Show Me the Money: Interjurisdiction Political Competition and Fiscal Extraction in China

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Abstract

We argue that interjurisdiction competition in authoritarian regimes engenders an alternative logic for taxation. Promotion-seeking local officials are incentivized to signal loyalty and competence to their principals through tangible fiscal revenues. The greater the number of officials accountable to the same principal, the more intense political competition is, resulting in higher taxation; however, too many officials accountable to the same principal leads to lower taxation because of less competitive officials' shirking and the fear of political instability. Using a panel dataset of all Chinese county-level jurisdictions between 1999 and 2006, we find strong evidence for an inverse U-shaped relationship between the number of county-level jurisdictions within a prefecture—our proxy for the intensity of political competition—and fiscal revenues in most provinces but not so in politically unstable ethnic minority regions. The results are robust to various alternative specifications, including models that account for heterogeneous county characteristics and spatial interdependence.

KEYWORDS: Authoritarian regimes; local government; taxation; China

China has been one of the most rapidly growing economies in the world as shown by a remarkable 738.23% growth in GDP from 1994 to 2010. Although the unparalleled economic performance has been extensively researched (e.g., Huang 2008; Naughton 1995; Oi 1999; Shirk 1993), few studies have investigated the determinants' of even more remarkable growth in fiscal revenues, which registered a massive 1492.56% increase in total government budgetary revenues over the same period.[1] The degree of fiscal extraction, measured by the share of budgetary revenues in GDP, rose from 10.85% in 1994 to 20.61% in 2010.[2] More importantly, county fiscal revenues vary substantially across China as illustrated in Figure 1.

[Figure 1 about here]

This pattern of subnational fiscal extraction is puzzling for two reasons. First, the variation in subnational economic development cannot fully account for the variation in fiscal revenue. Although scholars have identified a positive correlation between taxation and economic development in the comparative context (Besley and Persson 2013), the bivariate correlations between GDP and fiscal revenue are small and sometimes even negative in our Chinese county-level data. Second, an important argument about China's economic success hinges on the institutions that unleash competition between localities, coined "market-preserving federalism."[3] If interjurisdiction competition indeed generates incentives for local governments to promote economic development, each locality may be expected to vie to attract investment to its own turf. We should thus observe a "race-to-the-bottom" tax competition as identified in the standard

[1] The calculation is based on the GDP and total budgetary revenue data obtained from www.chinadataonline.org. The budgetary revenues include all levels of government in China. We restrict the time coverage of the data to 1994 because central−local fiscal arrangement has been standardized across China since the 1994 Tax Sharing Scheme fiscal reform.

[2] If we take into account the downward measurement error in government budgetary revenues (e.g., the unreported government extra-budgetary revenues) and upward measurement error in GDP (e.g., data manipulation by local governments), the degree of fiscal extraction could be even higher.

[3] Montinola, Qian, and Weingast (1995) and Qian and Roland (1998) formalize the theory; See Xu (2011) for a review of this literature.

political economy literature (Oates 1972; Wibbels and Arce 2003), yet the overall fiscal revenue in China has been *increasing* much faster than the GDP since 1994.

Current theories concerning government fiscal extraction cannot fully explain the subnational variation in China because they often treat the state as a unitary actor. Several influential studies emphasize that bargaining between state and society over fiscal extraction as the impetus for institutional change and regime stability (Levy 1989; North 1990; North and Weingast 1989). Studies of fiscal capacity and state building emphasize electoral institutions, the design of their taxation system, geography, and ethnicity (Bräutigam et al. 2008; Gehlback 2008; Herbst 2000; Kasara 2007; Lieberman 2003; Persson and Tabellini 2003). We extend this line of research by showing that the fiscal capacity of authoritarian states also hinges on the institutional design of subnational political competition, a factor that has not been explored systematically in the existing literature. We contend that this institutional feature deepens understanding of authoritarian resilience as a result of the institutionalization of political competition.

Specifically, we argue that the intensity of interjurisdiction political competition is an important determinant of subnational variation in fiscal revenue. Key to our argument is the way by which the organization of local government influences the likelihood of promotion of local officials. When the administrative structure induces more intense competition for promotion among local officials, fiscal revenues are used as a signal more credible than GDP for competence and loyalty to their principal in the administrative hierarchy. However, excessive political competition eventually leads to the fear of social instability from excessive taxation and induces less competitive officials to shirk, thus lowering the overall level of fiscal revenues.

