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Competence versus Incentive in Political Selection: Evidence from City Officials in China *

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Abstract

An inherent problem for institutional engineering is whether political incentive or selection should be given a priority. Motivated by the recent works on "incentive versus selection" in the literature of political accountability, this paper empirically investigates how the competence and incentive of public officials matter for the performance of public officials, using city-level panel data collected from China. To identify competence and incentive, we rely on two institutional features of the Chinese system, lateral transfer of officials between cities and promotion cycles/mandated retirement, respectively. We show that both competence and incentive have significant effects on economic growth, yet competence explains a larger fraction of the variation in growth rates than does incentive. Moreover, competence and incentive are substitutive in the sense that the incentive effect is weaker for the groups of officials with higher levels of competence. Those results indicate that selection appears to be more important than incentive to generate better outcomes from public officials.

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1 Introduction

In contemporary political theory, accountability is one of the keys to institutional design. Politicians are "accountable" when they are formally constrained by institutional rules and are incentivized to serve the interests of the people. In democracies, openly contested elections provide such incentives when the reelection motive induces efforts from the incumbents (Barro, 1973; Ferejohn, 1986; Manin et al., 1999).

The performance of politicians, however, depends not only on their incentives but also on their personal qualities, such as competence, experience, and ideological preferences. The inherent ability or quality of agents to form ideas and to get things done is immune to a short-term change in incentives. In addition to creating incentives, the function of elections should also be evaluated with regard to their efficacy in facilitating a proper selection of agents. The juxtaposition of incentive and personal effects thus poses an important challenge to political selection. Although it is desirable for all politicians to exert efforts to get reelected, the merit of such systems may be undermined if the reelection incentive impedes the quality of the selection.

Historically, the tension between the focus on political incentives and selection for leaders' personal qualities already occupied a central position in the debates about the US Constitution. Although James Madison (1787b) defended election by popular vote for its role in ascertaining both "fidelity to the object of government" (incentives) and "a knowledge of the means by which that object can be best attained" (competence), the mode of direct election was opposed by Elbridge Gerry for its potential failure to "secure more effectually a just preference of merit."(Madison, 1787a). On a related topic, Benjamin Franklin (1787) argued against executive salary (incentive) on the ground that paying politicians would only attract second-class agents, those who were "the bold and the violent, the men of strong passions and indefatigable activity in their selfish pursuits." Alexander Hamilton (1787) provided a strong defense for the merit of the Constitution in assuring that "the office of President will never fall to the lot of any man who is not in an eminent degree endowed with the requisite qualification."

Those debates crystallize the complex relationship between incentive and competence and extend well into the contemporary literature on political selection. The issue is a frequent topic studied by political and economic theorists. Fearon (1999) analyzes the effect of elections on selection and incentive in a two-period model. He shows that a sound

monitoring mechanism creates strong incentives for "bad types" of agents to mimic good ones, rendering an obstacle to effective selection. Echoing that message, Maskin and Tirole (2004) argue that representative democracy may reduce the welfare of voters as politicians can strategically pander to voters' ideological positions instead of choosing the optimal policy. Fox and Shotts (2009) and Huber and McCarty (2004) theorize a trade-off between selecting competent agents and enhancing incentives for policy congruence in the setting of political delegation. Finally, Mattozzi and Merlo (2008) show that high-powered monetary incentives may have adverse effects on performance, as they induce the entry of opportunistic and low-quality politicians. Those works imply that the provision of incentives and selection for personal qualities are substitutive in the sense that strengthening one would compromise the other.

The theoretical frameworks above justify an empirical investigation. To understand the mechanism of political selection, one needs to empirically examine (a) its efficacy to create incentives and to select for personal qualities, (b) the relative importance of the two in contributing to government performance, and (c) the correlation between them. The difficulty, though, is that neither incentive nor competence is readily observable from the electoral data. Although in the recent literature scholars have begun to study the effects attributed to incentive or selection by exploiting variations in politicians' terms (Alt et al., 2011; Besley and Case, 1995; Gagliarducci and Nannicini, 2013; Gordon and Huber, 2007), the extant research does not provide direct individual-specific measures of qualities such as personal competence. Hence, it is impossible to quantify the magnitudes and relative importance of incentive and personal qualities in the context of elections.

In this paper, we empirically examine the effects of incentive and competence by studying city officials in China. We rely on a city-leader matched data set for mayors and party secretaries for the period from 1994 to 2011 to study how competence and incentive affect local leaders' economic performance. We take advantage of two salient features of the Chinese political system to respectively identify competence and incentive. The first feature is that local leaders are often transferred among cities (Kou and Tsai, 2014; Li and Zhou, 2005). That element allows us to construct samples of cities that are each connected by leaders moving among them. Relying on the largest of those samples (hereafter, we call this sample the "connected sample"), we are able to rank leaders' personal contributions (hereafter, the "leader effect") to local economic growth, net of the confounding effects

caused by city-specific characteristics as well as institutional arrangements geared toward providing incentives. We take the leader effect as a measure of competence.

The second feature is that city leaders are mandated to retire at age 60, and promotion often happens in the year when the National Congress of the Chinese Communist Party (NCCCP) is held. Because an official is normally required to hold office for at least three years before the next assignment (including retirement), a city leader older than 57 is rarely promoted to the province, the administrative unit above the city. To get promoted, a city leader would have to increasingly stimulate successful performance before approaching age 57. In contrast, a leader who is 57 years old or older tends to shirk because the chance to get promoted has eclipsed. In addition, the cycle of the NCCCP provides us the opportunity to construct political cycles and construct a finer measure of incentive than the age limit. Therefore, we can identify the incentive effect using two measures, respectively relying on the age limit and officials' responses to political cycles.

We are aware of the differences between China's political system and Western democracies. Chinese officials are not accountable through formal political institutions in the same way as in Western democracies. Nevertheless, the Chinese system faces the same problem of selecting competent leaders (especially competent local leaders) and incentivizing them. With regard to selection, democracies choose political leaders by popular vote. Although candidates may have to cater to voters' diverse preferences (Achen and Bartels, 2004; Fackler and Lin, 1995; Ferraz and Finan, 2009; Harrington Jr, 1993; Healy and Malhotra, 2009; Montalvo, 2011; Welch and Hibbing, 1997), their competence in producing robust economic growth is one of the key elements voters care about. By the same token, the competence to generate growth is among the main considerations of the Chinese Communist Party (CCP) in the selection of bureaucrats.[1] Local leaders play an active role in promoting economic growth, which is deemed essential for social stability and the political survival of the party (Shirk, 1993; Walder, 1995). In turn, they are forced into a tournament for promotion using the same benchmark, that is, records of

[1]The leaders of the CCP are clearly aware of the importance of political selection. To give just one example, during his Southern Tour of 1992, Deng Xiaoping emphasized, "We must pay attention to training people, selecting and promoting to positions of leadership persons who have both ability and political integrity, in accordance with the principle that they should be revolutionary, young, well educated and professionally competent. This is of vital importance to ensure that the Party's basic line is followed for a hundred years and to maintain long-term peace and stability " (Deng, 1993).

economic growth (Yao and Zhang, 2015; Li and Zhou, 2005). With regard to incentive, reelection provides the most powerful incentive for leaders in a democracy. In the context of political tournament, that incentive becomes the competition for promotion to higher levels. In both cases, better performance in the current tenure is a key ladder to success. These similarities render our exercise meaningful to improve the general understanding of the issue of "incentive versus selection."

Our empirical results suggest that both political incentive and competence are important drivers of local economic growth. Approaching the age of 57 has a significant and positive effect on the growth rate. The effect disappears once officials are over 57. Moving closer to the next NCCCP, though, has a stronger effect than the effect of the age limit. Once political cycles are controlled for, age effects tend to shrink. Therefore, age matters only to the extent that it manifests the officials' accumulative responses to political cycles. At the same time, individual-specific leader effects explain a large share of the variation in the growth rate. The gap of competence between the 75th and 25th percentiles generates a discrepancy of the growth rate by 14 percentage points, way above the effects generated by the age limit or political cycles.

To assess the interaction between competence and incentive, we study the heterogeneous effects of incentive for leaders with different levels of competence. Although city officials are responsive to political cycles, such effect is nuanced by competence. Officials with higher levels of competence respond consistently less to incentives provided by political cycles. Incentive and competence tend to be substitutes for officials' economic performance.

