnect									-0.050
									(0.047)
Observations	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266	1,336,266
R-squared	0.174	0.174	0.174	0.174	0.174	0.174	0.174	0.174	0.174
Number of prefectures	366	366	366	366	366	366	366	366	366

Notes: Each column reports a separate regression. Column 1 presents the results of the regression that does not consider any personal characteristics or connections. Column 2-8 present the results of the regressions that examine the effects of age, gender, educational level, years in office, number of terms, corruption, and economic growth, respectively. Column 9 presents the results of the regression that examines the effect of provincial leaders' connections with visitors. Standard errors are clustered at the prefecture level. *: p<0.1; ** p<0.05; *** p<0.01.

Compared with Table 2, with this new dependent variable that is less susceptible to manipulation, the impact of leaders' visits is no longer significant in many situations. In other words, the provincial leaders' manipulation of air quality during the visits of central government leaders cannot largely influence airborne particulate matter from natural sources. The strong

contrast confirms that the variations in PM2.5 during leaders' visits are indeed the result of human manipulation.

4.5 Social Cost of Strategic Behavior

In order to investigate the evolution of air pollution before and after central government leaders' visits, I focus on seven cases which the visits significantly affect local PM2.5 levels and augment equations (2) and (3) by including 7 lags and 7 leads for each central government leader's visits. I also interact the lags and leads with the measures of personal characteristics or connections. It should be stressed that when the visits last more than one day, to better represent the days before and after the visits, I only generate lags for the first day and leads for the last day. Otherwise, for example, in a three-day visit, the first lead of the first day refers to the second day, which means that the lead cannot effectively denote the day after the visit.

