Does meritocratic promotion explain China's growth?

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Abstract

China has sustained incredible double-digit economic growth over three decades. One common explanation for this growth is meritocratic promotion, where officials at the same level compete with each other on the basis of relative GDP growth, and the winners are rewarded with promotion up the administrative hierarchy. This tournament competition generates strong incentives for politicians to boost growth. However, studying prefecture leaders, I find no evidence of meritocracy. My null result is stable across different definitions of promotion, regression models, and measures of GDP growth. I rule out possible alternative explanations. Meritocracy is not being implemented separately for politically connected and unconnected leaders, or for leaders who are environmentally friendly. Moreover, the 2012 corruption crackdown has not effected a structural change in promotion criteria.

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1 Introduction

China's economy has grown spectacularly over the past three decades, averaging nearly double-digit GDP growth rates, and lifting hundreds of millions of people out of poverty. What can explain this phenomenon? Over the past few decades, a sizeable literature has emerged claiming that China uses promotion tournaments to incentivize economic growth. Officials at the same level (for example, prefecture mayors within the same province) compete with each other on the basis of relative GDP growth, and the winners are rewarded with promotion up the administrative hierarchy. This tournament competition generates strong incentives for politicians to boost growth, and hence provides an explanation for China's incredible economic performance.

The seminal work in this literature is Li and Zhou (2005), which found a meritocratic effect for provincial leaders. This paper has been cited nearly 1000 times, indicating that meritocratic promotion is a well-accepted idea. For example, in a paper on a different topic, Wang (2016) includes this description: "[T]he promotion of local officials largely depends on their ability to boost economic growth (Li and Zhou, 2005)". In a review article in the Journal of Economic Literature, Brandt et al. (2014) write: "performance evaluation [...] assigned major weight to local GDP growth [...] these policies are widely viewed as having inspired tournament-like competition among county and provincial leaders, who [...] made strenuous efforts to ramp up local economies (Li and Zhou 2005)".

Despite this seeming consensus, there is some debate over meritocracy for provincial leaders. Shih et al. (2012) contends that political connections are what determine promotion, rather than economic performance. In contrast, Jia et al. (2015) finds that meritocracy exists, but only for connected leaders. And Su et al. (2012) claims that the original result in Li and Zhou (2005) does not replicate. Lorentzen and Lu (2018) sums up this debate as follows: "Although the evidence is mixed regarding the promotion of senior officials at or above the provincial level, studies have confirmed the existence of meritocracy at lower levels, such as prefectural cities and townships".

Meanwhile, taking as given the result of meritocratic promotion via tournament competition, economic theorists have been hard at work, building on the theoretical foundations of mechanism design to write papers on applied theory that have real world relevance.[1]

But is it wise to take this result as foundational? Given the debate over meritocracy at the provincial level, we might be skeptical about the findings at the prefecture and county levels, since fewer papers have been published using that data. Moreover, the evidence for

[1]Just in the past two years, there have been four theory papers written on meritocratic promotion: Chen et al. (2019), Li et al. (2019), Xiong (2019), and Wang and Zheng (2020).

meritocracy is not actually very strong. Yao and Zhang (2015) reports an interaction effect between prefecture leader ability and age, but does not find an average effect of ability on promotion. Landry et al. (2018) finds a positive correlation for county officials, but not for prefecture officals. If the Chinese government was actually implementing promotion tournaments in order to incentivize growth, we should detect a clear average correlation between growth and promotion, rather than mere interaction effects.

In this paper, I show that such skepticism is substantiated by the data, at least for prefecture politicians. Focusing on prefecture mayors over 1998-2017, I find no evidence that officials with higher GDP growth are more likely to be promoted. Given the variety of 'promotion' definitions in the literature, I collected finely coded career histories, which allow me to show that my results are robust to four different definitions of promotion. My results are stable across many different regression specifications. In every case, whether varying control variables, measures of GDP growth, or using logistic and ordered logistic regression instead of a linear probability model, I find no correlation between growth and promotion.

I also rule out possible alternative explanations for my null result. I show that meritocracy is not being implemented separately for politically connected and unconnected leaders, or for leaders who are environmentally friendly. I also show that the 2012 corruption crackdown has not effected a structural change in the promotion of prefecture leaders.

The remainder of the chapter is structured as follows: Section 2 discusses the institutional context, while Section A sketches a simple model of a promotion tournament. Section 3 summarizes the literature on meritocratic promotion at the province, prefecture, and county levels. Section 4 presents my data on prefecture mayors. Moving to the null result, I show in Section 5 that there is no correlation between promotion and growth. Section 6 rules out possible alternative explanations. Section 7 concludes.

2 Institutional context

China's political system is described as a regionally decentralized authoritarian regime (Xu, 2011). While local governments have control over their local economies, the central government retains control over personnel appointments via the Organization Department. This control over personnel allows the central government to exercise authority over all lower-level governments.[2] For example, since the central government controls the appointment of provincial leaders to the Politburo, it can set the policy agenda for the provinces. Similarly, provincial governments control personnel appointments of prefecture leaders, and hence can

[2]The Chinese administrative hierarchy has five nested levels: center, province, prefecture, county, township.

set policy for prefectures. This logic applies down to counties and townships.[3]

The upshot of centralized personnel appointments is that the central government can prioritize policies like economic growth, and has the means to strongly incentivize the implementation of those policies. In this context, scholars have argued that China has implemented a "promotion tournament", where officials at the same level compete to boost economic growth, and the top performers are rewarded with promotion to the next level of the bureaucracy (Li and Zhou, 2005; Xu, 2011).[4]

This system of meritocratic political selection, also known as "jurisdictional yardstick competition", serves as an incentive scheme for politicians to boost economic growth. Thus, provincial leaders compete with each other for promotion to the Politburo, prefecture leaders (within a province) compete for promotion to the provincial government, and county leaders (within a prefecture) compete for promotion to the prefecture government. As discussed in Section 3, scholars have studied meritocratic promotion at each of these three levels.[5]

3 Literature

3.1 Provincial leaders

The literature on meritocratic promotion started with a pair of papers (Li and Zhou, 2005; Chen, Li, and Zhou, 2005) finding a positive correlation between GDP growth and promotion for provincial party secretaries and governors. This finding was interpreted as evidence that China uses promotion tournaments to incentivize economic growth. These two papers were challenged by Su et al. (2012), which claimed that their results did not replicate after

[3]This is known as the "one-level down" system of cadre management, where officials at a given level are appointed by politicians governing the level immediately above, rather than the central government directly appointing all officials.

[4]This simple model of the promotion tournament is incomplete. As Wang and Zheng (2020) points out, a rank-order tournament requires a convex pay scale in order to induce an efficient level of effort. That is, the pay increase between levels of the bureaucracy must grow as one ascends the hierarchy. This theoretical requirement is contradicted by the empirical reality that the public sector pay scale is concave. Wang and Zheng (2020) solve this puzzle by hypothesizing that Chinese politicians derive income from corruption. Politicians accumulate wealth from corruption over their careers, and higher-ranked politicians are better able to protect this wealth, by colluding with anti-corruption inspectors. Hence, the *de facto* pay scale is convex, on this view, and politicians compete for the prize of keeping their ill-gotten gains. Thus, a consistent model of the promotion tournament must also presuppose widespread corruption, which may be a realistic assumption for post-reform China.

[5]It is not clear how different levels of the tournament interact. For example, as prefectures are nested within provinces, it is possible that provincial leaders boost growth indirectly by supervising prefecture officials, who directly manage the economy. (Of course, this logic can be applied one more level, with prefecture leaders supervising county officials, who directly manage the economy.) It seems plausible that higher-level leaders perform a mix of roles, directly managing some parts of the economy, while supervising lower-level officials.

fixing data errors in the promotion variable. Shih et al. (2012) further disputes the meritocracy narrative, finding that political connections (based on shared hometown, college, and workplace) explain promotion, rather than economic growth.[6]

Jia et al. (2015), attempts to reconcile these disparate findings, testing for an interaction effect between political connections and growth.[7] The authors find no average effect of growth on promotion, but do report a positive interaction effect with connections. They interpret this finding as incumbent politicians solving the competence-loyalty tradeoff by selecting competent officials out of the set of connected (loyal) officials. Note that this framing supports a model of limited meritocracy, where connected leaders are evaluated meritocratically, but unconnected leaders are not. This model does not generate generic incentives for economic growth, and hence does not provide a general explanation of China's rapid growth.[8]

3.2 Prefecture leaders

The literature on prefecture-level meritocratic promotion began with Yao and Zhang (2015). This paper applies the Abowd-Kramarz-Margolis method (for estimating worker and firm fixed effects) to leaders and prefectures, to estimate both leader ability (to boost growth) and the effect of leader ability on promotion. That is, the authors test for meritocracy by regressing promotion on ability. Despite finding no average effect of ability on promotion, the authors report a positive interaction effect between ability and age, and use this finding to frame their results as supporting the meritocracy hypothesis.[9]

Landry et al. (2018) studied meritocracy using a linear probability model for prefecture leaders over 1999-2007. The authors report finding no correlation, but in contrast to the literature, they use spell-level data rather than a prefecture-year panel. Hence, their independent variable is a leader's average growth over their tenure, rather than cumulative average growth in each year.

[6]Francois et al. (2020) finds that similar-ranking politicians working in the same department are actually more likely to belong to different factions. This result casts doubt on using shared workplace as a measure of political connections.

[7]The authors find an interaction effect for connections based on shared workplace, but not for shared hometown or college.

[8]Fisman et al. (2020) further studies the role of political connections, finding that hometown and college connections are actually negatively correlated with promotion, after controlling for city and college fixed effects. This "connections penalty" is stronger during the anti-factionalist Mao era, suggesting that promotions of connected officials were viewed as factionalism.

[9]I discuss in Chaper 2 how this age-ability interaction can be interpreted as supporting a limited version of meritocratic promotion. Briefly, the problem is that meritocratic promotion *only* for old leaders does not incentivize young leaders to boost growth, contradicting the notion of meritocratic promotion as a general incentive scheme.

