

# Fiscal Incentives and Political Budget Cycles in China

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## Abstract

Political budget cycles in democracies have been extensively analyzed, but few studies of non-democracies exist. This paper explores political budget cycles in China's provinces. The structural component of political decision making in China is actually similar to its democratic counterparts, even with an absence of general democratic elections, reflecting the motivation of politicians to stay in office or be promoted. A simple theoretical model suggests that, in order to increase the odds of being promoted, politicians have an incentive to treat current expenditures and capital expenditures differently. Using data from Chinese provinces from 1980 to 2006, the analysis finds that two years prior to the National Congress of the Communist Party (NCCP), politicians are likely to shift public spending toward capital expenditures, such as innovation funds and capital construction, and away from current expenditures, such as agricultural subsidies, social expenditures and government administration. The opposite pattern occurs during the year of the NCCP, when politicians increase current expenditures and decrease capital expenditures. The increased capital expenditures two years prior to the NCCP is accompanied by an increase in taxation and total aggregate spending. However, the effects of a provincial leader's tenure on political budget cycles are minimal, implying a weak causal relationship between spending composition and a politician's time in office at the provincial level.

## 1 Introduction

Traditional political budget cycles suggest that opportunistic incumbent politicians may have incentives to manipulate budget resources, such as increasing public spending or deferring tax increases, to induce economic expansion prior to elections, thus maximizing their chances of being re-elected

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(Drazen, 2001). However, the empirical results on aggregate political budget cycles are mixed.<sup>1</sup> Thus, instead of studying the effects of aggregate expenditure and revenues, some scholars examine the changes in public spending composition during election years. Following Rogoff (1990),<sup>2</sup> Kneebone and McKenzie (2001) examine the effect of political budget cycles on public spending composition for Canadian provinces, and Gonzales (2002) studies the changes in Mexico prior to federal elections. They all find evidence of pre-election fiscal manipulation aimed toward more visible projects and away from less salient ones.<sup>3</sup> Empirical findings utilizing international comparisons are also consistent with the predictions of Rogoff’s signaling model (1990). For example, Vergne (2009) looks at 42 developing countries from 1975 to 2001 and finds that during an election year, public spending on capital expenditure decreases while current expenditure increases. Katsimi and Sarantides (2012) also find evidence of a surge in current expenditure prior to elections in established democracies.

Most empirical studies devoted to finding evidence of political budget cycles, regardless of whether they consider the aggregate expenditure or disaggregated expenditure, have focused solely on democratic countries. Even though there may not be a direct connection between the wishes of the general population and the actions of the political elite in non-democratic countries, the structural component to political decision making could be similar to that in democratic countries, a consequence of a shared desire of politicians to remain in office and increase their political power, with a willingness to manipulate government policies to achieve these goals (Bunce, 1980). The purpose of this paper is to explore the structure of politicians’ fiscal incentives in the absence of democratic elections by carrying out a case study of China, one of the most important non-democratic countries in the world today.

There has been some prior scholarship studying politicians’ budget behavior over the political cycle in non-democratic countries. Bunce (1980) finds that budget cycles in the former Soviet Union coincide with leadership succession at the national level. Due to the volatile nature of power

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<sup>1</sup>One of the explanations is that political budget cycles are inconsistent with the concept of rational and forward-looking voters (Mccallum, 1978). In addition, voters may be fiscally conservative, disliking budget deficits, so they will punish politicians who promote election-year deficit spending at the polls instead of rewarding them (Brender and Drazen, 2008). Lastly, political budget cycles may be more prominent in developing countries because voters in more advanced democracies are better informed about fiscal outcomes and also more experienced with electoral politics, making them less likely to be “fooled” by pre-electoral fiscal manipulation (Brender and Drazen, 2005).

<sup>2</sup>Rogoff (1990) designs a signaling model and suggests that speculative politicians have incentives to shift public spending toward projects that are more prominent to voters and away from less salient ones prior to elections. Note that, in Rogoff’s model, current expenditures are considered as salient projects, whereas capital expenditures are considered as less salient ones.

<sup>3</sup>The determination of visible spending may vary from country to country due to differences in political and social institutions, political roles, and varying responsibilities of local authorities.

at the top of the Soviet system and the particular characteristics of the succession process, the priority of Soviet leaders in office is to satisfy the needs of the general public in order to preempt potential unrest, as well as to build strong popular support for their leadership. Hence, following succession, the new leader tends to increase public spending in areas more favorable to the general public: such increased expenditures are found in light industry, health, education, and welfare. Yet, in a later period, once political activity normalizes, the priority shifts to less popular policies, such as expenditures on heavy industry and the housing sector.<sup>4</sup> In China, Guo (2009) studies China's aggregate political budget cycles at the county level from 1997 to 2002, finding that local Chinese leaders strategically increase aggregate expenditures during the third and fourth years of their tenure, at the moment when the upper-level party committees are about to reshuffle general personnel positions.

This paper differs from Guo (2009) by analyzing expenditure data at the provincial level, rather than focusing on the county level, as well as by examining both aggregate and disaggregated expenditure. On the one hand, the actual division of expenditure responsibilities among various sub-provincial governments is vague (Shen et al., 2012). While the Chinese central government has made substantial efforts to hand over and entrust certain fiscal controls to sub-national governments since the 1980s, most of the fiscal reforms focused solely on the central-provincial fiscal relationship. Discretionary power over the allocation of spending at the sub-provincial government level is still questionable. On the other hand, political dependence of sub-provincial governments on upper-level authorities has intensified since the 1994 Tax Sharing Reform (Wedeman, 1999; Shen et al., 2012).<sup>5</sup> Therefore, the behavior and choices of local officials may not necessarily be associated with their personal concerns, but more likely, strongly correspond with the motives and preferences of upper-level authorities. Thus, the resulting effects of the preferences of local officials on fiscal policies will be difficult to identify. It is for these reasons that we focus here on the highest level of the Chinese sub-national government, the provinces, as the unit of analysis.

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<sup>4</sup>Roeder (1985) disagrees with Bunce (1980) and argues that the timing of the policy shift follows a "consolidation connection" instead of a "succession connection". He suggests that Soviet leaders seek to consolidate their positions, wishing to increase mass-oriented policies in the early post-succession period, and not in the succession period as suggested by Bunce (1980). Yet, in either case, political budget cycles do coincide with Soviet leaders' political life cycles.

<sup>5</sup>The 1994 Tax Sharing Reform strengthened the fiscal power of the central government to collect revenue from the local government, but the local governments were still responsible for balancing their own budgets. So, each level of authority imposes fiscal responsibilities on the next lower level of government, resulting in dire financial straits at the local-government level. To avoid serious budgetary shortfalls, local governments then heavily relied on the subsidies from upper-level governments, thus increasing both fiscal and political dependence. After the Tax Sharing Reform took place, the central and provincial governments held more leverage over sub-provincial governments (Shen et al., 2012). The details of this reform will be discussed in a later section.

In this paper, we first briefly review the political background in China to demonstrate that provincial leaders have sufficient discretionary power over the use of government money, and therefore have both the ability and the incentives to manipulate fiscal situations for their future political advancement. The main mechanism driving provincial leaders' motives in budget allocations is the performance-based promotion system. Even though leadership turnover in China is essentially political, the reforms of both the "personnel control system" and the "cadre responsibility system" in the 1980s implicitly encouraged local leaders to pay more attention to economic growth. Specifically, they were encouraged to focus on the more quantifiable and the more easily measurable projects, such as infrastructure development, in order to impress their superiors with measured economic performances (O'Brien and Li, 1999). While much literature has been devoted to studying the association between a politician's fiscal incentives and economic outcomes under this promotion system, few studies have explored politicians' behavior in allocating budget resources, especially changes made to the composition of public spending. The main contribution of this paper is to fill this gap by studying the pattern of political budget cycles at the provincial level, not only with regard to aggregate expenditure but also disaggregated expenditure, in order to provide a comprehensive picture of politicians' fiscal manipulation.

To illustrate the mechanism and build hypotheses, a simple theoretical model is presented to show that office-motivated provincial leaders maximize their chances of being promoted to higher positions by allocating budget resources to current expenditures and capital expenditures at different time points so as to boost economic performance at crucial moments (for example, during the years when there is a reshuffling of general personnel). The theoretical model suggests that politicians' incentives for being promoted induce them to shift public spending towards capital expenditure and away from current expenditure in the years prior to a promotion period, and, conversely, to shift toward current expenditure and away from capital expenditure during the promotion period. The increased capital expenditure prior to the promotion period is positively associated with total expenditure; thus, we find a pattern of taxation and total expenditure synchronized with changes in capital expenditure.

Unlike in democratic countries, political turnover at the provincial level in China is not formally institutionalized. Building upon such political uncertainty, this paper examines two possible

times when a provincial leader is most likely to be considered for promotion.<sup>6</sup> One is during the National Congress of the Communist Party (NCCP), which is held every five years and involves the negotiation of practically all significant political positions in the country. If provincial leaders expect to be rotated during the NCCP, they would strategically schedule a change in provincial government spending beforehand in order to advance their political careers. Additionally, according to Article 106 of the state constitution and Article 26 of the party constitution, the terms of office of provincial leaders, the same as county officials, are five years, irrespective of start date (Guo, 2009). Thus, except for studying the spending effects of the NCCP, this paper also addresses the effects of tenure on political budget cycles in both aggregate and disaggregated expenditure. If reevaluation during a provincial leader's fourth or fifth year in office plays a role in advancement, independently of the timing of the NCCP, then he should strategically manipulate fiscal choices at this time.

Using data from 30 provincial units in China from 1980 to 2006, this paper explores the existence of political budget cycles in both aggregate expenditure and different public spending categories. The five major types of public spending that we consider are: innovation funds<sup>7</sup>, capital construction, agricultural subsidies<sup>8</sup>, social expenditures<sup>9</sup>, and government administration<sup>10</sup>. One of the main findings of this paper is that, when the NCCP is to be held two years hence, politicians increase capital expenditures, such as capital construction and innovation funds, and decrease current expenditures, such as agricultural subsidies, social expenditures, and government administration. The opposite pattern occurs during the year of the NCCP: an increase in current expenditures and a decrease in capital expenditures is observed. The findings are robust when one examines the impact on budget cycles across pre- and post-1994 Tax Sharing Reform periods, and across provinces sharing the same economic status. However, the effect of a politician's tenure on political

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<sup>6</sup>Because politicians' terms of office coincide with the electoral cycles in democratic countries, the literature on political budget cycles in democratic countries only focuses on estimating the spending effects during the timing of the elections (Kneebone and McKenzie, 2001; Gonzales, 2002; Vergne, 2009; Katsimi and Sarantides, 2012). However, in China, politicians' terms of office may not coincide with the timing of the NCCP, so two models, one focusing on the effect of the NCCP and the other focusing on the effect of a politician's tenure, are implemented to capture possibly different promotion timings. The actual pattern of politicians' political turnover during the sample period will be shown in a later section.

<sup>7</sup>Innovation funds refer to funds, loans, or subsidies for enterprises to modernize or create new technology.

<sup>8</sup>Agricultural subsidies are funds that support the production of rural collective units and households, and funds which promote sustainable rural development; these include subsidies to water conservancy projects, irrigation projects, the rural aquatic products industry, and the development of grain production.

<sup>9</sup>Social expenditures consist of operating expenses for the department of Culture, Education, Science, and Public Health, such as expenditures for cultural preservation and publications, broadcasting, education, traditional Chinese medical science, public health, family planning, and so forth.

<sup>10</sup>Government administration refers to expenditures for corrections and security spending, which include judicial expenditure, law court disbursements, police expenditure, and so forth.

budget cycles is minimal, perhaps indicating little connection between a politician’s time in office and the potential for advancement.

## 2 Fiscal Decentralization in China

One common premise of studies of political budget cycles is that politicians have sufficient discretionary power over the use of government money to implement fiscal and economic policies within their jurisdictions. Thus, before examining China’s political budget cycles, it is necessary to provide an overview of the history of fiscal decentralization in China.

In China, the political system is organized into a five-level hierarchy: (1) central, (2) provincial, (3) prefectural, (4) county, and (5) township. As mentioned previously, most of the fiscal reforms initiated in the 1980s and 1990s targeted the central-provincial relationship, leaving the sub-provincial fiscal assignments primarily dependent upon the decisions of upper-level authorities. For this reason, this paper focuses on the provincial government level across China as its unit of analysis, as this is the highest level of sub-national government.

The central-provincial fiscal relationship has evolved over time. Prior to 1979, the fiscal system in China was highly centralized, an era now known as the “unified revenue and expenditure” period. Under the consolidated budget system, all fiscal appropriations were made by the central government. Even though provincial governments collected over 80 percent of tax proceeds, including taxes and profits from state-owned enterprises, they were required to remit all revenue to the central government. Furthermore, all expenditure allocations were planned and decided upon by the central government (Jin et al., 2005).

