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Culture and the Performance of Government Officials

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Abstract. This paper finds a novel way to measure culture and its impacts on growth. Southern China has a distinctive culture than northern China. Southern culture is more pro-economic growth than northern culture. Southern officials moving to northern cities (northbound officials) bring southern culture with them. Deploying a comprehensive dataset covering all Chinese prefectural cities in the period 1994 – 2017, our empirical study finds northbound officials significantly outperform their northern peers by 0.94 percentage points. This result is robust when we take into account moves in other directions, officials' promotion incentives, their ability, and their experience. Further analysis shows that northbound officials invest more and attract more people into their cities than their northern peers.

Keywords: Culture and growth, rice culture versus wheat culture, Chinese bureaucracy

JEL classification: O43, O15, P27

Culture and the Performance of Government Officials

It is a conventional wisdom that culture plays a role in economic growth. Yet empirical studies on the subject are insufficient in economics. Most of the existing studies explore cross-country variations in culture (measured by religious beliefs, trust, patience, work ethics, individualism, etc.) to pin down the impacts of culture on economic growth.¹ They suffer from two common drawbacks, though.

One is reverse causality. Although culture is a slow variable, cultural traits do change in response to economic growth. For example, in the early twentieth century and the early days of reform and opening, people's lack of sense of time was often cited as one of the factors hindering China from gaining economic prosperity, but today, Chinese workers are praised as one of the most disciplined workforces in the world. Economic growth often requires the change of formal and informal institutions (North, 1990), which in turn may change people's cultural beliefs. In addition, people's tastes may change in response to higher levels of income. For example, people with higher income may value economic growth less and value other goals (such as environmental quality) more. It is almost impossible for cross-country studies to correct this kind of reverse causality.

The other is the omission of other confounding factors. In addition to culture, many other factors affect a country's economic performance. It is unrealistic for any study to find proper data to control all of them. But many of them also play a role in forming or changing a country's culture, particularly the elements related to economic activities. For example, inward foreign direct investment can promote growth in a country, and may also bring into the country new work ethics. Most of those factors vary by time so the conventional fixed effect models cannot control them.

This paper takes advantage of China's north-south cultural differences and one of its unique political arrangements --- namely, the rotation of government officials --- to

¹ Doepke and Zilibotti (2014) present a theory for culture to influence economic growth through entrepreneurship. Swank (1996) provides a summary of early empirical works. Guiso, Sapienza, and Zingales (2006) provide a summary of more recent empirical works.

study the impacts of culture on government officials' economic performance. We hypothesize that city officials from the south bear the southern culture and study how they perform relative to their northern peers when they are assigned to northern cities. Culture thus is measured in a holistic way and is “turned on” by southern officials' move to the north (hereafter we refer them by *northbound* officials). The southern culture brought by a northbound official is exogenous to a northern city, so our study avoids the issues of reverse causality and omitted variables that plague many cross-country studies.

China is conventionally divided into the north and the south by the Qin Mountains and the Huai River. Wheat and corn are the staples in the north, and rice is the staple in the south. So the first dividing line between the south and the north is their cropping patterns. Recent studies show that rice agriculture fosters a more collective culture and tends to breed tighter social norms and wheat agriculture fosters an individualistic culture (Talhelm et al., 2014; Talhelm and English, 2019), and people brought up by rice culture are more willing to provide public goods than people brought up by wheat culture (Zhou et al., 2023). However, rice-planting societies are found to tolerate risk more than wheat-planting societies because collectivist culture provides a “cushion” for risk taking behavior (Chew et al., 2023).

Another dividing line is the different expressions of Confucianism in the south and north. Although it is the dominant belief system in the whole country, Confucianism is more dogmatic in the north than in the south. Instead of holding morality as the sole criterion for social conduct including economic dealings, southern Confucian scholars promoted both morality and material gains. As a result, southern culture holds a more pragmatic view toward wealth than northern culture. Combined with its tolerance for risk, southern China has produced more entrepreneurs in China's reform period.

A third dividing line is foreign influence in modern times. The southern coast has a long tradition of sea trade with foreign countries. Since the 16th century, it was also the first in the country to have face-to-face contact with the West. People in coastal China

are more familiar with the commercial culture brought by western merchants. In the reform period, coastal provinces took advantage of their proximity to Hong Kong, Macao and Taiwan, as well as their linkage to overseas Chinese, to lead China's reform and opening process. People in the south are more open-minded and are more willing to take audacious moves to change the status quo.

In summary, northern culture is featured by a kind of individualism that is less contained by social norms and less empathic toward social good, a stronger hold to dogmatic Confucian teachings (obedience to authority, respect for hierarchical orders, and the priority of moral judgement), and an aversion toward innovation and the development of private businesses; in contrast, southern culture fosters pro-society behavior, takes a more pragmatic view toward wealth, and encourages private entrepreneurship. Government officials play a significant role in local economic growth (Yao and Zhang, 2015). There are two ways for them to acquire a local culture. One is by their birthplaces --- an official born to a place in the south would naturally acquire the southern culture; verse versa, an official born to a place in the north would naturally acquire the northern culture. The other is by their job assignments. Chinese local officials are deeply involved in the local economy. This means that they have numerous opportunities to deal with local businesspeople as well as their colleagues in the local government. To succeed, they have to immerse themselves into the local culture that regulates the codes of conduct, often latent, for local interactions. The culture that officials have acquired this way may be more robust than the culture they have acquired at their birthplaces, for two reasons. One is that the culture acquired at one's early childhood may fade away if one left his/her birthplace at an early age. This may be especially true for Chinese officials. To avoid localized alliances, officials at all levels of the government are not allowed to preside over their home jurisdictions. So most city officials have already left their birthplaces for many years.² The second reason is that

² There are two levels of government below the city, township/street community and county/district. The average entry age of city officials in our sample was 47. So for officials who started from the grassroots, they might have left their home jurisdictions for over 20 years. The time span might be shorter for officials who started their career at the city level, but education might have compensated for it. In our sample, 92% of the city officials got their secondary or tertiary education outside their birth city.

being immersed in the local culture is often a prerequisite for officials to get things done, so the culture acquired at their jobs is likely to become an integral part of their skill kits. As a result, officials carry the culture they have acquired on their previous assignments to the cities that they are newly assigned to. This provides the basis for our study.

China's unique political system of personnel management gives us the chance to record the moves of government officials. The Chinese Communist Party (CCP) maintains a centralized selection system for government officials.³ One of the system's significant features is the rotation of government officials across jurisdictions. The assignment of a specific official to a specific city is not random, but its criteria are certainly not singleton. Chinese city officials have multiple tasks and economic growth is only one of them. Training and talent discovery may be the more important goal for rotation.⁴ The CCP has no specific plan to purposefully rotate southern officials to the north. The motivations governing the moves of the northbound officials, like the motivations governing the moves of other directions, are wide-ranged and diverse. As a result, the specifics determining individual officials' moves could cancel each other when we estimate the average effect of the northbound officials.