We are aware that political connections are found to be an important determinant for promotion in the Chinese system(Jia et al., 2014; Jiang and Zhang, 2015; Li and Walder, 2001; Shih et al., 2012). While it is difficult for us to construct the kind of indicators of political connections used in the literature, mainly caused by the large size of our dataset, we do find a reasonable substitute by focusing on the turnover of the provincial party secretary. Our empirical results, particularly the substitution between competence and incentive, are robust to accounting for the political connection thus defined.

Our findings are complementary to two lines of literature: the empirical literature on political accountability and the research connecting political leaders to economic performance. The literature on accountability establishes that economic performance is more

satisfactory for incumbent politicians with reelection motives, and the effects are stronger when the election is more competitive (Besley and Burgess, 2002; Ferraz and Finan, 2009; Gordon and Huber, 2007). We show that similar logic survives in a non-electoral system of appointed bureaucrats when promotions depend on systemic evaluations for their performance.

In the literature on political leaders, Jones and Olken (2005) use unexpected death as an exogenous variation to estimate national leaders' personal effects on economic growth. Besley et al. (2011) find a positive growth effect of the educational attainment of national leaders. Hobolt and Høyland (2011) study elections to the European Parliament and find that voters favor candidates with more experience. Those studies are all geared toward estimating the average contribution of leaders. Yao and Zhang (2015) estimate leaders' individual contributions but do not take into account the interplay of competence and incentive. Our finding about the substitution between incentive and competence provides a fresh piece of empirical evidence to the literature, confirming the rationale of political and economic theories that draw attention to the selection of political leaders.

The rest of this paper is organized as follows: The subsequent section provides the institutional background of political selection in the Chinese system. Section 3 presents our identification strategies to measure competence and incentives. Section 4 describes the data. Section 5 presents our main empirical results. Section 6 moves on to take into consideration the confounding influences of political connections and political cycles on the measure of competence, and provides a robustness check on some of the key results obtained in the previous section. And Section 7 concludes the paper.

2 Political Selection in China

China is a centralized bureaucratic state. The entire political system is operated via a chain of power of control, delegation, and appointment. The government at each administrative level from the center to the village is composed of two parts: an administrative branch and the party committee. [2] Both the administration and the party committee

[2]According to the Chinese Constitution, the National People's Congress and local People's Congresses represent the highest organ of state power at each administrative level. In practice, they are viewed less powerfully than the administrative branch and the party committee. In this paper, we do not discuss the role of the People's Congresses.

are directly responsible to their corresponding organs one level above. At the same time, policies and performance of local governments are closely scrutinized by the party committee's organizational department at the upper level. [3] In turn, the power to nominate, promote, and demote officials resides in the party committee of the direct superior. Political centralization is maintained via control over personnel by the party (Blanchard and Shleifer, 2000; Bo, 2002; Cai and Treisman, 2006; Manion, 1985; Xu, 2011).

Regulation over economic affairs, however, is decentralized; each administrative level retains a domain of economic autonomy (Xu, 2011). Jurisdictions of local governments include welfare provision, public investments, law enforcement, revenue collection, and the management of public enterprises. Depending on different notions about power sharing between the central and local governments, scholars categorize the administrative system of China differently as "local state corporatism" (Oi, 1992), "market-preserving federalism" (Montinola et al., 1995), de facto federalism" (Zheng, 2007), or "regionally decentralized authoritarianism" (Xu, 2011).

Despite the disagreements about the extent of decentralization, one consensus lies in the literature that local governments are actively involved in the Chinese economy. Moreover, economic growth is an important consideration of party committees in evaluating local government officials in the contemporary period. The focus on economy is justified by the pragmatic doctrine of Deng (1993): "The essence of socialism is liberation and development of the productive forces, elimination of exploitation and polarization, and the ultimate achievement of prosperity for all." The slogan "Development is the hard principle" soon became a popular theme among party cadres following Deng's Southern Tour in 1992. As a consequence of shifting toward more pro-market reforms, officials who did a good job in enhancing investment, boosting gross domestic product (GDP) growth, and increasing revenue are rewarded with promotion. This model is referred to in the literature as a "promotion tournament," in which local officials are incentivized as entrepreneurs to promote economic performance within their jurisdictions (Li and Zhou, 2005; Lü and Landry, 2014). The promotion tournament is conducted at almost every

[3]The internal organization with control over personnel has evolved over time. The power to select and manage all government cadres resided in the organizational department of the CCP Central Committee following the founding of the People's Republic of China in 1949. The power was gradually delegated to local party committees following a sequence of reforms in the 1950s. The current system of personnel management by direct superiors was formally established in 1984.

level of government; as a result, the political competition within the bureaucracy becomes increasingly intense as the administrative level moves up. Some researchers believe that this model is a key to explaining China's fast economic growth (Xu, 2011).

There are, however, competing arguments for the mechanism of bureaucratic control in China. A number of authors treat the Chinese bureaucracy as a case of nomenklatura modeled upon the Soviet Union (Burns, 2006; Kung and Chen, 2011), not taking into account ubiquitous policy experiments which were initiated by local governments and endorsed by the central government (Qian et al., 2006; Xu, 2011). Many others emphasize the importance of intraparty factions in determining career advancement within the party bureaucracy (Dittmer and Wu, 1995; Hillman, 2010; Jia et al., 2014; Jiang and Zhang, 2015; Li and Walder, 2001; Nathan, 1973; Shih et al., 2012). Our research on city officials does not quarrel with the literature on factions. We focus on cities, one level below the province. It is plausible that loyalty and political connections are more important considerations in the selection of higher-ranking bureaucrats, because they are most able to challenge the political authority of the central ruler. We do not deny the existence of factions at local levels, but we contend that it is less of a problem there.[4] Given the lack of information on factions at the local level, a priori it is equally likely that our estimates of incentive and competence are biased downward or upward. Nevertheless, in the robustness analysis we use the turnover of provincial party secretaries under whose term a particular city leader was first put into office as a proxy for that city leader's political connection. The results show that the inclusion of connection does not qualitatively change the estimated effects of competence and incentive.

Several features of political control in China allow us to form a credible empirical strategy to identify both competence and incentive at the same time.

First, officials are often transferred from one city to another. That feature contrasts with the case of elected politicians in democracies. In democracies, local officials rarely hold office in different jurisdictions. Voters observe the performance of officials within a certain jurisdiction and normally do not compare officials across jurisdictions when they cast their votes.[5] Indeed, cross-jurisdiction comparison is difficult even if voters want to

[4] A finding related to ours is Lü et al. (2014), whose empirical evidence shows that the promotion at lower administrative levels depends more on economic performance.

[5] A notable exception is Kayser and Peress (2012), who argue that voters in democratic countries do compare national economic growth to the international benchmark.

do so, primarily because it is hard to separate officials' contribution from the economic conditions of different localities. [6]

In the case of China, however, many local officials are regularly shuffled between localities.[7] Tracking those officials' moves, we are able to construct a fairly large "connected sample" of cities in which a city had at least one official ever being moved to at least one other city in the sample. Within this connected sample, we can then apply the econometric technique developed in the literature on employee - employer matched data to disentangle the contribution (the leader effect) of officials to economic growth from the contribution of local conditions. The leader effect then is a measure of competence.

Second, the CCP enforces a strict rule of retirement. The reform leading to mandatory retirement was initiated by Deng Xiaoping and was formally introduced at the 12th National Party Congress in 1982. As of today, all sub-provincial level officials (or equivalently, deputy ministers) or below are required to retire at age 60. At the same time, they are supposed to serve for a certain number of years before being promoted.[8] Although non-regular promotions can bypass the restriction, the rule is generally enforced (Kou and Tsai, 2014).

This feature implies that the chance of promotion would be small for city officials over age 57, because they would have to serve less than a full political cycle in the new position if being promoted. In fact, sub-provincial leaders reaching age 57 are often transferred to positions with less de facto power, such as the provincial People's Congress or People's Political Consultative Conference. In our empirical work, we then use age 57 as the cutoff to define incentive. For officials younger than 57, their incentive to work harder to

[6]Iyer and Mani (2012) document the pattern of lateral transfers for Indian bureaucrats in the federal government. They do not focus on the comparison of performance.

[7]Although there are many reasons why the CCP shuffles its cadres, the following three are the most important. One is to prevent the formation of local factions that have the potential to challenge the rule of the center. Another is to prevent local officials from forming alliances with local businesses. The recently revealed high-profile corruption cases have the commonality of strong business interests behind corrupt officials. The third reason is to allow promising local officials to obtain experience in localities of quite different economic and social conditions.

[8]According to the Regulations for the Selection and Appointment of Party Cadres (党政领导干部选拔任用工作条例) announced by the central organizational department of the CCP in 2002 and its revision in 2006, an official being promoted should have served in the lower-ranked position for *at least* three years.

promote growth becomes stronger when they approach 57; for officials 57 or older, their incentive declines or stays unchanged when they become older.