Fig.1 President's Visits on PM2.5, Cond. on Graduate

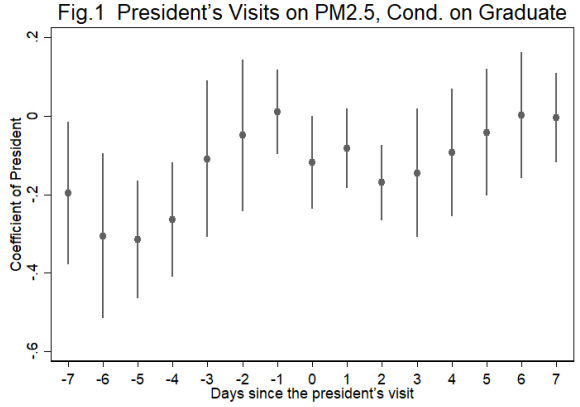


Fig.2 President's Visits on PM2.5, Cond. on Corruption

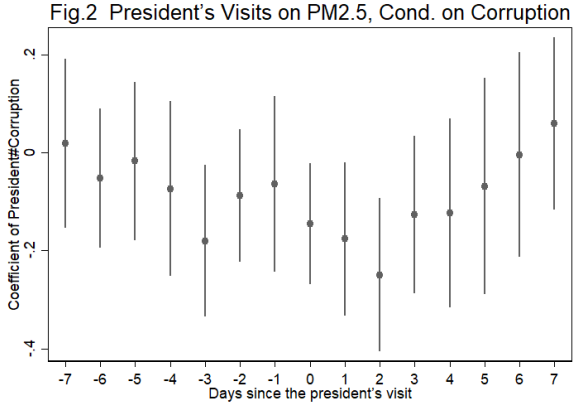


Fig.3 Premier's Visits on PM2.5

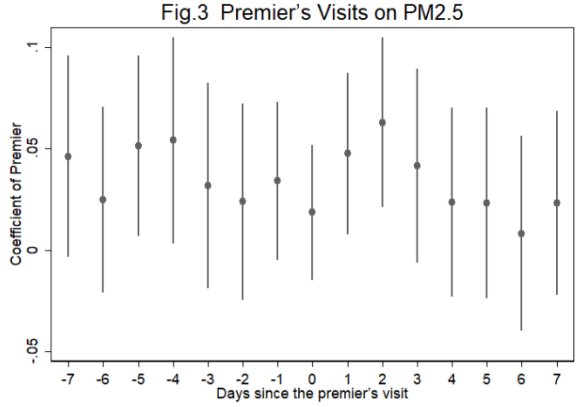
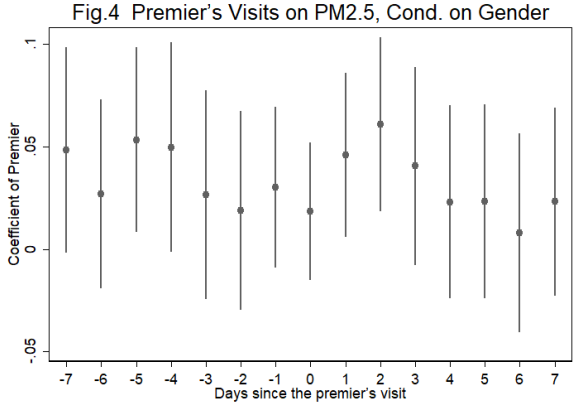
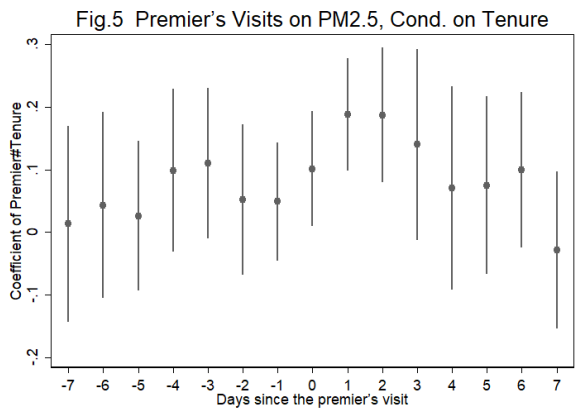
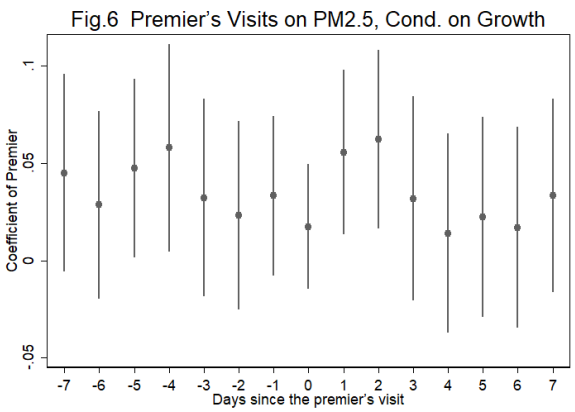
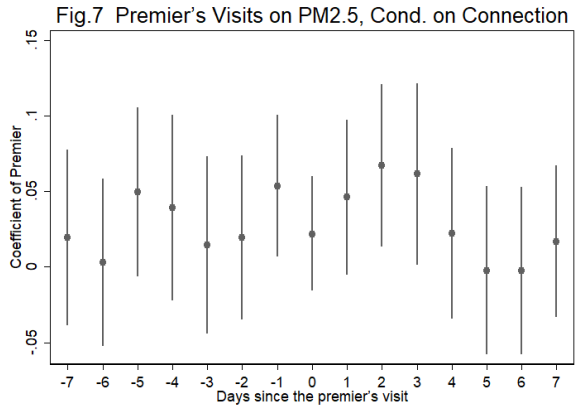


Fig.4 Premier's Visits on PM2.5, Cond. on Gender









Notes: The figures show the evolution of PM2.5 before and after central government leaders' visits. They represent the seven cases with statistically significant results in Table (2), after inserting lags and leads of the dummies denoting central government leaders' visits. Day 0 corresponds to the days of central government leaders' visits, which is normalized to 0. The dots represent the values of the coefficients shown on the left side of the figures. The solid lines represent the 95% confidence intervals using the standard errors clustering at the prefecture level.

Regression results are summarized in Figure 1-7. I first detect that in some situations, after inserting lags and leads of the leaders' visits into the regressions, PM2.5 levels no longer change substantially on the days of the visits, but do so on the days before and after. This finding indicates that the manipulation of air quality usually begin before the visits, probably because local officials prepare several days in advance. The influence of strategic behavior on PM2.5 levels could also persist for a few days after the visits, hinting that provincial leaders' actions may leave a lasting effect on air quality.

Nevertheless, there is no indication that provincial leaders who strategically decrease pollution in response to the president's visits afterward significantly increase it. The same applies to provincial leaders who boost pollution during the premier's visits, as they do not reduce pollution in the following days. Thus, the strategic behavior of provincial leaders result in social

costs that are not compensated for later. I do notice that there is an upward trend suggesting the gradual increase of PM2.5 levels following the president's visits, but it is not statistically significant.