Using data for Chinese city officials (party secretaries and mayors) in the period 1994 – 2017, we study whether northbound officials outperform their northern peers. We adopt two definitions for northbound officials, one by their last job assignments and the other by their birth cities. We find that under the first definition, on average northern cities will grow 0.94 percentage points faster when it has a northbound official. The effect obtained under the second definition is much smaller, only 0.22 percentage points. These results confirm our conjecture that culture acquired on officials' job assignments is more robust than culture acquired in their early childhood. Therefore, we stick with the first definition of culture in our main analysis.

³ There is a debate as to whether merit plays a significant role in this system. Li and Zhou (2005) and Yao and Zhang (2015) find economic performance is a significant predictor for officials' promotion; Shih et al. (2012) find political connections are more important; and Jia et al. (2015) find economic performance and personal connections reinforce each other.

⁴ Yao and Zhang (2015) find that a main purpose of rotation is to test officials' ability by exposing them to different economic and social environments.

We conduct several robustness checks for our baseline results. We find that the effect we've found for the northbound officials does not come from the effects of officials' moves from one city to another because moves in other directions (from north to south, within the north, and within the south) have no significant effect. We also exclude the possibility that the effect comes from the center's deliberate selection of the northbound officials based on their ability, promotion incentives, and past experience. We test many channels for northbound officials to outperform their northern peers, including the usual drivers of growth (investment, R&D spending, patents, and entrepreneurship) and two China-specific means, developing the real estate sector and attracting population. Only the growth rates of fixed investment and population are found to be significant.

Our paper makes three contributions to the literature. First, we contribute to the study of the role of culture in economic growth. Our most significant contribution is that we find an exogenous representation of culture in our study --- the southern culture is represented by the northbound officials' moves from the south to the north and thus is exogenous to the economic performance of the northern cities. This way we are able to clearly identify the impacts of culture on economic growth. Second, we contribute to the emerging literature on rice agriculture and its long-term impacts. The existing studies (see Section 1 for a review) are either descriptive or experimental. Our study is the first to provide solid empirical evidence. Our results agree with the existing studies that find pro-growth elements in the rice culture. Third, we contribute to the study of Chinese bureaucracy. While the effects of new officials are frequently studied, our study is the first to find a positive growth effect for officials being moved from the south to the north. This finding suggests that the CCP should increase the level of exchange between southern and northern officials. Northern officials will acquire the southern culture when they are moved to the south, and southern officials will bring higher growth rates when they are moved to the north.

The rest of the paper is organized as the follows. Section 1 below will provide a review of China's north-south cultural divide and the recent literature on the rice culture. Section 2 introduces our data and the key variables to be used in our empirical analysis.

Section 3 presents our main results for the effects of northbound officials. Section 4 analyzes the channels for northbound officials to outperform their northern peers. Lastly, Section 5 concludes the paper.

1. China's north-south cultural divide

Our thesis is that northbound officials carry the southern culture and they make a difference in northern cities' economic growth. Our first task is to show that southern China and northern China have distinctive cultures. For that, we rely on other studies and historical records to make that distinction. We find three sets of causes are the most important for China's north-south cultural divide to emerge: different patterns of climate and agriculture, different approaches to Confucianism, and different degrees of foreign influence.

1.1 Rice agriculture versus wheat agriculture

China is geographically divided into north and south by the Qin Mountains in the west and the Huai River in the east. The south and the north have different topography, climate, vegetation, and cropping patterns. Topography wise, northern China is characterized by plains in the east and the Loess Plateau in the west, and southern China is characterized by networks of rivers and lakes, and mountains in the west and the far south. Much of northern China belongs to the north temperate zone, and its northern part belongs to the sub-frigid zone. Southern China covers the temperate zone and the sub-tropic zone. Precipitation is very different in the two regions. The south has rich rainfalls and the north is much drier. Average annual rainfalls along the Huai River is 910 mm. It drops quickly going north. For example, Jining, a city about 200 km north to the Huai River, only receives 597 – 820 mm rainfalls in a year. In contrast, Hefei, a city also about 200 km to the Huai River, but in the south, receives 1,000 mm rainfalls in a year. Accordingly, rice is the main crop in the south and wheat and corn are the main crops in the north. Recent studies indicate that the south and the north have developed distinctive cultures due to their different patterns of farming.

Talhelm et al. (2014) pioneer the study of the link between the pattern of agriculture

and cultural formation. They hypothesize that rice agriculture fosters collectivism because irrigation is vital for rice production and irrigation needs coordination. In contrast, wheat production does not need much irrigation. In addition, rice is more labor intensive than wheat, and coordination is more needed in rice agriculture than in wheat agriculture. Talhelm et al. (2014) tested 1,162 Han Chinese university students and found significant differences between students from rice-dominated regions and students from wheat-dominant regions. On average, students from rice-dominated regions are more likely to take a holistic and relational approach in their pairing experiments, and students from wheat-dominant regions are more likely to take an analytical and abstract approach in the same experiments. In psychology, a holistic and relational approach is regarded as a typical feature of collectivism and an analytical and abstract approach is regarded as a typical feature of individualism. Talhelm and his coauthors' further works show that people brought up by rice agriculture tend to circumvent obstacles (Talhelm et al., 2018) and follow norms more tightly than people brought up by wheat agriculture (Talhelm and English, 2020). Talhelm claims that those two findings are evidence for rice agriculture to be less innovative than wheat agriculture (Talhelm, 2022). But this claim is debatable. In the first place, southern China has produced way more entrepreneurs than northern China in the reform era.⁵ Rigorous research also finds out that rice culture encourages risk taking behavior in China (Chew et al., 2024). The theoretical basis of this finding is the cushion hypothesis that people in a cooperative culture can expect others' help when it is needed. This is augmented by the finding that people from a rice culture are more willing to contribute in public goods experiments than people from a wheat culture (Zhou et al., 2023).

Leaving the pattern of farming aside, other factors may have also contributed to the cooperative culture in the south. One of them is clan ties. Since Ming dynasty, clan organizations (*zong-zu*) have become the primary institution for China's grassroots governance (Gan, 2003). Clans provided assistance to families within the same clan, ranging from hunger relief to old age care and subsidies for children's schooling. In

⁵ Although there is no exact statistics, a random glance

modern times, clans often became a source of support for people's business endeavors. But clan organizations have been much stronger in the south than in the north.⁶ In a nationally representative sample of villages in contemporary time, among the largest four surnames in a village, 24.3% of them in the south have ancestral halls and 58.1% of them maintain genealogies, but the corresponding numbers in the north are only 2.8% and 26.8%, respectively (Guo and Yao, 2024).