Third, the Chinese system also has a clear political cycle following the CCP's National Congress, which is regularly held every five years. Around the time that the National Congress convenes, the party committee at each level of government holds its own congress. Because promotion is more likely to happen when the congress is held, officials would exert more efforts when the date of the next congress draws closer. That factor allows us to conduct a finer test of incentive using the political cycle of the NCCCP on top of the one defined by age. In the literature, scholars adopt different operational notions to capture political cycles. Guo (2009) measures the cycle effect by the third year for an official in the current tenure, relying on the empirical regularity of officials often being transferred or promoted after serving a jurisdiction for three years. We do not follow that coding scheme because the time effect within a term is correlated with age, which are already in use. Moreover, the length of tenure of officials may be endogenous to their performance and competence. In comparison, the NCCCP is arguably more exogenous with regard to the personal incentive of exerting efforts. Our understanding is that the NCCCP and the National People's Congress are more conventional measures of political cycles in the literature on Chinese political economy (Nie et al., 2013; Tao, 2006; Tsai, 2013).

3 Identifications

3.1 Measuring Competence

As we emphasized, to estimate the leader effect, or competence, we need to rely on a connected sample of cities and officials. To start, we first explain what we mean by "competence" in our study. Competence can mean many things, including a person's ability to gather and process information, make proper judgments, persuade people to follow, organize large endeavors, manage crises, and so on. None of them is easily measurable. But it is possible to measure them with regard to outcomes. In the Chinese context, the most significant outcomes one can rely on to judge an official's competence lie in two areas: economic growth and political stability in his jurisdiction. Both can be measured.

Economic growth can be best summarized by the growth rate of GDP;[9] political stability can be measured by the frequency of civil unrest. In this paper, we study only economic growth, for two reasons. First, although maintaining political stability is an important task for city officials, especially for the party secretary, it does not determine an official's promotion if no large-scale civil unrest occurs in the city. As a result, daily competition among officials in different cities is more about economic growth. Second, growth brings other benefits to local officials, particularly a larger spending power because of higher revenues, in addition to better prospects for promotion. Those benefits can intensify competition among officials.

Using the rate of growth to measure officials' competence, however, has to face the challenge of disentangling officials' contribution from the local conditions of the cities they serve. In addition, two major officials are always working at the same time, the party secretary and the mayor. Although there are other treatments regarding the relationship between their contributions (see Yao and Zhang (2015) for details), in this paper we adopt a simple strategy to assume that they make independent contributions to a city's economic growth. To be concrete, the equation we estimate is

$$y_{i(jt)} = Z_{i(jt)}\beta + \theta_i + \psi_j + \gamma_t + \epsilon_{i(jt)}, \tag{1}$$

where $y_{i(jt)}$ is the real GDP growth rate (in percentage points) of city j in year t under official i's tenure; $Z_{i(jt)}$ is a set of time-varying controls; θ_i is the personal (fixed) effect of official i (either a party secretary or a mayor) of city j in year t; ψ_j is city j's fixed effect; γ_t is the fixed effect for year t; and $\epsilon_{i(jt)}$ is the random disturbance for city j's growth in year t. Note that by treating the party secretary and the mayor as making independent contributions to economic growth, the GDP growth rate of a city in a particular year, as well as the corresponding right-hand-side variables other than the leader effect, appears twice in the data set: one for the party secretary and the other for the mayor.

[9]We are aware of the controversy with regard to the reliability of China's GDP statistics such as Rawski (2001) and Wallace (2015). However, other studies find no statistical evidence that China's GDP data are systematically manipulated upward, notwithstanding various measurement errors due to the limited capacity of the National Bureau of Statistics (Holz, 2004, 2014; Klein and Özmucur, 2002). Some studies suggest that China's GDP may be underreported because of the private sector's intention to evade taxes (Koch-Weser, 2013). In all of our regressions, we control the city and year fixed effects. They are effective to control the systematic biases of GDP data at the city level.

In effect, we are stacking together the data of two separate regressions for party secretaries and mayors. The main gain of stacking the data is that it substantially increases the size of the largest connected sample. The size of a connected sample is a convex function of the number of leaders moving between cities. If we estimate mayors and party secretaries separately, the number of officials who were moved between cities in each sample is about half the number of movers in the combined sample, but the size of each sample is reduced to less than half the size of the combined sample. In fact, the size of the separate samples can be very small, depending on the actual circumstances, such as in our case.

The difficulty in estimating Equation (1) is that the leader effect θ_i and the city fixed effect ψ_j share the same dimension of the data and cannot be separately estimated in the normal case. Only their sum $\omega_{ij} = \theta_i + \psi_j$ can be estimated. However, if there are officials moving between two cities, then we can estimate the relative leader effects of all the officials having served in the two cities. Here is an example.

Suppose there are two cities, A and B, and three officials, numbered 1, 2, and 3. Official 1 worked in both cities, Official 2 worked only in City A, and Official 3 worked only in City B. When the year fixed effect is controlled, the following then are the parameters we can estimate:

- Official 1: $\omega_{1A} = \theta_1 + \psi_A$, $\omega_{1B} = \theta_1 + \psi_B$,
- Official 2: $\omega_{2A} = \theta_2 + \psi_A$,
- Official 3: $\omega_{3B} = \theta_3 + \psi_B$.

Then, subtracting ω_{2A} from ω_{1A}, we can easily obtain the differential of competence between Official 1 and Official 2, $\theta_{12} = \theta_1 - \theta_2$. That is, comparing officials in the same city is easy because they share the same city fixed effect. To compare officials across the two cities, we first take the difference between the two parameters estimated for Official 1 to obtain the difference between the two cities' fixed effects: $\psi_A - \psi_B$. Then substituting it into the difference between ω_{2A} and ω_{3B}, we get the differential of competence between Official 2 and Official 3, $\theta_{23} = \theta_2 - \theta_3$. Finally, adding up θ_{23} and θ_{12}, we get the differential of competence between Official 1 and Official 3, $\theta_{13} = \theta_1 - \theta_3$. In the end, we obtain a complete ordering of the three officials. Note that we are unable to estimate the absolute

level of an official's leader effect. In the estimation, we then set the mean of leader effects to zero. So the competence we estimate for each official is his contribution to economic growth relative to the mean in the sample.

3.2 Measuring Incentives

Based on the discussion in the previous section, officials' ages and political cycles will be used to capture the effects of incentive. The two measurements have both independent and interwoven effects. When an official gets older, it becomes more urgent for him to perform better; when he approaches 57 years old, his incentive may reach the maximum. Simultaneously, his incentive is also shaped by the political cycle defined by the timing of the party congress. When the next party congress is still far away, the incentive may be low. When the congress draws closer, the incentive inflates. Those are the independent effects of age and political cycles. Alternatively, officials from different age cohorts may react to political cycles differently. Officials who are still hopeful for promotion—that is, those who will still be younger than 57 at the next party congress—may react to political cycles, whereas officials who will be older than 57 at the next party congress may not. In addition, among the younger officials, those who will approach 57 by the time of the next party congress may have the strongest incentive because after the next party congress, their chances of promotion will diminish dramatically. It is noteworthy that an official's age and his experience of political cycles are mixed together. When a political cycle is finished, he becomes five years older. So his age effect comprises the effects of one or more political cycles. Figure 1 provides an illustration for an official who just happens to become a city leader in a year immediately after a party congress and who experiences three party congresses in his career but has not been promoted until he retires.

Figure 1 here.

In the figure, the horizontal axis represents the calendar year, and the vertical axis represents the level of effort the official spends to promote economic growth (the incentive effect). There are five critical years in the figure. T_0 is the year when the official becomes a city leader; T_1 is the year when the first party congress is held in his career as a city leader; T_2 is the year when the second party congress is held in his career; T_3 is the year

when he reaches age 57; and T_4 is the year when the third party congress is held in his career. The figure shows both the age effects and political-cycle effects.

Before the first party congress is held, the official exerts more and more effort as time goes by (and his age increases). That is the political cycle effect induced by the first party congress in his career and is shown by the first darker and solid upward-sloping line (line 1) in the figure.[10] His effort drops after the first party congress. Because by the next party congress (the third), he will be older than 57 and thus will lose the chance for promotion, he spends greater efforts in this political cycle. This effect is shown by line 2 in the figure, which has a higher starting point and a steeper slope than line 1. His effort drops substantially after the second party congress because he will be older than 57 by the time of the third party congress. But because he is still younger than 57, he will try again, hoping that he will be promoted between now and when he turns 57. However, his incentive will be substantially lower than before. This effect is represented by line 3 in the figure with a modest slope. After he turns 57, his efforts decline regardless of the third party congress (represented by line 4). Lines 3 and 4 together consist of the incentive effect caused by the third political cycle, which by construction is weak.