4.6 Impact of Regional Characteristics on Strategic Behavior

Apart from studying the effect of provincial leaders' personal characteristics, I also assess whether a prefecture's regional characteristics are associated with provincial leaders' strategic behavior, which is essential for understanding how they manage to manipulate air pollution. To do so, I incorporate regional heterogeneity into the analysis by removing prefecture-level fixed effects and replacing $Age_{i,t}$ with $Primary_i$, $Secondary_i$, and $Tertiary_i$ respectively in model (2). These three continuous variables denote prefecture i's percentages of the workforce engaged in the primary, secondary, and tertiary sectors in 2009. I also replace $Age_{i,t}$ with $\widetilde{PM2.5}_{i,t}$, a continuous variable measuring prefecture i's yearly average PM2.5 levels.

Table 4. Impact of Leaders' Visits on PM2.5 Levels Conditional on Regional Characteristics

VARIABLES	(1) *X=Primary*	(2) *X=Secondary*	(3) *X=Tertiary*	(4) $X=\widetilde{PM2.5}$
President	-0.068	-0.005	-0.037	0.201
	(0.076)	(0.067)	(0.084)	(0.296)
Premier	0.044	0.065	0.008	0.220
	(0.036)	(0.047)	(0.054)	(0.229)
President×*X*	0.060	-0.155	-0.023	-0.069
	(0.149)	(0.251)	(0.249)	(0.086)
Premier×*X*	-0.000	-0.080	0.109	-0.050
	(0.082)	(0.142)	(0.137)	(0.063)
Observations	1,314,360	1,314,360	1,314,360	1,314,360
R-squared	0.189	0.189	0.189	0.197
Number of prefectures	360	360	360	360

Notes: Each column reports a separate regression. Column 1 presents the results of the regression that considers the percentage of the workforce engaged in the primary sector. Column 2 presents the results of the regression that considers the percentage of the workforce engaged in the secondary sector. Column 3 presents the results of the regression that considers the percentage of the workforce engaged in the tertiary sector. Column 4 presents the results of the regression that considers the yearly average PM2.5 levels. Standard errors are clustered at the prefecture level. *: p<0.1; ** p<0.05; *** p<0.01.

The regression results presented in Table 4 demonstrate that provincial leaders who manage to improve air quality during the president's visits do not solely shut down manufacturing plants or facilities in the second sector, which may be critical for air quality manipulation. They also do not temporarily close the facilities of a single sector. Instead, they reduce air pollution through various means, and the entire process may involve different industries. In the same way,

provincial leaders who showcase their achievements in economic development by increasing pollution during the premier's visits facilitate production and mobilize workers across multiple sectors.

Furthermore, the provincial leaders' strategic behavior is independent of the prefectures' yearly average PM2.5 levels. That is, in response to the president' visits, the strategic behavior of reducing air pollution do not occur solely in prefectures that normally have poor air quality. Similarly, provincial leaders governing prefectures with relatively high pollution throughout the year still prefer to increase pollution during the premier's visits.

4.7 Impact of Strategic Behavior on Promotion

After examining the existence and characteristics of provincial leaders' strategic behavior, I am interested in testing whether manipulating air pollution leads to the promotions anticipated by provincial leaders. In order to measure the amount of manipulation during the visits, I employ the specification in equation (1) again after dropping $President_{i,t}$ and $Premier_{i,t}$ from the equation. I then keep the residuals of observations with $President_{i,t} = 1$ or $Premier_{i,t} = 1$, which capture the amount of air pollution produced or reduced as a result of leaders' visits. Because PM2.5 significantly decrease during the president's visits, to get the amount of manipulation, I convert the residuals of observations with $President_{i,t} = 1$ into their additive inverse. On the contrary, the residuals of observations with $Premier_{i,t} = 1$ do not require conversion.

