Disaggregating China's Local Political Budget Cycles: "Righting" the U

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Abstract

What impact does spending time horizon have on political budget cycles? While traditional political budget cycles increase visible spending with immediate gains before political turnover, I hypothesize that spending in categories with less-immediate gains categories increases when opportunity costs are lower. In this article, I build on existing literature on budget cycles in both democracies and non-democracies to disaggregate types of budget cycles: those with long-run versus short-run benefits. In China, after central-level reforms, welfare targets, with long-run gains, became visible to local leaders' constituents, the central leaders above them. Local leaders then had an incentive to provide welfare, but only when it was the least costly in terms of opportunity costs. Using fixed-effects models panel data from China's 333 municipalities for 1994-2012, I find welfare spending minimizes both relatively and absolutely around year three, and maximizes at the beginning and end of a politician's tenure, when opportunity costs and probability of political advancement are lowest. These cycles are the most dramatic in western provinces, where education is a particularly important tool for ideological spread. Health and Social Security spending also see expansion at the end of mayor's tenures, although the cycles are less pronounced than in education spending. This study expands the literature on political budget cycles by disaggregating government spending and considering the impact of timeliness on cycles.

Keywords: China, political budget cycles, welfare spending

Highlights:

- Welfare spending varies both across time and space in Chinese municipalities.
- After national-level reforms, central leaders increased political incentives for welfare spending for local leaders.
- Welfare spending, both relatively and absolutely, increases in years when local leader promotion is not likely, creating a U-shaped budget cycle.
- Political budget cycles are more dynamic in Western provinces, where education is used for ideological gains.

Political leaders around the world use government spending strategically to provide goods to constituents for political support, creating budget cycles in the lead up to political turnover (Nordhaus, 1975; Rogoff, 1990). The size and timing of cycles varies by electoral rules (Katsimi & Sarantides, 2012) and level of economic development (Shi & Svensson, 2006). While the vast body of budget-cycle literature emphasizes the electoral connection—the motivation to expand spending in order to win elections—recent literature also shows political budget cycles in non-democracies as well (Pepinsky, 2007; Blaydes, 2011). Whether appealing to the mass public during succession periods (Bunce, 1980) or satisfying political elites above for political advancement (Guo, 2009), non-democratic cycles related to political stability and advancement do occur and have the potential to be more dramatic than cycles in advanced democracies.

The logic underlying political budget cycle theories argues that political leaders distort government spending to fund "projects with high immediate visibility" (Rogoff, 1990) to win support. Most scholars focus on the resultant inflationary cycle and evaluate political cycles in overall spending, government deficits, or other aggregate measures. But focusing on these aggregate measures assumes the visibility of spending to constituents, presumes contextual similarities in timeliness, and masks competing fiscal priorities. Research that does disaggregate spending categories, however, also assumes visibility of spending to constituents and emphasizes spending that provides short-term benefits.

I theorize that budget cycles occur for less immediate, long-run spending categories when tied to political advancement. Visibility of spending itself is a necessary but insufficient condition for understanding political budget cycles while the immediacy of spending outcomes impacts the type of cycle. I argue the timing of gains from spending determines the shape of budget cycle: immediate-gains spending increases right before possible political advancement while visible spending with long-run benefits occurs when advancement is least likely. Conceptualizing spending as a signal of preference alignment, politicians cannot ignore long-run policy objectives demanded by constituents, but instead they act strategically,

varying the timing of spending on different spending categories. Quick-return spending occurs in the lead-up to political advancement. Spending with long-term benefits, on the other hand, is reserved for years when advancement is less likely. This creates inverse political budget cycles between competing spending priorities with differing time horizons.

Applying the logic of budget cycles to the fiscally decentralized context of China, I theorize that social spending—with long-run, diffuse benefits—follows a different budget cycle than economic development spending—characterized by shot-run benefits. Existing research shows an inverse-U shaped relationship between overall spending and politician tenure at the county level in China (Guo, 2009). When faced with term limits and a trade-off between traditionally promotion-related economic priorities and newly created welfare targets for promotion, local politicians favor quick-return spending on large-scale, highly visible projects in the years immediately before promotion is likely. In contrast, they increase spending on visible, yet less immediate-return welfare when the opportunity costs are low at the beginning and end of their term.

Using time-series cross-sectional data from all of China's 333 municipalities between 1994 and 2012, I demonstrate that education spending, a quintessential example of spending with long-run outcomes, is positively impacted by a 2006 reform that introduced welfare priorities as criteria for promotion—thus making education spending visible. Additionally, I show that the budget cycle of education provision differs from that of the expected inverse-U shaped cycle where spending increases before potential promotion: I find that local politicians spend more on education in the early and late years of tenure and less during years when the likelihood of promotion is the highest. The U-shaped pattern also holds for total social spending over the reform period and end-of-term spending for health and social security. This suggests that local politicians act strategically by targeting spending according to the priorities of their constituencies—the political elites above them who evaluate them for promotion.

1. Political Budget Cycles and Regime Type

The early political budget cycle literature focused on how electoral cycles influenced macroeconomic policies (Nordhaus, 1975; Tufte, 1978). Later work explained how, in a context of asymmetric information, incumbents increased spending to maintain political power in the lead up to potential electoral turnover. The baseline mechanism behind cycles links spending with signaling competence (Rogoff, 1990; Rogoff & Sibert, 1988). In an environment with incomplete information, spending, and particularly the favorable outcomes of spending, signal competence of the politician. Incumbents spend on policies that are both visible and provide immediate outcomes. Spending in pre-election periods signals an incumbents' ability and willingness to provide goods post-election.

Developing countries and young democracies with lower transparency and fewer institutional constraints are particularly prone to political budget cycles (Shi & Svensson, 2006). Contexts with less transparency see larger political budget cycles as spending becomes a more informative signal of leader confidence (de Haan & Klomp, 2013; Sakurai & Menezes-Filho, 2011; Vergne, 2009).

Drazen and Eslava (2010) present an alternative mechanism for cycles that provides an explanation of the varying cycles found in the comparative context. They argue that, mindful of budget constraints and varying voter preferences, incumbents change spending composition to signal preference alignment with constituents. In this model, voters rationally choose leaders whose preferences appear to align with their own. The result is disaggregated budget cycles even when the constituency values fiscal conservancy.

Because constituents often do not have access to full information about spending itself, the assumption of competence rests on the immediacy of positive outcomes, leading researchers to focus solely on what they contextually define as visible, immediate spending categories. This focus on visibility results in a wide range of empirical results in comparative studies: from social security spending in German Länder (Schneider, 2010), to public health expenditures in OECD countries (Potrafke, 2010), to municipal capital investment in Brazil

(Klein & Sakurai, 2015).

Because budget cycles rely on contexts with information asymmetry, less democratic, and presumably less transparent, settings may experience more dramatic swings than established democracies where constituents are more informed. Applying this logic beyond democracies, studies have shown electoral cycles in emerging democracies in Africa (Block, 2002), mixed regime types in Latin America (Ames, 1987), competitive authoritarian contexts such as Malaysia (Pepinsky, 2007), and in less competitive authoritarian Egypt under Mubarak (Blaydes, 2011). While younger democracies are more prone to cycles than older democracies (Brender & Drazen, 2005; de Haan & Klomp 2013; Shi & Svensson, 2006), competition rather than democracy itself appears to be the driving force of budget cycles. These studies argue that incumbents manipulate economic and fiscal policy to stay in power when their continuation is in question. Fiscal manipulation is an additional tool dictators can use beyond ballot stuffing and electoral fraud, which may be more appealing because of the unique control autocrats have over these policies, spending's signaling mechanism (Wright, 2011), and because of its lower risks (Pepinsky, 2007).

Significantly less work has been done on cycles in non-electoral settings, but many of the necessary conditions for cycles exist even when elections do not occur. At the national level, political budget cycles vary based on uncertainty in leader stability. In the Soviet Union, leaders pursued popular policies that increased public consumption before a succession period and less popular policies after succession had been settled (Bunce, 1980).[1] FDI increased once an autocrat is stable in their position, namely there is an inverse u-shaped relationship between autocrat tenure and FDI, driven, in part, by leader attention to economic activities after control has been established (Bak, 2016).

When local leaders are appointed rather than elected in non-democratic settings, their constituents are above them rather than below. The information asymmetry problem still exists between the constituents—the political party or central regime—and the local leaders. Those higher up the bureaucracy want to identify and promote leaders whose interests best

align with their own. But local leaders hold private information about their capabilities and interests. Local leaders have an incentive to "pander upwards" to signal their alignment with their superiors who control political advancement opportunities (Jensen & Malesky, 2018). As Jensen and Malesky (2018) argue, incentives to provide policy outcomes exist as long as meritocratic mechanisms create political competition among local leaders. For example, In China's semi-meritocratic system, the Communist Party's emphasis on development creates incentives for local leaders to spend on large development policies (O'Brien & Li, 1999), which leads to periods of increased spending when leaders are likely to be promoted (Guo 2009).