There are also other factors that have contributed the individualistic culture in the north. One of most significant is nomadic invasion. In the last 2000 years, three major nomadic invasions happened. The first, and the most devastating, happened in the 3rd – 5th century. Nomadic tribes occupied northern China and established many kingdoms. The second happened during the Song dynasty (960 – 1279), first by Liao and Jin, and finally by the Mongols who conquered the whole China and established the Yuan dynasty. The third was the invasion of the Manchu who established the Qing dynasty (1636 – 1912). Every time, institutions were destroyed and replaced by more personalized rules. This is probably one of the reasons for northern people's lack of willingness to observe social norms. In the meantime, personal loyalty became more important in social interaction and political life. Obedience to authority as a way of life thus is much stronger in the north than in the south. This probably explains why individualism in northern China did not produce the kind of western institutions that induce people's pro-social behavior.⁷

1.2 Different interpretations of Confucianism

Chinese civilization started in the middle and lower reach of the Yellow River. This region, stretching from Shannxi in the west to Shangdong in the east, constitutes the southern edge of northern China. Confucianism has played a dominant role in the

⁶ One of the reasons was that the north was subject to frequent nomadic invasions which changed its population mix. Another reason was that in beginning of both the Ming and Qing dynasties, the government moved large amounts of people from the north to the peripheral regions in the southwest. Both broke the lineages in the north. As a result, clan culture is much weaker in the north than in the south.

⁷ Talhelm's original intention for his study was to find out the root cause for the East-West divide of collectivism and individualism. But it is clear that other East-West differences along their historical paths have played much more important roles than the pattern of farming, among which religion, cultural and political movements in the West (e.g., Renaissance, Enlightenment and democratization), and industrialization were probably the most important.

formation and development of Chinese mainstream culture. It was the official doctrines between Emperor Han-Wudi (141 – 87 BC) and the end of the Qing dynasty. Cemented by official institutions, Confucianism provided a political philosophy for the organization of the government, rules of conduct for officials, and guidance for ordinary people's daily life. In terms of its impacts on economic affairs, Confucianism had two distinctive features. One is that it put a heavy weight on moral values for personal conduct, and the other is that it enforced a hierarchical order for social interaction. As a result, merchants were ranked the last among the categories of professions,⁸ and commercial principles gave way to moral and hierarchical judgements. Hai Rui has been regarded as a model official in China's imperial times, but his way to legal ruling preferred social order to the justice inherent in the case itself. For example, when two brothers came to the court, he would rule in favor of the elder brother if the case was a general one because he wanted to preserve the orthodox order, but would rule in favor of the younger brother if the case was a dispute of property because the younger brother was often the poorer one (Huang, 1982). As a result, law was personalized and lost its key function of providing universal rules for society.

Although Confucianism was the dominant ideology for the whole country, southern Confucian scholars have developed different versions of it. One of them was the Yong-jia School and its related Confucian thoughts developed in southeastern Zhejiang in the Southern Song dynasty (1127 – 1279). Scholars affiliated with the school believed *dao* (the rule of the universe) was manifested by things. Instead of taking morality as the sole criterion, they took both morality and material gains to judge personal conduct and social interaction. As a result, they put commerce as equally important as agriculture (For that, the school has also been called the utilitarian school). It is thus not surprising to find that Zhejiang has a long history of commercial culture. But commerce requires impersonal transactions, and accordingly, law became an important part of the Yong-jia School. For example, Chen Liang (1143 – 1194), a Yong-jia scholar with enduring influence, wrote:

⁸ The first three were shi (learned people), farmers, and workers.

“Human nature contains private interests, and law stands for public interests. This is why *tian-xia* (the universe) has unstoppably moved toward law. ... If *tian-xia* all goes for law, virtuous persons cannot fully extend their hands and feet, but vicious persons cannot do what they want either.”⁹

This understanding of law is very different from the legalist view and is closer to the modern views of law. Instead of treating law as a tool for the emperor to rule his subjects, Chen treated law as a social institution that promoted the public good. He also realized that law constrained the good person as well as the bad person. By his argument, law obtained universal authority.

The ideas of the Yong-jia School spread to other parts of the country by Zhejiang merchants and Confucian schools (*shu-yuan*). Zhejiang merchants had a heavy presence in Shanghai in the Republic period (1912 – 1949). In the early period of reform and opening, Wenzhou, where Yong-jia county belongs to, became the cradle of China’s private business. Numerous Zhejiang merchants went out of the province; their business reached almost every corner of the country. Southern officials thus are more used to private businesses, and are less likely to discriminate against them.

1.3 Foreign influence

The southern and southeastern coasts had a long history of marine trade. After the first Opium War, the Qing government was forced to open Guangzhou, Xiamen, Fuzhou, Ningbo, and Shanghai to foreigners. In subsequent years, more cities were forced to open. They were subsequently called “the treaty ports”. Except Tianjin, all those treaty ports were in the south. Westerners obtained concessions in those cities and carried out business from there. As a result, those cities were the first in the country to get exposed to the West’ modern commercial culture. Foreign influence started from the treaty ports and spread to the rest of the country along major transportation lines (Banerjee, Duflo, and Qian, 2020).

In the reform era, the coast again was the first to receive foreign influence, mostly

⁹ Translated from Wu (2012), p.432.

through Hong Kong, Macao and Taiwan. Three of the four Special Economic Zones were purposefully established to utilize their geographical proximity to those places.¹⁰ Coastal regions received heavy investment from Hong Kong and Taiwan. In the late 1990s, Singapore joined the rank and established the Singapore Suzhou Industrial Park in the Yangtze River delta. Most investment from western countries and Japan also went to the coastal cities. At the highest point, foreign capital accounted for 8% of China's capital formation and coastal provinces contributed more than 90% of China's export (Yao, 2014). Foreign investment brought managerial skills and codes of business conduct as well as capital and technology. The south once again has received more foreign influence than the north. Local officials had more opportunities than ordinary people to deal with foreigners because one of their major jobs was to attract foreign investment. As a result, southern officials are more influenced by western ideas than their northern peers.

In summary, southern China and northern China possess distinctive cultures. The southern culture is more centered around the public good, more leaning toward rule-based dealings, more tolerant of risk, less antagonistic toward material gains, and more exposed to western influence than the northern culture. As a result, the southern culture possesses a potential difference over the northern culture when it comes to economic growth. Because fostering economic growth is one of their most important mandates, it is natural for officials to adopt the southern culture when they work in southern cities. When they are moved to a northern city, it is also easy for them to realize the supremacy of the southern culture over the local culture when economic growth is concerned. As a result, they will not give up the southern culture, and will instead act according to the rules of it. Our thesis is that this will lead to their better performance over their northern peers.

¹⁰ Zhuhai is adjacent to Macao, Shenzhen is next to Hong Kong, and Xiamen is the opposite to Taiwan across the Taiwan Strait. Shantou is the home of many overseas Chinese.

2. Data and variables

2.1 Data

Our data of government officials come from the CCER Officials Dataset (COD) which contains bio and career information of Chinese government officials at or above the municipal level from 1994 to 2017. Municipal officials are matched with the annual economic data of the cities (investment, GDP and its composition, structure of the economy, government spending, etc.) that they served respectively, such as population, investment, and GDP. Detailed information about the data can be found in Wang, Yao, and Zhang (2022). In particular, COD records the hometown and career path of every official covered by the dataset, the key information that we rely on for our identification strategy. We also collected city-level annual data for the number of new firms, the number of newly listed firms, R&D spending, patents, real estate investment, and housing prices for the purpose to study the possible channels for northbound officials to help growth in northern cities. The sources of those data are the follows: the number of new firms is obtained from the Tian-Yan-Cha Database which is maintained by the State Administration for Industry and Commerce. Information for the number of newly listed firms is drawn from the Wind Database. Data for R&D spending are obtained from the CSMAR Database. Data for patents and real estate investment are extracted from *China City Statistical Yearbook*, and data for housing prices are provided by Housing Prices of 70 Large and Medium-size Cities, a database maintained by the National Bureau of Statistics.