Since the 1980s, due to a significant reduction in fiscal revenue for the central government, a result of the rapid growth of non-state-owned enterprises, a series of fiscal reforms were initiated, which led to considerable independence of provincial governments from the central government (Lin and Liu, 2000; Shen et al., 2012). In 1980, the consolidated budget system was replaced by the “fiscal contracting system”. Under this arrangement, provincial governments were responsible for balancing their own budgets and had discretionary power over fiscal arrangements with sub-provincial governments. Each year, provincial governments were required to remit a certain share of revenue to the central government based on the central-provincial sharing rules, which were determined by the central government.<sup>11</sup> At the same time, however, the provinces were allowed

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<sup>11</sup>In the case of the poor and remote provinces, the central government transferred money to cover those provinces’ fiscal deficits.

to retain the remaining revenue, creating an incentive to increase overall revenue and foster local prosperity.<sup>12</sup> The sharing rules vary among provinces and many have changed over time.

The reforms of the 1980s incentivized provincial governments to raise local revenue while, at the same time, reducing transfers to the central government. This resulted in the waning fiscal control of the central government, along with financial shortfalls in central revenue. Thus, starting in 1994, the Tax Sharing Reform plan was introduced. It was at this time that the “fiscal contracting system” was replaced by a rule-based system of tax assignments which defined central, shared, and local tax allocations. The purpose of this reform was to recentralize revenue upward and devolve expenditures downward, starting at the central government level, and then extending these strategies to lower-level local governments. In order to curb fiscal decline, a central tax administration was established and the largest taxes, such as the value-added tax, as well as personal and corporate income taxes, were collected by the central government (Jin et al., 2005; Shen et al., 2012). Sub-national governments relied mainly on shared taxes.<sup>13</sup> Even though the revenue system was centralized during the reform, the assignments of expenditure responsibilities did not change: the central government is responsible for nationwide services, whereas sub-national governments are responsible for all local public goods and services. Therefore, provincial governments still have discretion over budget allocations.

The shares of sub-national budgetary revenue and expenditure are graphed in Figures 1 and 2 to show the time trend of fiscal decentralization in expenditure and revenue over time.<sup>14</sup> Due to the

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<sup>12</sup>Revenue generated by provincial governments is classified into two types: central-fixed revenue (where all revenue is remitted to the central government, including customs duties and profits from centrally-owned state enterprises), and central-local shared revenue (where revenue is shared between the central and provincial governments, including profits from large-scale enterprises under dual ownership by both the central and provincial governments, as well as industrial and commercial taxes). See Lin and Liu (2000).

<sup>13</sup>Aside from the shared taxes, intergovernmental transfers are the dominant resource of revenues for sub-national governments after the reform. At the provincial level, central-provincial intergovernmental transfers can be classified into two broad categories: general purpose transfers, and specific purpose transfers. The details of the classification of intergovernmental transfers can be found in Shah and Shen (2006). However, due to a lack of detailed data on central-provincial transfers, this paper does not control for the transfer of money from the central government to provincial governments earmarked for specific purposes, assuming that all expenditures from provincial governments are under provincial control. The bias resulting from this missing variable is expected to be minimal for two reasons. First, the general purpose transfers account for the largest proportion of central-provincial intergovernmental transfers, so provincial governments are still responsible for most expenditures supported by intergovernmental transfers. In 2004, 63.8 percent of total central-provincial transfers were general purpose transfers (Shah and Shen, 2006). Second, the intergovernmental transfer system lacks central coordination and transparency; for example, transfers are made by different agencies without formal centralized review, resulting in many unrecorded transfers. According to a 2003 audit report from the National Audit Bureau, only 22.5 percent of total central-provincial transfers were reported in the provincial accounts of 17 audited provinces (Shah and Shen, 2006).

<sup>14</sup>Due to a lack of a clear guideline of fiscal responsibilities at the sub-provincial government level, fiscal assignments of sub-provincial governments rely heavily on the higher tiers of the government under this hierarchical party system. The provincial governments bear enormous leverage over sub-provincial governments. Thus, the sub-national budgetary revenue and expenditure are used instead of provincial budgetary revenue and expenditure.

Tax Sharing Reform plan, the budgetary revenue of the sub-national governments, as a share of the total national government, plummeted dramatically from 78 percent in 1993 to 45 percent in 1994. The central governments share increased from 22 percent in 1993 to 55 percent in 1994 (Figure 1), in accordance with the original intent of this new system. Figure 2 shows the budgetary expenditure of the sub-national governments and central governments as a share of the total national government from 1980 to 2011. As seen in Figure 2, the share of sub-national budgetary expenditures has increased gradually, even during the reform period of 1994, thus implying that fiscal appropriation at the sub-national level was unaffected by the reform.

### 3 Political Systems and Fiscal Incentives

In addition to a close examination of the discretionary power over budget allocations, another reason for a study of political budget cycles is to investigate politicians' incentives for manipulating fiscal expenditures, primarily driven by their concerns over their political futures.<sup>15</sup> How the Chinese political system shapes provincial leaders' fiscal incentives in the absence of local elections is critical when determining the pattern of budget cycles. In order to supply the necessary background information for this study, the following discussion provides an overview of the central-provincial governmental relationship.

As a single-party state with a dual-party government administrative system, the Chinese Communist Party (CCP) has the ultimate power and dominates the institution of the State. At the provincial level, the top two political positions are the Provincial Committee Secretary, who represents the CCP, and the Provincial Governor, representing the government and the State. The Provincial Committee Secretary, considered the *de facto* person in charge of the province, shapes the direction of policy and exerts personnel control. The Provincial Governor is in charge of implementing party policy and the day-to-day management of government (Li and Zhou, 2005).<sup>16</sup> With few exceptions, provincial leaders cannot stay in the same position for more than two five-year terms. Unlike democratic countries, where political turnover is determined by the general public

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<sup>15</sup>Another condition conducive for political budget cycles is assumed to hold in general, which is the existence of imperfect information about politicians' abilities (Rogoff, 1990). Because the abilities of agents (politicians) are unobservable, fiscal manipulations serve as signals to principals (either voters or the central committee, as in our case) about agents' competence. Thus, rational principals would respond to agents' fiscal manipulations, which is effective in gaining political power and achieving political goals.

<sup>16</sup>The power to establish the annual budget is in the hands of the Provincial Governor, who is supervised by the Provincial Committee Secretary. Because both provincial leaders have discretionary power over the appropriation of public spending, this paper examines not only the tenure of the Provincial Committee Secretary but also that of the Provincial Governor.

through democratic elections, in China, the CCP controls the procedure of elite recruitment and personnel management. The Provincial Committee Secretary is appointed by the CCP Central Committee, the highest authority in the CCP. In accordance with the Constitution of the People's Republic of China, the Provincial Governor is elected by the Provincial People's Congress, the organ of state power at the provincial level. In practice, however, a list of candidates for the position of Provincial Governor is "recommended", or at least, must be approved by the CCP Central Committee. Thus, the Provincial People's Congress essentially rubber stamps party decisions by ratifying the decisions of the CCP Central Committee (Lawrence and Martin, 2013). Unlike their democratic counterparts, then, a provincial leader's incentive to hold onto power mainly depends upon satisfying the needs of the Central Committee, rather than pleasing the general public in their jurisdiction. The preferences of the Central Committee on personnel evaluations are decisive for a provincial leader's political future, which leads to specific behavioral choices by a provincial leader regarding his economic policies.

Even though Chinese politics have long been considered as essentially informal, especially regarding political turnover, the cadre management system actually institutionalized personnel evaluations and reshuffling decisions by the Central Committee. Such a personnel control system not only provides official evaluation criteria for different levels of cadres to follow but also has helped the CCP retain its ultimate power by controlling the cadres. The shifts of the cadre management system over time also reflect the changes in preferences by the Central Committee.

Prior to the 1980s reform era, the only criterion for cadre evaluation was political obedience and ideological obligation to the Communist Party. Since 1979, however, beyond political loyalty, the CCP Central Committee has begun to emphasize more-quantifiable performance standards, such as sustaining Gross Domestic Product (GDP) and generating foreign investments, as well as having the cadre demonstrate expertise in administrative management. In addition, personal characteristics, including the age and education of a politician matter—the younger and more educated, the better. All of these newer evaluation factors by the leadership regarding party cadres and state officials became important components in their decision-making. Changes in the evaluation system institutionalized a close association between a provincial leader's political advancement and their jurisdiction's economic performance, thus incentivizing them to develop their local economy (Li and Zhou, 2005).

Much literature has verified the close association of local economic performances and provincial

leaders' turnover in China.<sup>17</sup> Li and Zhou (2005) study the turnover data of provincial leaders from 1979 to 1995, finding that the likelihood of promotion is positively correlated with economic performance, whereas the likelihood of termination is negatively correlated. Chen et al. (2005) extend the dataset to 2002 and confirm Li and Zhou's finding (2005). However, in order to impress their superiors and improve their odds of being promoted, local cadres pay more attention to easily measurable and more quantifiable projects at the cost of others that are less quantifiable (O'Brien and Li, 1999; Guo, 2009). For example, Wu et al. (2013) study the correlation between politicians' promotion odds and fiscal spending on infrastructure and environmental investment. Using data from 283 city-level governments from 2000 to 2009, their results indicate that local politicians have more incentive to invest in infrastructure projects over environmental development, because spending on the former is positively correlated with their odds of promotion, whereas spending on the latter is negatively correlated.

However, political turnover at the provincial level in China is not formally institutionalized, sometimes involving many extra-institutional factors, such as personal connections and networks, as well as the political competition between factions (Bo, 2004). Thus, it is not an easy task to discover the exact time points when a provincial leader is most likely to be considered for a promotion and when the incentive for manipulating the budget with more visible and quantifiable projects would be at its highest, even though we can assume that a politician's promotion concerns will very likely impact their priorities regarding government spending.

Building upon such political uncertainty, this paper examines anticipated advancement cycles associated with the NCCP, when a reshuffling of general personnel is more likely to occur. Since the late 1970s, the NCCP has been held regularly every five years, and it has become the only occasion for reordering important CCP personnel. Fiscal and monetary cycles in China have been found to be responsive to the political rhythms of the plenary sessions of the NCCP in the post-Mao reform era, reflecting politicians' career concerns during years of the NCCP (Tao, 2006). If this is indeed the case, political budget cycles related to the NCCP should be clearly observed. If politicians wish to improve their odds for promotion, it is in the year of the NCCP that they likely have the strongest incentive to manipulate fiscal spending to enhance their prospects. In addition to the NCCP effect, this paper also studies the effect of provincial leaders' time in office on fiscal manipulation. According to Article 106 of the state constitution and Article 26 of the

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<sup>17</sup>However, by applying a novel Bayesian method, Shih et al. (2012) find no evidence that strong growth performances were correlated to higher party rank when examining the data of the 12th through the 16th Party Congresses from 1982 to 2007.

party constitution, the terms of office of provincial leaders are five years, irrespective of start date (Guo, 2009). Since not all political turnover occurs during the year of the NCCP, a politician's term of office may not coincide with the NCCP cycles. Thus, except for studying the spending effects of the NCCP, this paper also addresses the effects of tenure on political budget cycles in both aggregate and disaggregated expenditure. If a provincial leader expects to be reevaluated during the fourth or fifth years of their tenure, he should plan a surge carefully in such periods to elicit high economic performance at decisive moments.

Before considering the regression analysis, the actual pattern of politicians' political turnover, shown in Tables 1 and 2, may shed some light on the expectations of provincial leaders regarding turnover. Table 1 shows the frequency distribution of political turnover relative to NCCP years. Some interesting findings can be observed. First, from Table 1, more than half of the political turnover occurs during either the year of the NCCP or in the following year. A change of the Provincial Committee Secretary is most likely to occur during the year of the NCCP (30 percent), whereas the turnover of a Provincial Governor is most likely to occur in the year following the NCCP (30 percent). This difference may be attributed to the different appointment procedures between the Provincial Committee Secretary and the Provincial Governor. Note that during the sample period, the NCCP was held in the fall every five years.<sup>18</sup>

Table 2 shows the frequency distribution of politicians' turnover during their tenures.<sup>19</sup> Table 2 suggests that few provincial leaders stay in the same position for more than six years, and more than half leave their offices before their fifth year (69.5 percent of the provincial committee secretaries and 83.6 percent of the provincial governors), indicating rather frequent political turnover among provincial leaders.<sup>20</sup> Even though, officially, a provincial leader has a five-year term, as seen in Table 2, there is no clear pattern of replacement during either their fifth or tenth years in office. A politician's five-year term does not guarantee their continued appointment; instead, the CCP

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<sup>18</sup>As mentioned previously, although in practice the decisions of political change for both the Provincial Committee Secretary and the Provincial Governor are made by the CCP Central Committee, the Provincial Committee Secretary is appointed by the CCP Central Committee directly, whereas the Provincial Governor "candidate" still must go through the electoral process by the Provincial People's Congress, which is held in the spring each year. For this reason, in the sample period, the decisions on political turnover of provincial governors were made during the NCCP, but were not announced until the following year, during the Provincial People's Congress. This is the reason why the peak of political turnovers for provincial governors appears the year after the NCCP.