Cycles related to leader turnover have also been found in measures of corruption. Wallace (2014) finds greater manipulation of GDP data at the provincial level in years where the head of government or party experienced turnover. Sidorkin and Vorobyev (2018) find that the perception of corruption by local firms increases when governors are near the end of their term. They argue when advancement is likely, governors behave in accordance with central priorities. When advancement is unlikely, however, they shift to extractive practices to line their own pockets.

In summary, information asymmetry and competition are necessary conditions for political budget cycles to occur. Leaders use spending as a means of signaling competency and interest alignment to constituents. This signaling is only necessary when leaders are concerned about losing their position of power. These conditions can be found in democracies, authoritarian contexts, both with and without elections. In contexts without elections, autocratic leaders are beholden to the constituents above them and they must have some belief that their political advancement is determined in part by expanding spending as a means of signaling interest alignment. But what happens when constituents demand conflicting priorities? Do we expect all budget cycles to follow the same timing?

1.1 Disaggregating Local Budget Cycles

Building on Drazen and Eslava's (2010) theory of preference alignment, I argue differently timed budget cycles arise from multiple, conflicting constituency preferences. It is unlikely that constituents have singular preference sets and that all preferences for spending are highly visible with immediate returns. While incumbents can attempt to identify immediately visible policy priorities and spend on them in the pre-election period, it is not optimal to ignore other preferences of the constituency.

I argue that while visibility of spending determines the possibility of political budget cycles, politicians face a balancing act to signal preference alignment with constituents. When faced with competing spending priorities, the timeliness of rewards will determine the timing of spending and thus the shape of the cycle. If a spending category is visible to constituents but characterized by long-term outcomes, political leaders will be incentivized to provide fiscal resources but only when strategically optimal. Spending on categories with long-run benefits incur significant opportunity costs: when resources are limited, expansion of one spending category comes at the cost of another.

While Rogoff (1990) defines visibility as short-run gains, I disaggregate these traits because spending and its outcomes are not the same.[2] Imagine a simplified budget allocation decision for a local politician in a developing context. Constituents demand both economic and social development in the form of government services. The incumbent has one decision: spend on economic development categories with immediate quantifiable returns or social welfare with slow returns. I theorize that if both forms of spending are highly visible and valuable to constituents, spending with short-run gains, namely economic development such as infrastructure investment projects, will occur immediately before political advancement is likely. At this time, the local government benefits from budget signaling as well as measurable outcomes. Spending characterized by long-run gains, on the other hand, will be diverted to non-advancement years because outcomes are not immediately visible. In the lead up to potential political turnover, these long-run investment policies are too risky: constituents

may not value the long-run payoffs, making the opportunity costs high. Instead of spending on the long-run investment, resources are shifted to policies with immediate returns. This difference in benefit timing, I argue, creates inverse cycles between visible spending categories with different time horizons. Short-run spending increases immediately before turnover while long-run spending increases in non-advancement years.

2. Incentives for Political Budget Cycles in China

While in advanced democracies, public opinion, lobby groups, and electoral competition increase government spending for welfare measures (Arvete, 2013; Hecock, 2006; Potrafke, 2010; Schneider, 2010; Stasagave, 2005) and define timing for political budget cycles, these same mechanisms do not have an institutional basis in non-democracies such as China. Instead, previous research argues non-democratic governments provide social goods for political survival and economic competition (Ansell, 2008; Bueno de Mesquita et al., 2003; Kosack, 2009; Oates, 1985; Tiebout, 1956; Wilson, 2008; Xiao & Tsang, 1999).

In China, the central government is incentivized to provide social goods for political survival, and this incentive is translated downward through the Chinese bureaucracy via the management of politicians. The central government controls political advancement through the personnel management system, known as *nomenklatura*, which implements a series of evaluations of appointed officials (Burns, 1989; Landry, 2008). Central government officials set evaluation targets based on national-level policy objectives and these review standards are used to evaluate the performance of politicians lower in the bureaucracy. Local politicians are held accountable to political elites above them who design and carry out evaluations: municipal-level politicians are evaluated by provincial level authorities, who are, in turn, evaluated by central-level authorities.

While annual evaluations include assessments of a politician's virtue, ability, diligence, and achievement (Burns, 1989), the most important measurable element of evaluation is the target responsibility system (TRS) (Landry, 2008; Tsui & Wang, 2004; Zuo, 2015).

The TRS is a set of hard and soft policy targets, such as GDP growth rates or elementary school student retention rates. Party committees also assign weights to the different targets, signaling the relative importance of differing policy objectives. Political advancement is at least in part determined by how well one's locality performs across these measures (Landry, 2008; Li & Zhou, 2005). The party committees who control evaluation targets are, therefore, the constituents of local politicians, and policies identified on performance evaluations are visible signals of constituents' preferences and priorities.

In China, municipal-level politicians are not subject to popular elections, but they do face five-year terms and performance evaluation from communist party institutions above them (Constitution, Article 106). Competition for high-ranked positions is significant, as appointees can come from any equally ranked position or any of the thousands of counties that make up the bureaucratic tier below the municipal level. Political leaders at the municipal level can technically be promoted at any time, creating some uncertainty as to when to optimally time spending. Previous research however, has shown distinct patterns in advancement, such as lower promotion in the first year, higher turnover after the first year, and very little advancement five years and later (Landry, 2008; Li & Zhou, 2005). It is not unreasonable to assume local politicians are aware of these patterns and can strategically time spending even with this uncertainty (Guo, 2009).

Guo (2009) finds that county-level[3] leaders increase overall spending in the years leading up to possible promotion.[4] This finding of an inverse-U shaped curve is consistent with the existing literature on the expansion of government spending prior to potential political turnover. Overall spending is highly visible to party institutions up the bureaucracy—local politicians' constituents—and economic development spending, the largest spending category of the local budget, is likely to have immediate returns.

2.1 Hypotheses

Local budgets can be divided broadly into two types of spending: economic spending and welfare spending. Economic spending includes categories such as large-scale capital investment in infrastructure. This spending is both visible through job creation and infrastructural production and has timely short-run outcomes, as China is known for fast construction and large scale projects. In contrast, welfare spending is generally less visible and has diffuse long-run benefits, such as increased human capital and economic security for vulnerable populations. Because local financing has a budget constraint,[5] local governments face a trade-off between economic spending and welfare spending.

Throughout the 1990s, TRS evaluation targets and relative weights favored economic development (Li & Zhou, 2005), but since the Hu-Wen administration (2002–2012), the concept of "scientific development" led to an increase in welfare targets on the TRS (Zuo, 2015). Given that promotion is tied to TRS evaluations, political leaders have an incentive to pursue these policies: if a leader seeks to advance her political career, it is in her interest to align local policies with central priorities, through meeting specific goals laid out in TRS evaluations.[6] Since the Hu-Wen administration created more welfare-related targets and these targets appeared on evaluations only after reform, thus becoming visible forms of spending, we can isolate the political incentive to provide welfare to the post-reform period, leading to the first hypothesis:

> *H1: Welfare spending will not follow a clear budget cycle before central government reform towards "scientific development" in 2006.*

The management of local politicians through the TRS has two consequences of interest for this analysis. First, because economic power is decentralized in China and local politicians have discretion over local policy implementation, they are incentivized to pursue large scale "promotion projects" that are highly visible and provide quick returns for favorable evaluation results (O'Brien & Li, 1999). Performance evaluations occur annually and across

total local term when being considered for promotion (Burns, 1989). Formally, local politicians in China are limited to two five-year terms,[7] but very few actually complete two terms and most are promoted or shifted laterally in their first term. Promotion can happen at any time, although promotion in a mayor or party secretary's second term is less likely (Li & Zhou, 2005). Guo (2009) argues that politicians, knowing that high levels of spending are unsustainable throughout one's term, act strategically, waiting to push forward large spending programs before promotion is likely, leading to a reverse U-shape curve of overall spending over the course of a local leader's tenure. At the county level, local politicians increase overall spending in their third and fourth tenure years in anticipation of the end of their term locally (Guo, 2009). Like the logic of cycles in democracies, politicians use their available resources to push for large projects to signal preference alignment to constituents that control political advancement when politically opportune.

Second, reform during the Hu-Wen administration shifted central government priorities towards social welfare targets, creating conflicting objectives for local politicians. Spending on one policy objective means fewer resources available for other objectives. Imagine the simplified decision discussed above by a local politician who has one choice: how much of the local budget to allocate to quick pay-off economic spending categories and how much to allocate to longer-term welfare. Assuming local politicians are office seeking, a local mayor attempts to maximize her probability of promotion. Probability of promotion is a function of tenure year, as leaders in their first year or after their fifth year are unlikely to be promoted; economic performance; welfare performance; and personal traits such as relationships and abilities.[8] The decision of the mayor is how much of the limited local budget to spend on economic versus welfare categories each year.