2.2 Definitions of key variables

The officials that we study are municipal party secretaries (PSs) and mayors. The unit of study is city-year. Our data allow us to build a city×year panel structure for our study. Our main explanatory variable is whether the PS or mayor in a particular city has a southern origin. We adopt two measures for the southern origin. One is *Move_SN* indicating whether the PS or mayor worked in the south immediately before he/she moved to a northern city, and the other is *Home_south* indicating whether the PS or

mayor was born in a southern city. In line with the definition of *Move_SN*, we use *Move_SS*, *Move_NS*, and *Move_NN* to indicate moves of officials within southern cities, from northern cities to southern cities, and within northern cities, respectively.

The main outcome variable is logarithm of the annual GDP growth rate (in fraction) in a city. We study the growth rate of municipal GDP, not the growth rate of per-capita GDP, primarily because municipal officials are evaluated by municipal GDP, not by per-capita GDP. Logarithm is taken to linearize the growth numbers.

In our baseline regressions, we control for the municipal per-capita GDP (1,000 yuan, lagged one year) to account for growth convergence. To check the robustness of our baseline results, we will also try to control several sets of officials' personal characteristics and the characteristics of the cities they served before. Personal characteristics come from the COD and city characteristics are obtained from *China City Statistical Yearbook*. The first set measures officials' personal abilities including their educational levels (*EDU*) and the average growth rate of per-capita GDP in the last three years (in logarithm) before they assumed the current position (*GDPPR_3yraverage*). Education is a conventional measure for officials' general ability (Besley et al., 2011). In our case, *EDU* is a categorical variable with 1 = high school or below, 2 = three-year college, 3 = four-year college, 4 = master, 5 = doctor. In the literature on Chinese officials (e.g., Li and Zhou, 2005; Yao and Zhang, 2015), the average growth rate in an official's tenure is used to measure that official's ability to grow the local economy. In our case, three-year averages are adopted because the average of a spell of tenure in our data was about three years.¹¹

The second set of controls measures officials' incentives. It contains three variables: *Age*, *Gender* (male = 0, female = 1) and *Minority* (Han = 0, minority = 1). The Chinese bureaucracy enforces strict retirement ages for officials; municipal officials have to

¹¹ PSs or mayors may take two kinds of offices in their previous positions. One is that they are already PS or mayor in their previous positions. PSs usually fall into this category. Therefore, *GDPPR_3yraverage* is an adequate measure for their ability in line with the literature. In the case of mayors, they have to be at least vice mayor or vice party secretary before they take the current position. *GDPPR_3yraverage* is not a perfect, but still acceptable measure because vice mayors and vice party secretaries assume substantial responsibility in local affairs.

retire at 60. Therefore, age becomes a very important factor defining officials' incentives. The literature (e.g., Xi, Yao and Zhang, 2018) has found that the chances of promotion diminish as officials approach their retirement ages, and younger officials are more eager than older officials to grow the local economy. The Chinese bureaucracy also pays attention to lifting the status of marginalized groups of officials. As a way to push for gender equality, female officials are more likely than male officials to get promoted. In the same vein, to push for ethnic equality, minority officials are more likely than Han officials to get promoted. As a result, female and minority officials may work harder than male and Han officials, respectively, to grow the local economy.

The last set of controls describes officials' experiences including whether their last position was in a coastal province in the south (*Coastal_prov*), the average per-capita GDP of the city that they served for their last assignment (1,000 yuan, *GDPPR_last city*), and the number of years working in the south in their career (*EXP_south*). *Coastal_prov* is defined by the five coastal provinces in the south: Guangdong, Fujian, Zhejiang, Shanghai, and Jiangsu. Those five provinces have several advantages over other provinces (including inland provinces in the south): they were more exposed to foreign influences in historical times, have a more open and more vibrant economy, and contain all the first-tier and semi-first-tier cities.¹² Because those provinces are so dominant in China's economy and officials having worked there may have accumulated strong knowledge to develop local economy, there are reasons to believe that our baseline results for *Move_SN* may only reflect officials' experience of working in those provinces, rather than indicate what we want to measure, i.e., the potential cultural differences ignited by southern officials' moves to the north. Controlling *GDPPR_last city* serves a similar purpose. To the extent that a city with a higher level of income must enjoy advantages over other cities, having worked in it may allow an official to accumulate more knowledge to develop local economy. *EXP_south* counts from the year when an official first started in the bureaucracy. Therefore, controlling *EXP_south*

¹² The conventional list of first-tier cities includes four cities: Beijing, Shanghai, Guangzhou, and Shenzhen. Suzhou and Hangzhou are regarded as semi-first-tier cities. Except Beijing, all those cities are coastal cities located in the south.

allows us to distinguish between the qualitative effect and quantitative effect of officials' immersion in the southern culture.

2.3 Descriptive analysis

Table A1 presents summary statistics for the variables to be used in our analysis. Here we provide some results of descriptive analysis. First of all, the share of northbound officials was relatively small, only 0.7% of all the city officials. The share of officials born in the south was much larger. It was 54.1%. The results based on these two definitions of southern culture can provide cross-checks for their validity. The northbound officials performed slightly better than their northern peers. A northern city with a northbound official on average grew 1.4 percentage points faster than other northern cities. The gap between officials born in the south and officials in the north was much smaller, only 0.1 percentage points. The moves in the other directions (SS, NN, NS) all resulted in the loss of growth. The gap between the SS movers and their southern peers was -0.4 percentage points, the corresponding gap in the north was -2.1 percentage points, and the gap between the NS movers and their southern peers was -4.7 percentage points. While these results are subject to the confounding effects of other factors, the contrast between SS moves and the moves in the other direction indicates that northbound officials' superior performance was not likely to be a result of their moves *per se*, but had a lot to do with the direction of their moves.

The northbound officials were older compared with their northern peers. The youngest northbound official was 45 years old while 8% of their northern peers were 45 years old or younger. The northbound officials were slightly less educated than their northern peers. While the share of college graduates was slightly higher among northbound officials than among their north peers (51.7% versus 49.8%), northbound officials had a smaller share of master and Ph.D. degree holders than their northern peers (3.4% versus 5.1%). In addition, the northbound officials had less minority officials (11.1% versus 16.1%) and more female officials (6.4% versus 3.8%) than their northern peers. In general, those personal-level differences are small and statistically

insignificant.

In comparison, there were significant gaps between the last city that the northbound officials had served and their current city. The average per-capita GDP of the cities of their last post was 44,977 yuan while it was only 28,315 yuan for the current cities. The cities of the northbound officials' last posts also grew faster than their destiny cities. The average GDP growth rate of the former group was 9.5%, and the corresponding figure was 6.7% for the latter group. Like we indicated before, officials serving in more affluent cities tend to have better experience, and officials achieving higher growth rates tend to be more capable. So we conclude that the northbound officials are likely to be more experienced and more capable than their northern peers.