The intensity of interjurisdiction political competition is inherently difficult to observe and quantify in authoritarian settings; nonetheless, we contend that in a political system where power

is allocated by appointment instead of election, the spatially heterogeneous organization of the administrative jurisdictions directly influences the probability of promotion of government officials to the next level of the bureaucratic ladder.[4] This conceptualization allows us to capture variation in the intensity of subnational political competition. Our identification strategy relies on the legacy of administrative districting in China, which has resulted in a highly heterogeneous structure of administrative jurisdictions: Whereas some prefecture-level governments control only a handful of county-level jurisdictions, others manage as many as forty units.[5] By and large, the supply of leadership positions available for promotion is largely fixed because the set of party and government institutions in prefectures and municipalities is mandated by the central authorities through a quota system for political appointments comparable to the *nomenklatura* of the former Soviet Union. Thus, the key source of variation in the degree of political competition is primarily driven by the number of local officials who each seek promotion, which varies across space, and not by the number of desirable posts above the county level in a given prefecture. We use this subnational variation in the number of county-level jurisdictions across prefecture-level governments as an indicator of the intensity of political competition among local leaders and evaluate its impact on local fiscal revenues.

We provide empirical support to our argument by using a dataset on local government fiscal revenues that covers all Chinese county-level units from 1999 to 2006. We find strong evidence for an inverse U-shaped relationship between the intensity of interjurisdiction political competition and fiscal extraction, both in terms of the level and the degree of fiscal extraction. The marginal effect is positive at first but decreases as the number of county-level jurisdictions

[4] The word *officials* primarily refers to party secretaries and the head of the local governments.

[5] In China, the words *prefecture* (*diqu*) and *municipality* (*shi*) both refer to prefecture-level units that manage county units below them. County-level units, in turn, carry various designations (county (*xian*), county-level city (*xianji shi*), or urban districts (*qu*)), but share the same rank in the administrative hierarchy.

increases and eventually becomes negative. We further show that this inverse U-shaped pattern is identified only in ordinary provinces but does not hold in regions where ethnic tensions pose challenges to political stability. Hence, the logic of interjurisdiction political competition on fiscal revenues operates best in politically stable regions.

We provide several robustness checks by conditioning on heterogeneous county endowment for tax potentials as well as taking into consideration various factors such as the consequences of the 1994 fiscal reform and local economic structure. Our key measure of political competition remains robust. We also adopt spatial analysis to account for the interdependence of fiscal extraction resulting from peer pressure. Estimates of our key independent variable remain consistent with the main results.

Understanding the logic of fiscal extraction is important to the study of political and economic development in autocracies. Regime survival hinges on overall economic performance, but it also depends specifically on the capacity of the state to raise sufficient fiscal resources that are required to maintain regime support because both repression and redistribution are costly. Even when the degree of decentralization is high, both redistribution and patronage require public financing and local agents cannot eschew the need for fiscal revenues. Because pure predation is not a sustainable long-term equilibrium in many cases, local officials must decide how much to extract from the economy for their political survival.

This study also contributes to studies of local government behaviors in China by endogenizing the effort to raise fiscal revenues through interjurisdiction political competition. Existing research has largely emphasized the ways through which China's *fiscal* institutions shape local government behavior in economic development and taxation (e.g., Bernstein and Lü 2003; Gordon and Li 2011; Jin et al. 2005; Oi 1992, 2012; Wong and Bird 2008). Numerous

scholars have studied the fiscal constraints that many local governments face as a result of the 1994 fiscal reform in China (e.g., Chen 2008; Oi and Zhao 2007; World Bank 2002). Our paper makes an important departure from this literature. Specifically, we focus instead on the *political* institution that shapes competition among local officials and evaluate how variation in competition affects fiscal revenues across China.

Proceeding from here, we first briefly describe the taxation system in China since 1994 in order to place our argument in the institutional context under which local officials operate. We then lay out our theoretical framework and discuss the operationalization of interjurisdiction political competition. Following our theoretical discussion, we detail the empirical strategy to test our argument and report empirical results. To take into account the spatial interdependence of local government behavior, we employ spatial analysis to analyze our county-level data.