In an appendix result, Jiang (2018) uses a survival model, following prefecture mayors and secretaries until they are promoted or retire. In contrast, every other paper in this literature uses jurisdiction-year panel data, measuring promotion using a politician's next position in the year after they leave office. Jiang (2018) finds an effect of growth on promotion for politically connected leaders, but not for unconnected leaders.[10] The paper does not test for a generic meritocracy effect for prefecture leaders (that is, whether there is an average growth-promotion correlation, abstracting away from political connections).

In a paper on land corruption, Chen and Kung (2019) includes secondary results on meritocratic promotion. Their main result is that local politicians give deals on land sales to Politburo-connected firms, and these politicians are in turn more likely to be promoted; these correlations are interpreted as corruption. They find that land sales predict promotion for secretaries, but not mayors; while GDP growth predicts promotion for mayors, but not secretaries. (They find an identical pattern at the provincial level for secretaries and governors.) They conclude that mayors (but not secretaries) compete in a promotion tournament based on growth.[11]

Finally, Li et al. (2019) studies GDP targets, explaining why targets increase in magnitude at lower levels of government. They write a formal model that assumes meritocratic promotion, and report a novel result: the effect of growth on promotion is increasing in the growth target. Their paper uses maximum likelihood estimation where the link function is a contest success function. Validating their assumption, they find a positive correlation between growth and promotion.

Overall, there is a surprising amount of variety in the empirical methods used in the literature on prefecture leaders. Despite this, almost every paper finds evidence for meritocratic promotion, confirming the narrative first established by Li and Zhou (2005).

3.3 County leaders

There are two papers studying meritocratic promotion at the county level (Chen and Kung, 2015; Landry et al., 2018).[12] Chen and Kung (2015) studies the interaction between land corruption and meritocratic promotion for county secretaries over 2000-2008. They find a positive correlation between promotion and the annual per capita GDP growth rate (they do not report results for growth relative to the prefecture average or for cumulative average

[10] However, the paper does show that these effects are statistically different.

[11] As I discuss in Chapter 2, their promotion data for prefecture mayors is possibly flawed due to data errors.

[12] County-level studies are less common because of the daunting task of collecting GDP and promotion data for the nearly 3000 county-level divisions in China.

growth over a secretary's term).

Landry et al. (2018) study meritocratic promotion for county mayors and secretaries over 1999-2007. Using term-level data on relative GDP growth, they find a positive correlation between growth and promotion for both mayors and secretaries. Finding consistent results across two studies suggests that the meritocracy hypothesis is strongly supported at the county level. This may be true, but given the course of the provincial and prefecture literatures (strong initial results that are contradicted by follow-up papers), it seems wise to wait for further county-level studies before making strong updates.

3.4 Related literature

Serrato et al. (2019) finds seemingly meritocratic promotion based on enforcement of the One-Child Policy. But in fact promotion was not meritocratic, as leaders were able to manipulate the population data. Thus, promotion appears meritocratic when using self-reported (manipulated) data, but is not when using unmanipulated census data. In my context, it is possible that mayors manipulate GDP data by exerting control over the prefecture statistics bureau. However, given that I find no correlation between growth and promotion, manipulated GDP data is not a concern.

In a study of GDP growth targets, Zhang et al. (2018) finds that actual growth rates are bunched above growth targets. This suggests that politicians take growth targets seriously. As a robustness check, I will test whether meeting or missing the growth target is correlated with promotion.

4 Data

I study meritocratic promotion for Chinese prefecture mayors over 1998-2017.[13] I am able to collect data on roughly 300 of China's 333 prefecture-level jurisdictions. While mayors are the second-ranked leader below the top-ranked party secretary[14], I focus on mayors because it is commonly thought that government executives are in charge of economic activities, while party secretaries are responsible for social stability.[15] Hence, we should observe mayors

[13]Data on mayors and GDP, though available online, is less complete before 1998. Future work could draw on the data in Serrato et al. (2019) to extend the sample back to 1985.

[14]At each level of government, the top politicians are the party secretary (of the Chinese Communist Party) and the government executive (i.e., the provincial governor and prefecture/county mayors). The party secretary is the top-ranked official at each level, while the government executive is ranked below the secretary.

[15]Jia (2017) remarks that provincial party secretaries' "major responsibilities include the implementation of the central government policies and social stability whereas governors key duty is to promote growth."

rather than party secretaries competing in the promotion tournament.[16] (I examine data on prefecture secretaries in Section 5.)

I collected economic data on prefectures (GDP, population, and revenue) from provincial statistical yearbooks. Since the yearbooks are online and require manual data entry from PDFs, I hired multiple research assistants to independently collect the same data, in order to rule out data entry errors. I also collected data on the same variables from CEIC's China Premium Database.

I use the provincial implicit GDP deflator to construct real prefecture GDP from data on nominal GDP. Using provincial data from CEIC, I calculate the annual deflator as the difference between the nominal and real GDP growth rates. Real prefecture level GDP is then calculated as nominal GDP divided by cumulative deflator growth since 1990.[17] Given the real GDP level, I calculate real GDP growth rates. Henceforth, all references to GDP are to real GDP.

To test for meritocratic promotion, I estimate the correlation between a mayor's cumulative average relative GDP growth and a promotion variable. First, for each prefecture I calculate GDP growth relative to the annual provincial average. Then I calculate the cumulative average of this relative growth for each year of the mayor's tenure.[18] This reflects that provincial elites evaluate mayors on their total performance, and not merely their performance in any single year. (I also use annual growth in robustness checks.)

I hired RAs to collect data on mayors' career paths from online CVs, available on Baidu. Each prefecture-year observation is matched with a mayor, based on being in office for the majority of the year. Specifically, if a mayor takes office after July 1 of year t, they are coded as starting their term in year t+1. I used a finely-coded turnover variable to capture subtleties

(fn. 15, p. 12-13) Chen and Kung (2019), in their study of land corruption, conclude that "the governor has to rely on himself for promotion, specifically by improving economic performance or GDP growth in his jurisdiction [...] only the provincial party secretaries are being rewarded for their wheeling and dealing." (p.212) Moreover, Sheng (2020) finds that meritocratic promotion was implemented only for provincial governors during the Jiang Zemin era (1990-2002), and never for provincial party secretaries.

[16] In the prefecture literature, Yao and Zhang (2015) and Li et al. (2019) pool mayors and secretaries. Landry et al. (2018) and Chen and Kung (2019) run separate regressions for mayors and secretaries. As noted in the literature section, Landry et al. (2018) finds no correlation for either prefecture mayors or secretaries, while Chen and Kung (2019) finds a correlation for mayors but not secretaries.

[17] Specifically, for province p and prefecture j, I calculate the annual provincial deflator as $deflator_{pt} = growth_{pt}^{nominal} - growth_{pt}^{real}$, with which I compute cumulative deflator growth since 1990, $deflatorGrowth_{pt}$. Then $GDP_{jt}^{real} = GDP_{jt}^{nominal} / deflatorGrowth_{pt}$.

[18] Note that a regression with the cumulative average of absolute GDP growth and province-year fixed effects will achieve the same outcome (since the fixed effects subtract the annual provincial average), assuming that mayors' spells perfectly overlap. This assumption is not satisfied, since in practice, terms have varying lengths and mayors take office in different years. Hence, using absolute growth with province-year fixed effects subtracts the annual provincial mean of the cumulative averages, where the latter are calculated across different years. This approach seems less intuitive.

in the administrative hierarchy, with four main categories: retirement/arrest, demotion, horizontal transfer, and promotion.

To avoid data entry errors, I had multiple research assistants collect the same data. Surprisingly, these independent data collections initially disagreed on 10-20% of promotion cases. These disagreements stemmed partly from nuances in the variable coding, but also ambiguities in the CVs themselves.[19] I instructed the two RAs to work together with me to discuss the issues[20], and collectively we resolved all disagreements. My data collection experience underscores the importance of systematic data collection and definition of the promotion variable. Papers in this literature collect their own data and use their own definitions, which could explain any disagreements between papers.

Given the possible ambiguities in measuring promotion, I construct four definitions of promotion with varying strictness to use in robustness checks (see Appendix Section B). For example, the strictest definition counts only moves to higher-ranking provincial positions, while the less restrictive definitions include a move from mayor to prefecture party secretary. Papers in the literature have varying approaches to coding moves to the prefecture or provincial Local People's Congress (LPC) and Chinese People's Political Consultative Conference (CPPCC). With my four definitions, I can use either approach, where these moves are counted as either transfers or promotions. In my preferred definition, a mayor is promoted if they take a position as a prefecture secretary, a mayor in a sub-provincial city, a higher-ranking position in the provincial or central government, or a higher-ranking position in the Communist Youth League.

I use an annual dummy promotion variable (=1 in the year of promotion, and 0 otherwise) in my main specification with a linear probability model. I also define an annual ordered categorical variable (=0 if retirement/arrest, =1 if demotion, =2 if transfer or stay in office, =3 if promotion) which I use with ordered logistic regressions. I vary the promotion definitions in robustness checks.

[19]For example, a mayor can move to an equal-ranking position in the provincial government, which would be classified as a transfer. However, their CV includes a parenthetical statement indicating that their *de facto* rank was higher, which should be a promotion.

[20]This worked better than having a third RA perform another independent data collection, since the problem was coding ambiguities that required careful interpretation, rather than simple data entry errors.