<sup>19</sup>The number of provincial governors and provincial committee secretaries are not the same in Table 1 and Table 2, because Table 1 only takes into account the provincial leaders who started their office during the sample period, from 1980 to 2006, whereas Table 2 considers the provincial leaders who left their offices during the sample period.

<sup>20</sup>Frequent turnover of provincial leaders largely stems from a fear of the rise of localism. During the late 1980s, the CCP imposed several institutional mechanisms, such as term limits and age limits for retirement, in order to avoid the formation of province-based factionalism. In 1999, "The Regulation of Cadre Exchange" was issued and one of the important rules emphasized and institutionalized the frequent reshuffling of provincial leaders (Li, 2004).

Central Committee can remove them from office at any time. But term limits tend to be strictly enforced, so that less than two percent of provincial leaders held their offices more than ten years. The empirical pattern here shows little connection between a politician's tenure and the likelihood of their political turnover. What this empirical evidence does point to is that provincial leaders often face high levels of uncertainty regarding their tenures, and thus their times in office may not play important roles in fiscal manipulation.

## 4 Theoretical Model

How do provincial leaders allocate fiscal spending to maximize their chances of being promoted? To formally derive our hypothesis, consider the following simple theoretical model of resource allocation.

### 4.1 Model Setting

Let us assume that provincial leaders are only office-motivated, caring only about remaining in office and being promoted by the central authority. The central authority evaluates a provincial leader by his personal competence and administrative competence, but the promotion decision not only is determined by these two factors but also is affected by some noisy information. The noisy information about a provincial leader's competence, denoted by  $\epsilon$ , where  $\epsilon \in R$ , refers to the factors that are not related to a provincial leader's characteristics and behavior, but may affect the promotion decision of the central authority (for example, the fluctuations at the macro-level environment and political environment). Thus, such noisy information cannot be altered by the provincial leader and is only realized by the central authority when they make the promotion decision.

A provincial leader's personal competence is determined by his personal characteristics and social networks, such as his age, education level, personal connection to the members in the central committee, and so on. For simplicity, suppose that the density function  $\gamma$  of a provincial leader's personal competence is uniform on the interval  $[0, a]$ . The lower the  $\gamma$  is, the more socially and personally competent a provincial leader is, so that probability of being promoted increases at a decreasing rate with the level of  $\gamma$ . In addition to a provincial leader's personal competence, the promotion decision is also determined by administrative competence. Since there exists a traditional principal-agent problem, the central authority may not be able to observe the ability

of a provincial leader. The central authority can only make a reference to a provincial leader's administrative competence by observing the quantifiable economic performance over his career, which is the output generated in his jurisdiction. Let  $Y_t$  denote the total gross domestic product generated in a provincial leader's jurisdiction in year  $t$ , and  $Z_t$  denote GDP net of taxes in a provincial leader's jurisdiction in year  $t$ . Thus, the sum of the  $Z$  values over a provincial leader's stay in office are positively associated with his likelihood of being promoted. Note that there also exists  $\bar{Z}$ , which refers to a minimum threshold of GDP net of taxes in a provincial leader's jurisdiction that he has to achieve in order to be considered for promotion. Let  $\bar{Z}$  be exogenous determined.

Suppose there are two periods. In each period, a provincial leader decides how to allocate budget resources between two types of productive use: one is current expenditure, denoted  $C$ , and the other is capital investment, denoted  $K$ . The difference between current expenditure and capital expenditure is crucial in our setting. Current expenditure includes social programs, such as education, health, security, and social welfare, incorporating the items that are consumed by the public and which provide immediate benefit. The monetary value spent on current expenditure in period  $t$ ,  $C_t$ , contributes to the current gross domestic product,  $Y_t$ .

However, capital expenditures, such as capital construction and infrastructure projects, have long-lasting impacts on the economy. Such long-lasting effects come from a current expenditure effect and a delayed effect. With spending on capital projects, there is a time lag between investment in a project and the implementation of that project. The funds devoted to capital expenditure,  $K_t$ , contribute to current output,  $Y_t$ . The delayed effect comes from the economic benefits generated from the implementation of a project, contributing to the output in the subsequent period,  $Y_{t+1}$ .

Let  $f$  and  $h$  be functions showing the GDP generated from capital expenditure and current expenditure, respectively, which are both subject to diminishing returns, with  $f' > 0$ ,  $h' > 0$ ,  $f'' < 0$ , and  $h'' < 0$ . Based on the above assumptions, GDP generated in period  $t$  includes the monetary value of capital and current expenditures in period  $t$ , and the capital expenditure from the previous period,  $t-1$  (due to the delayed effects), with the total value equal to  $f(K_t + \delta K_{t-1}) + h(C_t)$ . The first term,  $f(K_t + \delta K_{t-1})$ , captures capital expenditure's contribution to output, whereas the second term,  $h(C_t)$ , captures current expenditure's contribution to output.  $\delta$  represents the magnitude of the delayed effect.

Total resources required in period  $t$  are  $K_t + C_t$ , which are provided by taxation. The cost of tax collection is represented by  $g$ , where  $g = g(K_t + C_t)$ , incorporating the deadweight loss from

taxes as well as potential social unrest due to tax increases. Cost is assumed to increase at an increasing rate, with  $g' > 0$ ,  $g'' > 0$ . GDP net of taxes in a provincial leader's jurisdiction in year  $t$  is thus given by  $Z_t = f(K_t + \delta K_{t-1}) + h(C_t) - g(K_t + C_t)$ .

The timing of the events is as follows. First, a provincial leader's personal competence is pre-determined by nature. A provincial leader decides the level of capital expenditures and current expenditures in each period. Then at the end of period 2, the noisy information is realized by the central authority. The central authority then makes their promotion decision based on its evaluation of the provincial leader's competence and the noisy information they receive.

## 4.2 Budget Resources Allocation

The goal of an office-motivated provincial leader is to maximize the probability of being promoted to a higher office, which is the function of his personal and administrative competence. The objective function of a provincial leader is thus given by:

$$\begin{aligned}
& \max \text{prob}\left\{\sum_{t=1}^2 Z_t + \epsilon > \gamma \bar{Z}\right\} \\
& = \text{prob}\left\{\epsilon < \sum_{t=1}^2 Z_t - \gamma \bar{Z}\right\} \\
& = \Phi\left(\sum_{t=1}^2 Z_t - \gamma \bar{Z}\right) \tag{1}
\end{aligned}$$

$\sum_{t=1}^2 Z_t$  refers to a provincial leader's administrative competence, which is cumulative GDP net of taxes through period 2, when the promotion decision occurs, whereas  $\gamma$  refers to a provincial leader's personal competence. The lower the  $\gamma$  is, the higher the personal competence of a provincial leader is, so that a provincial leader faces a lower threshold of GDP net of taxes and the chances of being promoted is higher. Since  $\gamma$  is pre-determined and  $\bar{Z}$  is exogenous, the objective function of a provincial leader can be thus simplified by:

$$\max_{K_1, K_2, C_1, C_2} \sum_{t=1}^2 Z_t = f(K_1 + \delta K_0) + h(C_1) - g(K_1 + C_1) + f(K_2 + \delta K_1) + h(C_2) - g(K_2 + C_2)$$

Note that provincial leaders do not have the authority to choose the budget before period 1, but that capital expenditures in period 0 will contribute to GDP in period 1. Also, when the provincial leader decides on a resource allocation in period 2, he does not care about GDP in the following period, what would be period 3. Instead, he only wishes to maximize the total GDP

generated in period 1 and period 2. A provincial leader's optimal budget allocation is characterized by Proposition 1; which is proved in the appendix:

**Proposition 1.** *In a steady state, where  $K_0 = K_2$ , an office-motivated provincial leader spends more on capital expenditure in period 1 than in period 2 ( $K_1 > K_2$ ), and spends less on current expenditure in period 1 than in period 2 ( $C_1 < C_2$ ). Total spending is greater in period 1 than in period 2 ( $K_1 + C_1 > K_2 + C_2$ ).*

This simple model thus shows that a provincial leader has incentive to strategically manipulate fiscal allocations for the purpose of promotion. He spends more on capital expenditure in period 1 than in period 2, and more on current expenditure in period 2 than in period 1. The changes in capital expenditure synchronize with the changes in total spending, implying that, in order to maximize the prospects for promotion, politicians accelerate taxation in period 1 to finance an increased need for capital expenditure.

Intuitively, the effect of capital expenditure is long-lasting, contributing to GDP in consecutive periods, so in order to maximize output, a preferred allocation would be to spend more on capital expenditure a few periods prior to the promotion period. Additionally, the budget resources are financed by taxes from the general public, so they are not unlimited, but rather, are constrained by the increased cost of tax collection. Provincial leaders also have to consider the deadweight loss from taxation and the fact that taxation comes with an elevated potential for an outbreak of social unrest. Such social instability not only diminishes economic productivity but also decreases a provincial leader's likelihood of being promoted.

Based on the model, the main empirical hypotheses are that a provincial leader has an incentive to shift public spending towards capital expenditure and away from current expenditure prior to the promotion period, whereas the opposite pattern would occur at the time of promotion. The other hypothesis is higher total spending prior to the promotion period. The two possible promotion periods are during the NCCP and during a politician's fourth or fifth year in office. However, how many periods prior to these potential promotion periods will such spending effects be observed? This is the empirical question, and it will be answered in the following quantitative analysis.

## 5 Data Description

To test the above hypotheses, the empirical work uses data from 30 provincial units in the years from 1980 through 2006,<sup>21</sup> including 22 provinces, four municipalities (Beijing, Shanghai, Tianjing, and Chongqing), and four autonomous regions (Guangxi, Inner Mongolia, Ningxia, and Xinjiang).<sup>22</sup> All the data are collected from the *Provincial Statistical Yearbook* for different years and different provinces (National Bureau of Statistics, 1980-2006), various issues of the *Finance Yearbook of China* (Ministry of Finance, 1980-2006), and *China Finance Statistics* (Ministry of Finance, 1950-1988).

The dependent variables are aggregate expenditures, including budgetary expenditure and tax revenue, and disaggregated expenditures. Disaggregated expenditures include five categories: capital construction, innovation funds, agricultural subsidies, government administration, and social expenditures. Each category of expenditure includes only items covered by the general budget, not taking into account any funds outside of the general budget. All the fiscal data are in the current Chinese yuan, with figures put in real terms using the General Retail Price Index (with the index for 2006 set equal to 100), from the *Provincial Statistical Yearbook*. Among spending categories, capital construction and innovation funds are considered as capital expenditures, as they provide long-lasting effects on the economy. The other three categories—agricultural subsidies, government administration, and social expenditures—are considered as current expenditures, as they provide immediate benefits to the general public. Within the sample period, we find that capital construction accounts for approximately 12 percent of total expenditure, innovation funds have a 5.3 percent share, the agricultural subsidies has an 8.2 percent share, social expenditures have a 25 percent share, and government administration has about an 11 percent share.

The control variables are demographic indicators and structural variables. The demographic indicator includes total population. Because public goods provided by the government are non-

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<sup>21</sup>Hainan and Chongqing were separated from Guangdong and Sichuan in 1988 and 1997, respectively. Due to a lack of data for the years before they were separated, the data for Hainan and Guangdong is from 1988 to 2006, and the data for Chongqing and Sichuan is from 1997 to 2006.

<sup>22</sup>The highest-level Chinese administrative divisions are classified as provinces, municipalities, autonomous regions, and special administrative regions. Tibet, one of the autonomous regions, is omitted for two reasons. The first reason is due to its uniqueness, from the perspective of political instability and ethnic composition. The second reason is because of potential measurement problems. Because the subsidies to state enterprises are treated as negative revenue instead of an expenditure in official Chinese statistics, in certain years provincial budgetary revenue in Tibet shows negative numbers, which may result in potential measurement errors (TOCHKOV, 2007). In addition to Tibet, two special administrative regions, Hong Kong and Macau, are also omitted because these two regions were once colonized by the United Kingdom and Portugal, respectively. Today they are largely self-governing, even though they are now officially part of China.

excludable, total population here refers to local residents both with and without local household registration.<sup>23</sup> Structural variables include GDP per capita, urban disposable income, rural net income, national expenditure, total expenditure, and total revenue. The wealthiest provinces have more budgetary resources than poorer provinces, so GDP per capita is used to control for the variations in economic status across provinces. Also, it is entirely possible that there are different preferences for government spending allocations between urban and rural areas. For example, urban areas may have more demand for capital construction and social expenditures, whereas rural areas may demand agricultural subsidies. Since demands respond to incomes, both urban disposable income and rural net income are therefore controlled. In addition, for a case such as China, where the growth pattern of the economy is dictated by the macroeconomic policies of the central government (Tao, 2006), the macro-level effect may play an important role in shaping the pattern of fiscal spending. Thus, national expenditure, which is the same across provinces but varying over years, is used to control for the macro-level effects, reflecting the preferences of the central government. Moreover, total revenue and total expenditure are controlled, with expected positive signs.<sup>24</sup> Table 3 shows descriptive statistics for these fiscal and control variables.