Traditional political budget cycle logic would theorize that, knowing a significant amount of political advancement occurs in the second half of the first term, local politicians will spend more to increase their TRS scores in the lead up to possible promotion. Even though exact term length is not known with certainty, it is reasonable to assume lead-

ers know promotion is less likely in the first year of tenure and after the first term (after year five) (Guo, 2009; Li & Zhou, 2005), suggesting short term gains spending are most strategic after one's second year in office and before year five. This pattern makes sense in traditionally valued economic fields (infrastructure investment, etc.) which have fast returns allowing the local politician to benefit both from the financial measure of spending and also visible outcomes in local GDP and employment, but does not hold for non-economic targets, even after reform. First, non-economic targets, such as welfare, are much less of a guarantee than economic growth; they are on many TRS evaluations but are still weighted less than economic targets (Zuo, 2015). While welfare provision is encouraged by the center, economic development is demanded, making welfare a secondary policy priority. Second, because budgets are finite, a focus on welfare spending necessitates a diversion of funds that could be spent on more immediate, safer investments suggesting high opportunity costs.

Local politicians, however, cannot ignore the softer targets with long-run gains, especially following a significant central government initiative for welfare development, as doing so would mean ignoring clearly identified constituent priorities. In order to balance the desire to spend on economic development but to also signal an alignment with central policy initiatives, I hypothesize local politicians expand welfare when it is least costly in terms of opportunity costs, namely when first in office and at the end of tenure when promotion is less likely. This year-based spending allocation allows local politicians to signal alignment with central policies once they are placed in a new position, but then allows them to shift resources to more traditional financial priorities with immediate payoffs later when the opportunity costs of welfare spending increases, thus creating inverse cycles of economic and welfare categories.

> *H2: After reform, local welfare spending will have a U-shaped relationship with local politician tenure, with the highest spending at the beginning and end of a politician term.*

Finally, there are two local politicians of interest in the Chinese case. Each locality has

both a head of government (mayor) and head of party (party secretary). While both are considered local executives, the party secretary is normally considered more powerful than the mayor.[9] While the work load balance between the mayor and secretary is not known, mayors are generally responsible for day-to-day policy implementation whereas secretaries are responsible for ideological oversight (Chan & Gao, 2012; Edin, 2003). Additionally, at the provincial level, informal connections such as factional ties, play a larger role in party secretaries promotion than governor promotion, meaning economic targets may be more incentivizing for head of government rather than head of party since there are more, non-economically related evaluation measures (Choi, 2012). For these reasons, mayors are more likely to be sensitive to specific policy incentives laid out by the center.

H3: Mayor tenure will create larger budget cycles than will party secretary tenure.

I test these hypotheses by analyzing municipal party secretaries and mayors' patterns of spending on education, a spending category with long-run benefits and variation in visibility over time.

3. Education Spending Cycles

The key concern of this analysis is the long-run nature of welfare spending. While welfare includes education, healthcare, and social security, education spending exemplifies the importance of long-run benefits and will act as the primary measure of welfare spending in this analysis. Spending on other welfare categories such as healthcare can provide more immediate gains through economic productivity in the labor force, such as reduced sick days or injury-related loss in human capital,[10] making education a more ideal test of the hypotheses about disaggregated budget cycles. Investment in education can provide some immediate benefits through the hiring of teachers (job creation) and building of schools,[11] but the real benefits come years later with an educated labor force with higher human capital. Additionally, the measure of education spending here is local spending, which primarily goes to wages rather than construction.

Moreover, education is the largest portion of social welfare spending at the local level in China, even after significant reforms to social security and healthcare. Education spending alone is a significant proportion of local expenditures. Between 1995 and 2012, on average more than 20 percent of local budget expenditures went to education.[12] Understanding the determinants of education spending provides crucial insight on a significant portion of total welfare spending. As a robustness check, I also run models on total social spending and provide an extension for the cases of health and social security spending.

There are two necessary conditions for education spending to be influenced by budget cycles. First, local politicians must have significant discretion over spending. Second, the central government must tie education targets to promotion, providing the political incentives to manipulate spending in a politically motivated way.

Education financing during the Mao period was dictated by central authorities under the "complete collection and complete distribution" system, creating a standard level of equality across locations (Tsang, 1996; Tsang & Ding, 2005). The central government's decentralization of government financing in 1982 gave local governments responsibility over tax collection efforts and expenditure levels, within a set guideline, enabling local control and creating local variation in education provision (Tsui & Wang, 2004). Decentralization successfully moved education financing all the way down the Chinese bureaucracy: during the 1990s, the township level bore eighty percent of the burden of compulsory education financing (Urban Investigation Team of the National Bureau of Statistics 2005). The capacity to provide education funding was largely determined by economic development level.[13]

During the 1990s, with greater decentralized control, local politicians were incentivized through promotion criteria to increase expenditures on programs that would increase revenue and economic growth, which did not include education programs (Tsui, 1997). Spending on education was a long-term target prioritized by the center, but not supported institutionally by the tying of promotion criteria with education targets. Instead, during the 1980s, and 1990s, market reforms and increases to both local GDP and revenue became the tickets for

political advancement leaving few incentives for bearing the short-term costs of education despite the prospect of long-term gains.

Faced with financial shortfalls, local school systems began extracting significant fees from students.[14] Recognizing the burden these fees placed on students and the geographic inequality they deepened, the central government sought to reduce excessive fee burden for rural households through a series of fee reforms and recentralization of education financing.[15] In 2001, the State Council re-centralized education funding from the township level to the county level (The Decision on the Reform and Development of Basic Education 2001). According to this regulation, provincial governments provided support for operating schools, but municipal governments remained responsible for raising needed money through tuition or other measures for teacher salaries and other student related costs. Thus even after various reforms to education financing, local politicians retained discretion over education spending locally, meeting the first requirement for local budget cycles to exist.

The watershed reform to education financing came in 2006 with the passing of the Compulsory Education Law, which stipulated free compulsory education. Rolled out first in western provinces in 2006, free compulsory education expanded to the rest of the country by 2008 (Gong & Tsang, 2011). The central/local balance in financing responsibilities is dependent on region: the central government provides funding for eighty percent of miscellaneous fees and subsidies for public funds in the western provinces and fifty percent of miscellaneous fees in central provinces. Local governments are required to provide the remaining financing with municipal and provincial governments required to set up a special fund to cover what the central government does not (Compulsory Education Law 2006, Article 47; Yang, 2008). Overall, the new reforms increased total public spending on rural education by 223.5 billion yuan, or approximately 36.6 billion USD (Yang, 2008) and increased education spending across all levels of government (Figure 1). Given these pressures, however, education funding remains varied both across and within localities: provinces develop their own standards for funding, with most of these variations maintaining a heavy burden on the lowest levels

of government (Cheng, 2008).

[Figure 1 about here]

This new reform had two significant effects on local governments' provision of and incentives for education funding. First, while the central government stepped in to increase support for the expanded burden of education funding, not all added expenses were covered and local politicians gained greater discretion over how much education spending to provide (Sheng, 2005; Tao, 2001).[16] Second, with the magnitude of its reform, the central government signaled to local governments that education reform was a policy priority, increasing local attention to the policy issue. After reform, education targets began appearing on TRS evaluations across the country, both in the western regions where education reform was initially targeted but also in eastern developed regions (Yang, 2008; Zuo, 2015), thus making education spending visible to the party constituency and creating the political incentive to spend on education for advancement.

4. Methods and Data

Central-level reforms established incentives for local politicians to provide education spending by linking promotion to education policy targets. The addition of these targets in combination with existing economic targets incentivized politicians to spend on welfare when the opportunity costs of doing so were the lowest—at the beginning of tenure and at the end when promotion is least likely.

To test the predicted U-shaped relationship between tenure and education spending before and after national level reform, this analysis takes advantage of an unbalanced panel dataset of 333 Chinese municipalities from 1994 to 2012 to capture the Hu-Wen regime (2002-2012) and the fiscally comparable prior regime of Jiang Zemin before it.[17] Given the significant variation in education spending below the provincial level (Kipnis & Li, 2010), and given that municipalities are responsible for financing a significant amount of the education

budget, the municipal government, one level below the provincial government, will provide a finer look at variation in education spending across localities than national or provincial levels.