5 Results

5.1 Empirical specification

To test for meritocratic promotion, I regress a promotion variable on a mayor's average GDP growth, controlling for prefecture characteristics X, mayor characteristics Z, and fixed effects. Following the literature, my baseline model is a linear probability model as in the following specification:

$$y_{ijpt} = \beta \cdot Growth_{ijpt} + \delta X_{jpt} + \theta Z_{ijpt} + \gamma_{pt} + \epsilon_{ijpt} \tag{1}$$

Here y_{ijpt} is the promotion outcome of mayor i in prefecture j in province p in year t. $Growth_{ijpt}$ is the cumulative average relative GDP growth of mayor i; that is, taking i's growth relative to the annual provincial average, it is the average from i's first year in office until year t. To control for selection of connected mayors into fast-growing prefectures, I control for initial (log) GDP and population in X_{jpt}, as measured in the first year a mayor takes office. Z includes sex, a quadratic in age, a categorical variable for education (with categories for high school, college, masters, and PhD), and dummy variables for tenure (the number of years a leader has served as mayor). As Persson and Zhuravskaya (2016), studying provincial secretaries, finds that local leaders are less likely to be promoted than outsiders, I also control for whether a mayor is governing in their hometown prefecture. Since each province runs their own annual promotion tournament, I include a province-year fixed effect γ_{pt}. Standard errors are clustered at the prefecture level.

If promotion is meritocratic and there is no selection bias, we should observe $\beta > 0$. However, without quasi-experimental variation, selection bias is difficult to rule out. It is possible that, say, politically connected leaders are sent to fast-growing prefectures, and are later promoted on the basis of their connections. Conversely, it is also possible that high ability leaders are sent to slow-growing prefectures to bring up their growth rate. In this case, we should observe $\beta < 0$. Hence, my null result could reflect a true absence of meritocracy, or a true meritocratic effect confounded by some combination of positive and negative selection.

5.2 Regression results

Table 2 presents my LPM results in Columns 1-3. GDP growth has a negative and non-significant effect on promotion, and the coefficient remains fairly stable when mayor and prefecture characteristics are added to the regression. In contrast to the literature, I find no

correlation between growth and promotion.

Age has an inverted-U relationship with promotion, indicating that older mayors are more likely to be promoted, but also capturing the fact that mayors above the retirement age (60) have lower promotion chances. Tenure and education are both positively correlated with promotion (coefficients for these dummy variables are omitted)[21], indicating that there is some meritocratic element to promotion. Interestingly, mayors serving in their hometown prefecture are much less likely to be promoted, even controlling for prefecture type. This could be a selection effect, where high quality leaders (who are likely to reach high office) are appointed as mayors outside of their hometown. This shuffling could be designed for merely helping 'groomed' mayors to gain experience, or to prevent them from forming factional ties in their hometowns.

Columns 4-6 and 7-9 repeat the same analysis using logistic and ordered logistic regression, respectively. They both confirm my LPM results, again finding a negative and non-significant coefficient on GDP growth. I conclude that the weaknesses of linear probability models (i.e., generating predicted values outside of $[0, 1]$) are not important here.[22]

5.3 Power analysis

Given that I find a null result, a natural question is whether my analysis is sufficiently powered to detect a reasonable effect size. In their analysis of provincial leaders, Jia et al. (2015) report that a one standard deviation (2.4pp) increase in growth increases the probability of promotion by 1.7pp. I use this effect size (corresponding to a coefficient $\beta = 0.7$) to perform a simple power calculation. First, I assume that the sampling distribution of the estimate is t-distributed with center β, scale s, and degrees of freedom $n - k$. Since my prefecture GDP data has higher variance than the provincial data in Jia et al. (2015), I rescale to obtain $\beta = 0.017/0.048 = 0.36$. Taking the standard error $s = 0.11$ from my LPM results, I calculate that I have 89% power for this effect size. I conclude that statistical power is not a hindrance to detecting meritocratic promotion.

5.4 Robustness checks

Next, given the variety of regression specifications used in the meritocracy literature, perhaps my null result is due to not running the correct regression. To check this, I run a battery of robustness checks and plot the results in Fig. 1. The graph plots the LPM coefficient on *GDP*

[21] In Appendix Table 13, I report the coefficients for tenure and education.

[22] I vary the level of clustering in the LPM in Appendix Tables 14 and 15. I find that the main results are still nonsignificant.

growth across many regression specifications. These specifications can vary on: including covariates or not; using (cumulative) average GDP growth versus the annual growth rate; using province-year fixed effects (default) versus separately including province and year fixed effects; including prefecture fixed effects or not; using per capita GDP versus level GDP to construct the growth rate; and on the strictness of the promotion definition, which is decreasing in the definition number.

The main specification is denoted by the blue marker; this specification includes covariates, uses (cumulative) average GDP growth as the independent variable, uses province-year fixed effects, omits prefecture fixed effects, uses level GDP instead of per capita GDP to construct the growth rate, and uses my second definition of promotion (which includes a mayor moving to prefecture secretary or higher-ranked provincial positions).

As we can see, the coefficient is almost always negative and nonsignificant, and is never positive and significant. The coefficient is most negative using Definition 4, which is the most expansive definition of promotion. Compared to the other definitions, here the most leaders are counted as promoted, including those with lower growth rates, which generates a more negative correlation. Overall, the coefficients are stable, with the confidence intervals always overlapping.

In the Appendix, I perform multiple other robustness checks. Table 16 shows the main regression results when adding covariates one at a time; the coefficients are stably negative and nonsignificant. Next I explore whether promotion decisions are made by comparing prefecture leaders' GDP growth to the annual growth target set by their provincial government.[23] Table 17 tests whether mayors are promoted for having their cumulative average GDP growth higher than the provincial target. I find no correlation using either a dummy variable $\mathbb{1}\{Growth > Target\}$, a dummy for growth exceeding the target by 3pp (representing the 75th percentile of growth relative to the target), or a continuous variable for distance to the target.

Taking another angle, Table 18 tests whether mayors are promoted for being above the target in consecutive years. I find a strong positive correlation that disappears once I control for tenure, as being above the target in consecutive years is strongly correlated with how many years a mayor has been in office. To confirm this interpretation, I show in Table 19 that I get the same pattern when using consecutive years *below* the growth target. Overall, I do not find any evidence that mayors are evaluated based on their economic performance relative to the target set by their provincial government.

A different explanation for my null result is that a positive correlation is being masked

[23]Data on provincial growth targets is taken from the "Report on the Work of the Government", available online. Li et al. (2019) studies GDP growth targets in China.

by heterogeneity by prefecture type. Prefecture-level jurisdictions can one of three types: prefecture-level cities, prefectures, or autonomous prefectures.[24] So far I have been including a separate intercept for each type, but it is possible that different promotion criteria are applied in different types. For example, autonomous prefectures, being located in western provinces, might focus more on social stability than economic growth, relative to prefecture-level cities. To test this hypothesis, I interact the GDP growth variable with a dummy for prefecture type. The results are presented in Table 20. While promotion is much less likely in autonomous prefectures, I find no evidence that the growth-promotion correlation differs by prefecture type.

One worry about the promotion data is that some mayors are promoted during their first year in office, when it is not clear that GDP data is available to evaluate their growth performance. In particular, since GDP data is not released until the following year, the Organization Department is seemingly not able to measure GDP growth for mayors promoted during their first year. Table 21 excludes mayors who are promoted after serving in office for only one year. When excluding them, however, the coefficient remains negative and nonsignificant.

Several papers in the literature calculate GDP growth relative to a leader's predecessor's average growth, to capture whether the government evaluates performance by comparing a leader to their predecessor. Chen, Li, and Zhou (2005) take this approach for provincial leaders, while Shih et al. (2012) calculates growth relative to both the provincial average as well as the predecessor's average growth. I implement these methods in Tables 23 and 24, and again find no correlation.

To further explore the relationship between GDP growth and promotion, I replace my continuous average relative growth variable with dummy variables for the maximum growth in a province-year, having growth above the province-year median, and quartiles of GDP growth calculated by province-year. The results are reported in Tables 25, 26, and 27, where I find no relationship. Finally, I calculate relative GDP growth by subtracting the provincial average, where the latter is computed excluding observation i; I then use this variable to construct cumulative average relative growth.[25] This is to capture whether the government evaluates the relative performance of mayor i by comparing to the performance only of the $-i$ mayors. Table 28 shows that this change does not affect the null result.

In Section 4, I mentioned that we should observe meritocratic promotion for mayors rather than party secretaries. This is because mayors, as the government executive, are in

[24] As of this writing, there are 333 prefecture-level divisions in China, with 293 prefecture-level cities, 7 prefectures, and 33 autonomous prefectures (including leagues).

[25] My baseline results use the provincial average without excluding observation i.

charge of running the economy, while the party secretary is responsible for social stability. To confirm this assumption, I test for a growth-promotion correlation for prefecture secretaries, using data from papers in the literature (Chen and Kung, 2019; Yao and Zhang, 2015; Li et al., 2019; and Landry et al. 2018). The results are presented in Tables 29-32. I find no effect of GDP growth on promotion, measured as annual or cumulative average growth, in either linear probability or logistic regression models. Hence, the meritocratic promotion hypothesis is not supported by the data for either prefecture mayors or secretaries.

I conclude that my null result is robust to different regression models, different samples, and different variable definitions, and reflects the true correlation between GDP growth and promotion.

5.5 Heterogeneity

To further explore my null result, I examine heterogeneity across space and time. In particular, it is possible that the government uses meritocratic promotion in the rich, fast-growing coastal provinces, but applies different promotion criteria in the western provinces with large ethnic minority populations (where social stability is more important). I interact GDP growth with region dummies (see Table 3) to test for regional heterogeneity. Furthermore, Sheng (2020) finds that meritocracy at the provincial level only existed during the Jiang Zemin era (1993-2002), when economic growth was highly valued by the central government. To test for changes in promotion criteria over time, I interact GDP growth with dummies for eras corresponding to the general secretary (see Table 4).

Results are presented in Tables 5 and 6. Column 3 in both tables presents my preferred specification with full controls. I find no statistically significant differences across regions or eras.[26] I conclude that my null result is not driven by different regions or eras applying different promotion criteria, which cancel out and produce a null average effect. Instead, the absence of meritocratic promotion for prefecture mayors is consistent across regions and eras.[27]

[26]Figure 2 plots the coefficients from a regression interacting GDP growth with year dummies. I again find no pattern across years. Table 22 tests whether growth affects promotion differently in autonomous regions (Tibet, Xinjiang, Inner Mongolia, Ningxia, and Guangxi); I find no statistically significant difference.