Additionally, the regressions include a few political variables. First, two political factors, politicians' ages<sup>25</sup> and education levels (for provincial committee secretaries and provincial governors, respectively)<sup>26</sup>, come from the China Vitae website and Biographical Data of Central Committee Members: First to Sixteenth Party Congress (Shih et al., 2008). These two measures serve as exogenous variables to instrument for the tenure variables, as discussed in a later section. Second, tenure variables (for provincial committee secretaries and provincial governors, respectively)<sup>27</sup> and

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<sup>23</sup>The regression results are robust if the registered population is used instead of total population.

<sup>24</sup>For the regression using total expenditure, lagged revenue is controlled, whereas for the regression using tax revenue, lagged expenditure is controlled. In addition, for the regressions using disaggregated expenditure, both total expenditure and total revenues are controlled. All are expected to have positive coefficients.

<sup>25</sup>The age variable takes the value of "1" if the politician is over 65 years old, but otherwise has the value of "0".

<sup>26</sup>The education variable takes the value of "3" if the politician has a post-graduate degree, takes the value of "2" if he has a college degree, takes the value of "1" if he has a high school degree or its equivalent, and takes the value of "0" if he has anything less than a high school degree.

<sup>27</sup>The tenure variable of provincial committee secretaries captures how long the Provincial Committee Secretary has been in office, whereas the tenure variable of provincial governors captures how long the Provincial Governor has been in office. For example, if a Provincial Committee Secretary started his position in 1980, then this variable takes the value of "1" for that province in 1980, the value of "2" in 1981, and so on, until he leaves his position, at which point the variable once again reverts to the value of "1". The data comes from the Chinese Politics Website [www.zt360.cn](http://www.zt360.cn) (Zheng Tan Wang).

the NCCP dummy<sup>28</sup> are also constructed.

## 6 Methodology

The estimated model, focusing on the effect of the NCCP, is as follows:

$$\begin{aligned} spending_{it} = & \alpha_i + \beta_1 spending_{it-1} + \beta_2 NCCP_{it} + \beta_3 NCCP_{it+1} + \\ & \beta_4 NCCP_{it+2} + \beta_5 X_{it} + \beta_6 trend_t + \epsilon_{it} \end{aligned} \quad (2)$$

The dependent variable is fiscal spending, either total aggregate expenditure or disaggregated expenditure in a particular category, in province  $i$  in year  $t$ , measured in ten millions of 2006 Chinese yuan. Due to the persistent nature of fiscal spending, a lagged dependent variable is included as a control variable. The primary independent variables,  $NCCP_{it}$ ,  $NCCP_{it+1}$ , and  $NCCP_{it+2}$ , are dummy variables used to capture spending effects during the year of the NCCP ( $NCCP_{it}$ ), when the NCCP is one year in the future ( $NCCP_{it+1}$ ), and when the NCCP is two years into the future ( $NCCP_{it+2}$ ).  $X_{it}$  is a vector of control variables, including total population, GDP per capita, urban disposable income, rural net income, national expenditure, total (provincial) expenditure, and total (provincial) revenue.<sup>29</sup> Moreover, the regressions take into account a time trend and province fixed effects ( $\alpha_i$ ).<sup>30</sup> The term  $\epsilon$  is a disturbance term, which is likely to be correlated across years for the same province.

Allowing for an unbalanced panel and using  $p$ -values from unit root tests for each cross-sectional unit, the Fisher-type test is required to check for the existence of a unit root. If the time-series process has strong persistence, the fixed-effect estimator may suffer from substantial bias; in such case, first differences should be utilized instead of the fixed effect. To apply the Fisher-type test, the lag lengths were selected using Akaike information criteria. The test results suggest that all of the series of public spending variables fail to reject the null hypothesis that panels contain unit roots, showing that the bias of the fixed-effect may be sizable. Yet, the time series process becomes

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<sup>28</sup>The NCCP years are 1982, 1987, 1992, 1997, and 2002 and 1985. 1985 is included because a special meeting of the National Conference of Delegates of the CCP was held September 18-23 of that year, producing sizable political turnover in the CCP (Goodman, 1986). The pattern of political budget cycles is more apparent when considering 1985; however, excluding 1985 does not alter our results significantly.

<sup>29</sup>The control variables in the regressions of aggregate expenditure and disaggregated expenditure are slightly different, as previously mentioned.

<sup>30</sup>When estimating the effects of the NCCP, year fixed effects are not controlled in the regressions. Because the NCCP were held at the same year across provinces, once both NCCP dummies and year dummies are included, it is impossible to identify the NCCP effects from other time effects, making the estimated results very difficult to interpret. Thus, a time trend, rather than year dummies, is used in the first estimated model.

stationary when taking first differences and including a time trend.<sup>31</sup> For this reason, the baseline model in first differences for all variables, with the exception of NCCP variables and a time trend is used. Thus, the baseline model is as follows:

$$\begin{aligned} \Delta spending_{it} = & \gamma_i + \rho_1 \Delta spending_{it-1} + \rho_2 NCCP_{it} + \rho_3 NCCP_{it+1} + \\ & \rho_4 NCCP_{it+2} + \rho_5 \Delta X_{it} + \rho_6 trend_t + \Delta \epsilon_{it} \end{aligned} \quad (3)$$

Note that, although province fixed effects should be differenced out given equation (3), they are retained in case provincial effects actually remain in a regression involving changes.

The second estimated model focuses on the effect of politicians' tenures. In order to capture the curvilinear relationship between politicians' times in office and fiscal expenditures, the NCCP variables in the baseline model are replaced by the tenure variable and its square. Also, year dummies, rather than a time trend, are controlled. The second estimated models is as follows:

$$\begin{aligned} \Delta spending_{it} = & \lambda_i + \theta_1 \Delta spending_{it-1} + \theta_2 Tenure_{it} + \\ & \theta_3 Tenure_{it}^2 + \theta_4 X_{it} + \xi_t + \Delta \kappa_{it} \end{aligned} \quad (4)$$

Note that year fixed effects, denoted  $\xi_t$ , are used to capture province-invariant macro-level effects.<sup>32</sup> Two separate models, identical except for the tenure variables, are specified for provincial committee secretaries and provincial governors, respectively.

However, in the above baseline models, assuming there is no serial correlation of errors, there are two potential problems that may bias the results. The first is potential correlation between  $\Delta spending_{it-1}$  and  $\Delta \epsilon_{it}$ , as the  $spending_{it-1}$  term in  $\Delta spending_{it-1} = spending_{it-1} - spending_{it-2}$  is correlated with the  $\epsilon_{it-1}$  term in  $\Delta \epsilon_{it} = \epsilon_{it} - \epsilon_{it-1}$ . The second potential bias is a simultaneity problem in the second estimated equations, where the tenure variables may be endogenous. On the one hand, a politician may have incentives to manipulate fiscal expenditures during his tenure. On the other hand, the central authority evaluates a provincial leader based on the GDP generated in his jurisdiction, so that his fiscal policies would also have an impact on his evaluation by the central authorities, indirectly affecting his tenure.

<sup>31</sup>Given the rapid growth of the Chinese economy in last few decades, a linear time trend is included in the panel unit root test regressions in differences. Note that the Fisher-type test shows that the time series process of capital construction, innovation funds, and agricultural subsidies in differences without time trend are stationary; however, the rest of the fiscal variables (tax revenues, aggregate expenditure, social expenditures, and government administration) without time trend still preserve the unit root (fail to reject the panel unit root test). Thus, for these variables, either a time trend or year dummies should be added as control variables in our baseline regressions. For simplicity, all the regressions estimating the effects of the NCCP control for a time trend, whereas those estimating the effects of a politician's tenure control for year fixed effects.

<sup>32</sup>Unlike in the regressions using NCCP years, there is no obstacle in the tenure regressions to use of year fixed effects rather a more restrictive time trend.

To address the first issue, the System Generalized Method of Moments (System GMM) estimator, proposed by Arellano and Bond (1991) and augmented by Arellano and Bover (1995) and Blundell and Bond (1998) for dynamic panel-data models, is utilized as a robustness check. The System GMM augments the Difference GMM by generating both transformed (difference) equations and untransformed (level) equations.<sup>33</sup> These two equations are distinctly instrumented: the lagged differenced variables instrument the current level variables, whereas the lagged level variables instrument the current differenced variables. The assumption behind this application is that the differenced instrumental variables are assumed to be uncorrelated with the fixed effects (Roodman, 2009a; Roodman, 2009b). Furthermore, the System GMM can also solve the simultaneity problem of the second estimated equations, with two exogenous variables, politicians' education levels and ages, in addition to the lagged differenced variables, added as additional instruments for the tenure variables. Since the 1980s, the CCP installed a mandatory retirement system, whereby provincial leaders are required to retire at the age of 65 if they have not been promoted to a higher position within the central government (Li and Zhou, 2005). Thus, provincial leaders approaching 65 years of age are more likely to be removed from office. Politicians' education levels have been another other important criteria for the CCP to assess government officials since the 1980s. Therefore, these two variables affect tenure without affecting the change in spending, fulfilling the requirement of instrumental variables.

In order to minimize the data loss in the unbalanced panel and improve the validity of the instruments, orthogonal deviations, subtracting the average of all future available observations of a variable, are applied, instead of first-difference deviations, subtracting the lagged observation from the current one (Arellano and Bover, 1995; Roodman, 2009a). In addition, when employing the GMM estimator, if the sample size is not sufficiently large, a considerable number of instruments may lead to overfitting of the instrumented variables, thus causing a bias toward the ordinary least squares or generalized least squares estimator. To limit the instrument counts, the method of collapsing instruments is used (Roodman, 2009a; Roodman, 2009b). This same approach can be found in Tsai (2013). In this paper, the results from both first-difference and the System GMM estimations are reported.

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<sup>33</sup>Note that the System GMM, instead of the Difference GMM is applied in our case. When the dependent variable is close to a random walk, previous changes are more predictive of current levels than previous levels are of current changes; the Difference GMM estimation performs more poorly than the System GMM (Roodman, 2009a). As in our case, all the fiscal variables fail to reject the panel unit roots test, so that the System GMM is utilized.

## 7 Empirical Results

### 7.1 The Effect of the NCCP

Table 4 reports the results of the baseline regressions of aggregate expenditure and tax revenue using first differences, whereas Table 5 shows the results of the baseline regressions of disaggregated expenditure using first differences. The coefficients of interest are those for the  $NCCP_t$ ,  $NCCP_{t+1}$ , and  $NCCP_{t+2}$  dummies, which capture changes in public spending during the year of the NCCP, one year prior to the NCCP, and two years prior to the NCCP, respectively. The results of Table 4 show that politicians have incentives to increase total expenditure two years prior to the NCCP and decrease it during the year of the NCCP. The changes in total expenditure coincide with the changes in tax revenue (even though the coefficient of tax revenue during the year of the NCCP is insignificant, it shows the same sign as the total expenditure). Table 4 suggests that, on average, politicians increase taxes by 1.19 billion 2006 yuan, and increase total expenditure by 1.3 billion 2006 yuan, when the NCCP will be held two years hence.

These findings lead to the question of which categories experience the largest proportion of the changes in public spending. To answer this, regressions using disaggregated expenditure are also analyzed. Table 5 shows that when the NCCP is to be held in two years, politicians increase capital expenditure, specifically capital construction and innovation funds. For current expenditure, the opposite pattern occurs: politicians decrease spending on agricultural subsidies when the NCCP will be held in two years (the coefficient of social expenditures also shows a negative sign but is insignificant). During both the year of the NCCP and one year prior to the NCCP, politicians have incentives to increase social expenditures and government administration. Even though agricultural subsidies show consistent negative effects for the three consecutive years, such effects appear to diminish when approaching the NCCP, indicating that a politician's incentive to manipulate agricultural subsidies may be the least during the NCCP year. The empirical results here match the predictions of our theoretical model, demonstrating that political budget cycles in China coincide with the timing of the NCCP.

### 7.2 The Effect of Politicians' Tenure

Table 6 and Table 7 report the tenure effect (both for provincial governors and provincial committee secretaries) on political budget cycles. Table 6 shows the results of the tenure effect on aggregate expenditure and tax revenue using first differences, whereas Table 7 illustrates the results of the

tenure effect on disaggregated expenditure using first differences. The coefficients of interest are those for the tenure variable and its square. Both regressions (1) and (2) include the same control variables as in the baseline model, as well as provincial fixed effects and year fixed effects. The coefficients from regressions (1) and (2) capture a politician’s fiscal manipulation near the end of his term, regardless of the NCCP cycle.