While a significant amount of the education spending burden falls on county-level governments, one level below the municipalities, the municipal government is responsible for overseeing most counties and are required to maintain accounts to fill in for county-level education budget shortfalls (Compulsory Education Law 2006). As municipal leaders are county leaders' political superiors and have influence over the TRS evaluations for the counties below them, municipal leaders have final say over both the municipal budget and the county budgets. Municipal spending here includes all of the counties under a given municipality as well as municipal government spending itself, as most reported government expenditure in China are aggregate measures.[18]

4.1 Dependent Variable

The two dependent variables for this analysis, spending per capita and spending per total expenditures,[19] encompass two different aspects of education spending. Education spending per capita represents an estimate of how many resources are available to each student and is an absolute measure of provision. Greater per capita spending signals higher levels of overall welfare provision, but does not measure shifts in government priorities. Spending as a percent of total local government expenditures highlights the priorities of government spending: a larger share of total spending suggests higher priorities. Increases in education as a proportion of expenditures signals a shift to education services from other policy areas. Finding budget cycles in both per expenditures and per capita measures will provide evidence that a shift to education is not simply the residual from economic spending.[20] Figure 1 depicts average spending on education across cities from 1993 to 2012. While the trend is clear, the vertical lines depicting variance across cities also grow over time, suggesting significant sub-national variation.

Education reforms at the national level and subsequent changes to the TRS could affect both education spending per capita and per total expenditures. Previous research shows that education indicators have been included on some TRS evaluations post-2006 for both western and eastern municipalities (Yang, 2008; Zuo, 2015). Even if specific education categories are not on every TRS evaluation, local politicians may still choose to provide education spending because politically minded leaders want to align their local policies with central priorities. If local politicians wish to signal to the central government that they are prioritizing central initiatives over other, traditionally economic, interests, local politicians can increase the proportion of total expenditures on education aligning local policy with central policy.

4.2 Independent Variables

The key independent variables in each model are local leader tenure. For each municipality, tenure year of both mayor and party secretary were gathered from online bibliographic sources.[21] The average tenure for mayors in this time period was 3.5 years and the average tenure for party secretaries was 3.9 years. Party secretaries have, on average, slightly longer tenure than mayors but the majority of both mayors and party secretaries do not serve a second term in office. Mayors and party secretaries are modeled separately because of high collinearity.

There are three main control variables likely to impact the outcome of education spending. Economic development is measured by the log gross municipal product (GMP) of the given municipality. It is assumed that for most measures of the dependent variable, increases in GMP will increase resources available for education spending. The second control variable is size of local government. This variable is measured as the logged sum of government revenues and expenditures. Revenue levels are a significant determinant of a locality's ability to provide education spending while expenditures controls for total level of government spending in the locality. Finally, the size of the school aged population increases local demand for

education funding. The variable population under 14 proxies for school aged population.[22] The larger the school-aged population is, the greater demand for education funding. Fixed effects control for all time invariant determinants of spending.

4.3 Models

Panel data provides the means of measuring welfare expenditures as they vary across municipal units. I implement a series of fixed effects models on differenced dependent variables and include standard errors robust to an AR(1) process. Each of the control variables is differenced, as this analysis assumes that budget targets can be changed quickly and easily, with short term effects of the key control variables the most important time pattern. Additionally, while some localities have very minimal spending, a differenced model removes concerns about needing to provide a minimum level of spending, which would imply a left censored distribution. Because tenure is expected to have a non-linear relationship with education spending, a square term of tenure is included. The final model is

$$\Delta Y = \beta_{0i}(Tenure)_{it} + \beta_2(Tenure^2)_{it} + \alpha\Delta X_{it} + FE + \epsilon_{it}$$

Given that random effects create greater bias in unbalanced panels (Wooldridge, 2002), and Hausman tests (Hausman, 1978) are inconsistent across models, I favor the stricter fixed effects model for the panel data.

To test for serial correlation, I implement the Wooldridge (2002) test for serial correlation (Drukker, 2003), which is present in all models. To avoid potential bias from a lagged dependent variable (Nickell, 1981; Wilson & Butler, 2007) especially in the shorter models (Beck & Katz, 1995) performed on the post-reform sub-sample 2007–2012, I include an AR(1) correction for the standard errors. An error analysis (not shown) suggests this combined with the differenced model adequately takes care of the remaining autocorrelation.

5. Results

The first question is if aggregate social spending and non-social spending hold the same or different budget cycles at the municipal level. Table 1 presents aggregate spending on social spending (columns 1 and 2) and non-social spending (columns 3 and 4) for spending per total expenditures. The inverse cycles in the two aggregate categories suggests these types of spending do act as tradeoffs. Social spending has an inverse-U relationship with leader tenure, given the positive coefficient on the square term, and non-social spending has a U-shaped relationship with leader tenure, marked by the negative coefficient on the square term.[23] During the first term, spending on social categories peaks in year one, with new leaders expanding social spending when first in office, and hits a low point during the third year, when spending on social categories is not expanded again until the fourth year of tenure. This holds for both mayor and party secretary, with party secretary tenure having a smaller impact than mayor tenure. But looking at aggregate categories as a proportion of total spending masks the visibility of spending. Additionally, such analysis cannot determine if increases in social spending is the residual from lower spending elsewhere or strategic spending on the part of local politicians. To accomplish this, I look at education spending specifically.

[Table 1 about here]

If we look at the full sample, leader tenure has minimal impact on education provision (Table 2). For both measures of the dependent variable, per capita education spending and education expenditures as a proportion of total government expenditure, the key variables are signed opposite from what we expect from the inverse-U shaped budget cycle where spending is increased in the lead up to potential political turnover: the linear term is negatively signed while the square term is positive, indicating a righted U-shape. Mayor and secretary coefficients are consistent, although only mayor tenure and mayor tenure squared for education per capita are statistically significant. Based on R^2 values, the models fit

education per capita better than education per expenditures and, given the large within R^2 relative to the between R^2 values for per capita models, significant variation across cities remains unexplained. As expected, spending has a righted-U shape relationship with tenure, suggesting education spending follows a different political budget cycle than overall expenditures found in Guo (2009).

[Table 2 about here]

An increase in the population under the age of 14 increases the provision of education spending, as expected. Increases in economic development (GMP) increases the proportion of the budget spent on education but not spending per capita. Finally, year-on increases in size of government increase per-capita education expenditure while decreasing the amount of total budget spent on education provision, suggesting that, as the government grows in size, education provision grows absolutely but not relatively.

Knowing that education became a national policy priority after the 2006 reform, politician tenure should have a larger impact after 2006 when education became visible to constituents in the party. To test this, I split the sample into pre-reform (1994–2006) and post-reform (2007–2012) sub-samples to evaluate if leader tenure has a different impact before and after reform, namely before and after education spending was tied to political advancement.[24] Split sample results presented in Table 3 support the first two hypotheses on the impact of reform. Prior to reform, there is no statistically significant relationship between leader tenure and education provision in any of the models. After reform, however, mayor tenure has a significant, non-linear relationship with both education per capita and education expenditures (columns 2 and 6). Like the full sample model, the linear term is negative and quite large while the non-linear term is positive, suggesting a U-shaped relationship between tenure and education provision.

[Table 3 about here]

Again, secretary models are signed consistently with mayor models but are not statistically-significant, supporting hypothesis three. The smaller effect of party secretaries' tenure on education provision may be the result of division of labor: even if the party secretary has final say over the local budget, mayors generally have a larger role in day-to-day government service management while party secretaries are responsible for overall direction. This result is also consistent with the growing evidence that performance targets have a larger impact on government leader promotion than party leader promotion. Factional and other non-performance based measures play a larger role in secretary promotion than for head of government (Choi, 2012), suggesting while TRS evaluations affect both, the incentive mechanism may be weaker for secretaries than mayors.

To show the provision of welfare across a mayor's first term in office, I present predictive margins for mayor tenure year of the first five years in office before and after reform for education per capita and spending as a proportion of total expenditures (Figure 2). First, the side by side comparisons of pre-reform (column 1) and post-reform tenure (column 2) predictive margins shows, as expected, that central-level reform does initiate increases in sub-national spending, which is especially noticeable in the per capita measure of the dependent variable. The negative predictive margins for differenced education spending as a percent of total expenditures, while still showing an increase after reform, highlight that, while increased, year-on growth of education as a proportion of the budget is still minimal, with education provision gaining importance in the local budget in the first and fifth years.

[Figure 2 about here]

Second, for both dependent variables, pre-reform spending does not follow an obvious budget cycle. Post-reform, both measures of the dependent variable show the non-linear, U-shaped relationship between tenure and expenditures. For both measures of the dependent variable, education spending minimizes around year three of mayor tenure while, of the first five years in office, education provision is the highest in the first and fifth years. Because the dependent variable measures are differenced, the increase in year one reflects the local

leader increasing spending over the previous administration. This is consistent with the understanding that education spending has opportunity costs: money spent on education cannot be spent on budget items that potentially have more immediate economic gains useful in the run up to political promotion. Thus, local politicians, when competing for promotion, shift resources away from long term investments, hedging their bets on economic growth still being the main determinant of promotion.

One could argue that mayors are not likely to spend on education spending in the fifth year and later, leading to a contradiction in the increase in spending late in the first term. But spending after one's likelihood of promotion decreases still falls in line with the opportunity-cost explanation of budget cycles. Education spending in the fifth year of tenure still comes at a lower opportunity cost than in the third and fourth year. Even though a mayors' chance of promotion is lower does not change the incentive to signal interest compatibility and the relative opportunity costs of spending.