The age effect can be decomposed into two parts. The first is the average of the political-cycle effects represented by lines 1, 2, and 3. In the figure, it is depicted by line A. It represents the age effect before the official turns 57. Its slope (the size of the age effect) depends on the slopes and configuration of lines 1 - 3. For instance, if line 3 has a small slope or dashes down, then the slope of line A can be small. The second part of the age effect is indicated by line B in the figure, whose slope very much depends on the slope of line 4.

Judging by the above discussion, we can account for the age effect and political- cycle effect by defining the following two variables:

- Age effect: $|57 - Age|$
- Political-cycle effect: *the current calendar year − the calendar year of the immediate last party congress*

[10] Assuming that the trend growth rate is well accounted for by factors other than age and political cycles, then by our construction, which we will introduce later, the trend growth rate should be the rate when the official exerts no effort.

Subsequently, we will denote them by $|57 - Age|$ and *Political Cycles*, respectively. The variable $|57 - Age|$ captures two linear trends with respect to age 57. By our theoretical discussions, the trend before age 57 should slope upward, and the trend after age 57 should slope downward. In subsequent regressions, we allow the two trends to have different intercepts. Specifically, we create two dummy variables for two age groups, respectively, one for people who were younger than 57 and the other for people who were at least 57. They are labeled Group A ($Age < 57$) and Group B (Age ≥ 57) in the subsequent text. Then, we interact $|57 - Age|$ with these two dummies. The variable *Political Cycles* takes values between 1 and 5 because the party congress is held every five years. It also defines a linear trend, albeit this time it follows the political cycle. It should have a positive slope if the political-cycle effect matters.

4 Data and Variables

As in Yao and Zhang (2015), in this paper we study both the party secretary and the mayor in each sub-provincial and prefectural city for the period 1994 - 2011. Our data set used here extends that in Yao and Zhang (2015) by including more detailed information on the characteristics as well as the career path of each city leader: sex, effective highest education,[11] the number of cities served since the deputy positions at the prefecture level, and membership in the provincial party standing committee. Information on the party secretaries and mayors was collected from the *China Yearbook of Municipalities*, provincial yearbooks, and reports from the media, especially the Internet.[12]

We then match the leaders to annual macroeconomic data collected from provincial yearbooks by the following rules:

1. Each city - year observation is matched with one secretary and one mayor.

2. If a turnover occurred within a year, we take the leader who stayed for more than six months in that year.

[11]There are CCP "party schools" at the central level, each province, and each prefectural city that provide on-the-job education for cadres. The party schools are authorized to issue master and Ph.D. degrees to cadres, and in many cases, that degree is listed in a cadre's curriculum vitae. However, to the extent of our knowledge, education other than the party school makes a better proxy of personal educational attainment. Here, "effective highest education" excludes degrees offered by party schools.

[12]We thank Junyan Jiang for sharing data with us.

3. If multiple turnovers occurred in a year and no leader stayed for more than six months, we take the leader with the longest stay in that year.

We have data that match officials with cities in 312 out of the 333 qualified cities for the period 1994 - 2011. Subsequently, we will call the 312 cities the "sample cities." For years before 2003, however, we do not know many of the officials' personal information (including age, which is crucial for our study) that we just mentioned. For that reason, we rely on several samples to conduct our empirical work.

We first construct connected samples using the long sample of 1994 - 2011 and find the largest connected sample among them. Doing so allows us to get large connected samples. The connectedness of cities is critically dependent on the number of officials who moved between cities. A short sample does not capture many moves and thus does not provide large connected samples. The largest connected sample thus constructed, which we will subsequently refer to as the "connected sample," is fairly large. It contains 175 cities and 1,196 officials (party secretaries and mayors). Figure 2 presents a map of the 313 cities covered by our study (lightly colored) and the 175 cities in the connected sample (heavily colored).

Figure 2 here.

Then, we define a shorter sample that covers the period 2003 - 11. We have data for leaders' personal characteristics for this sample. Subsequently, this sample will be called the "2003 - 11 sample."[13] It contains all the cities in the 1994 - 2011 sample, but only officials who served after 2003.

Lastly, we define the "connected sample of 2003 - 11" that includes all the cities in the connected sample but only officials in that sample who served after 2003. We will provide details about how this sample and the previous two are used when we present our econometric strategies and results.

Before we do so, we provide some descriptive results for the distribution of age. As shown in Figure 3, most city officials were in their late 40s or early 50s. The distribution

[13]The year 2003 was chosen as the starting year because (a) we have complete data for officials since that year, and (b) the CCP held its 16th National Congress in November 2002, and Hu Jintao became the general secretary. That regime switch marked a new era in China's political arena, and we can focus on the political players at the city level all during the Hu period, so we can avoid potential confounding impacts from the regime change at the central level.

has a mean of 50.8 and a median of 51, and it is almost symmetric. Except for only one leader who retired two months after his 60th birthday, all officials retired at or before age 60, and fewer than 10 percent of the leaders were older than 55. On the lower end, the youngest leader was 38 years old; those younger than 45 accounted for about 20 percent of the sample.

Figure 3 here.

The Central Committee of the CCP is reelected every five years. Although turnover of leaders at local levels happens more frequently, most turnovers at the provincial level and about half the turnovers at the prefectural level happen in the years when the NCCCP is held. Therefore, the age at the next National Party Congress is critical for an official to consider his chances of promotion. Figure 4 shows the distribution of officials' ages at the next National Party Congress. We find that about 10 percent of the officials would reach 57, the age at which they would lose their chances of promotion, at the next National Party Congress. That means that the majority in our sample would still have time to improve their performance.

Figure 4 here.

5 Main Empirical Results

5.1 Competence Estimated from the Connected Sample

We estimate Equation (1) based on the connected sample for the period 1994 - 2011 to obtain the leader effects (competence). Figure 5 shows the kernel density of the estimated leader effects and compares it with the normal distribution. Although it is very close to the normal distribution, the density function has a positive mode and is more compact than the normal distribution. A test of whether the leader effects matter for growth is an F-test based on the null hypothesis that all θ_i are zero. The F-statistic is $F(1, 195, 4, 014) = 1.93$, which rejects the null by a large margin. Note that since the estimated leader effects are only officials' contributions relative to their mean, the F-test tells us only that the officials in our sample have sufficiently diverse levels of competence. We do not know the absolute levels of their competence. However, knowing their relative levels of competence is sufficient for carrying out the current study.

Figure 5 here.

5.2 Incentive and Its Contributions

We could nest the study of the age and political-cycle effects in Equation (1) if we had information for age before 2003. Lacking that piece of information, we first study the effects of incentive in the following equation based on the 2003 - 11 sample:

$$y_{i(jt)} = X_{i(jt)}\beta + \delta_{11}|57 - \text{Age}| * GroupA(Age < 57) + \delta_{12}|57 - \text{Age}| * GroupB(Age \geq 57) + \delta_2 \text{Political Cycles} + \theta_i + \psi_j + \epsilon_{i(jt)} \quad (2)$$

In the equation, $X_{i(jt)}$ includes a set of personal characteristics describing officials' education and career backgrounds, as well as the city variables included in Equation (1); and ψ_j is the city fixed effects. Note that the 2003 - 11 sample includes all the sample cities that belong to different connected samples. Therefore, θ_i's are not correctly estimated. Because age and political cycles are both highly correlated with the calendar year, we do not include year fixed effects in the equation.

We estimate Equation (2) for two purposes: (a) to follow the literature that deploys similar specifications (Alt et al., 2011) and (b) to take advantage of the large number of leaders covered by the 2003 - 11 sample. The inclusion of the personal fixed effects helps us control personal-level heterogeneities, although they are not correctly estimated.[14] By our theory about the incentive effects, both δ_{11} and δ_{12} should be negative to ensure the positive slope before age 57 and the negative slope after age 57 shown in Figure 1, and δ_2 should be positive to ensure a positive political-cycle effect.