[27]In unreported results, I calculate the regression weights from Aronow and Samii (2016), which determine the effective sample used by OLS. I find no striking patterns; the weights are fairly even across regions and eras, confirming the interaction results.

6 Extensions

6.1 Political connections

The main alternative to the meritocracy hypothesis is that political connections determine promotion. Rather than the best-performing leaders being promoted, the connections view contends that it is the best-connected leaders who advance through the bureaucracy. My null result could be obscuring a real positive correlation, if I do not properly control for connections. While my baseline results control for a mayor having any poltical connection (either shared hometown, school, or 'patron', defined below), there is possibly a more subtle relationship between connections and promotion, where only connected leaders are promoted meritocratically.

Studying provincial leaders, Shih et al. (2012) finds that factional ties explain promotion, where ties are defined based on shared birthplace or overlapping time in college or past workplaces. In contrast, Jia et al. (2015) finds a positive interaction effect between workplace connections and growth (and no effect for hometown or college ties), concluding that some limited form of meritocracy exists, while also providing an answer to the competence-loyalty tradeoff. However, Fisman et al. (2020), studying candidates for the Politburo, finds that hometown and college ties have a negative effect on promotion (and no effect for workplace ties), after including fixed effects to control for quality differences. Overall, the literature on provincial leaders is quite mixed.

Papers studying prefecture leaders use varying definitions of political connections. Chen and Kung (2019) controls for 'factional ties', but includes no details on the variable construction beyond citing Shih et al. (2012) and Jia et al. (2015). Li et al. (2019) does not control for connections, while Yao and Zhang (2015) uses provincial experience as a proxy for connections. Jiang (2018) defines connections based on a leader being in office at the same time as the provincial secretary who appointed them. Landry et al. (2018) uses a similar definition, but also requires that the leader was appointed at least one year after the provincial secretary took office (i.e., leaders are not connected if they were appointed in the same year that the provincial secretary took office)[28].

While workplace ties are commonly used, this definition is vulnerable to false positives and selection bias. In particular, if a high ability leader rises to a high-ranking office on the basis of their performance, but doesn't form any connections during that time, they will

[28]From correspondence with Xiaobo Lu. Note that this does not match the definition used in the text: "a political connection is coded 1 when a prefectural politician experienced a position change under the watch of the provincial party secretary who appointed them to the current position in the first place, and 0 otherwise." (Landry et al. 2018, p.1084)

nevertheless be coded as connected. Moreover, if high-ability leaders are more likely to be promoted, this will generate a spurious correlation between connections and promotion.

I collected data on shared hometown and college with the provincial secretary and governor. Table 7 shows the summary statistics. Roughly 30% of mayors share a home province with a provincial leader (either secretary or governor), while only 4% share a home prefecture (and 1% attended the same school). Using Jiang (2018)'s definition, where a mayor's patron is the provincial secretary who appointed them, 73% of mayors are in office while their patron is the current provincial secretary.

Next I examine whether connections play a role in determining the effect of growth on promotion. Table 8 shows that controlling for connections individually has no effect on the growth coefficient. Further, of the connection variables, only the patron variable has a significant effect, but it is surprisingly negative. This is despite including tenure fixed effects, as by construction, mayors are more likely to be connected to their patron earlier in their term.

To explore whether meritocracy is restricted only to connected mayors, I interact GDP growth with the connection variables. As reported in Table 9, the interaction coefficient is not significant. Hence, I conclude that my null result is not driven by meritocratic promotion being applied differentially to connected and unconnected mayors.

6.2 Pollution

Another factor that could explain my null result is omitting variables that are used as promotion criteria. In particular, Zheng et al. (2014) finds that pollution reduction is correlated with promotion for prefecture mayors over 2004-2009. My null result could be driven by pollution being an omitted variable. Under this scenario, mayors are promoted meritocratically based on GDP growth, so long as they are also environmentally friendly.

I test this hypothesis by interacting GDP growth with a pollution variable. I measure pollution using data on PM2.5 (from NASA) and industrial sulfur dioxide emissions (SO2, collected from the provincial yearbooks). I calculate dummy variables for whether a mayor's pollution is above the province-year median; I measure pollution using the growth rate as well as by taking the log, for both PM2.5 and SO2. If only the environmentally-friendly mayors are promoted meritocratically, we should observe a negative coefficient on the interaction between growth and the above-median pollution dummy.

The results are presented in Tables 10 and 11. The interaction effects are nonsignificant for both pollution variables, and for both the growth and log specifications. I conclude that meritocratic promotion is not applied differentially to mayors based on their environmental

quality.

6.3 Corruption crackdown

Upon taking office in late 2012, Xi Jinping launched an extensive corruption crackdown, arresting thousands of officials, from low-level bureaucrats to Politburo members. Has this crackdown affected the promotion tournament? If Hsieh et al (2019) are correct that China's growth depends on crony capitalism, then we might expect the crackdown to upend meritocratic promotion. In particular, if mayors need to engage in corruption in order to boost growth, then the high-growth mayors will also be the corrupt officials targeted in the crackdown.

There are two mechanisms through which the crackdown can generate a null result for meritocratic promotion. First, corruption is possibly an omitted variable, driving both GDP growth and arrests. If high-growth mayors are arrested, I will pick up a mechanically negative effect on promotion, since by definition, being arrested means $Promotion = 0$. This negative effect could mask a true positive effect.

Second, by deterring growth-boosting corruption, the crackdown would also hinder economic growth. If the government realizes that GDP growth is tightly linked to corruption, it may put less or even negative weight on growth in determining promotion. Hence, my null result could be explained by a structural break in the growth-promotion relationship in 2012, with a positive correlation before being cancelled out by a negative correlation afterwards. I test these hypotheses in Table 12 by controlling for arrests and interacting GDP growth with a post-crackdown dummy.

I find that the mechanical effect of arrests is negligible. In my data, 35 mayors are arrested for corruption while in office, making up 2% of all 1684 mayors, which is not large enough to sway the main result. As shown in Columns (1) and (2), controlling for arrests barely changes the coefficient on growth. Moreover, a t-test of average relative growth comparing arrested and non-arrested mayors finds that arrested mayors actually have lower growth rates (although not statistically different). Hence, it is not the case that high-growth mayors are arrested for corruption. One interpretation, consistent with Hsieh et al. (2019), is that the crackdown was not targeting growth-friendly corruption, which is still permitted by the regime, but rather growth-hindering corruption. Otherwise, this result casts some doubt on Hseih's claim that cronyism is necessary for growth.

In Columns (3) and (4) I test for a structural break in the effect of growth on promotion at the launch of the corruption crackdown. I find that the both the individual and interaction terms are negative and nonsignificant, even controlling for arrests. So it is not

the case that the government promoted mayors meritocratically before the crackdown and nonmeritocratically afterwards. Hence, the corruption crackdown does not explain the null result for meritocratic promotion.

7 Conclusion

In contrast to the literature, I find no evidence for meritocratic promotion of prefecture leaders. This null result is robust to many different specifications and variable definitions, and is not explained by heterogeneous effects or omitted factors like political connections or the corruption crackdown. One explanation for this null result is that prefecture mayors are evaluated on many factors, such as party loyalty, environmental quality, and social policy, as well as economic growth, and hence the signal from GDP growth is too weak to detect empirically.

The original motivation for the meritocracy literature was to provide an explanation for China's incredible economic growth. But is meritocracy necessary for understanding how China could sustain double-digit growth for three decades? After all, China had favorable conditions for growth: high levels of human capital, high state capacity, and political stability, to name a few. Perhaps standard growth theory gives a sufficient explanation, without needing to appeal to the incentives of politicians. Alternatively, it is possible that politicians were indeed incentivized to boost growth, but for the purpose of raising tax revenues rather than winning a promotion tournament. As argued by Su et al. (2012), local governments targeted economic growth in order to make up for the revenue shortfall caused by the 1994 tax reform, which shifted revenues to the central government. I am not taking a stand on whether these alternative explanations are correct. Instead, I merely want to demonstrate that, as economists, our explanations for China's growth remain strong even if we discard the meritocracy hypothesis. I will revisit the question of meritocracy in China in Chapter 2, where I find some evidence for meritocratic promotion at the county level.

8 Tables and figures

Table 1: Summary statistics

	mean	min	p50	max	count
Annual GDP growth	0.11	-0.49	0.10	2.02	5640
Average relative growth	0.00	-0.59	-0.00	1.62	5640
Log GDP	6.37	1.18	6.40	10.02	5640
Log population	5.74	2.00	5.85	7.27	5636
Promotion	0.18	0.00	0.00	1.00	5640
Age	49.97	26.00	50.00	61.00	5566
Sex	0.07	0.00	0.00	1.00	5420
Education	2.84	1.00	3.00	4.00	5329
Tenure	2.56	1.00	2.00	14.00	5640
Arrested	0.06	0.00	0.00	1.00	5285
Home prefecture	0.11	0.00	0.00	1.00	5573
Political connection	0.73	0.00	1.00	1.00	5628
Observations	5640				

Table 2: No effect of GDP growth on promotion

	LPM			Logit			Ordered logit		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDP growth	-0.034	-0.091	-0.060	-0.282	-0.890	-0.687	-0.044	-0.485	-0.164
	(0.085)	(0.089)	(0.108)	(0.718)	(0.845)	(0.901)	(0.672)	(0.743)	(0.848)
Age		0.047*	0.056**		0.374	0.519**		0.548**	0.654***
		(0.024)	(0.025)		(0.261)	(0.246)		(0.218)	(0.217)
Age squared		-0.001**	-0.001**		-0.004	-0.005**		-0.006***	-0.007***
		(0.000)	(0.000)		(0.003)	(0.002)		(0.002)	(0.002)
Sex		0.017	0.018		0.121	0.132		0.132	0.148
		(0.024)	(0.024)		(0.154)	(0.154)		(0.155)	(0.154)
Home prefecture		-0.083***	-0.065***		-0.793***	-0.600***		-0.715***	-0.572***
		(0.018)	(0.019)		(0.178)	(0.181)		(0.161)	(0.167)
Connection		-0.042**	-0.041**		-0.224	-0.223		-0.276*	-0.277*
		(0.020)	(0.020)		(0.156)	(0.159)		(0.154)	(0.156)
Initial GDP			-0.017*			-0.124			-0.097
			(0.009)			(0.079)			(0.079)
Initial Population			0.018*			0.132			0.160*
			(0.011)			(0.090)			(0.089)
Observations	5640	5172	5141	4367	3954	3927	5658	5198	5173
Adjusted R^2	0.080	0.126	0.128						
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Prefecture covariates	No	No	Yes	No	No	Yes	No	No	Yes

Standard errors in parentheses

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

Note: *GDPgrowth* is a mayor's cumulative average relative growth rate over their term. Mayor covariates include dummy variables for tenure and education categories. Prefecture covariates includes dummy variables for prefecture type. Standard errors clustered at the prefecture level in LPM, and at the province-year level in the logit and ordered logit models.