As a robustness check, I also run the models including two indicator variables for mayor's last year in office and end of five year term. If the model holds, mayor's last year in office should be correlated with lower education spending while end of term should be correlated with higher spending. Results presented in Table 4 show largely confirming evidence. During the pre-reform period, there is no statistically significant correlation between a mayor's last year in office or the end of term for per capita spending. Spending as a proportion of total expenditure is positively correlated with a leader's last year in the pre-reform period. During the reform period when we expect budget cycles, however, last year in office brings a statistically significant decrease in education spending per capita while end of term is positively correlated with spending. The results hold for the per total expenditure measure, although the last year in office is not statistically significant ($p>0.19$). Again, the strong trend in the per capita model provides evidence that cycles are not just a residual of industrial spending.

[Table 4 about here]

5.1 Regional Variation

Education spending, like many policies in China, is regionally determined. Besides the variation in policy roll-out, education plays a different role in China's various regions. Western provinces in China are generally under-developed but considered strategic to the central government because of international borders and because the vast majority of China's ethnic minorities live in these areas. Given this context, we might expect education provision to vary by region after reform.

Table 5 shows the second sub-sample analysis on the post-reform sample (2007–2012) for education spending per capita. We see with the split sample mayor tenure is significant and consistent across regions, with a more dynamic cycle in western provinces.[25] Secretary tenure now becomes significant in western provinces. While total education spending in western provinces is more centralized, with the central government providing more resources not counted in this dataset, the measure used here is the locally-controlled budget. One possible explanation for the importance of secretary tenure impacting education provision in western provinces and not others is that education in western, minority-led areas is an ideological priority, with patriotic education that supports one cohesive China especially important (Zhang & Zhao, 2006; Zhao, 1998). Education reform began with Western provinces, highlighting the importance of this policy for the region. This suggests there is variation in policy variation, with education spending more visible in western provinces. The overall stronger cycle in western provinces may also be linked with higher levels of poverty in these areas, meaning the central government's emphasis on reform should be the strongest in these regions.

[Table 5 about here]

5.2 Extension: Social Security and Health

The above analysis focuses on education spending because it provides the best example of spending that became visible and is, in most cases, detached from "quick returns" industrial

spending. There are two other cases of social spending where we might see budget cycles similar to those found in education spending, but where contextual details make them less ideal cases: social security and health.

Social security spending in China, broadly called "social safety net" spending, was included in Hu Jintao's "scientific development" plan, meaning it was signaled as a key area of interest for the central Party. Similar to education spending, social security has long-run gains related to poverty relieve that do not interact with observable short-run economic spending. Unlike education, however, indicators on the social safety net did not enjoy a prolonged privileged status on the TRS system. According to the little data we have on the TRS system, social safety net indicators were only highlighted as national categories for inclusion in the TRS system from 2006 to 2008. After 2008, they were removed from the national plan (Zuo, 2015). While social security is detached from economic spending, making it an ideal candidate for inverse budget cycles, the short period in which it was likely on TRS evaluations limits our ability to test the inverse cycles hypotheses. With only two years of data, spending is not expected to follow a clear cycle.

Healthcare spending suffers two importance contextual caveats important for this analysis. First, healthcare spending includes industrial spending more closely tied to GDP growth than education spending, as it is used for construction of new hospitals, infrastructure, and drug manufacturing. While school construction is declining, healthcare facility construction is increasing, with the number of hospitals going from 16,318 in 2000 to 23,170 in 2012 (China Statistical Yearbook, 2013). Service provision is included, but it is impossible to separate out what proportion of healthcare spending goes to services versus more immediate-gain projects. Second, while healthcare is included in the earlier reforms for "scientific development," reform to the healthcare system and its inclusion on TRS evaluations did not occur until 2009, limiting the time frame for this analysis to three years.With the shorter time frame and mix of long and short run spending, health spending is not expected to follow a clear cycle or may peak earlier than other social spending categories.

With these caveats in mind, Figure 3 presents predictive margins by mayor tenure the pre- and post-reform for these two spending categories per total expenditures, with reform defined by the years each were likely on TRS evaluations and thus visible. During the pre-reform period for both types of spending, we see no statistical difference across mayor tenure. In the post-reform periods, there is a significant increase of social security spending in years four and five. Health spending also deviates in year four, although it holds steady in year five at the end of tenure whereas both social security and education spending continue to extend. While not as clear of cycles as education spending, these two other welfare categories provide some evidence that mayors expand spending at the end of their term rather than in the middle when promotion is more likely.

[Figure 3 about here]

5.3 Robustness Checks and Limitations

I also re-run the models with the dependent variable measured as deviation from period average. The signs of the key independent variables remain unchanged, although the non-linear trend in education spending per total expenditure is not statistically significant. The coefficients are available in the appendix.

For an additional robustness check beyond education spending, I run the models on social security spending per capita. The inverse-U shaped cycle holds after reform (post-2005) for social security (table available in the appendix), although the models suffer significant omitted variable bias and subsequent low R-squared values.

The proportion of total school aged children is a constructed measure, given that the age break downs of cities is not regularly available at the municipal level. To evaluate the quality of this measure, I calculated the size of the elementary school aged population two ways, first depending solely on census data for 2000, 2005, and 2010 assuming a linear relationship between the time points, then using birth cohorts and national level child mortality rates calculated by the UN to estimate the young population each year. The two measures had a

high correlation ($\rho = 0.94$) and when substituted in for the models, no significant differences results.

Measuring size of government as the sum of expenditures and revenue might artificially inflate the model since the dependent variable is a measure of expenditures. To ensure this does not unduly influence the model, I ran all models substituting revenue for the aggregate size of government measure. All of the main findings in the paper remain consistent in both sign and significance. The models on education spending per total expenditures see a significant increase in the R^2 values with the size of government measure, but these models suffer significant omitted variable bias without expenditures included in the analysis and the inclusion of the total expenditure data as an independent variable is less of a concern in these models. For these reasons, size of government was selected as the most appropriate measure for the main reported models.[26]

It is possible that one set of municipalities drives the results. To evaluate this, I ran all of the models systematically dropping one city at a time to see if any one panel was driving results. The results presented above were overwhelmingly consistent across all of the models.

Finally, missing data is also a concern for panel models, especially as it un-balances the panel further. Approximately 62 percent of missing data occur for the independent variables of leader tenure before 1998. Less than 4 percent of missing data occurs in the post-reform panels. As a check on the robustness of the overall panel form in the full sample models and the null findings in the pre-reform models, I re-run all models with the sample restricted to 1998–2012. The results are all consistent with the results presented here.

A major concern for the budget cycle literature is the issue of advancement endogeneity (Dubois 2016). When leaders choose the timing of political advancement, such as setting elections in parliamentary settings, advancement becomes endogenous to spending (Lächler 1982). Political leaders push for elections when they expand funding, increasing their likelihood of maintaining political power. In the Chinese context, local leaders themselves cannot control the timing of advancement, meaning there is little concern of endogenous promotion

being driven from below. The timing of political turn over is primarily driven by openings higher up in the bureaucracy, driven by factors external to the city rather than internal factors of the local context. A mayor's performance and tenure make them eligible for the openings, but do not determine the timing of promotion. Qualitative evidence from the Organization Department would provide clarity, such information is not publicly available.

One important limitation of this literature is the reliance on data provided by the Chinese state. As other studies have shown, administrative data are subject to political manipulation both generally and in the lead up to political turnover (Wallace, 2014). Because welfare spending categories do not have easily comparable objective measures outside of state statistics, it is difficult to ensure that increased spending reflected in records is actually expanded spending or statistical manipulation. While this is a concern for the outcomes of spending, the identified budget cycles are still substantively interesting, even if they are driven by corrupt practices. The patterns shown here show variation in political incentives, regardless of the validity of the underlying data.

6. Discussion and Conclusion

When facing resource scarcity, local politicians act strategically, dividing resources among different policy objectives based on the timing of benefits. Incentivized to show preference alignment with constituents, incumbents spend on policy objectives with long-term gains when the opportunity costs of doing so are the lowest, namely when political advancement is less likely. By doing so, they can signal preference alignment across often conflicting policy objectives. This paper contributes directly to the literature on political budget cycles in developing contexts without competitive elections by disaggregating the varying forms of local budget cycles based on spending type. Not only do local politicians in China have political incentives to provide goods through spending, but they also act strategically when faced with conflicting incentives with budget constraints, creating nearly opposite spending cycles based on economic and non-economic financing, especially for mayors. This research

highlights an important political determinant of social welfare spending in non-democracies, an often under-theorized element of non-democratic welfare provision.