The Taxation System in China since 1994

The Chinese central government adopted several fiscal arrangements with provinces and local governments after 1949.[6] The current system is based on the Tax Sharing Scheme (TSS hereafter), introduced in 1994 as a package of fiscal reforms that sought to improve regional revenue mobilization and equalization as well as tax simplification and to re-centralize revenues to the central government.[7] As a result of this fiscal reform, the Chinese central government eliminated much of the prior transaction costs of constantly bargaining with different provinces in tax revenue sharing and enhanced its own fiscal capacity (Oksenberg and Tong 1991; Wang 1997; Wong and Bird 2008). Nonetheless, the TSS has also generated a number of adverse

[6] See Jia and Zhao (2008) for an overview of the evolution of China's fiscal system.
[7] The TSS reform specified only the fiscal relationship between the central government and provincial governments. However, the below-province tax sharing among different levels of government, although varying across provinces, remain in a similar system where local governments collect taxes and submit some of them to the upper-level governments.

consequences for local public finance (e.g., Bernstein and Lü 2003; Dabla-Norris 2005; Oi et al. 2012; Park et al. 1996; World Bank 2002).

The key to this reform is the specification of the ways by which the central government and local governments share various types of taxes. Specifically, the TSS stipulated that the central government retains 100% of the tax revenues in sources such as tariffs, consumption taxes, and taxes and revenues from state-owned enterprises controlled by the central government. Meanwhile, local governments retain 100% of tax revenues from sources such as business tax, personal income tax, agricultural taxes, and tax and revenue from state-owned enterprises controlled by local governments.[8] Finally, the central and local governments share tax revenues from several sources such as VAT, stock exchange transaction tax, and natural resources taxes.[9]

To facilitate tax collection under this tax sharing scheme, China's tax bureaus were divided into two distinct entities: a *National Tax Bureau (Guojia Shuiwu Ju)* and a *Local Tax Bureau (Difang Shuiwu Ju)*. The national bureau deploys local officers to collect revenues earmarked for the central government, but local bureaus collect only the taxes specifically designated for local governments. As for shared taxes, the offices of the national bureau collect them first and then return the local shares to local finance bureaus. Meanwhile, the personnel appointments of county tax bureaus are controlled by the tax bureau at the provincial level, not by county governments as is otherwise the case for most local government agencies. This so-called "vertical administration" seeks to avoid collusion and data manipulation by county governments.[10]

[8] See Jia and Zhao (2008) for details about taxes designated to central and local government.
[9] This tax-sharing scheme has undergone several revisions since 1994. For example, taxes and revenues from state-owned enterprises controlled by local governments began sharing tax revenue between central and local governments in 2002. Agricultural taxes were abolished in 2004. The central government's share of stock exchange transactions taxes was later increased.
[10] See Yang (2004) on the institutional development of vertical administration in China's bureaucratic system.

Although tax rates are set by the central government and county governments do not directly control personnel appointments at the local tax offices, local officials still influence *effective* fiscal extraction. First, local governments compete with one another to register businesses and thus generate stable tax revenues.[11] Second, they also provide various benefits to local tax offices in order to persuade them to exert greater efforts in collecting taxes.[12] Third, local government officials sometimes work alongside local tax officers to visit local businesses for tax collections.

Data on fiscal revenues are difficult to manipulate in this context. First, shared tax revenues are directly collected by the local offices of national tax bureau, and local governments cannot easily pressure the chiefs of local offices to inflate reported taxes artificially because these revenues are ultimately remitted to upper-level governments. Second, the "vertical administration" of tax bureaus implies that the chiefs of local tax offices are not beholden to county governments' interference in the operations of local tax offices through personnel changes. Third, greater fiscal revenues result in a bigger budget for government expenditure, and local governments have strong incentives to ensure that fiscal budgets are large enough to meet their own expenditure requirements. Consequently, both central and local government officials know that fiscal revenues are a tangible and thus more credible way for local officials to signal competence in economic development and fiscal extraction. Despite the risk of collusion between local governments and tax officials, they are more likely to focus on collecting more tax revenues instead of attempting to manipulate the numbers.[13]

Political Competition and Taxation in Non-democratic Regimes

[11] See Tian and Zhao (2008) and Wu (2007) for detailed ethnographic studies of local politics of taxation in China.
[12] Based on the author's interview as well as detailed in Tian and Zhao (2008) and Wu (2007). For example, the local government in one county helped finance the new office building for the local tax office.
[13] Zhou (2010) discusses the collusion among local governments to meet the targets set by the upper level government. Tian and Zhao (2008) and Wu (2007) offer detailed case studies of the ways through which county and township government collect taxes instead of manipulate the numbers in China.