Figure 1: Robustness checks: linear probability model

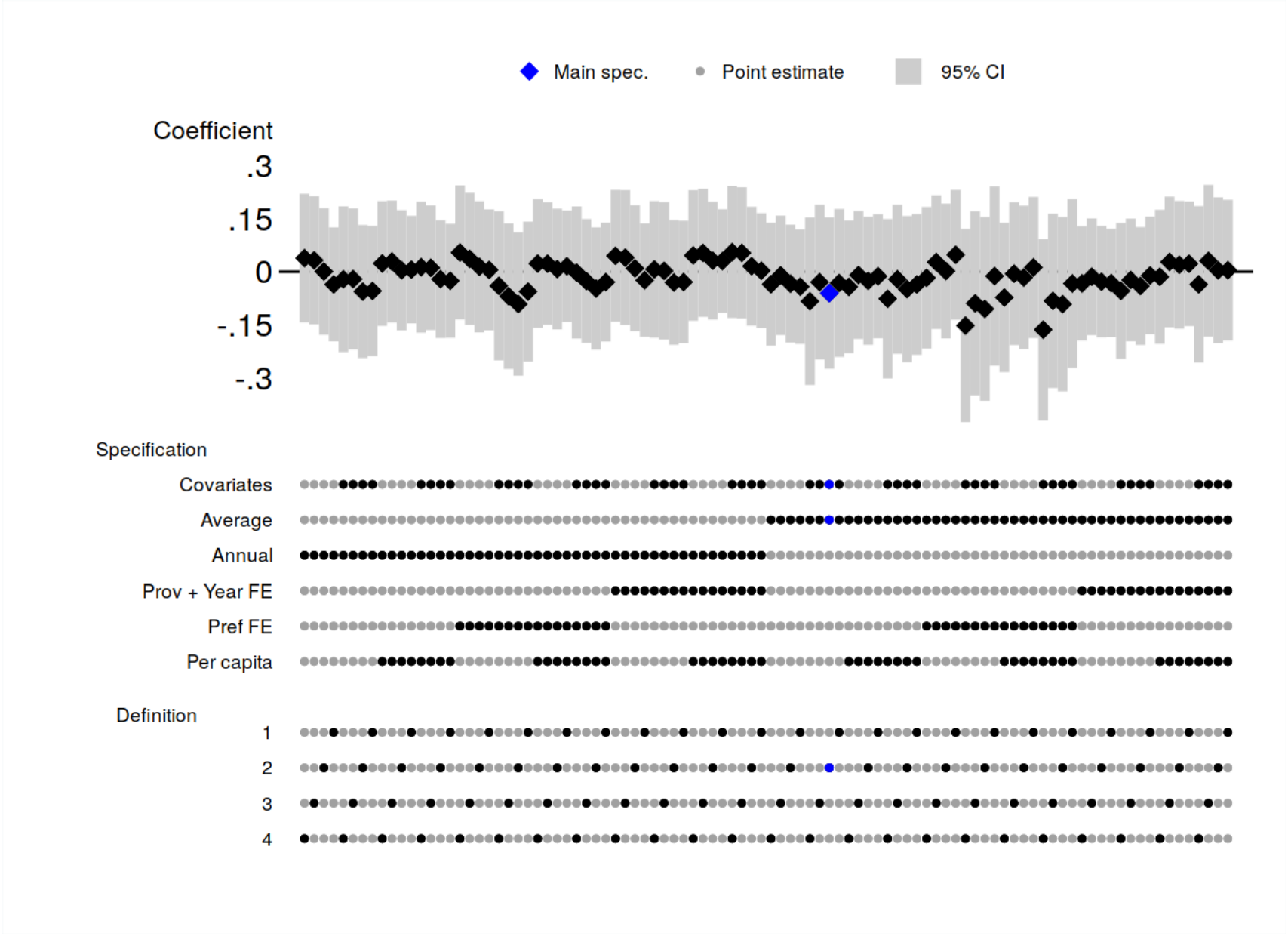

Table 3: Regions

Southeast	Jiangsu	Zhejiang	Fujian	Guangdong	Hainan
Southcentral	Henan	Hubei	Hunan	Anhui	Jiangxi
Northeast	Shandong	Hebei	Liaoning	Jilin	Heilongjiang
Northcentral	Shanxi	Inner Mongolia			
Northwest	Shaanxi	Ningxia	Gansu	Qinghai	Xinjiang
Southwest	Guangxi	Guizhou	Yunnan	Sichuan	Tibet

Table 4: Eras

Jiang	**Hu: I**	**Hu: II**	**Xi**
1998-2002	2003-2007	2008-2012	2013-2017

Table 5: Heterogeneous effects by region

	(1)	(2)	(3)
GDP growth	0.116	-0.263	-0.213
	(0.346)	(0.478)	(0.482)
Growth × Northeast	-0.252	0.057	-0.015
	(0.421)	(0.535)	(0.540)
Growth × Northcentral	-0.157	0.111	0.125
	(0.449)	(0.547)	(0.559)
Growth × Northwest	-0.215	0.152	0.134
	(0.379)	(0.526)	(0.530)
Growth × Southwest	-0.174	0.234	0.293
	(0.362)	(0.482)	(0.510)
Growth × Southcentral	-0.088	0.309	0.305
	(0.385)	(0.513)	(0.515)
Observations	5640	5172	5141
Adjusted R^2	0.079	0.125	0.127
Province-year FE	Yes	Yes	Yes
Mayor characteristics	No	Yes	Yes
Prefecture characteristics	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Omitted group is Southeast. Regression model is as in Equation 1, with *Growth* interacted with region dummies. *GDP growth* is a mayor's cumulative average relative growth rate over their term. Mayor covariates include dummy variables for tenure and education categories. Prefecture covariates includes dummy variables for prefecture type. Standard errors clustered at the prefecture level.

Table 6: Heterogeneous effects by era

	(1)	(2)	(3)
GDP growth	0.101	0.013	0.031
	(0.179)	(0.217)	(0.220)
Growth × Hu I era	-0.110	-0.090	-0.053
	(0.184)	(0.225)	(0.247)
Growth × Hu II era	-0.087	0.079	0.120
	(0.253)	(0.281)	(0.287)
Growth × Xi era	-0.477	-0.443	-0.470
	(0.300)	(0.320)	(0.321)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor characteristics	No	No	Yes
Prefecture characteristics	No	Yes	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Omitted group is Jiang Zemin II era (1998-2002). Regression model is as in Equation 1, with *Growth* interacted with region dummies. *GDP growth* is a mayor's cumulative average relative growth rate over their term. Mayor covariates include dummy variables for tenure and education categories. Prefecture covariates includes dummy variables for prefecture type. Standard errors clustered at the prefecture level.

Table 7: Summary stats: political connections

	mean	min	max	count
Hometown (prefecture)	0.03	0	1	5571
Hometown (province)	0.30	0	1	5573
School	0.01	0	1	5516
Patron	0.73	0	1	5626
Observations	5638			

Table 8: Controlling for political connections

	(1)	(2)	(3)	(4)	(5)
GDP growth	-0.061	-0.060	-0.061	-0.071	-0.079
	(0.106)	(0.107)	(0.107)	(0.107)	(0.108)
Hometown (prefecture)		-0.010			
		(0.029)			
Hometown (province)			0.022		
			(0.015)		
School				0.024	
				(0.040)	
Patron					-0.042**
					(0.020)
Observations	5153	5153	5153	5142	5141
Adjusted R^2	0.125	0.125	0.125	0.126	0.126
Province-year FE	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Average growth* is a mayor's cumulative average relative growth rate over their term. Covariates include dummy variables for tenure, education categories, and prefecture type. Standard errors clustered at the prefecture level.

Table 9: Interacting growth × connections

	(1)	(2)	(3)	(4)	(5)
	Baseline	Pref. hometown	Prov. hometown	School	Patron
GDP growth	-0.061	-0.067	0.041	-0.068	0.002
	(0.106)	(0.099)	(0.126)	(0.107)	(0.264)
Connection		-0.011	0.022	0.016	-0.042**
		(0.029)	(0.015)	(0.044)	(0.020)
Connection × Growth		0.189	-0.326	-1.187	-0.102
		(0.907)	(0.261)	(2.109)	(0.273)
Observations	5153	5153	5153	5142	5141
Adjusted R^2	0.125	0.125	0.125	0.126	0.126
Province-year FE	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Average growth* is a mayor's cumulative average relative growth rate over their term. Covariates include dummy variables for tenure, education categories, and prefecture type. Standard errors clustered at the prefecture level.