Political budget cycles have important consequences for developmental processes, regardless of regime type. Evidence presented above suggests that regimes interested in social development can incentivize spending on welfare categories, but it can be a double-edged sword. Expanding welfare categories increases human capital and can reduce inequality, but the temporal and potentially superficial expansion undermines these efforts.

One important implication of this research is the need to understand the consequences of cycle-based spending on educational outcomes. Education remains one of the most complained about sectors in post-reform China (Yang, 2008). Spending campaigns characterized by brief influxes of capital without prolonged political support are unlikely to fundamentally alter quality education or regional inequality in China. Further research should evaluate the impact these momentary cash infusions have on quality of education outputs, including enrollment and academic achievement. The strong and consistent findings across spending per capita and weaker explanatory power of the per expenditure models suggest education provision is influenced by political cycles while the exact role of education spending as a budget priority may be part of a larger spending push in the bookend years of a local leader's tenure.

More broadly, greater research is needed on disaggregating spending categories in contextually similar settings to validate the linking of political incentives to the timing of government spending.

7. Notes

[1]Roeder (1985) argues counter to this succession pattern. Instead he argues that internal power consolidation drove cycles rather than succession, with cycles determined by heightened competition.

[2]Spending can be visible either through budgetary oversight or resultant outcomes. This

is not fully contradictory to Rogoff's (1990) models but a refinement disaggregating types of visibility.

[3]The Chinese bureaucracy has four levels of nested sub-national governments: provinces, municipalities, counties, and townships.

[4]Other promotion-related criteria also follow political cycles, such as coal mine fatalities (Nie et al., 2013).

[5]While budget constraints in China are soft rather than hard, local competition, factor mobility, and centralizing monetary policies increase commitment devices to harden budgets (Montinola, Qian, & Weingast, 1995; Qian & Roland, 1998).

[6]Specific TRS evaluations are not publicly available. For a wide ranging analysis of TRS evaluation criteria before and after the Hu-Wen administration, see Zuo (2015).

[7]In the dataset for this analysis, only ten mayors and fourteen party secretaries stay in their position for ten or more years.

[8]Choi (2012) argues that even well connected leaders must maintain some economic performance for promotion to occur.

[9]A move from a mayoral position to party secretary is seen as a promotion while the reverse is seen as a demotion all else equal (Landry, 2008).

[10]Additionally, health reform occurred in 2009, making the post-reform period too short to test for budget cycle patterns in this analysis.

[11]The building of schools for infrastructure development is also not likely as the number of schools consistently declines from 1994 to 2012. Data from regional yearbooks.

[12]Data from fiscal yearbooks.

[13]This problem was exacerbated by the 1994 tax sharing reform, where the central government re-centralized various forms of taxation, leaving local governments with significantly lower revenues (Gong & Tsang, 2011).

[14]While the 1985 compulsory education law mandated nine years of compulsory education, it did not stipulate the right to free education. Fees often included admission fees, textbook

fees, lodging fees for students who boarded, and school selection fees. Students can opt to go to a school better than the one located in their neighborhood or village if parents pay a school selection fee. This fee structure is currently being phased out in many urban centers in China, which also puts a significant financial strain on the education system, but was not part of the early and mid-2000 reforms (Fan, 2008).

[15]Including the 2000 "single fee policy," which allowed local governments to charge only one legal fee for schooling in nationally identified poor counties. Reforms targeting inappropriate expropriations by the local state challenged local financing for educational services and limited the amount of rents local politicians could extract from their populations and the 2005 with the New Mechanism for Financing Rural Compulsory Education, which included the "two exemptions and one subsidy" policy, which exempted poor families from textbook fees and tuition and provided subsidies for lodging fees, but this was a preliminary step leading up the 2006 law. Multiple overlapping fees are common place in China's education system. For example, a 2002 audit one year after the reform was implemented, found that elementary schools charged an estimated 2.32 billion yuan (380 million USD) in illegal fees (Ren, 2008).

[16]Teachers' salaries are still the responsibility of local governments, increasing financial burden on local governments (Cheng, 2008; Yang, 2008).

[17]Due to fiscal reform in 1994, local finance data before then is not comparable to the post-tax reform era.

[18]County-level spending is also not readily available for the reform era. Additionally, inter-city variation dwarfs intra-city variation. In 2005, the average variance in education spending per capita across counties within cities in Guangdong province was 14,465 RMB while the variance across cities in Guangdong was 343,190 RMB, more than 20 times greater.

[19]The accuracy of data is always a concern when using Chinese official data sources. I do expect that figures are biased, but I assume that the bias is in one general direction. Previous research has found that spending on education is biased downward for most localities: local

governments may choose to hide some revenue sources funding education to prevent greater extraction from higher levels of government (Kipnis & Li, 2010).

[20]If budget cycles only exist in the percent of total expenditures, this would suggest positive cycles in education only existed because of the retreat from economic spending. Finding a cycle in per capita spending suggests active provision, rather than residual provision.

[21]Data for 1994–2000 were provided by Landry (2008), while data from 2001–2012 were collected by the author. See the appendix for sources.

[22]Exact population breakdown by age is not available. Population under 14 over-estimates the total compulsory school-aged population but is a highly correlated measure.

[23]Because the dependent variable is a difference term, negative baselines are expected. This means the bottom of the curve is a positive number, as is found in all of the models with non-linear, inverse-U shaped trends.

[24]The result of a Chow test suggest the two time periods of the sample (1994-2006 and 2007–2012), are two substantially different time periods, justifying the split sample.

[25]Western municipalities are defined by those in the provinces of Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang. A Chow test justifies the separation of western provinces from eastern and central provinces, but there is no statistical difference in coefficients between eastern and central provinces.

[26]Intergovernmental transfers would also be a possible measure of size of government, but data on transfers at the municipal level are not readily available for the full reform period. Additionally, while size of government does correlate with GMP, it better measures resources available to the government.

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9. Tables

Table 1: Per expenditure

	Social Spending		Non Social Spending	
	(1)	(2)	(3)	(4)
Mayor Tenure	-1.629***		0.016***	
	(0.319)		(0.003)	
Mayor Tenure^2	0.174***		-0.002***	
	(0.045)		(0.0004)	
Sec. Tenure		-0.821***		0.008***
		(0.295)		(0.003)
Sec. Tenure^2		0.104***		-0.001***
		(0.038)		(0.0003)
Prop. Pop <14	47.02**	46.11**	-0.470**	-0.461**
	(19.79)	(19.94)	(0.198)	(0.199)
Log GMP	3.670***	3.800***	-0.0367***	-0.0380***
	(1.305)	(1.310)	(0.0131)	(0.0131)
Log Size of Gov't	-14.56***	-14.19***	0.146***	0.142***
	(1.390)	(1.396)	(0.0139)	(0.0140)
Constant	7.267***	5.689***	-0.0727***	-0.0569***
	(0.724)	(0.713)	(0.00724)	(0.00713)
Observations	2,280	2,294	2,280	2,294
Number of municipalities	332	332	332	332

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

Table 2: Impact of Leader Tenure on Education Spending per capita and per Expenditures, 1994-2012

	Education Spending per Capita		Education Spending per Exp.	
	(1)	(2)	(3)	(4)
Mayor Tenure	-13.79***		-0.133	
	(4.282)		(0.0849)	
Mayor Tenure^2	2.204***		0.0146	
	(0.583)		(0.0111)	
Sec. Tenure		-4.518		-0.0396
		(4.344)		(0.0854)
Sec. Tenure^2		0.660		0.0103
		(0.577)		(0.0109)
Prop. Pop < 14	236.0***	267.4***	0.371**	0.302*
	(6.031)	(7.150)	(0.145)	(0.173)
Log GMP	0.707	8.246	2.251***	2.411***
	(6.470)	(6.129)	(0.149)	(0.148)
Log Size of Gov't	209.8***	202.7***	-6.570***	-6.392***
	(13.64)	(13.27)	(0.300)	(0.295)
Constant	69.13***	59.92***	0.614***	0.344**
	(5.248)	(5.265)	(0.145)	(0.149)
R^2 Within	0.30	0.27	0.12	0.13
Between	0.18	0.14	0.08	0.04
Overall	0.24	0.21	0.12	0.12
Observations	5,227	5,292	5,227	5,292
No. of Municipalities	333	333	333	333

Dependent variables and control variables are differenced.
All models include municipal fixed effects.
Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Impact of Mayor and Secretary funding before and after the education reform of 2006, split samples between 1994-2006 (pre-reform), 2007-2012 (post-reform)