Table 1 presents the results of three regressions. In R_1 where the age effect is studied, the age effect is found to be statistically significant for the group of officials who are younger than 57. One year closer to 57 increases the annual growth rate of per capita GDP by 0.06 percentage points. That effect is not very strong. The youngest official in our sample was 42 years old. Our point estimate implies that a mayor or party secretary

[14]When we say that the personal fixed effects are not correctly estimated, we mean that we cannot use them to compare leaders, as we would when we use the leader effects estimated from Equation (1). However, like in other studies, those personal fixed effects can still be used to control personal-level heterogeneities.

at age 56, who is supposed to have the highest incentive, would lead the youngest official, who is supposed to have the lowest incentive, by only 0.84 percentage points. On the other hand, the age effect is positive but highly insignificant for the group of officials who are older than 57. So we probably can conclude that the age effect is not strong in our sample.

Table 1 here.

That conclusion is confirmed by R_2 that studies the age effect and the average political-cycle effect together. The age effect has the right sign but statistically turns insignificant. The political-cycle effect, though, is very strong; one more year closer to the next party congress increases the growth rate by 0.5 percentage points, which means that the gap between the first year and the last year of a political cycle is 2.5 percentage points, a very significant number.

Age and political cycles can have interwoven effects. To test them, we define three dummies for age groups based on an official's age at the next party congress: Group 1 (age $\leq$ 53 at next congress), Group 2 (53 $<$ age $<$ 57 at next congress), and Group 3 (age $\geq$ 57 at next congress). By these definitions, an official stays in one particular group for a number of years. That allows us to isolate the impact caused purely by political cycles within each age group. Then, we add into Equation (2) two of the three dummies (Group 2 and Group 3, leaving the Group 1 as the reference group) and the following three interaction terms: $Political\ Cycle * Group\ 1$, $Political\ Cycle * Group\ 2$, and $Political\ Cycle * Group\ 3$. The two stand-alone age group dummies account for the (weak) marginal (independent) effect of age. For the political-cycle effect to hold, we expect the coefficients of the first two interaction terms to be positive, but the coefficient of the last interaction term to be insignificant. That is, for officials who are still hopeful at the next party congress, incentive is higher when time moves away from the last party congress and moves closer to the next congress; but for officials who have passed the critical age of 57, incentive does not matter. The sum of the coefficients of the three interaction terms then is the marginal (independent) effect of political cycles.

The results of the new regression are presented under Column R_3 in Table 1. They basically confirm the results of R_2, but offer more details. Neither of the two stand-alone age group dummies is statistically significant, indicating a weak age effect. In contrast,

the political- cycle effects are strong. For the group of officials age 53 or younger at the next party congress, one year closer to the next party congress increases the growth rate by 0.51 percentage points, very close to the average effect of political cycles obtained by R_2. For the group of officials between ages 54 and 56 at the next party congress, the effect becomes stronger: one year closer to the next party congress increases the growth rate by 0.62 percentage points, boosting the gap between the first and last year of a political cycle to 3.1 percentage points. Lastly, political cycles do not provide incentive for officials age 57 or older at the next party congress.

None of the personal characteristics is statistically insignificant in any of the three regressions. In the literature, education is often used as a proxy for officials' competence. As far as our sample is concerned, education seems not to be a good proxy. Gender does not matter either. Nor does an official's link in the provincial party committee or his experience as a city leader. As for the city characteristics, initial per capita GDP (measured at the starting year of an official's tenure in the city) has a negative sign, indicating a possibility of convergence, although none of the estimates are statistically significant. A larger population and higher inflation rates are both detrimental for growth.

As we mentioned in the beginning, Equation (2) does not provide a correct estimate for θ_i. Next, we provide a finer study by adopting a two-step approach. In the first step, we repeat the estimation of Equation (1) based on the connected sample and subtract all the estimated leader effects from the growth rate to get the residual

$\widehat{\zeta_{i(jt)}} = y_{i(jt)} - \widehat{\theta_i}$

If the leader effect correctly measures a leader's personal competence, this residual does not include the contribution of leaders' personal competence. Then, in the second step, we test the two incentive effects by estimating the following equation based on the connected sample of 2003 - 11:

$$\widehat{\zeta}_{i(jt)} = X_{i(jt)}\beta + \delta_{11}|57 - \text{Age}| * \text{GroupA}(\text{Age} < 57) + \delta_{12}|57 - \text{Age}| * \text{GroupB}(\text{Age} \geq 57) + \delta_2 \text{Political Cycles} + \psi_j + \epsilon_{i(jt)} \quad (3)$$

Because the contribution of competence is eliminated from $\widehat{\zeta_{i(jt)}}$, the two incentive effects can be more clearly identified. The results are presented in Table 2. To save space, we do not show the results of the control variables. Although most of the results

of our interest are qualitatively the same as those presented in Table 1, there is one significant change: in R_2 when the independent effects of age and political cycles are studied, the age effect for the group of officials younger than 57 becomes significant. However, its magnitude is small: one year closer to 57 increases the growth rate by 0.06 percentage points, which means that the gap between the oldest official and the youngest official in this group is only 0.84 percentage points.

Table 2 here.

5.3 The Interplay of Competence and Incentive

One of the central themes of this paper is to study the relationship between competence and incentive. In particular, we are interested in incentive's heterogeneous effects across officials with different levels of competence and aim to answer the following questions: Is incentive equally important for less competent and more competent officials? Or is it less important for more competent officials than for less competent officials? Or is the reverse true? Answering those questions is meaningful because it allows us to assess whether competence and incentive are substitutes or complements for each other, or are neutral to each other.

In the framework of the two-step estimation we presented in the last section, we divide officials in the connected sample of 2003 - 11 into four groups of equal number by their competence (which is estimated from Equation (1)) and rerun Equation (3) on each of the groups. Table 3 presents the results. Again, results of control variables are omitted to save space.

Table 3 here.

Regressions (1) - (4) correspond to R_1 in Table 2, which studies only the age effects. Among the four quartiles, age is significant only in the first quartile for officials younger than 57. That is, only the least competent officials respond to their age. However, even that effect is probably caused by this group's responses to political cycles, because when the age effects are studied together with political cycles—as shown by the results of regressions (5) - (8) that correspond to R_2 in Table 2—all the estimates for the age effect turn insignificant. In contrast, political cycles have significant impacts on all four quartiles,

and the order of those impacts is the opposite of the order of competence. Figure 6 shows the point estimates along with the 95 percent confidence intervals for the four groups. The least capable group's incentive is 2.6 times the incentive of the most capable group. Statistically, the estimates of the first and second quartiles are highly significant, whereas the estimates of the third and fourth quartiles are only marginally significant. Therefore, strong substitution exists between competence and incentive caused by political cycles.

Figure 6 here.

Regressions (9) - (12) then repeat R_3 in Table 2 to study the interaction between age and political cycles. Like in the previous results, age alone does not have a direct impact on growth. By contrast, the response to political cycles varies considerably across age and competence groups. In the least capable quartile, the results of *Political Cycles* are consistent with those found for the whole sample. That is, *Political Cycles* is only significant for Group 1 (53 or younger) and Group 2 (between 54 and 57), but not for Group 3 whose members have lost the chance of promotion (57 or beyond). The results of the other three quartiles are more irregular. A significant result is found for Group 1 in the second quartile and for Group 2 in the fourth quartile. All other results are statistically insignificant. Officials in Group 2 of age have their last chance to get promoted, so their incentives might be particularly strong. In turn, the most competent among them may have the extra incentive to prove their competence. This is probably the reason why a significant result is found for Group 2 in the fourth quartile. Nevertheless, overall the incentive effect is the most salient and statistically significant for the least competent quartile, confirming the inverse relationship between the level of competence and short term incentives.

6 Robustness Analyses on the Measure of Competence

So far, we have relied on the premise that θ_i's estimated from Equation (1) correctly measure leaders' competence. However, they could include leaders' responses to incentives as well as the effects of their political connections. In fact, θ_i's capture leaders' average

contribution during their whole careers, which inevitably includes their responses to political cycles, their growing ages, and changes in their political connections. Although the issue is caused mainly by the lack of data on personal characteristics for leaders of earlier years,[15] it is a good time for us to look closely at how the omission of the incentive effects and the impact of political connections might affect our estimates of the θ_i's.

Regarding the omission of the political-cycle effect, we first notice that almost every leader was subject to at least one political cycle in our sample. Therefore, if leaders have more or less the same rate of response to political cycles, the political-cycle effect will affect only the mean in the sample. As a result, the θ_i's estimated from Equation (1) will not be affected because they are measured relative to the mean. If incentive and competence complement each other, that is, if more competent leaders respond to political cycles more acutely than less competent leaders, the θ_i's will be subject to larger upward biases for more competent leaders. But it will not change the relative order of the leaders, so the ranking of θ_i's is still correct (although their magnitudes are not). If incentive and competence substitute each other, that is, if more competent leaders respond to political cycles less acutely than less competent leaders, the θ_i's will be subject to larger upward biases for less competent leaders. In this case, the θ_i's estimated from Equation (1) do not even reflect the right ranking of leaders' competence.