Table 10: Pollution results: SO2

	(1)	(2)	(3)	(4)
Growth rate	-0.093	-0.021	-0.103	-0.119
	(0.145)	(0.192)	(0.136)	(0.182)
SO2 growth > median	-0.000	-0.000		
	(0.012)	(0.012)		
Growth × SO2 growth > median		-0.152		
		(0.284)		
Log SO2 > median			-0.006	-0.006
			(0.012)	(0.012)
Growth × Log SO2 > median				0.029
				(0.269)
Observations	3717	3717	3957	3957
Adjusted R^2	0.127	0.127	0.125	0.125
Province-year FE	Yes	Yes	Yes	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Growth rate* is a mayor's cumulative average relative growth rate over their term. Covariates include a quadratic in age, dummy variables for sex, tenure, education categories, and home prefecture, as well as log initial GDP and population, and dummy variables for prefecture type. Standard errors clustered at the prefecture level.

Table 11: Pollution results: PM2.5

	(1)	(2)	(3)	(4)
Growth rate	-0.042	-0.081	-0.051	-0.036
	(0.117)	(0.171)	(0.114)	(0.153)
PM2.5 growth > median	-0.002	-0.002		
	(0.010)	(0.010)		
Growth × PM2.5 growth > median		0.078		
		(0.211)		
Log PM2.5 > median			-0.001	-0.001
			(0.011)	(0.011)
Growth × Log PM2.5 > median				-0.032
				(0.220)
Observations	4714	4714	4820	4820
Adjusted R^2	0.123	0.123	0.124	0.123
Province-year FE	Yes	Yes	Yes	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Growth rate* is a mayor's cumulative average relative growth rate over their term. Covariates include a quadratic in age, dummy variables for sex, tenure, education categories, and home prefecture, as well as log initial GDP and population, and dummy variables for prefecture type. Standard errors clustered at the prefecture level.

Table 12: Corruption crackdown

	(1)	(2)	(3)	(4)
Growth rate	-0.061	-0.064	-0.001	-0.006
	(0.106)	(0.107)	(0.113)	(0.113)
Arrest		-0.270***		-0.269***
		(0.037)		(0.037)
Growth × Post			-0.289	-0.279
			(0.256)	(0.259)
Observations	5153	5153	5153	5153
Adjusted R^2	0.125	0.128	0.125	0.128
Province-year FE	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Growth rate* is a mayor's cumulative average relative growth rate over their term. *Arrest* is a dummy variable for mayors who were arrested while in office. Covariates include a quadratic in age, dummy variables for sex, tenure, education categories, and home prefecture, as well as log initial GDP and population, and dummy variables for prefecture type. Standard errors clustered at the prefecture level.

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A A model of a promotion tournament

One way to think about China's promotion tournament is as an incentive scheme.[29] To encourage leaders to exert effort in growing GDP, the goverment rewards the best-performing leaders with promotion. Here I focus on the prefecture-level promotion tournament. Suppose that the provincial government's payoff is a function of the tax revenues remitted upwards from the prefecture governments competing in the tournament. In particular, assume that the provincial government receives taxes equal to a share α of prefecture leader i's growth, for a payoff αg_i. Next assume that economic growth is a function of a leader's effort e_i and an idiosyncratic shock ε_i: $g_i = e_i + \varepsilon_i$, where ε_i has a mean-zero distribution function F.

The prefecture leader's payoff is r if they are promoted and 0 otherwise (assuming commitment on the part of the provincial government). The cost of effort is $c(e_i)$, where $c' > 0$ and $c'' > 0$. The leader is promoted if $\alpha g_i \geq \bar{u}$, where $\bar{u} \sim U[-1/2\nu, 1/2\nu]$ is the growth performance of the next best competitor. The probability of promotion is given by

$$\mathbb{P}(\alpha g_i \geq \bar{u}) = \int [\frac{1}{2} + \nu\alpha(e_i + \varepsilon_i)]dF(\varepsilon_i) = \frac{1}{2} + \nu\alpha e_i,$$

where $\int \varepsilon_i dF(\varepsilon_i) = 0$.

Hence, leader i chooses e_i to maximize $r(1/2 + \nu\alpha e_i) - c(e_i)$. Taking the first-order condition, and using $c'' > 0$, we have a unique e_i^* defined by $r\nu\alpha = c'(e_i^*)$. The main insight here is that the probability of promotion is increasing in GDP growth. To show this, differentiate $\mathbb{P}(\alpha g_i \geq \bar{u})$ with respect to g_i to get $\nu\alpha > 0$. Thus, if China is running a promotion tournament, we should observe a positive correlation between relative GDP growth and promotion.

B Promotion definitions

A mayor is promoted if they take a position as a:

- $Promotion_1$: prefecture secretary
- $Promotion_2$: $Promotion_1$+ mayor in a sub-provincial city, higher-ranking position in the provincial or central government, or a higher-ranking position in the Communist Youth League.

[29] This section is based on Jia et al. (2015), who also provide a model of promotion as a screening device for the government to select high ability leaders.

- $Promotion_3$: $Promotion_2$+ vice-chairman, vice-secretary, chairman, or secretary of the Leading Party Members Group in the provincial Local People's Congress or Chinese People's Political Consultative Conference.
- $Promotion_4$: $Promotion_3$+ head of a provincial bureau.

Unless noted otherwise, my results use $Promotion_2$.

C Results

Table 13: LPM: results for tenure and education

	(1)	(2)	(3)
GDP growth	-0.034	-0.093	-0.059
	(0.085)	(0.090)	(0.109)
Tenure		0.037***	0.036***
		(0.006)	(0.006)
High school		0.000	0.000
		(.)	(.)
College		0.044	0.041
		(0.033)	(0.031)
Master's		0.051	0.044
		(0.032)	(0.030)
Ph.D.		0.068**	0.065**
		(0.034)	(0.033)
Age		0.053**	0.062**
		(0.024)	(0.025)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.018	0.018
		(0.024)	(0.023)
Home prefecture		-0.087***	-0.068***
		(0.018)	(0.020)
Connection		-0.067***	-0.065***
		(0.020)	(0.020)
Initial GDP			-0.022**
			(0.009)
Initial Population			0.020*
			(0.011)
Observations	5640	5175	5144
Adjusted R^2	0.080	0.122	0.124
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *GDPgrowth* is a mayor's cumulative average relative growth rate over their term. Prefecture covariates includes dummy variables for prefecture type. Standard errors clustered at the prefecture level.

Table 14: LPM: clustering at province-year level

	(1)	(2)	(3)
GDP growth	-0.034	-0.091	-0.060
	(0.085)	(0.086)	(0.100)
Age		0.047*	0.056**
		(0.025)	(0.025)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.017	0.018
		(0.022)	(0.022)
Home prefecture		-0.083***	-0.065***
		(0.017)	(0.018)
Connection		-0.042*	-0.041*
		(0.021)	(0.022)
Initial GDP			-0.017*
			(0.010)
Initial Population			0.018*
			(0.011)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: $GDPgrowth$ is a mayor's cumulative average relative growth rate over their term. Mayor covariates include dummy variables for tenure and education categories. Prefecture covariates includes dummy variables for prefecture type. Standard errors clustered at the province-year level.

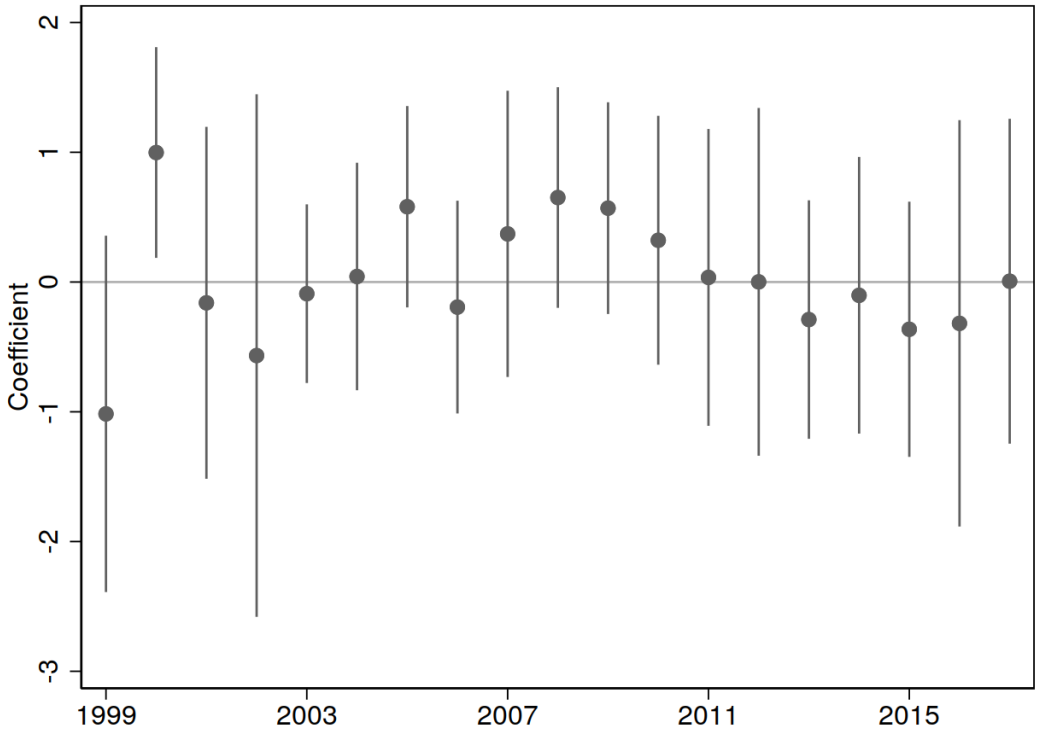
Table 15: LPM: clustering at province level

	(1)	(2)	(3)
GDP growth	-0.034	-0.091	-0.060
	(0.063)	(0.059)	(0.074)
Age		0.047*	0.056**
		(0.023)	(0.022)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.017	0.018
		(0.022)	(0.021)
Home prefecture		-0.083***	-0.065***
		(0.020)	(0.017)
Connection		-0.042**	-0.041**
		(0.016)	(0.017)
Initial GDP			-0.017
			(0.011)
Initial Population			0.018*
			(0.010)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: $GDPgrowth$ is a mayor's cumulative average relative growth rate over their term. Mayor covariates include dummy variables for tenure and education categories. Prefecture covariates includes dummy variables for prefecture type. Standard errors clustered at the province level.