Table 6 suggests that a politician’s tenure has no impact on his decision-making over the level of aggregate expenditure, yet there is a curvilinear relationship between their tenure and tax revenue. Columns 4 and 5 in Table 6 show that both provincial governors and provincial committee secretaries have incentives to increase taxes over time during their tenures, reaching peaks in their fifth and sixth years in office, indicating that they prefer to reduce spending in second terms. Table 7 suggests that the effects of tenure on capital expenditure—both capital construction and innovation funds—are insignificant (Columns 2 through 5 in Table 7). For current expenditure, the tenure effects for provincial governors are insignificant. The only significant effects for the provincial committee secretaries are in government administration (Column 10 in Table 7), demonstrating that provincial committee secretaries are likely to decrease government administration over the course of their tenures, reaching the lowest spending levels in their sixth and seventh years in office. The empirical analysis here seems to contradict our initial conjecture by showing no spending effects in a politicians fourth and fifth years in office. Except for tax revenue and government administration in the case of provincial committee secretaries, the consequence of a politician’s tenure on political budget cycles is negligible.

## 8 Robustness Checks

### 8.1 GMM Approach

The baseline model using the first difference approach may suffer from potential bias due to the correlation between the difference of the lagged dependent variables and the difference of the error term. The problem is even worse in the second estimated model due to the potential simultaneity problem between fiscal policies and politicians’ tenures. To show the robustness of the results, the GMM approach is applied, and the results are presented in Tables 8 through 10. Note that all the regressions in Table 8 include a time trend, provincial fixed effects and the same control variables used in the baseline model, whereas all the regressions in Table 9 include year fixed effects and

provincial fixed effects.<sup>34</sup>

Table 8 reports the NCCP effects on both aggregate and disaggregated expenditure using the GMM approach. In Table 8, the difference of the second lag of the dependent variable ( $\Delta spending_{it-2}$ ) is used to instrument for the lagged dependent variables ( $spending_{it-1}$ ).<sup>35</sup> The GMM estimation shows mostly the same coefficient signs and significance levels as the first difference estimation. The NCCP effects on total expenditure and tax revenue two years prior to the NCCP are positive and significant, showing the same results as the baseline regressions, even though in the year of the NCCP, the NCCP effects on total expenditure become insignificant and such effects on tax revenue become significant. For the current expenditures, the NCCP effects on social expenditures and government administration two years prior to the NCCP become positive and significant, but the NCCP effects during the year of the NCCP are still consistent with the baseline regression. So, the results of previous regressions do not change significantly when employing GMM estimation, verifying the robustness of the results in Table 4 and 5.

Tables 9 and 10 report the effects of politicians' tenures on aggregate expenditures and disaggregated expenditures, respectively. In Tables 9 and 10, in addition to the difference of the second lag of the dependent variable ( $\Delta spending_{it-2}$ ) employed in Table 8, two exogenous variables, politicians' ages and education levels, are added as instruments. However, the GMM estimation in Tables 9 and 10 show no significant tenure effect in any regression, implying that the bias from the simultaneity problem may be so severe that most regression results are spurious without considering endogeneity of the tenure variables. While controlling for such effects, the effect of a politicians tenure on political budget cycles becomes inconsequential.

A few test results are also reported in Tables 8 through 10. First, the model is evaluated by performing the Wald statistic test of the null hypothesis that all coefficients together are equal to zero. The test results, found in Tables 8 through 10, show the joint significance of all coefficients. Moreover, the validity of the instruments can be appraised using the Hansen test of overidentifying restrictions. The Hansen test, instead of the Sargan test, is applied because the Sargan test requires homoscedastic errors for consistency, and it does not allow rejection of the null hypothesis of exogeneity of the instruments. Lastly, the first-order serial correlation in levels is detected by performing the second-order serial correlation test of the null hypothesis that there is no serial

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<sup>34</sup>To avoid the bias resulting from an excessive number of instruments, control variables used in the baseline model are excluded in Table 9.

<sup>35</sup>Using longer lags of the dependent variables as instruments do not change the results, leading to the same signs as shown in Table 8, but in order to avoid overfitting of the instrumented variables, only one lag of the dependent variable is employed.

correlation.<sup>36</sup> Except for the regressions of agricultural subsidies (seen in Columns 8 and 9 in Table 10),<sup>37</sup> all regressions in Tables 8 through 10 fail to reject the null hypothesis that there is no serial correlation. Since the effects of politicians’ tenures show almost no effects on fiscal expenditures, the remaining robustness checks focus only on the NCCP effect.

## 8.2 Reform Period

Even if Figure 2 shows no significant changes in the share of local expenditures before and after the 1994 Tax Sharing Reforms, the decrease in the tax revenue may increase provincial leaders’ reliance on monetary transfers from the central government, thus affecting their incentive structures regarding fiscal expenditures. To validate that the results are robust and consistent, the interaction terms between a reform dummy<sup>38</sup> and different NCCP dummies are added to the baseline model, allowing the effects of fiscal expenditure to vary across pre- and post-reform periods. The results are reported in Table 11. The regression specification includes a time trend, provincial dummies, and the same control variables used in the baseline model. The coefficients of interest are those for the interaction terms between a reform dummy and different NCCP dummies. The effects during the pre-reform period are given by the coefficients of the NCCP dummies, whereas the effects during the post-reform period are computed by adding the NCCP coefficient to the reform/NCCP interaction coefficient.

Panel A in Table 11 illustrates the comparison of aggregate expenditure between the pre- and post-reform periods. Most  $NCCP_t * Reform$  and  $NCCP_{t+2} * Reform$  coefficients in Panel A in Table 11 (except for the coefficient of  $NCCP_t * Reform$  in the regression with total expenditure as the dependent variable) show significant effects. The bottom section of Panel A in Table 11 reports the effects during the pre-reform and post-reform periods respectively, showing that the effects of fiscal manipulation on aggregate expenditure are mainly driven by the post-reform period. Aside from the negative effects of aggregate expenditure, manipulation during the pre-reform period is found to be trivial. The post-reform regression results, as seen in Panel A, are mostly consistent with the results of the baseline model, demonstrating that tax revenue and fiscal expenditure increase two years prior to the NCCP in order to finance the increased capital expenditure.

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<sup>36</sup>In the generalized method of moments estimation, first-order serial correlation is expected in differences, because  $\Delta\epsilon_{it} = \epsilon_{it} - \epsilon_{it-1}$  and  $\Delta\epsilon_{it-1} = \epsilon_{it-1} - \epsilon_{it-2}$  both have the same term  $\epsilon_{it-1}$ . The test for second-order serial correlation in the first-difference residuals is carried out instead (Roodman, 2009a).

<sup>37</sup>The serial correlation of the regressions of agricultural subsidies may potentially invalidate the subset of the instruments, so the results here should be read with caution.

<sup>38</sup>A reform dummy takes the value of “1” from 1994 to 2006, and takes the value of “0” if before 1994.

Panel B in Table 11 shows the results for disaggregated expenditures. Columns 2 through 5 in the bottom section of Panel B in Table 11 suggest that the incentives to manipulate capital expenditures mainly stem from the post-reform period. As for the current expenditure, aside from the regression of government administration, Columns 6 through 9 in the bottom section of Panel B in Table 11 suggest that the incentives to manipulate current expenditures mainly come from post-reform fiscal manipulation. The significant  $NCCP_t$  and  $NCCP_{t+1}$  coefficients (but insignificant reform/ $NCCP_t$  and reform/ $NCCP_{t+1}$  interaction coefficients) in the regression with government administration as the dependent variable (Columns 6 in the top section of Panel B in Table 11) indicate that fiscal manipulation of current expenditures was present both before and after the reform.

In sum, even though some reform/ $NCCP$  interaction coefficients are significant, omitting the reform factor in the baseline model does not alter our results: the patterns found in the above analysis either before or after the reform are consistent with the results of the baseline model, which thus verifies the robustness of the results in Table 11. Also, after the reform, the pattern of political budget cycles on aggregate expenditure and disaggregated expenditures (except for government administration) become more prominent. The clear pattern of a politician's behavior during the post-reform period may be partially attributed to on-the-job learning that would naturally develop from a politician's increasing experience in politics and an adaption to the cadre management system. Simply put, politicians may gradually become more farsighted and learn how to achieve their desired goals by manipulating fiscal policies during the promotion periods.

### 8.3 Income

The other major factor that varies across provinces that may affect politicians' incentive structures, as well as their fiscal manipulations, is provincial economic status. Given the large discrepancies in income across provinces, provincial leaders' incentives for fiscal manipulation may be different in individual regions. For example, according to Shih et al. (2012), provincial economic performance in wealthier provinces may have less effect on a provincial leader's promotion, because a politician who serves in a wealthier province prior to a rotation is more likely to use political connections to engineer a new appointment. In cases such as this, political connections, rather than fiscal manipulation per se, may play a more important role in a politician's promotion. Thus, politicians in prosperous provinces may have less incentive to manipulate fiscal expenditure than politicians in poorer provinces.

To test this proposition, the 30 provinces in the sample are split evenly into “rich” and “poor” according to their average GDP per capita in the sample period. A rich-province dummy is constructed.<sup>39</sup> Interaction terms between a rich-province dummy and different NCCP dummies are added to the baseline model, allowing the effects of fiscal expenditure by provincial economic status. The results are reported in Table 12. The regression specification takes into account the time trend and provincial dummies, and the same control variables used in the baseline model. The coefficients of interest are those for the interaction term between a rich-province dummy and different NCCP dummies. The results for poor provinces are given by NCCP dummy coefficients, whereas the outcomes for rich provinces are computed by adding the NCCP coefficient to the rich-province/NCCP interaction coefficient.

Panel A in Table 12 shows the comparison between aggregate expenditure in poor and rich provinces. Even though most interaction coefficients in panel A in Table 12 (except for the coefficient of  $NCCP_t * Rich$  in the regression with tax revenue as dependent variables) have significant effects, demonstrating that, though fiscal manipulation of aggregate expenditure may be somewhat different between rich and poor provinces, all significant outcomes in the bottom section of Panel A in Table 12 show nearly the same signs and power as the baseline model, verifying the robustness of the results. As for the disaggregated expenditure, shown in Panel B in Table 12, none of the rich-province/NCCP interaction coefficients show significant effects, so the degree of fiscal manipulation on disaggregated expenditure does not depend on provincial economic status. Thus, the effects of economic differences across provinces, as they relate to politicians’ fiscal manipulations on disaggregated expenditures, are found to be trivial.

#### 8.4 The Effects off the NCCP Years

Our baseline model presumes that there are no other time-varying unobserved factors coinciding with the cycle of the NCCP. This assumption remains unverified using direct methods, but the regressions in Table 13 are conducted to measure spending effects further in advance of the NCCP. According to the results from our baseline model, reported in regression (5) of Table 13, the changes in public spending are significant during the NCCP years and two year prior to the NCCP. Regressions (6) and (7) of Table 13, which serve as a robustness check, capture the changes in public spending off these two years. By amending the baseline model with dummies for different pre-

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<sup>39</sup>A rich-province dummy takes the value of “1” for the 15 most wealthy provinces, and takes the value of “0” for the remaining 15 provinces.

NCCP years, regression (6) includes the dummies of three consecutive years ending one year prior to the NCCP ( $NCCP_{t+1}$ ,  $NCCP_{t+2}$ , and  $NCCP_{t+3}$  dummies), whereas regression (7) includes the dummies of three consecutive years ending two years prior to the NCCP ( $NCCP_{t+2}$ ,  $NCCP_{t+3}$ , and  $NCCP_{t+4}$  dummies). Note that the NCCP is held every five years, so  $NCCP_{t+3}$  dummies capture the effects when the NCCP will be held in three years time, meaning two years after the previous NCCP, and  $NCCP_{t+4}$  dummies capture the effects when the NCCP will be held in four years time, or one year after the previous NCCP.

In the regressions with tax revenue as a dependent variable, the coefficient of  $NCCP_{t+3}$  shows a negative and significant effect and the coefficient of  $NCCP_{t+4}$  shows a weakly positive and significant effect. In the regression with total expenditure as a dependent variable, the coefficients off the NCCP years ( $NCCP_{t+3}$  and  $NCCP_{t+4}$ ) are all insignificant. As before, provincial leaders increase total expenditure to finance the increased capital expenditure two years prior the NCCP. But once such demand diminishes during the NCCP years and the years that follow, tax revenue decrease as well. Also, politicians have no incentives to manipulate total expenditure. As for capital expenditures, capital construction and innovation funds, their coefficients are insignificant in all specifications (except for regression (7) of innovation funds), indicating that politicians have no incentives to manipulate capital spending off the NCCP years ( $NCCP_{t+3}$  and  $NCCP_{t+4}$ ). However, politicians do have incentives to manipulate current expenditures, even off the NCCP years. Except for the coefficients of  $NCCP_{t+3}$  in the agricultural subsidies and government administration regressions, the spending effects off the NCCP years are negative and significant. During the NCCP years, politicians want to avoid potential social unrest that may affect their chances of being promoted, so their priority shifts to public policies. Once they are in office, such incentives are reduced, so the spending on current expenditure diminishes, reaching its lowest point two years prior to the NCCP, at a time when their highest priority is to focus on spending on long-lasting capital projects.