Regarding the omission of the age effect, we realize that the θ_i's of leaders around age 57 will be subject to upward biases, and the θ_i's of leaders younger or older than 57 will be subject to downward biases if the age effect presented in Figure 1 is correct. That means that $\widehat{\zeta_{i(jt)}}$ will be biased downward for leaders around age 57 and biased upward for younger and older leaders. As a result, the estimated age profiles will have smaller slopes. That is, our estimates of δ_{11} and δ_{12} are subject to downward biases.

Because we have found that competence and incentive substitute each other, our definition of the four groups of leaders may be called into question. Specifically, higher-order quartiles may include leaders with lower levels of true competence, and vice versa. But that is unlikely a killer of our results. When a higher-order quartile contains less competent leaders, the estimated political-cycle effect for that quartile should be stronger

[15] One alternative is to use only data after 2003. Thus, we can study the age and political-cycle effects together with the leader effects in Equation (1). The drawback of this approach, though, is that the size of the largest connected sample falls dramatically to the extent that it renders meaningful regressions impossible. So we do not adopt that approach.

under the premise that less competent leaders respond more to political cycles. For the same reason, when a lower-order quartile contains more competent leaders, the estimated political-cycle effect for that quartile should be weaker. Therefore, the difference between any two quartiles should be smaller than it ought to be when competence is correctly estimated. As a result, the gaps presented in Figure 6 are lower bounds of the true gaps between quartiles.

Our results of age may be more problematic, because we do find that the age effect is small, but we do not know whether that small effect is caused by biases in our estimates of the θ_i's. For that reason, we should remain cautious in drawing a conclusion regarding the effect of the age limit. What we can be sure about, however, is that leaders older than 56 do not respond to political cycles.

As many scholars have noted, political connections with higher-level officials may also contribute an official's career advancement (Jia et al., 2014; Jiang and Zhang, 2015; Li and Walder, 2001; Shih et al., 2012). It could also be possible that connections affect the estimation of competence and incentive effects by a selection for treatment. For competence, our fixed-effect approach takes into consideration everything that does not change across time, which also includes time-invariant connections. Political connections can also affect local leaders' incentives. Jia et al. (2014) have found that performance and connections are complementary in career advancement, so the connected officials may have exerted more efforts than their unconnected counterparts. Connections can also help local leaders get a larger amount of fiscal transfer from upper-level governments (Jiang and Zhang, 2015), so they can perform better with less efforts.

Although there is no direct remedy for the omission of age, we do have a way to deal with the omission of political cycles and find a reasonable measure for connections. The NCCCP has been held regularly every five years, so we can extend our definition of political cycles to years before 2003. For political connections, we realize that it is impossible for us to provide an individual-specific measure on the basis of colleagues and alumni as in the standard literature, primarily because we have a large dataset that stretches back to the 1990s. Keeping this in mind, we deal with the impacts of political connections by controlling the turnover of provincial party secretaries. The empirical studies on political connections have mostly relied on the changes occurring at upper-level bureaucracies to identify the effect of political connections. The most important

connection a city official could build is the one with the provincial party secretary who has a large say on his or her appointment as a city leader in the first place. Thus, it is reasonable to assume that a city official is well-connected to the incumbent party secretary at the time when that city official first assumed his or her position. When the incumbent provincial secretary left, this connection vanished. Thus, we create a dummy variable CP_{ijt} indicating the turnover of the incumbent provincial party secretary. Specifically, CP_{ijt} is set to 0 for a city official who assumed office under the incumbent provincial party secretary until that party secretary left; CP_{ijt} is set to 1 when the incumbent provincial secretary left during the city official's tenure, and remains to be 1 henceforth.[16]

Summarizing the above discussions, we then nest the political-cycle effect with our measure of competence in Equation (1) and control for political connections, as follows:

$$y_{i(jt)} = Z_{i(jt)}\beta + (\theta_i + \phi_i * \text{Political Cycle}) + \tau CP_{ijt} + \psi_j + \gamma_t + \epsilon_{i(jt)}. \tag{4}$$

In the equation, we allow leaders to have their own rates of response to political cycles, which are measured by the ϕ_i's. The θ_i's are now the leader effects net of leaders' responses to political cycles, so they are closer to leaders' true competence. The correlation between ϕ_i' and θ_i tells us whether competence complements or substitutes the incentive caused by political cycles.

The estimate of τ is -0.948, which is significant at the 5% significance level. This implies that after a turnover of the incumbent provincial party secretary, there would be a nearly one-percentage-point decrease of the growth rate. Hence, CP_{ijt} is a reasonable measure of the political connections that a city official has.

We then plot in Figure 7 the estimates of ϕ_i' and θ_i obtained from Equation (4) to validate the negative correlation between the level of competence and the response to political cycles. As the figure shows clearly, this negative correlation does exist, confirming our result that competence and incentive substitute for each other.

Figure 7 here.

[16]This measure of political connection resembles that in (Jiang and Zhang, 2015), but it also accommodates other potential relationships such as colleagues and alumni.

7 Conclusion

A glaring feature of China's political system is its operation without public officials' direct accountability to local electorates. In the Chinese bureaucracy, all officials are evaluated, appointed, and promoted, first by their superiors and ultimately by the central authority. Yet for the very reason that officials face the same yardstick criteria in a centralized bureaucracy, it is meaningful to compare their personal effects on local economic growth and study their reaction to the structure of political incentive. The empirical exercise presented in this paper parallels the literature on "incentive versus selection" in democratic institutions. The findings are consistent with the existing theoretical frameworks on political accountability.

Using a city-leader matched dataset, we establish that the variation in the growth rate is attributable more to the difference in personal competence than to the change in political incentives. Although officials do respond strategically to promotion age limits and political cycles, the incentive effect is nuanced by their competence. More competent officials are less responsive to political cycles. In addition, age matters only to the extent that it manifests the officials' accumulative responses to political cycles. Once political cycles are controlled for, age effects tend to vanish. In total, selection over competence is a more significant explanatory variable than political incentive for regional economic growth.

Those findings shed lights on the institutional design for political selection. In a canonical paper on political accountability, Barro (1973) studies the mechanism of electoral control and assumes reelection as the only mechanism for providing the incentive. In turn, the immediate implication of his model on the design of electoral terms is to implement very short terms without term limits. That conclusion, however, is challenged by the empirical fact that legislators become more entrepreneurial when they are granted longer terms (Dal Bó and Rossi, 2011). Our study reinforces that challenge by showing that competence matters more and can substitute for the effects of incentive. As a result, selection probably should supersede reelection incentives in the design of political selection. Along this line, there is a rationale to make the term of public officials longer and in the meantime to place more emphasis on *ex ante* selection. An extreme version of such design is to restrict an official's tenure to just one term, but to make the length of the term substantially longer (e.g., from the commonly observed four years to eight

years).

Our findings also provide clues for scholars to understand why some non-democracies achieve better economic performance than others. In the literature, leaders are found to have significant impacts on the records of economic performance in non-democracies (Glaeser et al., 2004; Jones and Olken, 2005), however, less attention has been paid to disentangling officials' competence from their incentives in driving their performance. Our paper exploits the unique institutional features offered by China's political system to identify how local leaders' competence and incentive play a role in local economic growth. In doing so, we also contribute indirectly to the debate about the relationship between economic performance and political promotion for Chinese bureaucrats (Li and Zhou, 2005; Shih et al., 2012).

Note that the conclusion of this paper applies only narrowly to economic growth and thus should not be read as reacting to the broad debate about meritocracy in China (Bell, 2015; Elliott, 2012). Our focus is the relative contribution of leaders' competence and incentive to economic performance per se, leaving aside the normative question of whether economic growth should be the main goal of the government, let alone the integrity of the whole bureaucracy. In theory, selection based on competence to promote economic growth could be simply detrimental for larger social goals, because it may lead to misallocation of government resources, neglect of the environment (Jia, 2012), under-provision of social welfare, and other undesired consequences. Our paper fulfills a positive objective to study how the mechanism of political selection works in China; the focus on economic growth is justified because of its significance for the political survival of the Chinese regime.