In summary, the above descriptive evident shows that northbound officials did perform better than their northern peers and this advantage was not likely to come from moves *per se*. Promotion incentives were not likely to play a significant role in determining northbound officials' performance, but their ability and experience were.

3. Main results for the role of culture

3.1 Baseline results

Our baseline regression is simple. The unit of observation is the city×year cell. The outcome variable is the logarithm of a city's annual growth rate in a specific year, and the key explanatory variable is *Move_SN*. Alternatively, we will replace it by *Home_south*. We will also run separate regressions for PSs and mayors, respectively. Because the conventional growth determinants (such as investment and R&D, etc.) can be influenced by officials' efforts, we do not include them in our regressions. The size of population can also be a tool that officials use to boost local growth. Therefore, we do not include it either. Instead, we include the lagged city per-capita GDP to control for possible convergence. Our data allow us to perform city and year two-way fixed effect regressions. This way, the comparison under our scrutiny is within the city, i.e., between a city's GDP growth rates in years when it has northbound officials and its GDP growth rates in years when it has northern officials, with other cities without

northbound officials controlling the time trends. Our identification assumption is that the assignment of the northbound officials is exogenous to their recipient cities' GDP growth conditional the lagged city per-capita GDP as well as the city and year fixed effects. We will check this assumption by further controlling officials' personal characteristics.

[Table 1 about here]

Table 1 presents the baseline results. Columns (1) – (3) present the results when PSs or mayors are considered. Column (1) shows the results for *Move_SN*. The reference group is officials of other types of moves (north to south, south to south, and north to north) as well as officials produced in the same city. Having a northbound official increases the annual GDP growth rate of a northern city by 9.0%, and this effect is significant at the 10% significance level. The average growth rate in our sample was 10.5%. Therefore, an average northern city will grow faster by 0.94 percentage points when it gets a northbound official. Column (2) replaces *Move_SN* by *Home_south*. The estimate is still statistically significant, but its size is much smaller --- it is reduced to 2.1%. Officials born in the south may not take their education in the south; nor do they necessarily have worked in the south. The culture that they acquired in their childhood is less effective than the culture that they acquired when they assumed leadership roles. To further explore the interaction of those two kinds of culture, Column (3) adds the interaction term between *Move_SN* and *Home_south*. The coefficient of *Move_SN* remains almost the same as it is in Column (1) while the coefficient of *Home_south* becomes insignificant. The coefficient of the interaction term is also not significant. The contrasting results for *Move_SN* and *Home_south* tell us two things. First, working experience is more important than birth to determine how much southern culture that officials are able to carry over to their jobs in northern cities. Put in another way, earlier-life experience is less effective than later-life experience to determine an official's cultural orientation. Second, officials born in the north can adopt the southern culture, probably in a short period of time because some of them might have only worked in the south for a few years. Officials coming from the north may quickly find that southern

officials are more effective than their northern peers. They may also find southern business people are more rational than their northern counterparts. Those findings may allow the officials to quickly realize that the southern culture is better than the northern culture in terms of getting things done and induce them to change their cultural orientation.

Columns (4) and (5) repeats Columns (1) and (2), respectively, for PSs. The results are similar. Columns (6) and (7) do the same for mayors. The coefficient of *Move_SN* is still positive but no longer significant although *Home_south* is. The mayor is the No.2 person in a city, and his/her job is to implement the decisions of the party secretary. So the mayor's experience may not be as important as the PS's.

The above results have provided solid evidence for a positive and significant effect of having a northbound official, particularly a northbound party secretary, in a northern city. But to establish that this effect is caused by the southern culture brought along by the northbound officials, we need to exclude several plausible channels other than culture.

3.2 The "three-torch effect"

One immediate question about our baseline results is that the positive effect of northbound officials may be just a result of officials' moves from one city to another city. As the old sayings goes: "A newly-arrived official lights three torches of fire." These three torches of fire may boost the official's performance. We call this "the three-torch effect." To rule out this effect, we run several regressions. Column (1) of Table 2 reports the first regression in which we add to the baseline regression a variable *Other_moves* that indicates any move other than the move from south to north. The omitted category is cities whose PS and mayor were promoted locally (i.e., no move happened). The estimate of *Other_moves* is not significant, and the estimate of *Move_SN* remains significant and its magnitude has slightly increased. This shows that our baseline result for *Move_SN* is not driven by the three-torch effect. To strengthen this conclusion, we run three more regressions to study the individual effects of the

three other kinds of moves: from north to south, within the south, and within the north. Their results are presented in Columns (2) – (4). Moves from north to south and moves within the south do not have a significant impact, and moves within the north even have a sizable and negative impact. The first result is easy to understand: officials moved from north to south do not possess a culture advantage in the south. The second result can be justified by the lack of potential differences, one direction or another, among the southern officials --- they are equally immersed in the southern culture so no additional growth is generated when they are moved from southern city to another southern city. The third result hints one drawback of the kind of individualism prevailing in the north, i.e., it creates antagonism rather than freedom of choice. In the west, individualism works the best when it is combined with a strong self-regulated social order.¹³ In northern China, individualism is combined with the culture of obedience to authority. Therefore, it does not align people's interests with the common good; rather, it leads to wasteful competition for power among individuals.

[Table 2 about here]

On the other hand, the above results highlight the uniqueness of officials' moves from the south to the north; only moves in this direction create extra growth. This result buttresses our thesis that the southern culture is superior to the northern culture in promoting economic growth. But we need to do more to exclude other reasonable doubts.

3.3 *Endogenous moves*

To fully establish our culture thesis, we need to deal with the potential endogeneity of the assignment of the northbound officials. The central authorities may pick southern officials with the right talents and move them to the north. Our baseline results for *Move_SN* thus can be caused by those talents, not the southern culture brought by the northbound officials. This concern leads us to study the roles played by individual officials' personal characteristics. Because individual attributes are studied, we have to

¹³ A classical treatise on this subject is Tocqueville's *Democracy in America* (Tocqueville, 2002).

separate PSs and mayors. This way, each city contributes two observations, one for the party secretary and the other for the mayor. The variable *Move_SN* is then defined for the party secretary and the mayor separately.

[Table 3 about here]

One possibility against our baseline results is that the northbound officials are more capable than their northern peers. As we mentioned before, we use two indicators to measure officials' ability, education (*EDU*) and the three-year average of growth rates in the city they served for the last position (*GDPPR_3yraverage*). The results are reported in Columns (1) of Table 3. *EDU* is highly insignificant and *GDPPR_3yraverage* is positive and highly significant. Past performance is a much more significant predictor than education for an official's ability. *Move_SN* becomes insignificant although it remains positive. It seems that the central authorities pick up high-ability officials in southern cities and move them to the north. Ability seems to super-seed culture to explain northbound officials' higher performance in northern cities. But this conclusion needs to be qualified because *GDPPR_3yraverage* may pick up the impacts of other personal attributes.

The second issue we need to tackle is officials' promotion incentives. It could be the case that the northbound officials had higher levels of incentives so they performed better than others. As we discussed before, age, gender and ethnicity can be used to measure officials' incentives for promotion. Their robustness results are presented in Column (2) of Table 3. An older age does place a penalty on officials' performance, but gender and ethnicity do not matter. The coefficient of *Move_SN* remains significant this time. Promotion incentives as we have measured are not as strong as ability to confound the role of culture.