In the next step, I quantify a politician's strategic behavior by measuring the amount of manipulation he caused. The first round of promotions took place from October 2007, when the 17th National Congress of the CCP was held, to March 2008, when the annual plenary sessions of the NPC and of the CPPCC were adjourned. Meanwhile, the second round of promotions started from October 2012, when the 18th National Congress of the CCP was held, to March 2013, when the annual plenary sessions were concluded. Therefore, for politician o attending the first round of competition, I calculate $Manipulation_o$, the mean of the amounts of manipulation in the prefectures under his governance from March 2003 to March 2008, as a proxy for strategic behavior. Similarly, for one attending the second round of competition, I adopt the mean of the amounts of manipulation in the prefectures under his governance from March 2008 to March

2013. As previously stated, a prefecture has two provincial leaders, so the amount of manipulation in one prefecture can be applied to calculate the manipulation of both politicians. I also exclude provincial leaders whose prefectures were never inspected by central government leaders from March 2003 to March 2013.

I use the following probit model to investigate the effect of strategic behavior on promotion:

$$\begin{aligned} Outcome_o = {} & \theta_0 + \theta_1 Manipulation_o + \theta_2 \widetilde{Age}_o + \theta_3 \widetilde{Gender}_o + \theta_4 \widetilde{Graduate}_o + \theta_5 \widetilde{Growth}_o \\ & + \theta_6 \widetilde{PresidentConnect}_o + \theta_7 \widetilde{PremierConnect}_o + \theta_8 Round_o \\ & + \mu_o \end{aligned} \quad (4)$$

$Outcome_o$ is a dummy variable indicating whether provincial leader *o* was promoted to a central government leader by March 2008 if he was in the first round of competition, or by March 2013 if in the second round. I further consider two additional situations. First, I focus on whether politician *o* was promoted to a member of the Politburo, which is the power center of the CCP. Second, I check whether politician *o* was promoted to an important position. Specifically, among all central government leaders, the vice chairmen of the Standing Committee of the NPC and the vice chairmen of the National Committee of the CPPCC are regarded as less important figures, so I include all central government leaders except for those promoted to these two positions. The regression results for all three situations are reported in columns (1)-(3) of Table (5) in that order.

Different from those in models (2)-(3), the independent variables here refer only to the basic information of one specific politician. For example, $\widetilde{Age}_o$ denotes the age of politician *o* in the year 2008 if he was in the first round of competition or in the year 2013 if in the second round. As evaluators typically do not consider those who are already 65 years old or above, I drop these politicians from the study. $\widetilde{Gender}_o$ denotes the gender of politician *o*. $\widetilde{Graduate}_o$ indicates whether politician *o* had a graduate degree or not. $\widetilde{Growth}_o$ is the average annual economic growth rate at the province level for all provinces that politician *o* governed during his term, which can be estimated using nighttime light intensity. I consider the time period 2003-2008 if politician *o* was in the first round of competition and the period 2008-2013 if he attended the second round. $\widetilde{PresidentConnect}_o$ and $\widetilde{PremierConnect}_o$ indicate whether politician *o* is the provincial compatriot, alumnus, former coworker, or political ally of president and premier, respectively. In addition, $Round_o$ is a dummy variable representing which round of competition

politician o attended. If individual o attended both rounds of competition, then he will be treated as two different politicians in this cross-sectional analysis, and the two politicians should have the same values for all independent variables except for $Round_o$.

Table 5. Impact of Manipulation on Promotion

VARIABLES	(1)	(2)	(3)
Manipulation	0.148	0.377	0.112
	(0.460)	(0.540)	(0.501)
$\widetilde{Growth}$	-1.988*	-2.209	-1.639
	(1.133)	(1.450)	(1.149)
$\widetilde{Age}$	-0.072*	-0.091**	-0.110***
	(0.039)	(0.043)	(0.042)
$\widetilde{Graudate}$	-0.732**	-0.052	0.110
	(0.363)	(0.420)	(0.414)
$\widetilde{Gender}$	1.029	1.124	1.021
	(0.941)	(0.899)	(0.916)
$\widetilde{PresidentConnect}$	0.357	0.240	0.086
	(0.301)	(0.354)	(0.332)
$\widetilde{PremierConnect}$	-0.377	-0.156	-0.272
	(0.518)	(0.540)	(0.537)
Round	0.999***	0.656*	0.813**
	(0.353)	(0.387)	(0.371)
Observations	116	116	116

Notes: Each column reports a separate regression. Column 1 considers the promotions to central government leaders. Column 2 considers the promotions to members of the Politburo. Column 3 considers the promotions to important positions at the central government. Standard errors need to be bootstrapped, as I adopt the residuals in the first stage as a measure of manipulation. *: p<0.1; ** p<0.05; *** p<0.01.