In this section, we first present a simple theoretical framework of subnational political competition and fiscal extraction in non-democratic regimes. We discuss both the incentives and constraints on local governments' behaviors in fiscal extraction. We then situate China in our theoretical framework and detail the mechanisms through which interjurisdiction political competition influences local government behavior in fiscal extraction.

The Logic of Interjurisdiction Political Competition and Fiscal Extraction

The logic of political competition in authoritarian regimes differs from its democratic counterpart and thus generates different fiscal consequences. Regime survival demands that the state maintains political control, and the autocrat is interested in selecting loyal local agents. Political control also requires financial resources, and it is in the interest of the ruler to select competent agents for fiscal extraction; yet observables suggest that local agents do not behave uniformly. For example, economic performance and *effective* tax rates vary across localities in China. This heterogeneity is sometimes dismissed as evidence of political weakness: Uneven effective tax rates are blamed on weak state control, corruption, ineffective bureaucracies, or the prevalence of informal institutions that preclude uniform extraction. We offer an alternative theory by arguing that the variation of local effective taxation can be explained by the variation in intensity of interjurisdiction political competition. Our theoretical framework builds on insights from the theory of multiregional governance form (*M*-form) (Maskin, Qian, and Xu 2000; Qian, Roland, and Xu 2006; Qian and Xu 1993; Xu 2011) and the theories of using promotion to incentivize employees in labor economics and business administration (Gibbs 1989, 1995; Karachiwalla and Park 2012).

We begin with the principal–agent framework. In non-democratic regimes, the principals are upper-level government officials and the agents are local officials and principals have the power

to appoint or remove local officials. The political survival of the principals requires selecting not only loyal agents but also competent ones, who are in turn rewarded with promotion if they perform well. We assume that the number of agents (n) is always greater than the number of promotions (k) even if all these agents are competent and belong to the principal's faction. Hence, we can conceptualize the political competition among agents as a "tournament" for promotion in which only k promotions are available to n contestants, and $k < n$. Because overall competence is hard to observe in practice, principals focus on observable and tangible indicators.

From the perspective of local officials, tax collection constitutes a clear and tangible signal of competence because fiscal revenues serve two purposes. First, greater fiscal revenues provide a credible signal of a local official's ability to promote economic growth and extract fiscal resources. This is particularly important when other indicators of local economic performance (e.g., GDP) are noisy and unreliable or known to be easily manipulated. Fiscal revenues, by contrast, are more credible, especially when shares of the revenues are remitted to upper-level governments as a result of the intergovernmental fiscal arrangements. Second, greater fiscal revenues allow local governments to enhance their own capacity to finance public expenditures. In addition to using fiscal revenues to directly signal competence in taxation to their principals, local officials can also signal competence indirectly by channeling retained revenue to finance public projects in areas that are easily visible.

In this setting, we contend that local officials' efforts in fiscal extraction depends on the probability of promotion ($P = k/n$), which is largely determined by the number of contestants (n) and the number of promotions (k). Previous studies included formal models to facilitate understanding the relationship between effort and promotion as the incentives in a "tournament"

setting (Gibbs 1989, 1995; Karachiwalla and Park 2012). We apply the same logic to understand the relationship between interjurisdiction political competition and fiscal extraction.