In sum, in all regressions, the sign of the coefficient on  $NCCP_{t+2}$  is unchanged when different pre-NCCP dummies are used as covariates. In addition, the coefficients of  $NCCP_{t+2}$  in regressions (6) and (7) show a similar magnitude and equally significant results as those found in the baseline model regression, which is regression (5). Therefore, the results of Table 13 confirm the robustness of our baseline model results.

## 9 Discussion

The empirical results indicate that political budget cycles in China synchronize with the cycles of the NCCP, but are uncorrelated with politicians' tenures. The weak and insignificant tenure effect may partially confirm previous findings that the correlation between politicians' years in office and political turnover is weak. The other possible explanation is that, while most promotions occur during the NCCP years, politicians' tenures and the timing of the NCCP coincide, so no separate tenure effect can be observed. One of the main findings in the paper is that, in order to impress their superiors by having more visible and quantifiable projects during the NCCP years, opportunistic and farsighted politicians shift public spending toward capital expenditures and away from current expenditures two years prior to the NCCP. The increased capital expenditure may be attributed to the cadre management system, which institutionalizes the correlation between economic performance and political career advancement. As shown in our simple theoretical model, significant effects of capital spending should happen prior to a promotion period. Because government investments in infrastructure and development projects are usually sustainable but time consuming, provincial leaders have to strategically schedule such projects in advance if they hope to have those projects implemented at times when they are about to be considered for a promotion. Thus, as shown, capital expenditure reaches its peak two years prior to the NCCP.

An increase in current expenditure during the promotion period can also be observed, which reveals to some degree that the central government's promotion mechanism does provide indirect incentives for provincial leaders to spend money on social programs, such as education, welfare, and healthcare. Even though provincial leaders' political futures rely less on popular support than those of local officials in a democratic country, they are still compelled by a fear of widespread social instability. Indeed, even the General Secretary and the Premier of the CCP, who sit atop the Chinese government hierarchy, may be removed from their positions by the Standing Committee if there is an outbreak of regional social unrest or the destruction of public goods (Shih et. al, 2005). To avoid these two scenarios, which would threaten their political power, the General Secretary and the Premier require provincial leaders to provide essential public goods. Since the General Secretary and the Premier have the ultimate power in determining a provincial leader's political future, such policies require an internalization of budget allocation considerations from the top down to provincial leaders. A fear of demotion by the top leaders in the CCP, which extends to provincial leaders, implicitly induces lower-level leaders to spend on important social programs to

keep the peace of the general public. The threat of demotion or removal from office is felt most strongly during a leadership transition, which corresponds to the finding that the peak of current spending occurs during the NCCP years. Note that the results here provide evidence only of a provincial leader's motives to carry out important expenditures that would prevent the worst from happening in their jurisdiction. There is not enough evidence in these results to claim the efficiency of public goods allocation and sufficient financial support for local public goods provision; rather, it is commonly believed that a public goods provision in China is actually under-funded (Jin et al., 2005; Persson and Zhuravskaya, 2012).

## 10 Conclusion

In democracies, political budget cycles are propelled by electoral cycles and are largely perceived as motivated by the political desire of politicians to be reelected. The impact of election cycles on policies is well-established in the study of democratic countries, yet the pattern of political budget cycles in the absence of competitive general elections remains underexplored. This paper contributes to the existing literature by investigating the case of China, providing both a theoretical argument and empirical evidence to reveal that provincial leaders have incentives to schedule important changes in government expenditures at crucial moments in order to increase their likelihood of being promoted. Although political turnover in China has long been considered as essentially informal, often relying on personal connections and deftly dealing with fractious politics, this paper finds that, just as in Western democracies, budget cycles do exist in China, so that public spending is correlated with political rhythms. The implication is that political turnover in China may be more institutionalized than traditionally conceived. The analysis here shows that Chinese budget cycles coincide with the cycle of the NCCP, thus demonstrating the institutionalization of the affairs of the political elite in China. Yet, different from Guo (2009), this paper does not find cyclical budget changes over politicians' tenures. Compared to county-level officials, the turnover of politicians at the provincial level may be more associated with a national leadership transition, rather than bounded by the rules of term limits. Thus, provincial leaders manipulate budget plans to coincide with the NCCP for their professional gain, but only in specific years; budget manipulation does not take place every year that they are in office.

In addition, while much effort has been devoted to studying the association between politicians' fiscal incentives and the economic outcomes under the performance-based elite promotion system,

few studies have explored politicians' behavior when allocating budget resources for both aggregate and disaggregated expenditure. As shown above, using data from Chinese provinces, it is clear that provincial leaders accelerate aggregate expenditure two years prior to the NCCP to finance the increased investment. During this time, spending on capital expenditure increases, whereas spending on current expenditure decreases. Yet during the promotion period, the priority shifts to current expenditures in order to avoid a potential outbreak of social unrest. The findings in this paper confirm what has been stated in the previous literature on the subject: namely, that politicians prioritize more visible projects and more easily quantifiable investments to attain their personal goals of remaining in office or moving to a higher office. Yet, the findings also suggest that the fear of demotion may incentivize provincial leaders to provide at least a bare minimum of public goods, even in the absence of downward local accountability. Aside from the incentives of development projects that are studied and widely known, the center's promotion mechanism implicitly maintains the basic living standard of the general population. Though these incentives may not be enough for provincial leaders to provide an optimal level of public goods, the results of this paper provide evidence that politicians in non-democratic countries such as China still have a vested interest in maintaining their political popularity, which thus benefits the general population in the goods and services provided to them.

## APPENDIX

### A Proof of Proposition 1

**Proof.** The first order condition for capital and current expenditure are as follows.

$$K_1 : f'(K_1 + \delta K_0) + \delta f'(K_2 + \delta K_1) = g'(K_1 + C_1) \quad (5)$$

$$K_2 : f'(K_2 + \delta K_1) = g'(K_2 + C_2) \quad (6)$$

$$C_1 : h'(C_1) = g'(K_1 + C_1) \quad (7)$$

$$C_2 : h'(C_2) = g'(K_2 + C_2) \quad (8)$$

Given these conditions, the equation  $f'(K_1 + \delta K_0) + \delta h'(C_2) = h'(C_1)$  can be obtained, which implies that the inequality  $h'(C_2) < h'(C_1)$  holds if  $\delta \geq 1$ . Due to the concavity of  $h$ , the inequality  $h'(C_2) < h'(C_1)$  leads to  $C_2 > C_1$ , implying  $g'(K_1 + C_1) > g'(K_2 + C_2)$  according to equations (7) and (8). The convexity of  $g$ , then, indicates  $K_1 + C_1 > K_2 + C_2$ .  $K_1 > K_2$  follows since both  $C_2 > C_1$  and  $K_1 + C_1 > K_2 + C_2$  hold. When  $\delta < 1$ , suppose  $K_1 \leq K_2$  and under the steady state that  $K_0 = K_2$ , then  $K_1 + \delta K_0 \leq K_2 + \delta K_1$  holds, implying  $f'(K_1 + \delta K_0) \geq f'(K_2 + \delta K_1)$ . This inequality then implies  $h'(C_1) = f'(K_1 + \delta K_0) + \delta f'(K_2 + \delta K_1) \geq (1 + \delta)f'(K_2 + \delta K_1) = (1 + \delta)h'(C_2)$ , which in turn implies  $h'(C_1) > h'(C_2)$  and  $C_1 < C_2$ . Given  $K_1 \leq K_2$ , the inequality  $K_1 + C_1 < K_2 + C_2$  then follows. But convexity of  $g$  then implies  $g'(K_1 + C_1) < g'(K_2 + C_2)$ , leading to  $h'(C_1) < h'(C_2)$ , which contradicts  $h'(C_1) > h'(C_2)$ . Therefore,  $K_1 \leq K_2$  is ruled out, implying  $K_1 > K_2$ . The second step is to compare the total expenditure in the two periods. To establish  $K_1 + C_1 > K_2 + C_2$ , suppose the contrary. With  $K_1 + C_1 \leq K_2 + C_2$ , (7) and (8) imply  $h'(C_1) \leq h'(C_2)$  or  $C_1 \geq C_2$ . Since  $K_1 > K_2$  has been shown to hold, the result is a contradiction. Therefore,  $K_1 + C_1 > K_2 + C_2$  holds, implying  $C_1 < C_2$  by (7) and (8). Thus, Proposition 1 holds for any  $\delta$ .

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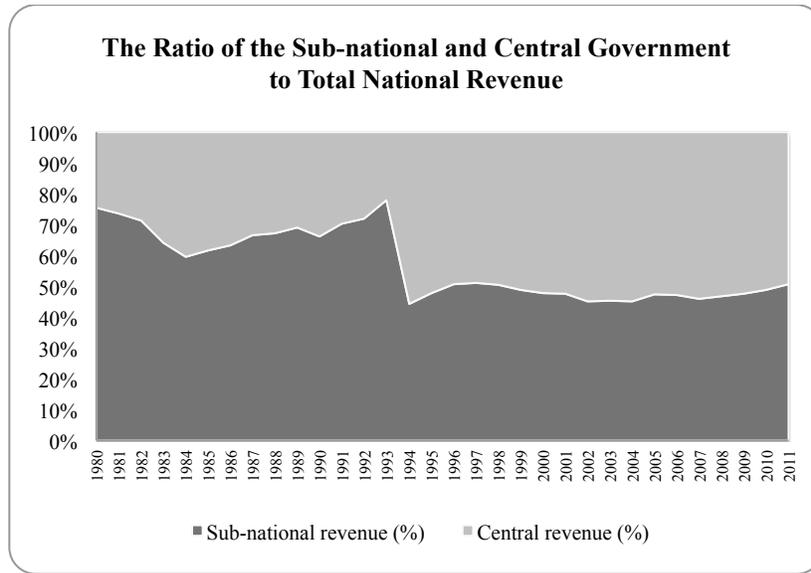
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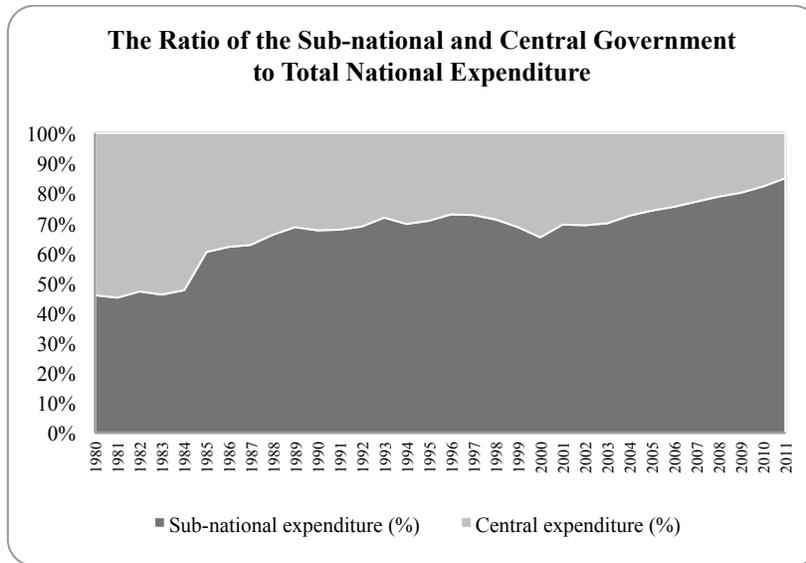
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Figure 1: The Proportion of the Sub-national and Central Government Components of Total National Revenue



Source: China Statistical Yearbook 2012

Figure 2: The Proportion of the Sub-national and Central Government Components of Total National Expenditure



Source: China Statistical Yearbook 2012

Table 1: Frequency Distribution of Politicians' Turnover During the NCCP years

	1st year of Provincial Committee Secretary		1st year of Provincial Governor	
	Frequency	Percentage	Frequency	Percentage
Two years prior to the NCCP	22	13.7%	28	15%
One year prior to the NCCP	32	19.9%	35	18.7%
Year of the NCCP	49	30.4%	42	22.5%
One year after the NCCP	39	24.2%	57	30.5%
Two years after the NCCP	19	11.8%	25	13.3%
Total N	161	100%	187	100%