The third issue is the confounding impacts of officials' experience. As indicated in the last section, we measure officials' experience by three variables: *Coastal_prov*, *GDPPR_last city*, and *EXP_south*. Their robustness results are presented in Column (3) of Table 3. *GDPPR_last city* is found to significantly increase officials' performance in

their current job. The level of income is a sufficient statistic for all the factors related to a city's stage of economic development, and for that matter, it is also a sufficient statistic for the quality of the municipal government. Having worked in a city of a higher income level, an official is more likely to develop a better understanding of the economy and the ways to boost it. The other two variables *Coastal_prov* and *EXP_south* are insignificant, and *Move_SN* continues to remain significant. These results tell us two things about southern culture. First, southern culture is not limited to coastal provinces, but universal in the southern provinces, and second, once again, officials not born in the south can quickly absorb the southern culture.

Column (4) of Table 3 presents the results when all the three groups of individual characteristics are controlled for. The results of the control variables are qualitatively the same as those presented before, and the coefficient of *Move_SN* is significant although its magnitude is smaller than the baseline coefficient. Comparing this result with the insignificant result reported by Column (1), one realizes that ability measured by *GDPPR_3yraverage* is positively correlated with some of the factors covered by officials' promotion incentives and experience, some of which negatively affect northbound officials' performance in northern cities. *Coastal_prov* and *EXP_south* are the likely culprits. Having worked in a coastal province or having worked in the south longer are likely to improve an official's ability to grow the local economy, but as Table 3 shows, other things being equal, they weakly reduce northbound officials' performance.

3.4 Pre-trends

The last concern that we need to address is whether our baseline results are driven by the growth trends existing in northern cities before northbound officials are moved from south to north. To rule out this possibility, we conduct an event study. Its results are represented by Figure 1. Four years before a move (control years) and four years in and after the move (treatment years) are included in the analysis. This is enough because most city officials work in a city for 3 – 4 years. The year before a move is chosen to

be the base year.¹⁴ Estimates and their 5% confidence intervals for the other years are presented. The estimates for the control years are very small and insignificant, but the estimates for the treatment years, except the one for the year immediately after the move, are large and significant. These results present decisive evidence that our baseline results are not driven by pre-trends. In addition, the significant estimates for the treatment years buttress our baseline results..

[Figure 1 about here]

4. Possible channels

In the last section, we established a positive and significant role of culture in differentiating northbound officials from their northern peers. In this section, we explore the possible channels by which the northbound officials outperform their northern peers. Our purpose is not to find out how culture impacts on officials' performance --- culture functions at the psychological level and it is impossible to pin down the way of its function without psychological or physiological studies; rather, we would like to obtain supporting evidence for our culture thesis by studying the means that northbound officials deploy to accelerate local growth. They include the usual drivers of growth such as physical investment, R&D investment, innovation, and entrepreneurial activities. In addition, there are China-specific means of promoting local growth. We will study two of them. One is the competition for population. Population growth has begun to slow down in China since twenty years ago. Over the last 15 years, many inland cities have experienced fast decline of population. On the other hand, overcapacity has become a chronic problem of the Chinese economy since the Global Financial Crisis forced the country to avert back to domestic consumption for sustained growth. Population growth brings more demand to a city and therefore will result in higher growth rates. The other means that we will study is real estate development. In the last 20 years, local governments have relied heavily on the real estate sector to generate growth and revenue because that sector is able to generate fast

¹⁴ A move may happen in any time of a year, so we treat the year of a move as being impacted by the move.

and significant results. We will look at the growth rates of real estate investment in all sample cities and housing prices in the 70 cities with reported data.

[Table 4 about here]

We first study physical investment. The outcome variable we adopt is the growth rate of fixed investment. We study fixed investment because we could find consistent data for it. The regression specification is the same as in the baseline regression. Column (1) of Table 4 presents the results. Northbound officials invest significantly more than their peers. Fixed investment grows 5.4 percentage points more when a city has a northbound official. The average growth rate of fixed investment in our sample was 26.4%. The effect we've found for northbound official thus is substantial. Fixed investment is by far the most important growth driver in China. It creates instant demand to fuel short-term growth as well as accumulates productive capital for future growth. Northbound officials have a better understanding, and possibly better ability, to carry out investment than their northern peers.

Then we study the growth rates of R&D investment, patents and the number of new firms. The growth rate of new firms is meant to capture the growth of entrepreneurial activities. We augment it by also studying the number of newly listed firms in a year. Their results are presented in Columns (2) – (6). No difference is found between northbound officials and other officials in any of the regressions.¹⁵ Therefore, among the usual drivers of growth, we only find that northbound officials invest more than their peers to boost local growth.

Next we study the two China-specific means of boosting growth and report their results in Columns (7) – (10) of Table 4. Northbound officials are found to significantly raise population growth in their cities (Column (7)). Population growth in a city with a northbound official will grow 2.1 percentage points faster than its peers. Since the average population growth in our sample was only 2.3%, this effect is quite substantial.

¹⁵ We also study the number of invention patents and its growth rate, as well as the number of new firms in a year, and we do not find a significant result.

However, no difference is found between them and their peers in terms of either the growth rate of real estate investment, or the growth rate of housing prices.¹⁶ This finding does not fit into the conventional story that real estate development is a convenient tool for local officials to pump up short-term growth.

In summary, northbound officials are better at accelerating fixed investment and attracting population than their northern peers. Because we do not find a significant result for real estate investment, northbound officials' advantage in fixed investment indicates they must have invested more in infrastructure and manufacturing capacities. As for their advantage in population growth, the residential registration (*hu-kou*) system gives northbound officials a means to attract people to migrate from the countryside or other cities to their own cities. The *hu-kou* system grants residential status to people according to their birthplaces and carries heavy social and economic benefits, particularly the access to education, affordable housing, healthcare, and pension, as well as peculiar privileges such as having equal rights as the residents with *hukou* do to buy a home or a car in cities with restrictions on home and car purchases. Municipal governments have the right to decide those benefits, giving city officials a handler to attract people from the countryside and other cities. One of the defining patterns of China's internal migration in the last 20 some years is people moving from the north to the south. Southern officials thus may have developed a better sense about how to manage population inflows. As a result, they can do a better job than their northern peers when they are moved to northern cities.

5. Concluding remarks

In this paper, we take advantage of China's unique political system to study how the southern culture brought by southern officials to northern cities plays a role in the economic growth of the recipient cities. Embedded in the northbound officials, southern culture is exogenous to the recipient cities in the north. Our findings are thus free of the endogeneity problems encountered by cross-country studies. In addition to contributing

¹⁶ The table reports the results of prices of new homes. We have also looked at the prices of second-hand homes and do not find significant results.

to the academic literature on culture and growth, our results possess policy implications for the Chinese authorities to improve the Chinese bureaucracy. Over the last several decades, city officials have been mostly rotated within their own provinces. This has a lot to do with the “one level up” rule maintained by the Chinese bureaucracy --- the allocation and promotion of government officials are determined by the government one level above the jurisdiction that those officials currently serve for. For example, the rotation and promotion of city officials are managed by the provincial party organs. Our finding that south-north moves of city officials bring substantial economic gains. One of the problems regarding China’s regional disparities is that the south-north income gap is enlarging. Moving southern officials to the north can partly mitigate the problem. In addition, southern officials can spread southern culture among their fellow officials in their recipient cities, which is a positive result in its own right.