	Education Spending Per Capita				Education Spending per Total Expenditure			
	Pre-Reform	Post-Reform	Pre-Reform	Post-Reform	Pre-Reform	Post-Reform	Pre-Reform	Post-Reform
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mayor Tenure	0.756	-87.18***			0.0990	-0.794***		
	(1.984)	(13.66)			(0.0943)	(0.202)		
Mayor Tenure^2	0.0787	14.18***			-0.00532	0.106***		
	(0.251)	(2.063)			(0.0121)	(0.0300)		
Sec. Tenure			-0.522	-18.10			0.0938	-0.191
			(1.981)	(12.14)			(0.0977)	(0.178)
Sec. Tenure^2			0.0916	2.778*			-0.00398	0.0282
			(0.250)	(1.653)			(0.0125)	(0.0237)
Prop. Pop < 14	239.6***	8,957***	266.6***	8,966***	0.192	-16.72*	0.122	-16.54*
	(3.056)	(585.7)	(3.401)	(589.5)	(0.126)	(9.958)	(0.151)	(10.01)
Log GMP	-5.040	24.82	-0.597	20.34	1.895***	0.753	2.056***	0.772
	(3.200)	(42.16)	(3.072)	(42.73)	(0.136)	(0.667)	(0.136)	(0.669)
Log Size of Gov't	125.9***	186.5***	119.4***	193.5***	-5.028***	-12.35***	-4.781***	-12.26***
	(8.556)	(31.26)	(7.907)	(31.50)	(0.376)	(0.523)	(0.366)	(0.524)
Constant	0.878	290.5***	4.901	214.5***	-0.700***	3.688***	-0.761***	2.783***
	(3.913)	(19.37)	(3.804)	(18.48)	(0.156)	(0.372)	(0.164)	(0.361)
R^2 Within	0.72	0.20	0.72	0.17	0.12	0.30	0.12	0.30
Between	0.26	0.03	0.15	0.00	0.13	0.14	0.09	0.14
Overall	0.72	0.14	0.70	0.09	0.11	0.29	0.12	0.28
Observations	3,245	1,649	3,306	1,653	3,245	1,649	3,306	1,653
No. of Municipalities	332	333	332	333	332	333	332	333

All models include municipal fixed effects.
Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Alternative Measure of Tenure: Mayor last year in office and end-of-term

	Per Capita		Per Expenditure	
	Pre reform	Post Reform	Pre reform	Post Reform
	(1)	(2)	(3)	(4)
Last Year in Office	3.617	-33.348**	0.456***	-0.317
	(2.732)	(14.563)	(0.112)	(0.242)
End of Term	3.469	89.449***	0.157	0.965***
	(4.954)	(19.575)	(0.214)	(0.312)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	3,485	1,661	3,485	1,661
Number of municipalities	332	333	332	333

All dependent and control variables are differenced.
All models include municipal fixed effects.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

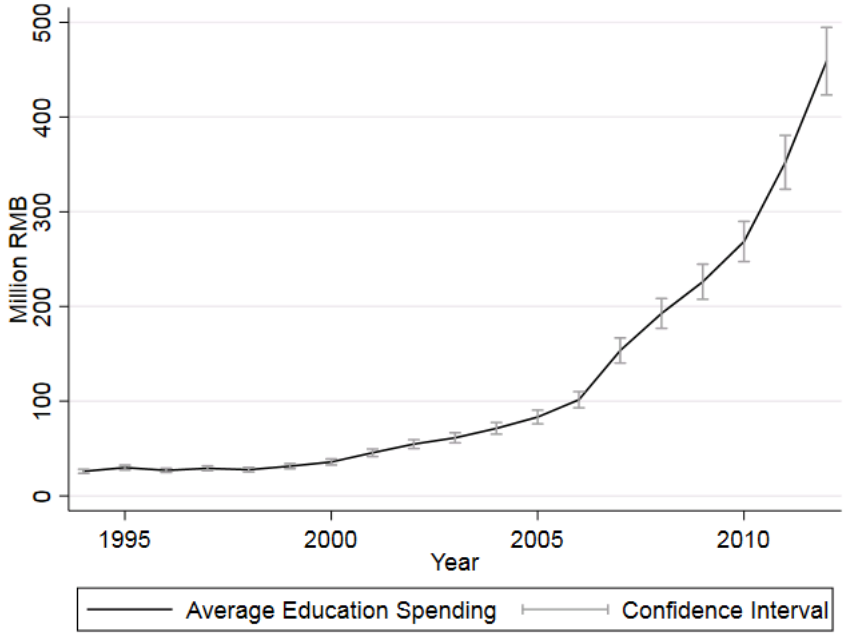
Table 5: Tenure Impact on Education Spending per Capita Post-Reform by Region

	Eastern and Central		Western	
	(1)	(2)	(3)	(4)
Mayor Tenure	-37.07***		-164.3***	
	(14.29)		(33.66)	
Mayor Tenure^2	5.982***		24.98***	
	(2.253)		(4.604)	
Sec. Tenure		0.981		-73.41**
		(11.36)		(33.76)
Sec. Tenure^2		0.457		8.773*
		(1.545)		(4.549)
Prop. Pop $<$ 14	10,298***	10,167***	8,676***	8,813***
	(1,253)	(1,254)	(828.3)	(840.7)
Log GMP	-31.09	-34.33	190.2*	195.9*
	(39.81)	(39.73)	(115.0)	(117.1)
Log Size of Gov't	20.15	20.34	291.0***	310.5***
	(39.93)	(39.90)	(56.15)	(57.27)
Constant	264.9***	213.9***	393.2***	320.2***
	(22.74)	(21.80)	(49.89)	(44.55)
R^2 Within	0.07	0.07	0.37	0.32
Between	0.00	0.01	0.12	0.01
Overall	0.03	0.02	0.29	0.20
Observations	1,255	1,262	394	391
No. of Municipalities	254	254	79	79

All models include municipal fixed effects.
Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

10. Figures

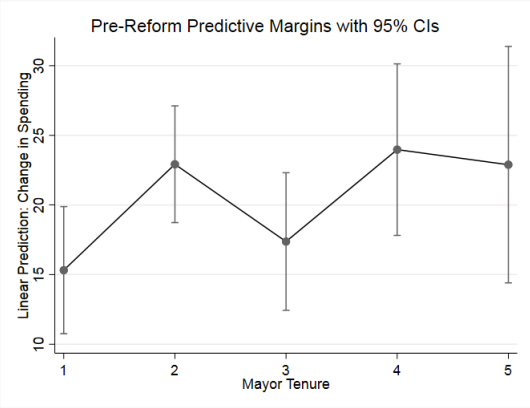
Figure 1: Average Municipal Level of Education Spending

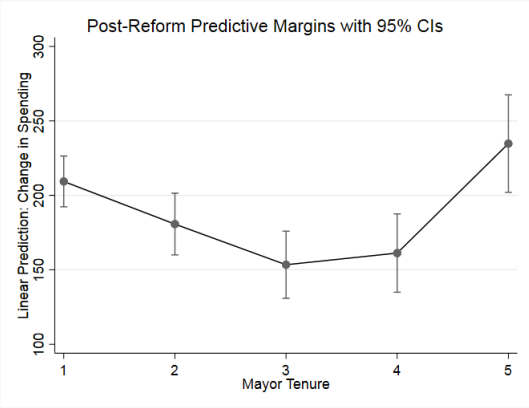


Data from fiscal yearbooks.

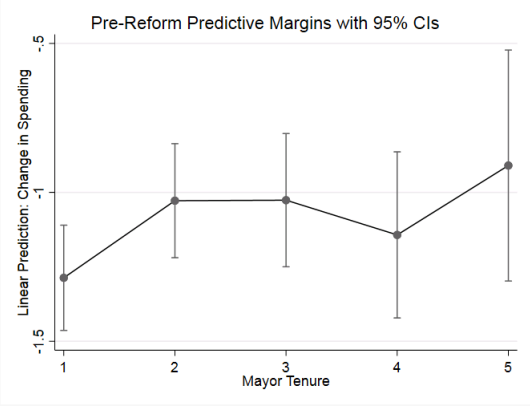
Figure 2: Predictive Margins

Predictive Margins for Non-Linear Impact of Mayor Tenure on Education Spending per capita





Predictive Margins for Non-Linear Impact of Mayor Tenure on Education Spending per Total Expenditure