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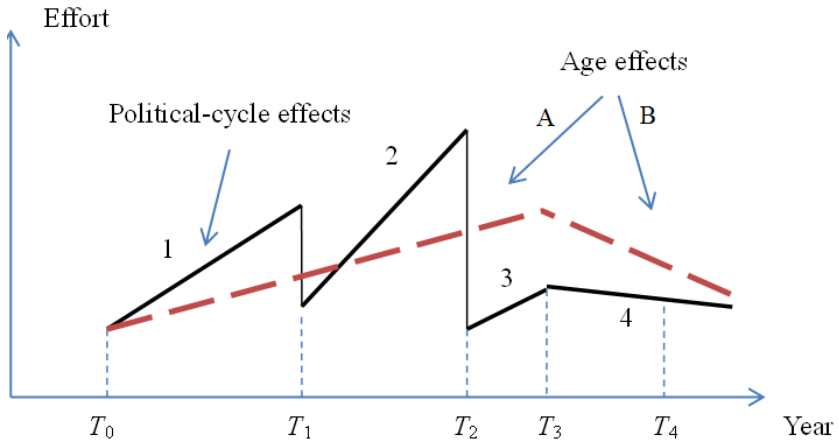
Figure 1: Age effects and political-cycle effects



Note: in the figure, T_0 is the year when an official becomes a city leader; T_1 is the year when the first party congress is held in his career as a city leader; T_2 is the year when the second party congress is held in his career; T_3 is the year when he reaches age 57; T_4 is the year when the third party congress is held in his or her career.