It is necessary to highlight that, contrary to subsection 4.2, I do not investigate the influence of being at the end of tenure or that of being in the second term on promotion. This is because, even if those factors may motivate politicians' strategic behavior in the presence of visitors, their impact on promotion should be negligible. I also do not take corruption into account in model (4), as most of these officials' corrupt actions were discovered after March 2013.

I draw the following conclusions from Table (5). First, manipulating air quality during central government leaders' visits has a positive and insignificant effect on promotion. Economic growth is also insignificantly associated with promotion. While gender and connections with visitors are not strongly correlated with promotion in all three situations, I notice that age is vital to the promotion to the Politburo and important positions. Moreover, holding a graduate degree has a negative and significant impact on being promoted to a central government leader, which is

possibly because evaluators prioritize practical experience over graduate education. Combined with the findings on the role of graduate degrees in strategic behavior in subsection 4.2, the results here hint that provincial leaders might have misjudged the criteria determining their promotion, and the president is not the only evaluator of promotion. There is no doubt that it is easier for politicians in the second round to be promoted, as most central government leaders who started working in March 2003 retired in March 2013 due to the convening of the 19th National Congress, thus making room for younger officials.

5. Conclusion

This paper empirically studies the political showcasing by provincial leaders in response to visits from central government leaders in China. By analyzing changes in PM2.5 levels, I confirm that provincial leaders strategically decrease pollution during the president's visits and increase pollution during the premier's visits. This phenomenon aligns with anecdotal evidence that Chinese politicians tend to manipulate air quality during important events and showcase themselves during visits from higher authorities. It also reflects the premier's greater focus on a region's production and economic growth.

Second, I discover that certain personal characteristics of provincial leaders, such as lacking a graduate education and involvement in corruption, are strongly associated with their strategic behavior facing the president's visits. On the other hand, characteristics like gender, achievements in economic development, years in office, and connections with the premier are significantly related to provincial leaders' actions during the premier's visits. These personal characteristics can be attributed to the visitors' scopes of responsibility and provincial leaders' situations and concerns.

Third, the evidence shows that the manipulation of air pollution begins several days in advance and its effect may remain for a few days after the visits, and provincial leaders do not offset the social costs by boosting production after the president's visits or reducing production after the premier's visits. This strategic behavior is further confirmed by examining the impact of central government leaders' visits on PM10 levels. Additionally, I find that provincial leaders, in an effort to control local air pollution, manipulate production across multiple sectors rather than

solely focusing on the secondary sector. The decision to manipulate air pollution is also independent of a prefecture's yearly average PM2.5 level. The final point to address is, despite local officials going to great lengths to manipulate air pollution in hopes of gaining promotion, their political showcase has only a positive but insignificant impact on promotion.

My research applies the theory of incentives to the behavior of Chinese bureaucrats and empirically examines the prevalence of air pollution manipulation, political showcase, and influence activities within the Chinese government. For policymakers, to avoid the distortionary consequences of high-powered incentives, a better approach might be to base politicians' promotions on objective metrics rather than subjective impressions during top-down inspections. Conducting unannounced visits or sending lesser-known representatives could also help mitigate the issue of political showcase.

As with any study, the results of this paper should be interpreted with caution for the following reasons. First, due to data constraints, I only study the period from March 2003 to March 2013. As political dynamics adapt and transform over time in response to various internal and external factors, the findings from this limited period may not be applicable to the current or future political landscape. Second, while I primarily investigate the public visits by central government leaders, they may also make private visits, which are rarely reported in the news. Therefore, if possible, future studies could expand upon my findings by collecting data on central government leaders' private visits and exploring the influence of private visits.

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Appendix

I get the prefecture-level meteorological data using the Inverse Distance Weighting (IDW) method, which refers to a spatial interpolation model that utilizes a weighted average of known values to estimate the value of an unsampled point.

First, I construct $0.1° \times 0.1°$ longitude-latitude grids covering the entire country using R. I assign data from a monitoring station to a grid if the station is located within that grid. For grids without any monitoring stations, I calculate the value based on observations from the five closest monitoring stations, weighted by their distances. This ensures that every grid is assigned a value. Second, I conduct zonal statistics operation using R and obtain a value for every prefecture-level division.