A potential drawback of our study is that our measure of culture is holistic and our analysis does not tell us which traits of southern culture play a positive role for the northbound officials to outperform their northern peers. However, to the extent that cultural traits tend to correlate in one direction (e.g., an individualistic culture tends to have individualistic traits), this drawback is not likely to be a serious problem. In the Chinese context, the distinction between southern culture and northern culture is clear enough for one to expect holistically different behaviors between southern people and northern people. The distinction can be even more pronounced for government officials because they have to deal with a wide range of people in the local city. Officials need to get familiar with the local culture. But our finding suggests that cultural adaptation is one-directional: northern officials adopt southern culture when they are moved to the south, but southern officials, including those who were initially from the north, keep southern culture when they are moved to the north. The only explanation is that southern culture possesses significant advantages over northern culture for the type of jobs that city officials carry out, among which promoting economic growth is central.

References:

- Banerjee, Abhijit, Esther Duflo, and Nancy Qian. "On the road: Access to transportation infrastructure and economic growth in China." *Journal of Development Economics*, Volume 145, June 2020, 102442.
- Besley, Timothy, Jose Montalvo, and Marta Reynal-Querol. "Do Educated Leaders Matter?" *The Economic Journal*, 2011, 121(554): F205–227.
- Chew, Soo Hong, Richard Ebstein, and Yunfeng Lu. "The Rice Culture Theory of Cooperative Behavior: Evidence from Incentivized Decision Making Tasks in China." Unpublished manuscript, National University of Singapore, 2024.
- Doepke, Matthias, and Fabrizio Zilibotti. "Culture, Entrepreneurship and Growth." In Philippe Aghion and Steven Durlauf eds. *Handbook of Economic Growth*. Vol. 2, pp. 1-48. Amsterdam: North Holland, 2014.
- Gan, Chunsong. *Institutional Confucianism and Its Dissolution*. Beijing: Renmin University Press, 2003.
- Guiso, Luigi, Paola Sapienza, and Luigi Zingales. "Does Culture Affect Economic Outcomes?" *Journal of Economic Perspectives*, 2006, 20 (2): 23–48.
- Guo, Yunnan, and Yang Yao. "Elections Reduce Local Capture." Unpublished manuscript, The University of International Economics and Business, 2024.
- Huang, Ray. *1587, A Year of No Significance: The Ming Dynasty in Decline*. New Heaven: Yale University Press, 1982.
- Li, Hongbin and Li-An Zhou. "Political turnover and economic performance: the incentive role of personnel control in China." *Journal of Public Economics*, 2015, 89(9-10): 1743-1762.
- North, Douglass. *Institutions, Institutional Change, and Economic Performance*. Cambridge: Cambridge University Press, 1990.
- Swank, Duane. "Culture, Institutions, and Economic Growth: Theory, Recent Evidence, and the Role of Communitarian Polities." *American Journal of Political Science*, 1996, 40(3): 660–79.

- Talhelm, Thomas, Zhang, X. , Oishi, S. , Shimin, C. , & Kitayama, S. . “Large-scale psychological differences within China explained by rice versus wheat agriculture.” *Science*, 2014, 344(6184): 603-608.
- Talhelm, Thomas, and A. English. "Historically Rice-Farming Societies Have Tighter Social Norms in China and Worldwide." *PNAS*, 2020, 117 (33): 19816-19824.
- Talhelm, Thomas. “The Rice Theory of Culture.” *Online Readings in Psychology and Culture*, 2022, 4(1). <https://doi.org/10.9707/2307-0919.1172>.
- Tocqueville, Alexis. *Democracy in America* (Translator: Harvey Mansfield), Chicago: The University of Chicago Press, 2002.
- Wu, Gou. *Song, the Dawn of Modernity*. Nanning: Guangxi Normal University Press, 2012.
- Xi, Tianyang, Yang Yao, and Muyang Zhang. “Capability and Opportunism: Evidence from City Officials in China.” *Journal of Comparative Economics*, 2018, 46: 1046-1061.
- Yao, Yang. “The Chinese Growth Miracle.” *Handbook of Economic Growth*, Chapter 7, Vol. 2B: 943-1032. Amsterdam: North Holland, 2014.
- Yao, Yang, and Muyang Zhang. “Subnational leaders and economic growth: Evidence from Chinese cities.” *Journal of Economic Growth*, 2015, 20: 405–436.
- Zhou, Xiaoyu, Theodore Alysandratos, and Michael Naef. “Rice Farming and the Origins of Cooperative Behaviour.” *The Economic Journal*, 2023, 133(654): 2504–2532.

Table 1. Baseline results

Variable	PS or mayor			PS		Mayor	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Move_SN</i>	0.0897*		0.0780*	0.0808*		0.0622	
	(0.0532)		(0.0482)	(0.0482)		(0.0655)	
<i>Home_south</i>		0.0212*	0.0180		0.0229*		0.0193**
		(0.0128)	(0.0129)		(0.0120)		(0.0098)
<i>Move_SN</i> × <i>Home_south</i>			0.0032				
			(0.0338)				
Lagged	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0003)
Per-capita GDP							
Constant	0.0674***	0.0561***	0.0570***	0.0687***	0.0537***	0.0697***	0.0592***
	(0.0082)	(0.0113)	(0.0113)	(0.0082)	(0.0130)	(0.0082)	(0.0098)
City FEs	Y	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y	Y
# Obs.	4,197	4,197	4,197	4,150	3,746	4,153	3,857
Adj. R ²	0.704	0.704	0.704	0.703	0.713	0.702	0.700

Notes: *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively.

Table 2. Effects of culture or effects of three-torch fires?

	(1)	(2)	(3)	(4)
<i>Move_SN</i>	0.0917*			
	(0.0533)			
<i>Other_moves</i>	0.0093			
	(0.0067)			
<i>Move_NS</i>		0.1157		
		(0.0835)		
<i>Move_SS</i>			-0.1157	
			(0.0835)	
<i>Move_NN</i>				-0.0897*
				(0.0532)
Lagged	0.0001	0.0001	0.0001	0.0001
Per-capita GDP	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Constant	0.0628***	0.0688***	0.1265***	0.1125***
	(0.0094)	(0.0081)	(0.0422)	(0.0274)
City FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
# Obs.	4,197	4,197	4,197	4,197
Adj. R ²	0.704	0.705	0.705	0.704

Notes: *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively.