Figure 2: Heterogeneity by year



Note: Coefficients are from baseline regression with GDP growth interacted with year dummies. Omitted year is 1998.

Table 16: Adding covariates in series

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GDP growth	-0.034	-0.029	-0.051	-0.082	-0.070	-0.074	-0.091	-0.101	-0.079	-0.060
	(0.085)	(0.085)	(0.083)	(0.087)	(0.089)	(0.089)	(0.089)	(0.090)	(0.108)	(0.108)
Age		0.036*	0.032	0.055**	0.056**	0.047*	0.047*	0.061**	0.058**	0.056**
		(0.022)	(0.022)	(0.024)	(0.025)	(0.024)	(0.024)	(0.025)	(0.025)	(0.025)
Age squared		-0.000*	-0.000	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sex			0.012	0.008	0.010	0.018	0.017	0.017	0.020	0.018
			(0.021)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Home prefecture						-0.081***	-0.083***	-0.083***	-0.085***	-0.065***
						(0.018)	(0.018)	(0.018)	(0.018)	(0.019)
Political connection							-0.042**	-0.042**	-0.042**	-0.041**
							(0.020)	(0.020)	(0.020)	(0.020)
Initial GDP								-0.000	-0.010	-0.017*
								(0.008)	(0.009)	(0.009)
Initial Population									0.019*	0.018*
									(0.011)	(0.011)
Observations	5640	5565	5347	5345	5244	5184	5172	5161	5141	5141
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tenure	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture type	No	No	No	No	No	No	No	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: the coefficient on *Growth* will be different if the order of covariates is different. See Gelbach (2016).

Table 17: GDP growth above the target

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Above target	0.009	-0.005	-0.003						
	(0.011)	(0.012)	(0.012)						
Above by 3pp				-0.017	-0.019	-0.015			
				(0.011)	(0.012)	(0.013)			
Distance to target							0.032	-0.061	0.005
							(0.080)	(0.086)	(0.107)
Age		0.048*	0.056**		0.047*	0.055**		0.048**	0.056**
		(0.024)	(0.025)		(0.024)	(0.025)		(0.024)	(0.025)
Age squared		-0.001**	-0.001**		-0.001**	-0.001**		-0.001**	-0.001**
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
Gender		0.017	0.018		0.017	0.018		0.017	0.018
		(0.024)	(0.024)		(0.024)	(0.024)		(0.024)	(0.024)
Home prefecture		-0.083***	-0.065***		-0.083***	-0.065***		-0.083***	-0.065***
		(0.018)	(0.019)		(0.018)	(0.019)		(0.018)	(0.019)
Political connection		-0.041**	-0.041**		-0.041**	-0.041**		-0.042**	-0.041**
		(0.020)	(0.020)		(0.020)	(0.020)		(0.020)	(0.020)
Initial GDP			-0.018*			-0.017*			-0.018*
			(0.009)			(0.009)			(0.009)
Initial Population			0.019*			0.018*			0.019*
			(0.010)			(0.011)			(0.011)
Observations	5640	5172	5141	5640	5172	5141	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128	0.080	0.126	0.128	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Prefecture covariates	No	No	Yes	No	No	Yes	No	No	Yes

Standard errors in parentheses

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

Note: *Above target* and *Above by 3pp* are indicator variables for a mayor being above the provincial GDP growth target by any amount, and by 3 percentage points, respectively. *Distance to target* is calculated as cumulative average GDP growth minus the annual target. Standard errors clustered at the prefecture level.

Table 18: Consecutive years above the growth target

	(1)	(2)	(3)	(4)	(5)	(6)
Above twice	0.078***	0.004	0.004			
	(0.011)	(0.015)	(0.015)			
Above thrice				0.102***	0.002	0.003
				(0.014)	(0.020)	(0.020)
Age		0.048**	0.057**		0.048**	0.056**
		(0.024)	(0.025)		(0.024)	(0.025)
Age squared		-0.001**	-0.001**		-0.001**	-0.001**
		(0.000)	(0.000)		(0.000)	(0.000)
Gender		0.017	0.018		0.017	0.018
		(0.024)	(0.024)		(0.024)	(0.024)
Home prefecture		-0.083***	-0.065***		-0.083***	-0.065***
		(0.018)	(0.019)		(0.018)	(0.019)
Political connection		-0.041**	-0.041**		-0.041**	-0.041**
		(0.020)	(0.020)		(0.020)	(0.020)
Initial GDP			-0.018*			-0.018*
			(0.009)			(0.009)
Initial Population			0.019*			0.019*
			(0.010)			(0.010)
Observations	5640	5172	5141	5640	5172	5141
Adjusted R^2	0.088	0.126	0.128	0.091	0.126	0.128
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes	No	Yes	Yes
Prefecture covariates	No	No	Yes	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Above twice* and *Above thrice* are indicator variables for a mayor being above the provincial GDP growth target two and three years in a row, respectively. Standard errors clustered at the prefecture level.

Table 19: Consecutive years below the growth target

	(1)	(2)	(3)	(4)	(5)	(6)
Below twice	0.054***	0.009	0.009			
	(0.014)	(0.017)	(0.017)			
Below thrice				0.109***	0.024	0.023
				(0.022)	(0.026)	(0.026)
Age		0.047*	0.056**		0.047*	0.055**
		(0.024)	(0.025)		(0.024)	(0.025)
Age squared		-0.001**	-0.001**		-0.001**	-0.001**
		(0.000)	(0.000)		(0.000)	(0.000)
Gender		0.017	0.018		0.017	0.018
		(0.024)	(0.024)		(0.024)	(0.024)
Home prefecture		-0.083***	-0.065***		-0.084***	-0.065***
		(0.018)	(0.019)		(0.018)	(0.019)
Political connection		-0.041**	-0.041**		-0.042**	-0.041**
		(0.020)	(0.020)		(0.020)	(0.020)
Initial GDP			-0.018*			-0.018*
			(0.009)			(0.009)
Initial Population			0.019*			0.019*
			(0.010)			(0.010)
Observations	5640	5172	5141	5640	5172	5141
Adjusted R^2	0.082	0.126	0.128	0.085	0.126	0.128
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes	No	Yes	Yes
Prefecture covariates	No	No	Yes	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Below twice* and *Below thrice* are indicator variables for a mayor being below the provincial GDP growth target two and three years in a row, respectively. Standard errors clustered at the prefecture level.

Table 20: Does meritocration promotion vary by prefecture type?

	(1)	(2)	(3)
GDP growth	-0.023	-0.138	-0.116
	(0.095)	(0.101)	(0.120)
Type: prefecture	0.018	-0.012	-0.042
	(0.027)	(0.032)	(0.035)
Type: Autonomous prefecture	-0.097***	-0.087***	-0.094***
	(0.013)	(0.019)	(0.021)
Growth × prefecture	0.110	0.681	0.440
	(0.422)	(0.517)	(0.518)
Growth × autonomous	0.110	0.376	0.377
	(0.259)	(0.238)	(0.241)
Age		0.045*	0.056**
		(0.024)	(0.025)
Age squared		-0.000*	-0.001**
		(0.000)	(0.000)
Gender		0.016	0.018
		(0.024)	(0.024)
Home prefecture		-0.065***	-0.067***
		(0.019)	(0.019)
Political connection		-0.041**	-0.041**
		(0.020)	(0.020)
Initial GDP			-0.017*
			(0.009)
Initial Population			0.018*
			(0.011)
Observations	5640	5172	5141
Adjusted R^2	0.083	0.128	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Omitted group is prefecture-level cities. Standard errors clustered at the prefecture level.

Table 21: Dropping mayors promoted in first year

	(1)	(2)	(3)
GDP growth	0.001	-0.047	-0.027
	(0.077)	(0.080)	(0.097)
Age		0.056***	0.070***
		(0.020)	(0.020)
Age squared		-0.001***	-0.001***
		(0.000)	(0.000)
Sex		0.002	0.003
		(0.022)	(0.022)
Home prefecture		-0.082***	-0.067***
		(0.016)	(0.018)
Political connection		-0.041**	-0.041**
		(0.019)	(0.019)
Initial GDP			-0.011
			(0.009)
Initial Population			0.017*
			(0.010)
Observations	5472	5013	4982
Adjusted R^2	0.070	0.167	0.168
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *GDP growth* is a mayor's cumulative average relative growth rate over their term. Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level. Excluding mayors who are promoted after serving one year in office.

Table 22: Interaction with autonomous dummy

	(1)	(2)	(3)
GDP growth	-0.005	-0.102	-0.064
	(0.112)	(0.122)	(0.124)
Growth × Autonomous	-0.103	0.037	0.022
	(0.139)	(0.148)	(0.228)
Age		0.047*	0.056**
		(0.024)	(0.025)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.017	0.018
		(0.024)	(0.024)
Home prefecture		-0.083***	-0.065***
		(0.018)	(0.019)
Political connection		-0.042**	-0.041**
		(0.020)	(0.020)
Initial GDP			-0.018*
			(0.009)
Initial Population			0.018*
			(0.011)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *GDP growth* is a mayor's cumulative average relative growth rate over their term. Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level. Autonomous regions: Tibet, Xinjiang, Inner Mongolia, Ningxia, and Guangxi.