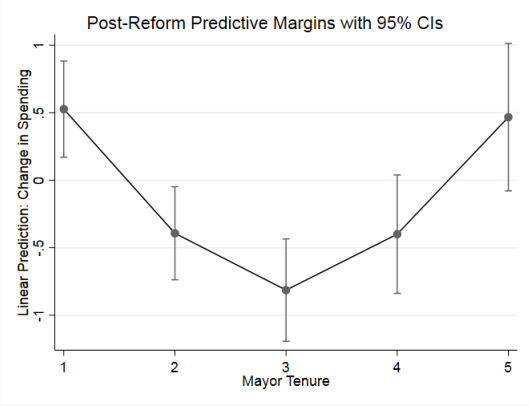
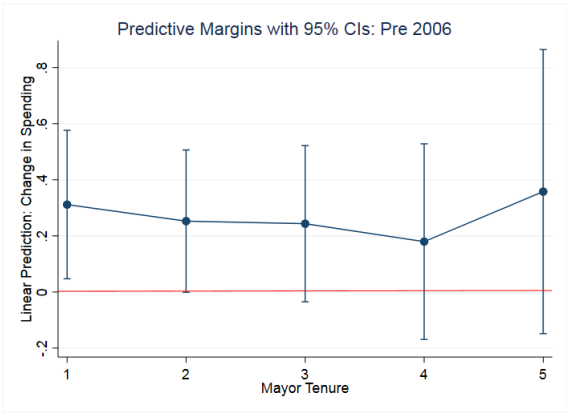
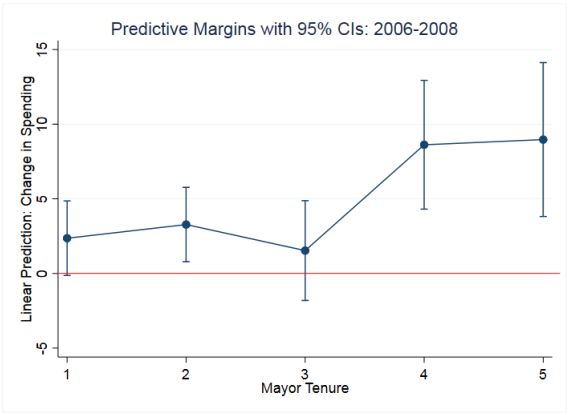


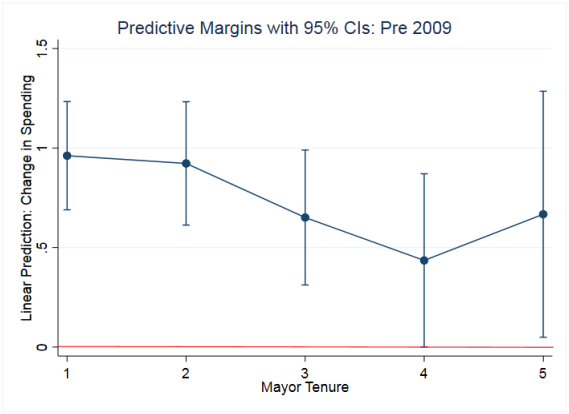
Figure 3: Predictive Margins

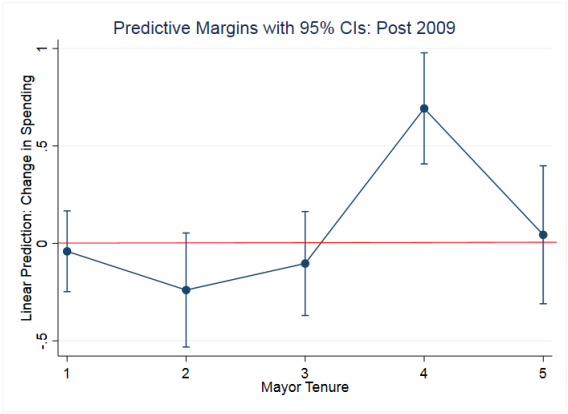
Panel A: Predictive Margins for Non-Linear Impact of Mayor Tenure on Differenced Social Security Spending per Total Expenditure





Panel B: Predictive Margins for Non-Linear Impact of Mayor Tenure on Differenced Health Spending per Total Expenditure





11. Appendix

11.1 Data Sources and Definitions

Education per Capita: Nationwide Cities and Counties Financial Statistics, Urban Statistical Yearbooks. Total education expenditures for municipal level and below divided by total population.

Education Per Spending: Nationwide Cities and Counties Financial Statistics, Urban Statistical Yearbooks. Total education expenditures for municipal level and below divided by total municipal spending.

Mayor/Secretary Tenure: Online bibliographies. Number of years since they began their current post. Most turnovers occur between March and June in a given year. As long as the turnover occurs before June, the new leader is credited with holding the position. For example, if leader A takes office in February 2002, 2002 is marked as Leader A's first year. If Leader B takes office in September 2002, Leader B's first year will be 2003 and the previous leader will be counted for 2002. Local term is defined by a local politician's time in a given locality. Politicians in China are often rotated laterally to the same position in different locations (Edin 2003; Landry 2008). I count a leader's tenure as starting when they assume a position in either a new location or new position: a mayor promoted to party secretary in the same city is assumed to start a new tenure with the new position. End of term evaluations occur over the leader's total tenure, not based on the formal five year term. A politician who is considered for promotion after six years, for example, will have a term-review for all six years in office.

Population distribution calculation: The age break down of populations across municipalities is not published every year. In order to estimate this value, I used three time points, annual birth rates, and estimated morality rates to calculate the size population under the age of 14 for the variable using proportion of the population under the age of 14. First, age break downs (less than 1 year, 1-5 years, 6-10 years, etc) by municipality

are available for the 2000 and 2010 censuses. In 2005, there was a nation-wide 1% sample of the population with age break downs by city. The 2000 and 2010 census data provide the most accurate as possible estimate of "long term" residents. The 2005 population estimates, however, are a bit more suspect, providing estimates of the population that, for some localities, are significantly out of line with the 2000 and 2010 census data, so I used the 2005 estimates as general guidelines/comparison after removing the localities with severely skewed estimates, rather than a solid mid-point estimate. Each year, municipalities publish their birth cohort, or the number of births in the municipality in that year: data I collected from the Chinese Regional Economic Statistical Yearbook. I used this data to estimate the number of 1-4 years, summing over the previous years. I then checked this number against the 2005 estimates that were, generally, in line with the 2000/2010 census data. I assumed a linear relationship between the 2000 census estimates, the 2005 estimates based on birth cohorts, and the 2010 census estimates. To evaluate the validity of these numbers, I also re-calculated the estimates using the 2000 and 2005 data, extrapolating to 2010 using UN data on mortality rates in China. The estimates using UN child mortality rates also roughly fell in line with the first set of estimates which used 2010 as the end point. Given the One Child Policy, it is reasonable to expect that population growth will remain relatively stable, or at least not alter dramatically, also supporting this calculation.

11.2 Evolution of Education Spending

While the 1985 compulsory education law mandated nine years of compulsory education, it did not stipulate the right to free education. Fees often included admission fees, textbook fees, lodging fees for students who boarded, and school selection fees. Students can opt to go to a school better than the one located in their neighborhood or village if parents pay a school selection fee. This fee structure is currently being phased out in many urban centers in China, which also puts a significant financial strain on the education system, but was not part of the early and mid-2000 reforms (Fan 2008).

Including the 2000 "single fee policy," which allowed local governments to charge only one legal fee for schooling in nationally identified poor counties. Reforms targeting inappropriate expropriations by the local state challenged local financing for educational services and limited the amount of rents local politicians could extract from their populations and the 2005 with the New Mechanism for Financing Rural Compulsory Education, which included the "two exemptions and one subsidy" policy, which exempted poor families from textbook fees and tuition and provided subsidies for lodging fees, but this was a preliminary step leading up the 2006 law. Multiple overlapping fees are common place in China's education system. For example, a 2002 audit one year after the reform was implemented, found that elementary schools charged an estimated 2.32 billion yuan (380 million USD) in illegal fees (Ren 2008).

11.3 Robustness Checks

Table 6: Impact of Mayor Tenure on Social Security

	Social Security Spending			
	Per Capita		Per Exp	
	Pre-Reform	Post-Reform	Pre-Reform	Post-Reform
	(1)	(2)	(3)	(4)
Mayor Tenure	-1.177	-23.99***	-0.0756	-1.296***
	(1.747)	(9.268)	(0.147)	(0.295)
Mayor Tenure^2	0.153	3.314**	0.0102	0.155***
	(0.235)	(1.317)	(0.0198)	(0.0420)
Prop. Pop $<$ 14	14.65***	648.0	-1.070***	-35.31*
	(5.298)	(590.9)	(0.407)	(18.52)
Log GMP	-19.57***	17.30	-1.539***	2.825**
	(6.110)	(39.43)	(0.498)	(1.243)
Log Size of Gov't	58.93***	98.52***	1.681***	-5.081***
	(5.859)	(34.46)	(0.475)	(1.084
Constant	5.538	98.55***	0.410	3.360***
	(3.468)	(23.91)	(0.274)	(0.746)
R^2 Within	0.10	0.01	0.01	0.03
Between	0.08	0.00	0.00	0.00
Overall	0.10	0.01	0.01	0.26
Observations	1,809	1,942	1,809	1,942
Number of municipalities	329	333	329	333

All dependent and control variables are differenced.
All models include municipal fixed effects.
Models 5-8 include only non-autonomous region municipalities.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Deviation from period averages: Post reform

	Per Capita	Per Expenditure
	(1)	(2)
Mayor Tenure	-53.01***	-0.497***
	(13.989)	(0.186)
Mayor Tenure^2	7.0239***	0.020
	(2.161)	(0.028)
Observations	1,650	1,650
Number of municipalities	333	333

All control variables are lagged.
All models include municipal fixed effects.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1