Table 3. Confounding impacts of officials' personal characteristics

	(1)	(2)	(3)	(4)
<i>Move_SN</i>	0.0585 (0.0410)	0.0754* (0.0392)	0.0750* (0.0394)	0.0665* (0.0412)
<i>EDU</i>	0.0024 (0.0028)			0.0011 (0.0032)
<i>GDPPR_3yaverage</i>	0.5133*** (0.0607)			0.5102*** (0.0598)
<i>Age</i>		-0.0017*** (0.0006)		-0.0008 (0.0007)
<i>Gender</i>		0.0008 (0.0098)		-0.0143 (0.0118)
<i>Minority</i>		0.0006 (0.0116)		-0.0035 (0.0169)
<i>Coastal_prov</i>			-0.0382 (0.1038)	-0.1841 (0.4662)
<i>GDPPR_last city</i>			0.00023* (0.00013)	0.00031** (0.00013)
<i>EXP_south</i>			-0.0003 (0.0004)	-0.0003 (0.0005)
# Obs.	5,188	8,299	8,071	5,156
Adj. R ²	0.738	0.703	0.706	0.741

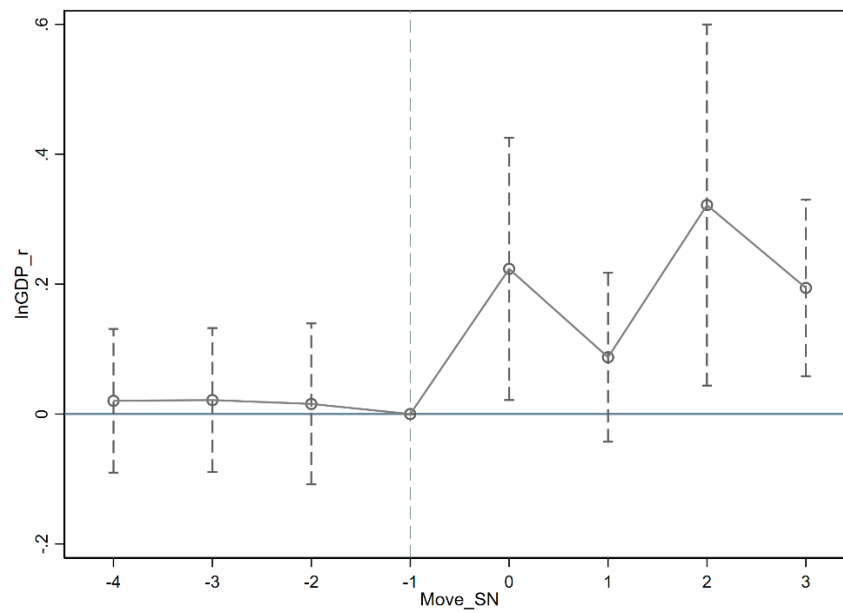
Notes: *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively. All the regressions control lagged per-capita GDP and city and year fixed effects. The results for lagged per-capita GDP and the constant are not shown to save space.

Table 4. Potential channels for northbound officials to promote growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Investment	R&D	Patents_total	Patents_invention	# New firms	#listed firms	Population	RE investment	Housing prices_new	Housing prices_secondary
<i>Move_SN</i>	0.0537*	-2.5858	0.0119	0.1046	11.4004	-0.0994	0.0212**	0.0170	0.0034	0.0051
	(0.0304)	(1.9880)	(0.0476)	(0.1966)	(11.0039)	(0.1384)	(0.0097)	(0.0538)	(0.0308)	(0.0238)
Constant	0.2629***	1.7409***	0.2753***	0.4236***	6.4819***	0.4281***	0.0223***	0.3454***	0.0077**	0.0058**
	(0.0056)	(0.2520)	(0.0073)	(0.0138)	(0.5295)	(0.0155)	(0.0043)	(0.0268)	(0.0030)	(0.0028)
City FEs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
# Obs.	4,667	1,639	7,222	6,242	7,121	5,963	6,009	5,743	570	570
Adj. R ²	0.123	0.029	0.082	0.099	0.002	0.3812	0.008	0.021	0.480	0.312

Notes: *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively. Except #listed firms, other dependent variables are all growth (fraction).

Figure 1. Test of pre-trends



Notes: The year before an official's move (Move_SN = -1) is chosen as the base year.

Confidence intervals of the 5% significance level are presented.

Table A1. Description of variables

Variable	Obs	Mean	Std. dev.	Min	Max
<i>GDP growth rate</i>	4,948	0.1051	0.1998	-0.9258	4.7306
<i>lnGDP growth rate</i>	4,948	0.0752	0.2608	-2.6004	1.7458
<i>Move_SN</i>	7,697	0.0070	0.0835	0	1
<i>Move_NS</i>	7,697	0.0027	0.0522	0	1
<i>Move_NN</i>	7,697	0.2009	0.4007	0	1
<i>Move_SS</i>	7,697	0.2219	0.4156	0	1
<i>Home_south</i>	7,697	0.5713	0.4949	0	1
<i>Lagged Per-capita GDP</i> (1,000 yuan)	4,203	30.7022	28.0542	0.099	467.7490
Officials' personal characteristics					
<i>EDU</i>	13,009	2.3865	1.0024	1	5
<i>GDPPR_3yraverage</i>	8,232	0.1369	0.0851	-0.1784	1.1168
<i>Age</i>	14,217	50.8946	4.3286	21	74
<i>Gender</i> (female = 1)	14,436	0.0414	0.1991	0	1
<i>Ethnicity</i> (minority = 1)	14,453	0.1544	0.3614	0	1
<i>Coastal_prov</i>	14,453	0.1674	0.3733	0	1
<i>GDPPR_last city</i> (1,000 yuan)	10,251	29.8685	28.1574	0.099	467.7490
<i>EXP_south</i> (years)	14,453	8.2761	9.9586	0	41
Potential channels					
<i>Investment growth</i>	4,657	0.2635	0.4132	-0.8903	14.7295
<i>R&D growth</i>	1,647	1.7043	10.2896	-0.9429	216.6142
<i>Patents_total</i>	7,619	1,314.3980	4,856.7342	1	93,819
<i>Patents_total growth</i>	7,223	0.2754	0.6509	-0.9720	14.2857
<i>Patents_invention</i>	7,619	161.0672	788.9038	0	18,828
<i>Patents_invention growth</i>	6,243	0.4242	1.1391	-1	16
<i>Newfirms</i>	7,515	74.0701	559.6314	1	37673
<i>Newfirms growth</i>	7,121	6.5651	44.6714	-0.9997	1748
<i>Newly listedfirms</i>	5,963	0.4273	1.5146	0	41
<i>Newly listedfirms growth</i>	1,165	-0.3435	1.1304	-1	11
<i>Population</i> (10 thousands)	6,363	398.5121	241.6104	12	1,435
<i>Population growth</i>	6,015	0.0225	0.3354	-0.5384	13.6798
<i>REinvestment growth</i>	5,743	0.3455	2.0501	-0.9774	124.8865
<i>Housing prices_new</i>	634	104.0256	7.1018	81.9	147.5
<i>Housing prices_new growth</i>	570	0.0077	0.0987	-0.3188	0.4944
<i>Housing prices_secondary</i>	634	102.8314	5.9989	81.3	148.9
<i>Housing prices_secondary growth</i>	570	0.0059	0.0788	-0.3338	0.5240