Table 2: Frequency Distribution of Politicians' Turnover During Their Tenures

	Provincial Committee Secretary		Provincial Governor	
	Frequency	Percentage	Frequency	Percentage
1st year	10	5.9%	14	7.4%
2nd year	27	15.9%	37	19.6%
3rd year	35	20.6%	50	26.5%
4th year	21	12.4%	39	20.6%
5th year	25	14.7%	18	9.5%
6th year	15	8.8%	15	7.9%
7th year	12	7.1%	5	2.6%
8th year	14	8.2%	3	1.6%
9th year	2	1.2%	2	1.1%
10th year	6	3.5%	3	1.6%
11th year and more	3	1.8%	3	1.6%
Total N	170	100%	198	100%

Table 3: Summary Statistics

	Observations	Mean	Standard Deviation
Fiscal variables (100 million in 2006 Chinese yuan)			
Total expenditure	760	246.32	343.63
Total revenue	760	158.45	242.02
Tax revenue	760	132.21	204.91
Capital construction	760	25.65	41.59
Innovation funds	756	10.98	20.45
Social expenditures	760	56.99	76.39
Agricultural subsidies	760	14.83	18.63
Government administration	760	23.55	32.93
National expenditure	760	9547.1	10309.17
Control variables			
Total population (10 thousand)	760	3812.63	2363.55
Log(GDP)	760	3.47	0.53
Log(urban disposable income)	760	3.39	0.47
Log(rural net income)	760	3.02	0.41

Table 4: The Effect of the NCCP on Aggregate Expenditure (First Difference)

Dependent Variables	Total Expenditure	Tax Revenue
NCCP(t)	-4.42** (1.64)	-1.31 (1.94)
NCCP(t+1)	-1.30 (2.57)	2.47 (2.75)
NCCP(t+2)	13.04*** (3.74)	11.91** (4.45)
ΔLagged dependent variable	0.21 (0.23)	-0.04 (0.20)
ΔLog(GDP)	-43.50 (66.30)	65.96 (64.00)
ΔPopulation	-0.08** (0.03)	0.08*** (0.02)
ΔLog(rural net income)	-2.27 (21.29)	-35.26 (29.42)
ΔLog(urban disposable income)	56.69 (39.87)	-85.29* (43.54)
ΔNational expenditure	0.02*** (0.003)	0.007*** (0.002)
ΔLagged revenue	0.29** (0.15)	
ΔLagged expenditure		0.47** (0.19)
Province fixed effects	Yes	Yes
Time trend	Yes	Yes
Year fixed effects	No	No
Number of observations	700	700
Number of provinces	30	30
R-square	0.72	0.52

Note: The notation of “Δ” indicates that the first difference was taken. Robust standard errors are in parentheses. \*\*\* Significance at 1 percent level. \*\* Significance at 5 percent level. \* Significance at 10 percent level.

Table 5: The Effect of the NCCP on Disaggregated Expenditure (First Difference)

Dependent Variables	Capital construction	Innovation funds	Social expenditures	Agricultural subsidies	Government administration
NCCP(t)	0.75 (0.76)	-0.82*** (0.28)	1.32*** (0.43)	-0.66*** (0.17)	0.55*** (0.19)
NCCP(t+1)	1.14 (0.90)	0.28 (0.30)	1.21** (0.46)	-1.23*** (0.27)	0.48*** (0.16)
NCCP(t+2)	2.29*** (0.79)	1.03** (0.42)	-0.07 (0.56)	-2.19*** (0.44)	0.40 (0.26)
$\Delta$ Lagged dependent variable	-0.04 (0.11)	0.18** (0.09)	0.21* (0.12)	-0.38*** (0.07)	0.31*** (0.07)
$\Delta$ Log(GDP)	-17.54 (13.02)	10.91 (11.77)	-12.44* (6.34)	4.06 (8.04)	1.96 (3.25)
$\Delta$ Population	-0.003 (0.008)	-0.01 (0.006)	-0.0004 (0.007)	0.003 (0.003)	0.003 (0.005)
$\Delta$ Log (rural net income)	-2.68 (3.57)	3.30 (5.12)	16.33*** (5.43)	-1.95 (3.10)	5.49** (2.38)
$\Delta$ Log (urban disposable income)	-8.72 (9.15)	-3.26 (9.93)	17.90** (6.71)	-5.52 (5.32)	8.58** (3.30)
$\Delta$ National expenditure	-0.001** (0.0006)	-0.001* (0.0005)	0.002*** (0.0005)	0.00 (0.00)	0.0005** (0.0002)
$\Delta$ Total revenue	-0.02 (0.03)	0.03 (0.02)	0.03 (0.03)	0.01 (0.01)	0.01 (0.01)
$\Delta$ Total expenditure	0.13*** (0.03)	0.02 (0.01)	0.09** (0.04)	0.03** (0.01)	0.04*** (0.01)
Province fixed effects	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No
Number of observations	700	693	700	700	700
Number of provinces	30	30	30	30	30
R-square	0.41	0.26	0.82	0.34	0.81

Note: The notation of “ $\Delta$ ” indicates that the first difference was taken. Robust standard errors are in parentheses.

\*\*\* Significance at 1 percent level. \*\* Significance at 5 percent level. \* Significance at 10 percent level.

Table 6: The Effect of Politicians' Tenure on Aggregate Expenditure (First Difference)

Dependent Variables	Total Expenditure		Tax Revenue	
	(1)	(2)	(1)	(2)
Committee Secretary tenure	1.91 (1.65)		3.74** (1.55)	
Committee Secretary tenure-square	-0.22 (0.17)		-0.34** (0.16)	
Governor tenure		-0.77 (1.23)		2.13** (0.90)
Governor tenure-square		0.05 (0.13)		-0.20** (0.08)
Province fixed effects	Yes	Yes	Yes	Yes
Time trend	No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes
Number of observations	700	700	700	700
Number of provinces	30	30	30	30
R-square	0.77	0.77	0.61	0.61

Note: The control variables are the same as in the baseline model, including  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log(rural net income),  $\Delta$ Log(urban disposable income),  $\Delta$ National expenditure, and  $\Delta$ Lagged revenue ( $\Delta$ Lagged revenue for the regression of total expenditure, and  $\Delta$ Lagged expenditure for the regression of tax revenue). The notation of " $\Delta$ " indicates that the first difference was taken. Robust standard errors are in parentheses. \*\* Significance at 5 percent level.

Table 7: The Effect of Politicians' Tenure on Disaggregated Expenditure (First Difference)

Dependent Variables	Capital construction		Innovation funds		Social expenditures		Agricultural subsidies		Government administration	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Committee Secretary tenure	-0.08 (0.35)		0.009 (0.17)		-0.34 (0.27)		0.18 (0.21)		-0.27** (0.10)	
Committee Secretary tenure-square	0.01 (0.04)		0.004 (0.02)		0.03 (0.03)		-0.01 (0.02)		0.02** (0.01)	
Governor tenure		-0.47 (0.30)		-0.04 (0.28)		0.39 (0.27)		0.04 (0.15)		0.04 (0.12)
Governor tenure-square		0.07* (0.04)		0.004 (0.03)		-0.04 (0.02)		0.0004 (0.01)		-0.003 (0.01)
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time trend	No	No	No	No	No	No	No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	700	700	693	693	700	700	700	700	700	700
Number of provinces	30	30	30	30	30	30	30	30	30	30
R-square	0.50	0.50	0.32	0.32	0.83	0.83	0.52	0.52	0.84	0.84

Note: The control variables are the same as in the baseline model, including  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log(rural net income),  $\Delta$ Log(urban disposable income),  $\Delta$ National expenditure,  $\Delta$ Total revenue, and  $\Delta$ Total expenditure. The notation of " $\Delta$ " indicates that the first difference was taken. Robust standard errors are in parentheses. \*\* Significance at 5 percent level. \* Significance at 10 percent level.

Table 8: The Effect of the NCCP on Aggregate and Disaggregated Expenditure (GMM Application)

Dependent Variables	Total expenditure	Tax revenue	Capital construction	Innovation funds	Social expenditures	Agricultural subsidies	Government administration
NCCP(t)	1.62 (1.61)	6.72*** (1.58)	1.04 (0.75)	-0.76*** (0.22)	1.40*** (0.26)	-0.91*** (0.22)	0.92*** (0.18)
NCCP(t+1)	10.23*** (2.48)	10.36*** (2.22)	1.75*** (0.67)	0.37 (0.36)	2.40*** (0.39)	-0.28 (0.28)	1.44*** (0.18)
NCCP(t+2)	16.37*** (2.84)	20.88*** (5.84)	3.05*** (0.72)	1.15*** (0.41)	1.31** (0.63)	-4.23*** (1.44)	1.62*** (0.22)
Lagged dependent variable	1.11*** (0.07)	1.33*** (1.41)	0.93*** (0.08)	1.07*** (0.09)	0.83*** (0.13)	1.66*** (0.37)	1.13*** (0.07)
Number of observations	730	730	730	724	730	730	730
Number of provinces	30	30	30	30	30	30	30
Wald test	420289.62 (0.00)	261687.16 (0.00)	13016.92 (0.00)	23469.28 (0.00)	67488.76 (0.00)	2687.44 (0.00)	559314.52 (0.00)
Hansen test	0.10 (0.757)	0.43 (0.511)	2.50 (0.114)	0.00 (0.995)	2.27 (0.132)	1.85 (0.174)	0.84 (0.361)
Second order test	0.56 (0.573)	0.91 (0.361)	-2.06 (0.04)	-0.91 (0.360)	-0.94 (0.348)	2.02 (0.044)	-1.19 (0.235)

Note: Each regression includes a time trend and a full set of provincial dummies. The control variables are the same as in the baseline model, including lagged dependent variable, log(GDP), population, log(rural net income), log(urban disposable income), national expenditure, and total revenue (lagged revenue for the regression of total expenditure, lagged expenditure for the regression of tax revenue, and total revenue and total expenditure for the regression of disaggregated expenditure). \*\*\* Significance at 1 percent level.

Table 9: The Effect of Politicians' Tenure on Aggregate Expenditure (GMM Application)

Dependent Variables	Total Expenditure		Tax Revenue	
	(3)	(4)	(3)	(4)
Committee Secretary tenure	-2.56 (2.76)		2.46 (3.36)	
Committee Secretary tenure-square	0.10 (0.22)		-0.24 (0.29)	
Governor tenure		-2.47 (2.37)		-0.42 (4.17)
Governor tenure-square		0.26 (0.18)		-0.006 (0.34)
Lagged dependent variable	1.17*** (0.02)	1.17*** (0.02)	1.22*** (0.03)	1.22*** (0.03)
Number of observations	730	730	730	730
Number of provinces	30	30	30	30
Wald test	2.49e+06 (0.00)	3.04e+07 (0.00)	2.97e+06 (0.00)	3.89e+09 (0.00)
Hansen test	2.18 (0.824)	2.19(0.823)	0.00 (1.000)	0.11 (1.00)
Second Order test	1.61(0.108)	1.56(0.120)	1.08 (0.282)	1.09 (0.278)

Note: Each regression includes a full set of year dummies and provincial dummies. Robust standard errors are in parentheses. \*\*\* Significance at 1 percent level.

Table 10: The Effect of Politicians' Tenure on Disaggregated Expenditure (GMM Application)

Dependent Variables	Capital construction		Innovation funds		Social expenditures		Agricultural subsidies		Government administration	
	(3)	(4)	(3)	(4)	(3)	(4)	(3)	(4)	(3)	(4)
Committee Secretary tenure	-0.78 (0.53)		0.40 (0.51)		1.38 (0.88)		0.39 (0.33)		0.01 (0.23)	
Committee Secretary tenure-square	0.06 (0.05)		-0.02 (0.04)		-0.13* (0.08)		-0.04 (0.03)		-0.004 (0.02)	
Governor tenure		-0.35 (0.94)		-1.05 (0.71)		0.71 (0.88)		0.68 (0.56)		0.33 (0.29)
Governor tenure-square		0.06 (0.07)		0.11 (0.08)		-0.05 (0.07)		-0.04 (0.04)		-0.02 (0.02)
Lagged dependent variable	1.08*** (0.02)	1.08*** (0.02)	1.09*** (0.06)	1.09*** (0.05)	1.15*** (0.01)	1.15*** (0.01)	1.28*** (0.05)	1.29*** (0.05)	1.19*** (0.03)	1.19*** (0.03)
Number of observations	730	730	724	724	730	730	730	730	730	730
Number of provinces	30	30	30	30	30	30	30	30	30	30
Wald test	8.61e+07 (0.00)	1.30e+06 (0.00)	390800.6 (0.00)	2.45e+06 (0.00)	4.89e+07 (0.00)	3.63e+06 (0.00)	1.21e+06 (0.00)	119757.6 (0.00)	1.63e+07 (0.00)	3.37e+07 (0.00)
Hansen test	2.22 (0.82)	0.57 (0.989)	0.01 (1.00)	0.07 (1.00)	0.49 (0.992)	0.33 (0.997)	0.05 (1.00)	2.75 (0.738)	0.07 (1.00)	0.00 (1.00)
Second order test	-0.72 (0.471)	-0.74 (0.460)	-1.21 (0.225)	-1.18 (0.237)	-0.39 (0.695)	-0.45 (0.654)	2.76 (0.006)	2.72 (0.006)	0.02 (0.987)	0.00 (0.998)

Note: Each regression includes a full set of year dummies and provincial dummies. Robust standard errors are in parentheses. \*\*\* Significance at 1 percent level. \* Significance at 10 percent level.