Table 23: Growth relative to predecessor's average

	(1)	(2)	(3)
GDP growth	0.057	0.027	0.034
	(0.070)	(0.082)	(0.096)
Age		0.079**	0.075**
		(0.034)	(0.034)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.005	0.006
		(0.024)	(0.024)
Home prefecture		-0.083***	-0.061***
		(0.020)	(0.021)
Connection		-0.037*	-0.037*
		(0.021)	(0.021)
Initial GDP			-0.015
			(0.010)
Initial Population			0.013
			(0.011)
Observations	4875	4647	4635
Adjusted R^2	0.078	0.122	0.125
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *GDP growth* is a mayor's cumulative average relative growth rate over their term; growth is calculated relative to a mayor's predecessor's average growth rate (through subtraction). Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level.

Table 24: Growth relative to provincial average and predecessor's average

	(1)	(2)	(3)
GDP growth	0.012	-0.000	-0.002
	(0.072)	(0.084)	(0.098)
Age		0.079**	0.074**
		(0.034)	(0.034)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.005	0.006
		(0.024)	(0.024)
Home prefecture		-0.084***	-0.061***
		(0.020)	(0.021)
Connection		-0.038*	-0.038*
		(0.021)	(0.021)
Initial GDP			-0.016
			(0.010)
Initial Population			0.014
			(0.011)
Observations	4875	4647	4635
Adjusted R^2	0.078	0.122	0.125
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *GDP growth* is a mayor's cumulative average relative growth rate over their term; growth is calculated relative to the provincial average and the mayor's predecessor's average growth rate (through subtraction). Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level.

Table 25: Indicator variable for maximum growth

	(1)	(2)	(3)
Maximum growth	-0.025	-0.021	-0.021
	(0.017)	(0.018)	(0.018)
Age		0.047*	0.056**
		(0.024)	(0.025)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.017	0.017
		(0.024)	(0.024)
Home prefecture		-0.083***	-0.065***
		(0.018)	(0.019)
Political connection		-0.042**	-0.041**
		(0.020)	(0.020)
Initial GDP			-0.018*
			(0.009)
Initial Population			0.018*
			(0.010)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Maximum growth* is a dummy variable for a mayor having the highest growth in a province-year. Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level.

Table 26: Indicator variable for growth above median

	(1)	(2)	(3)
Growth > median	-0.004	-0.009	-0.008
	(0.010)	(0.010)	(0.010)
Age		0.047*	0.056**
		(0.024)	(0.025)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.017	0.018
		(0.024)	(0.024)
Home prefecture		-0.083***	-0.065***
		(0.018)	(0.019)
Political connection		-0.042**	-0.041**
		(0.020)	(0.020)
Initial GDP			-0.018*
			(0.009)
Initial Population			0.018*
			(0.010)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: *Growth > median* is a dummy variable for a mayor having growth higher than the province-year median. Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level.

Table 27: Indicator variable for growth quartiles

	(1)	(2)	(3)
Growth: 2nd quartile	0.006	0.011	0.011
	(0.013)	(0.014)	(0.014)
Growth: 3rd quartile	0.006	0.003	0.004
	(0.014)	(0.014)	(0.014)
Growth: 4th quartile	-0.010	-0.011	-0.011
	(0.013)	(0.014)	(0.014)
Age		0.047*	0.055**
		(0.024)	(0.025)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.016	0.017
		(0.024)	(0.024)
Home prefecture		-0.083***	-0.064***
		(0.018)	(0.019)
Political connection		-0.042**	-0.041**
		(0.020)	(0.020)
Initial GDP			-0.018*
			(0.009)
Initial Population			0.017*
			(0.010)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Growth quartiles are dummy variables calculated for each province-year. Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level.

Table 28: Calculate provincial average excluding i

	(1)	(2)	(3)
GDP growth	-0.037	-0.087	-0.063
	(0.075)	(0.079)	(0.098)
Age		0.047*	0.056**
		(0.024)	(0.025)
Age squared		-0.001**	-0.001**
		(0.000)	(0.000)
Sex		0.017	0.018
		(0.024)	(0.024)
Home prefecture		-0.083***	-0.065***
		(0.018)	(0.019)
Political connection		-0.042**	-0.041**
		(0.020)	(0.020)
Initial GDP			-0.017*
			(0.009)
Initial Population			0.018*
			(0.011)
Observations	5640	5172	5141
Adjusted R^2	0.080	0.126	0.128
Province-year FE	Yes	Yes	Yes
Mayor covariates	No	Yes	Yes
Prefecture covariates	No	No	Yes

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: GDP growth is calculated relative to the provincial average, where the latter is computed excluding observation i; this variable is then used to calculate cumulative relative average growth. Mayor covariates include dummy variables for tenure and education categories. Standard errors clustered at the prefecture level.

Table 29: Chen and Kung (2019): prefecture secretaries

	LPM		Logit		Ordered logit	
	(1)	(2)	(3)	(4)	(5)	(6)
Annual growth	0.055		1.123		0.731	
	(0.076)		(1.474)		(0.784)	
Cumulative average growth		0.048		0.702		0.388
		(0.080)		(1.672)		(0.905)
Age	0.051*	0.051*	0.921	0.949*	2.646***	2.654***
	(0.029)	(0.029)	(0.577)	(0.569)	(0.378)	(0.378)
Age squared	-0.001*	-0.001*	-0.010*	-0.010*	-0.027***	-0.027***
	(0.000)	(0.000)	(0.006)	(0.005)	(0.004)	(0.004)
Sex	0.012	0.012	0.347	0.354	-0.328	-0.324
	(0.029)	(0.029)	(0.491)	(0.486)	(0.419)	(0.419)
Education	0.000	0.000	-0.003	-0.003	-0.031	-0.031
	(0.002)	(0.002)	(0.038)	(0.038)	(0.026)	(0.026)
Connections	0.003	0.003	0.063	0.051	0.264	0.266
	(0.017)	(0.017)	(0.270)	(0.269)	(0.220)	(0.219)
Initial GDP	0.036***	0.035***	0.635***	0.629***	0.450***	0.447***
	(0.006)	(0.006)	(0.106)	(0.105)	(0.074)	(0.074)
Tenure	0.025***	0.025***	0.402***	0.399***	0.004	0.003
	(0.004)	(0.004)	(0.068)	(0.067)	(0.060)	(0.060)
Observations	3009	3009	1465	1465	3023	3023

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Sample covers 2004-2014. Regression model: $Promotion_{ijpt} = \beta\, Growth_{ijpt} + \lambda X_{ijpt} + \epsilon_{ijpt}$. Province-year fixed effects. Standard errors clustered at the prefecture level (LPM and ordered logit) and province-year level (logit). Note that *Tenure* measures years in office *as observed in the data*, rather than actual years in office; the authors do not include a tenure variable. Similarly, *Initial GDP* is defined using a leader's first observed year in office.

Table 30: Yao and Zhang (2015): prefecture secretaries

	LPM		Logit	
	(1)	(2)	(3)	(4)
Annual growth	0.073		0.628	
	(0.063)		(0.609)	
Cumulative average growth		-0.124		-1.303
		(0.087)		(0.942)
Age	0.026	0.029	0.242	0.285
	(0.025)	(0.025)	(0.329)	(0.333)
Age squared	-0.000	-0.000	-0.003	-0.003
	(0.000)	(0.000)	(0.003)	(0.003)
Tenure	0.021***	0.021***	0.229***	0.232***
	(0.003)	(0.003)	(0.031)	(0.031)
Provincial experience	0.032***	0.030***	0.377***	0.360***
	(0.011)	(0.011)	(0.140)	(0.140)
Initial GDP	0.028***	0.030***	0.324***	0.340***
	(0.009)	(0.009)	(0.106)	(0.106)
Observations	3756	3756	2445	2445

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Sample covers 1998-2010. Regression model: $Promotion_{ijpt} = \beta\, Growth_{ijpt} + \lambda X_{ijpt} + \epsilon_{ijpt}$. Province-year fixed effects. Standard errors clustered at the prefecture level (LPM) and province-year level (logit).

Table 31: Li et al. (2019): prefecture secretaries

	LPM		Logit	
	(1)	(2)	(3)	(4)
Annual growth	0.100		1.853	
	(0.182)		(2.078)	
Cumulative average growth		0.226		4.918*
		(0.197)		(2.569)
Age	-0.037	-0.037	-0.450	-0.445
	(0.032)	(0.032)	(0.404)	(0.404)
Age squared	0.000	0.000	0.004	0.004
	(0.000)	(0.000)	(0.004)	(0.004)
Tenure	0.043***	0.043***	0.402***	0.399***
	(0.005)	(0.005)	(0.042)	(0.042)
Education	0.032	0.032	0.465	0.478
	(0.022)	(0.022)	(0.332)	(0.339)
Observations	3290	3290	1976	1976
Adjusted R^2	0.141	0.141		

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Sample covers 2003-2014. Regression model: $Promotion_{ijpt} = \beta\, Growth_{ijpt} + \lambda X_{ijpt} + \epsilon_{ijpt}$. Province-year fixed effects. Standard errors clustered at the prefecture level (LPM) and province-year level (logit).

Table 32: Landry et al. (2018): prefecture secretaries

	LPM		Logit	
	(1)	(2)	(3)	(4)
Annual growth	-0.008		-0.062	
	(0.005)		(0.074)	
Cumulative average growth		-0.006		-0.113
		(0.006)		(0.088)
Age	-0.076**	-0.077**	-0.721**	-0.715**
	(0.031)	(0.031)	(0.330)	(0.331)
Age squared	0.001**	0.001**	0.007**	0.007**
	(0.000)	(0.000)	(0.003)	(0.003)
Tenure	0.038***	0.038***	0.328***	0.330***
	(0.006)	(0.006)	(0.071)	(0.071)
Connections	0.008	0.008	-0.091	-0.093
	(0.014)	(0.014)	(0.286)	(0.286)
Observations	2487	2487	1465	1465

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Sample covers 1999-2007. Regression model: $Promotion_{ijpt} = \beta\, Growth_{ijpt} + \lambda X_{ijpt} + \epsilon_{ijpt}$. Province-year and prefecture type fixed effects. Standard errors clustered at the prefecture level (LPM) and province-year level (logit).