Figure 2: The 313 sample cities and the 175 cities in the connected sample

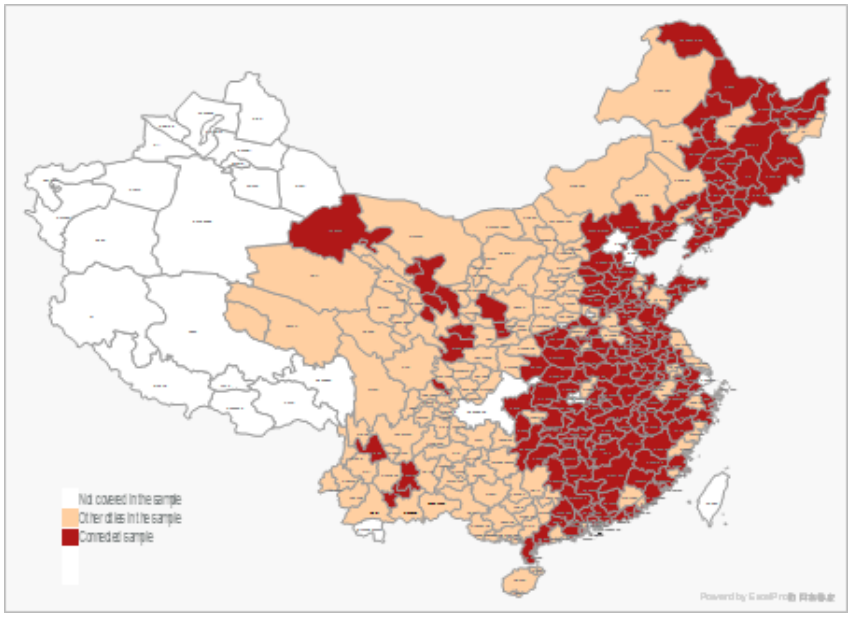


Figure 3: Distribution of officials' ages

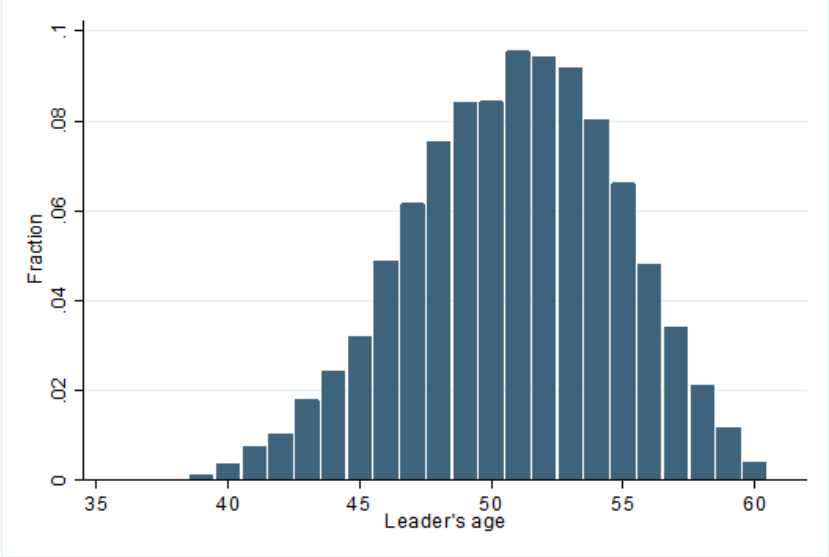


Figure 4: Distribution of officials' age at the subsequent party congress

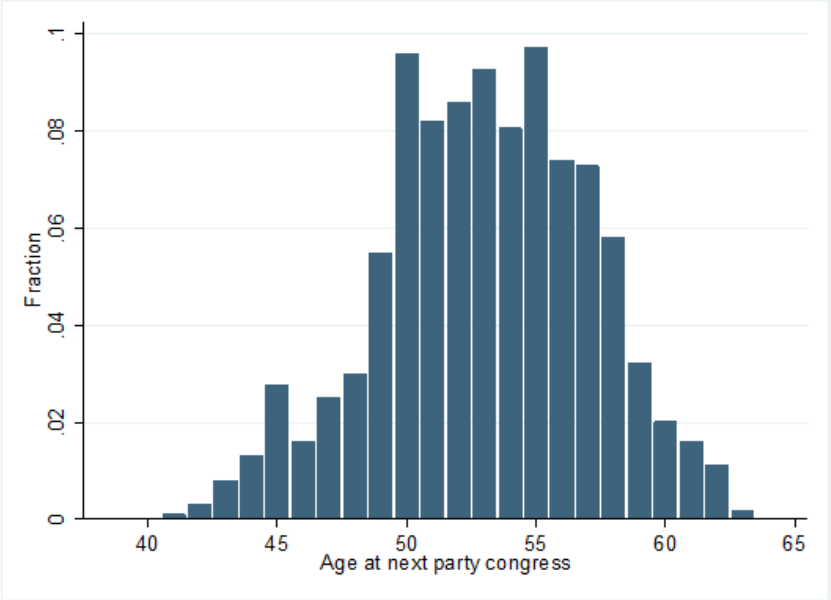


Figure 5: Kernel density of estimated leader effects

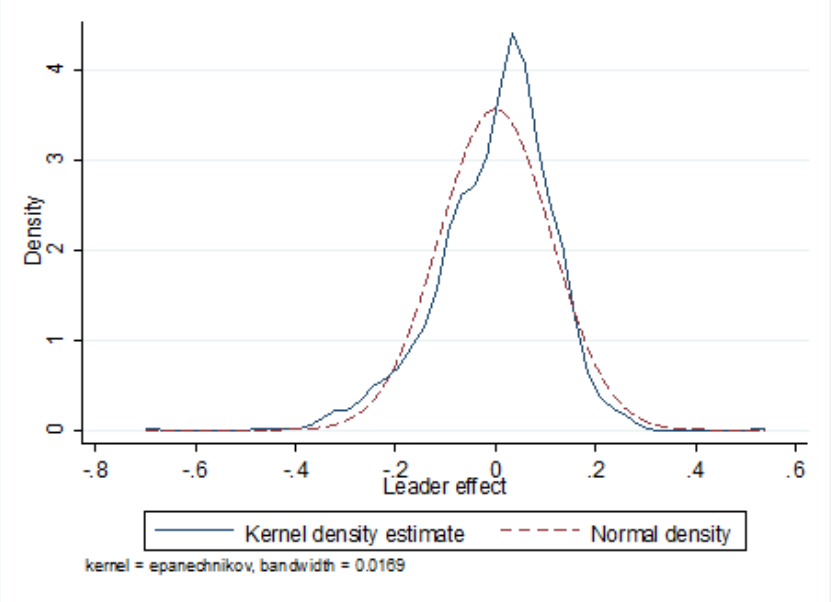


Figure 6: The political-cycle effect by competence quartiles

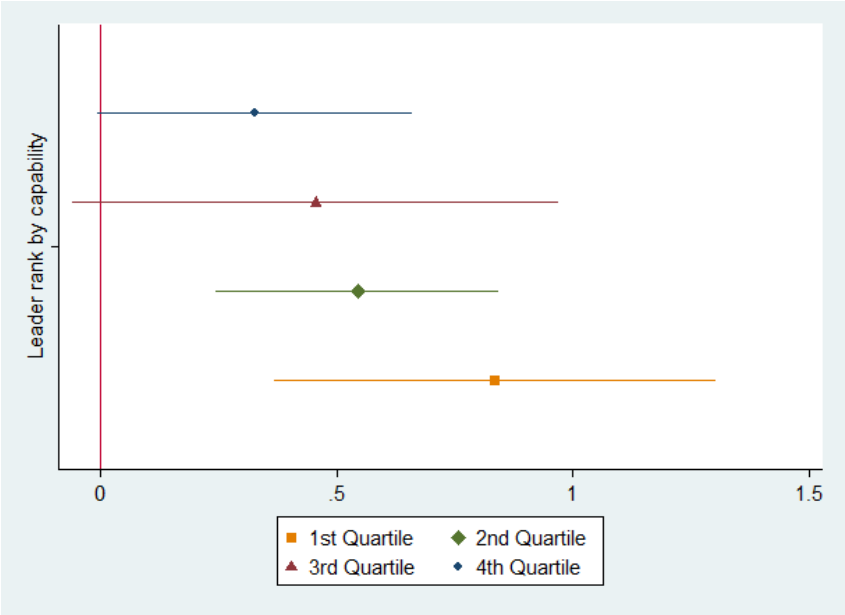


Figure 7: Competence and the rate of response to political cycles

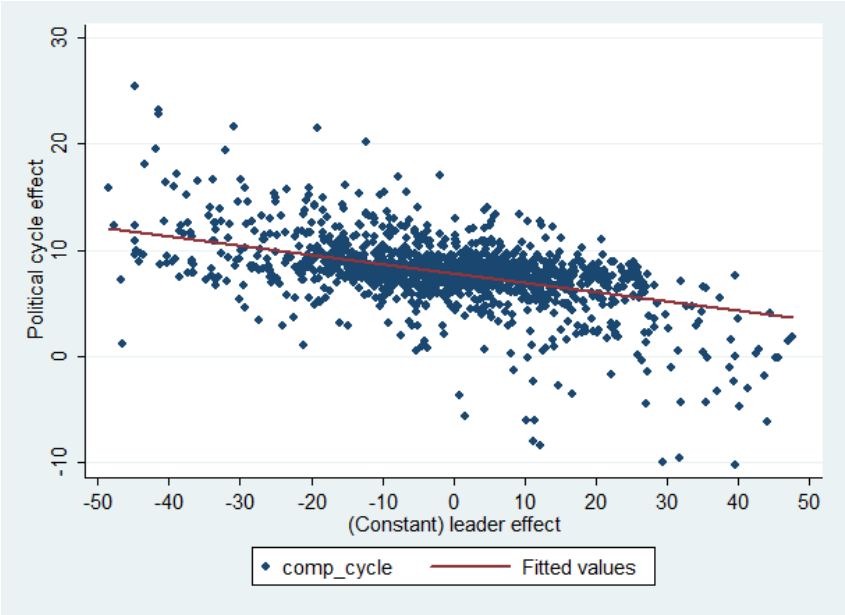


Table 1: Testing the incentive effect: the 2003 - 11 sample

Dependent variable: annual growth rate of per-capita GDP (%)			
Variables	R_1	R_2	R_3
$\|57 - age\| * Group\ A\ (age < 57)$	-0.0617*	-0.0428	
	(0.0333)	(0.0328)	
$\|57 - age\| * Group\ B\ (age \geq 57)$	0.155	0.158	
	(0.345)	(0.341)	
Political cycle		0.501***	
		(0.120)	
Group 2 ($53 < age < 57$ at next congress)			-0.148
			(0.637)
Group 3 ($age \geq 57$ at next congress)			0.593
			(0.725)
Political cycle * Group 1			0.508***
			(0.158)
Political cycle * Group 2			0.621***
			(0.153)
Political cycle * Group 3			0.298
			(0.227)
Personal characteristics			
Community college	-0.0751	0.243	0.224
	(4.759)	(4.957)	(4.799)
Four-year college	-0.354	-0.166	-0.194
	(4.814)	(5.014)	(4.853)
Master's	0.215	0.375	0.254
	(4.807)	(5.007)	(4.849)
Ph.D.	0.0576	0.156	-0.00943
	(4.821)	(5.021)	(4.862)
Post-doctorate	-0.0578	0.0487	-0.140
	(5.050)	(5.233)	(5.083)
Female	0.405	0.310	0.272
	(0.861)	(0.868)	(0.861)
Provincial standing committee member	0.187	0.117	0.130
	(0.288)	(0.282)	(0.282)
Number of cities served	0.0428	0.0251	0.0522
	(0.151)	(0.152)	(0.148)
City characteristics			
Log initial GDP per capita	-0.112	-0.0660	-0.0608

	(0.0819)	(0.0822)	(0.0820)
Log population	-12.37	-14.61*	-14.31*
	(7.628)	(7.797)	(7.791)
	Table 1 continued		
Inflation rate	-18.80***	-21.44***	-21.48***
	(4.549)	(4.518)	(4.515)
Constant	85.49*	96.44**	94.33**
	(43.95)	(44.79)	(44.66)
Observations	5,311	5,311	5,342
R-squared	0.188	0.193	0.193

Note: Robust standard errors are in parentheses. *** $p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 2: Testing the incentive effect: the connected sample of 2003 - 11

Dependent variable: $\widehat{\zeta_{i(jt)}} = y_{i(jt)} - \widehat{\theta}_i$			
Variables	R_1	R_2	R_3
$\|57 - age\| * Group\ A\ (age < 57)$	-0.0815***	-0.0632**	
	(0.0283)	(0.0279)	
$\|57 - age\| * Group\ B\ (age \geq 57)$	-0.258	-0.241	
	(0.279)	(0.269)	
Political cycle		0.487***	
		(0.111)	
Group 2 ($53 < age < 57$ at next congress)			-0.241
			(0.597)
Group 3 ($age \geq 57$ at next congress)			0.650
			(0.721)
Political cycle * Group 1			0.314**
			(0.142)
Political cycle * Group 2			0.451***
			(0.120)
Political cycle * Group 3			0.0539
			(0.245)
Constant	109.3**	122.0**	11.65***
	(48.37)	(49.63)	(0.624)
Observations	3,810	3,810	3,829
R-squared	0.789	0.791	0.787

Note: Robust standard errors are in parentheses. *** $p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 3: Heterogeneous effects of incentive by competence

Dependent variable: $\widehat{\zeta_{i(jt)}} = y_{i(jt)} - \widehat{\theta}_i$												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	1st quartile	2nd quartile	3rd quartile	4th quartile	1st quartile	2nd quartile	3rd quartile	4th quartile	1st quartile	2nd quartile	3rd quartile	4th quartile
$\|57 - age\| * Group\ A$	-0.143*	-0.0328	-0.105	-0.0611	-0.0996	-0.00714	-0.0903	-0.0474				
	(0.0722)	(0.0612)	(0.0660)	(0.0472)	(0.0725)	(0.0626)	(0.0645)	(0.0454)				
$\|57 - age\| * Group\ B$	-0.560	-0.543	0.423	-0.227	-0.636	-0.500	0.408	-0.172				
	(0.461)	(0.727)	(0.732)	(1.027)	(0.445)	(0.706)	(0.713)	(1.001)				
Political cycle					0.835***	0.544***	0.455*	0.326*				
					(0.235)	(0.151)	(0.260)	(0.168)				
Group 2									-0.316	0.0467	-1.237	-0.203
									(1.539)	(0.970)	(1.233)	(0.982)
Group 3									0.695	1.262	0.813	-0.612
									(1.608)	(1.135)	(1.366)	(1.585)
Political cycle * Group 1									0.663*	0.468**	0.00866	0.285
									(0.346)	(0.178)	(0.300)	(0.235)
Political cycle * Group 2									0.630**	0.402	0.325	0.545***
									(0.293)	(0.249)	(0.297)	(0.191)
Political cycle * Group 3									0.350	-0.294	-0.183	0.558
									(0.492)	(0.510)	(0.492)	(0.669)
Constant	170.4**	121.4**	363.0**	-65.70	192.4***	134.7***	385.6**	-60.79	24.72***	14.85***	9.625***	-2.685*
	(75.86)	(46.66)	(154.8)	(61.64)	(70.63)	(50.24)	(154.5)	(62.08)	(1.151)	(0.986)	(1.124)	(1.526)
Observations	943	958	964	945	943	958	964	945	951	961	968	949
R-squared	0.594	0.470	0.358	0.737	0.603	0.479	0.362	0.738	0.587	0.467	0.323	0.738

Note: Robust standard errors are in parentheses. *** $p < 0.01$, **$p < 0.05$, *$p < 0.1$.