Table 11: Robustness Check: Pre and Post-Reform Comparison

(A) Aggregate Expenditure				
Dependent Variables	Total Expenditure		Tax Revenue	
NCCP(t)	-3.74**		0.14	
	(1.46)		(1.07)	
NCCP(t)*Reform	-2.66		-5.84*	
	(2.86)		(3.33)	
NCCP(t+1)	-1.21		-1.20	
	(1.18)		(1.61)	
NCCP(t+1)*Reform	-0.27		7.32	
	(5.74)		(4.57)	
NCCP(t+2)	0.31		-1.35	
	(4.54)		(2.58)	
NCCP(t+2)*Reform	17.12**		18.54**	
	(8.39)		(8.62)	
R-square	0.72		0.53	
<i>Test of general linear restriction</i>				
	pre	post	pre	post
NCCP(t)	-3.74**	-6.40**	0.14	-5.70
	(1.46)	(2.86)	(1.07)	(3.47)
NCCP(t+1)	-1.21	-1.48	-1.20	6.11
	(1.18)	(5.28)	(1.61)	(4.57)
NCCP(t+2)	0.31	17.44***	-1.35	17.19**
	(4.54)	(5.17)	(2.58)	(6.86)

(B) Disaggregated Expenditure										
Dependent Variables	Capital construction		Innovation funds		Social expenditures		Agricultural subsidies		Government administration	
NCCP(t)	-0.26		-0.43		0.30		-0.001		0.31***	
	(0.19)		(0.32)		(0.26)		(0.13)		(0.07)	
NCCP(t)*Reform	1.67		-0.98		1.98**		-0.88***		0.47	
	(1.72)		(0.90)		(0.88)		(0.32)		(0.45)	
NCCP(t+1)	-0.67**		0.21		-0.44		0.23		0.28**	
	(0.29)		(0.24)		(0.31)		(0.26)		(0.10)	
NCCP(t+1)*Reform	3.38*		0.21		3.09**		-2.75***		0.33	
	(1.79)		(0.72)		(1.15)		(0.68)		(0.37)	
NCCP(t+2)	0.08		0.69		0.92		-0.03		0.60	
	(0.67)		(1.02)		(0.59)		(0.33)		(0.42)	
NCCP(t+2)*Reform	3.35***		0.44		-0.91		-3.19***		-0.19	
	(1.05)		(1.23)		(1.05)		(0.49)		(0.64)	
R-square	0.42		0.26		0.82		0.36		0.81	
<i>Test of general linear restriction</i>										
	pre	post	pre	post	pre	post	pre	post	pre	post
NCCP(t)	-0.26	1.40	-0.43	1.41*	0.30	2.28**	-0.001	-0.89**	0.31***	0.77*
	(0.19)	(1.72)	(0.32)	(0.75)	(0.26)	(0.86)	(0.13)	(0.33)	(0.07)	(0.45)
NCCP(t+1)	-0.67**	2.71	0.21	0.42	-0.44	2.65**	0.23	-2.52***	0.28**	0.61*
	(0.29)	(1.72)	(0.24)	(0.63)	(0.31)	(0.96)	(0.26)	(0.55)	(0.10)	(0.33)
NCCP(t+2)	0.08	3.43***	0.69	1.13**	0.92	0.007	-0.03	-3.22***	0.60	0.41
	(0.67)	(1.06)	(1.02)	(0.50)	(0.59)	(0.77)	(0.33)	(0.54)	(0.42)	(0.35)

Note: Each regression includes a time trend and a full set of provincial dummies. The control variables of Panel (A) include  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log(rural net income),  $\Delta$ Log(urban disposable income), and  $\Delta$ Lagged revenue ( $\Delta$ Lagged revenue for the regression of total expenditure,  $\Delta$ Lagged expenditure for the regression of tax revenue), and a time trend. The control variables of Panel (B) include  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log(rural net income),  $\Delta$ Log(urban disposable income),  $\Delta$ National expenditure,  $\Delta$ Total revenue,  $\Delta$ Total expenditure, and a time trend. The notation of “ $\Delta$ ” indicates that the first difference was taken. Sample size is 700 (except for the regression of innovation funds, which have the sample size 693), including 30 provinces. Robust standard errors are in parentheses. \*\*\* Significance at 1 percent level. \*\* Significance at 5 percent level. \* Significance at 10 percent level.

Table 12: Robustness Checks: Poor and Rich Provinces Comparison

(A) Aggregate Expenditure				
Dependent Variables	Total Expenditure	Tax Revenue		
NCCP(t)	0.87 (2.61)	-0.82 (2.38)		
NCCP(t)*Rich	-11.07** (4.77)	-0.79 (2.53)		
NCCP(t+1)	6.48** (2.38)	-2.96 (2.62)		
NCCP(t+1)*Rich	-15.87** (7.05)	12.39** (5.30)		
NCCP(t+2)	5.25* (2.97)	0.19 (3.32)		
NCCP(t+2)*Rich	17.77** (8.09)	25.49*** (8.92)		
R-square	0.72	0.54		
<i>Test of general linear restriction</i>				
	poor	rich	poor	rich
NCCP(t)	0.87 (2.61)	-10.20*** (3.13)	-0.82 (2.38)	-1.60 (2.18)
NCCP(t+1)	6.48** (2.38)	-9.39* (5.65)	-2.96 (2.62)	9.44* (5.11)
NCCP(t+2)	5.25* (2.97)	23.02*** (7.48)	0.19 (3.32)	25.67*** (8.71)

(B) Disaggregated Expenditure										
Dependent Variables	Capital construction		Innovation funds		Social expenditures		Agricultural subsidies		Government administration	
NCCP(t)	1.04 (0.91)		-0.62** (0.23)		0.97** (0.42)		-0.59*** (0.16)		0.38** (0.18)	
NCCP(t)*Rich	-0.63 (1.30)		-0.42 (0.58)		0.78 (0.89)		-0.16 (0.39)		0.38 (0.36)	
NCCP(t+1)	1.10 (0.78)		0.47 (0.33)		1.20** (0.50)		-1.39*** (0.35)		0.33 (0.21)	
NCCP(t+1)*Rich	0.09 (1.48)		-0.38 (0.73)		-0.004 (1.07)		0.37 (0.70)		0.28 (0.37)	
NCCP(t+2)	2.40** (1.00)		0.64* (0.38)		-0.16 (0.56)		-2.45*** (0.57)		0.61** (0.27)	
NCCP(t+2)*Rich	-0.24 (1.55)		0.84 (0.88)		0.19 (1.21)		0.56 (0.92)		-0.45 (0.44)	
R-square	0.41		0.26		0.82		0.34		0.82	
<i>Test of general linear restriction</i>										
	poor	rich	poor	rich	poor	rich	poor	rich	poor	rich
NCCP(t)	1.04 (0.91)	0.41 (1.08)	-0.62** (0.23)	-1.04* (0.54)	0.97** (0.42)	1.74** (0.79)	-0.59*** (0.16)	-0.75** (0.34)	0.38** (0.18)	0.76** (0.35)
NCCP(t+1)	1.10 (0.78)	1.19 (1.50)	0.47 (0.33)	0.09 (0.60)	1.20** (0.50)	1.20 (0.87)	-1.39*** (0.35)	-1.02* (0.53)	0.33 (0.21)	0.62** (0.29)
NCCP(t+2)	2.40** (1.00)	2.17* (1.23)	0.64* (0.38)	1.48* (0.78)	-0.16 (0.56)	0.02 (1.05)	-2.45*** (0.57)	-1.89** (0.72)	0.61** (0.27)	0.16 (0.40)

Note: Each regression includes a time trend and a full set of provincial dummies. The control variables of Panel (A) include  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log(rural net income),  $\Delta$ Log(urban disposable income), and  $\Delta$ Lagged revenue ( $\Delta$ Lagged revenue for the regression of total expenditure,  $\Delta$ Lagged expenditure for the regression of tax revenue), and time trend. The control variables of Panel (B) include  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log(rural net income),  $\Delta$ Log(urban disposable income),  $\Delta$ National expenditure,  $\Delta$ Total revenue, and  $\Delta$ Total expenditure. The notation of “ $\Delta$ ” indicates that the first difference was taken. Sample size is 700 (except for the regression of innovation funds, which have the sample size 693), including 30 provinces. Robust standard errors are in parentheses. \*\*\* Significance at 1 percent level. \*\* Significance at 5 percent level. \* Significance at 10 percent level.

Table 13: Robustness Check: Effects off the NCCP year

(A) Aggregate Expenditure						
Dependent Variables	Total Expenditure			Tax Revenue		
	(5)	(6)	(7)	(5)	(6)	(7)
NCCP(t)	-4.42** (1.64)			-1.31 (1.94)		
NCCP(t+1)	-1.30 (2.57)	1.41 (3.06)		2.47 (2.75)	0.01 (2.01)	
NCCP(t+2)	13.04*** (3.74)	15.45*** (3.29)	15.79*** (4.83)	11.91** (4.45)	9.14** (3.57)	10.85*** (3.46)
NCCP(t+3)		2.64 (3.31)	3.03 (2.35)		-9.89** (4.17)	-8.11** (3.86)
NCCP(t+4)			2.90 (2.61)			5.50* (2.81)
R-square	0.72	0.72	0.72	0.52	0.52	0.53

(B) Disaggregated Expenditure-Capital Expenditure						
Dependent Variables	Capital construction			Innovation funds		
	(5)	(6)	(7)	(5)	(6)	(7)
NCCP(t)	0.75 (0.76)			-0.82*** (0.28)		
NCCP(t+1)	1.14 (0.90)	0.83 (0.76)		0.28 (0.30)	0.60 (0.42)	
NCCP(t+2)	2.29*** (0.79)	2.05*** (0.60)	1.35** (0.67)	1.03** (0.42)	1.28*** (0.46)	1.24*** (0.43)
NCCP(t+3)		0.08 (0.88)	-0.61 (1.02)		-0.11 (0.44)	-0.13 (0.31)
NCCP(t+4)			-1.18 (0.68)			0.65** (0.30)
R-square	0.41	0.41	0.41	0.26	0.25	0.26

(C) Disaggregated Expenditure-Current Expenditure									
Dependent Variables	Social expenditures			Agricultural subsidies			Government administration		
	(5)	(6)	(7)	(5)	(6)	(7)	(5)	(6)	(7)
NCCP(t)	1.32*** (0.43)			-0.66*** (0.17)			0.55*** (0.19)		
NCCP(t+1)	1.21** (0.46)	0.24 (0.52)		-1.23*** (0.27)	0.21 (0.20)		0.48*** (0.16)	0.50** (0.20)	
NCCP(t+2)	-0.07 (0.56)	-0.98 (0.68)	-1.36** (0.66)	-2.19*** (0.44)	-0.85** (0.38)	-1.26*** (0.37)	0.40 (0.26)	0.53** (0.19)	-0.03 (0.30)
NCCP(t+3)		-1.33 (0.95)	-1.71** (0.77)		3.78*** (0.65)	3.38*** (0.58)		0.86* (0.40)	0.30 (0.29)
NCCP(t+4)			-0.93* (0.54)			-1.03*** (0.27)			-1.12*** (0.33)
R-square	0.82	0.82	0.82	0.34	0.39	0.39	0.81	0.82	0.82

Note: Each regression includes a time trend and a full set of provincial dummies. The control variables of Panel (A) include  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log (rural net income),  $\Delta$ Log(urban disposable income), and  $\Delta$ Lagged revenue ( $\Delta$ Lagged revenue for the regression of total expenditure,  $\Delta$ Lagged expenditure for the regression of tax revenue), and time trend. The control variables of Panel (B) and (C) include  $\Delta$ Lagged dependent variable,  $\Delta$ Log(GDP),  $\Delta$ Population,  $\Delta$ Log(rural net income),  $\Delta$ Log(urban disposable income),  $\Delta$ National expenditure,  $\Delta$ Total revenue, and  $\Delta$ Total expenditure. The notation of " $\Delta$ " indicates that the first difference was taken. Sample size is 700 (except for the regression of innovation funds, which have the sample size 693), including 30 provinces. Robust standard errors are in parentheses. \*\*\* Significance at 1 percent level. \*\* Significance at 5 percent level. \* Significance at 10 percent level.