Similar to these models, we assume the political promotion is a function of a local politician's skill, effort, and luck. Competition in a "promotion tournament" implies that a local official's promotion depends not only on his or her effort but also competitors' effort. We first contend that local officials exert zero effort when $P = 0$ or $P = 1$. The logic is that local officials exert no effort if they are all promoted or otherwise, as promotion does not depend on fiscal extraction. Along the continuum of promotion rate, officials exert the greatest effort in fiscal extraction at a promotion rate $\bar{P}$, where effort yields the highest marginal return at this promotion probability. When the actual promotion rate exceeds $\bar{P}$, local officials exert less effort both because of rising marginal costs of greater taxation and the belief that only intangibles (e.g., bad luck) stand in the way of a better job, given high probability of promotion. Conversely, when the actual promotion rate is smaller than $\bar{P}$, local officials exert less effort because costly efforts have much lower marginal returns but intangibles (e.g., good luck) loom larger for a potential promotion. If the number of promotions (k) is fixed, then the promotion rate is solely determined by the number of contestants (n). Thus, we should observe an inverse U-shaped relationship between fiscal extraction and the number of contestants (i.e., promotion rate).

Underlying the forgoing model is the assumption that officials are from relatively homogeneous localities in terms of endowment for taxation potential. Cai and Treisman (2005) argue that heterogeneity in regional endowment reduces the intensity of competition for mobile capital. Similarly, heterogeneous county endowment could reduce fiscal extraction because officials in disadvantageous localities could exert less effort. Nonetheless, the heterogeneity shifts only the distribution of efforts in fiscal extraction (Gibbs 1989; Karachiwalla and Park

2012), but the inversed U-shaped relationship remains intact. The intuition of this result is that if the promotion rate is $\bar{P}$, a heterogeneous endowment suggests that the official in a county whose endowment is right at the $1-\bar{P}$ percentile of endowment will exert the greatest effort in fiscal extraction because his or her effort makes the greater difference in being promoted or not. The officials in localities whose endowments are on either side of the $1-\bar{P}$ percentile will exert less effort because officials in more (less) endowed counties exert less effort as a result of higher (lower) promotion probabilities, following the same logic in the homogeneous case.

Notably local politicians' disincentives in fiscal extraction come not only from costly efforts but also the risk of social upheaval from over-taxation. The fear of instability has two implications for local taxation. First, when the risk of political instability is high and well understood by risk-averse officials, the incentive of fiscal extraction is low because principals value maintaining order over fiscal extraction. Second, even ambitious officials must be careful not to outdo their competitors (whose behaviors are revealed only ex post) by increasing taxation so much as to trigger protests or riots. Hence, rising intensity in political competition results in greater tax revenues only up to a point.

Interjurisdiction Political Competition and Local Taxation in China

We contextualize the theoretical framework above with interjurisdiction political competition and fiscal extraction in China. Measuring political competition is a challenging task in non-democratic regimes such as China. Following our theoretical framework, we use the number of officials seeking promotion at the next level as a proxy for interjurisdiction political competition.

The Chinese state is well-suited to evaluate the ways through which a multilevel government system creates institutional constraints that influence political behavior. The formal structure of Chinese local government is highly heterogeneous because the structure of political competition

varies spatially. The largest authoritarian polity in the world is decidedly multilevel, incorporating nearly one million villages and neighborhoods nested in townships (~50,000), counties/districts (~2500), municipalities/prefectures (~330), and provinces (31) under the central government. Figure 2 illustrates the hierarchy of multilevel governments in China.[14] This hierarchy is also quite heterogeneous in ways that reflect the historical experience of the Chinese Empire as well as the policy priorities of subsequent regimes that have adjusted jurisdictional boundaries and the size of local governments.

[Figure 2 about here]

We focus on county-level jurisdictions[15] because this level of government under a prefecture (or municipality) varies widely across space, allowing us to explore spatial variation in competition. For the time period under investigation here (1999–2006), the number of county-level jurisdictions under a prefecture ranges from 1 to 40 with a mean of 10.65 (standard deviation: 5.50). Figure 3 maps this indicator across China in 2005.[16]

[Figure 3 about here]

County-level officials strive for promotion, and they usually belong to the same pool of contestants[17] within a municipality/prefecture because cadre evaluations are administered by the Organization Department in their corresponding prefecture (Landry 2008). Regardless of

[14] In some rare exceptions in which the county-level jurisdictions are administrated by provincial governments.
[15] See footnote 5 for the definition of county-level jurisdictions in China.
[16] Some researchers have documented boundary or administrative changes that many county-level jurisdictions have experienced since 1978, such as the administrative upgrades from county to county-level city and eventually to a district within the prefecture (Chung and Lam 2004; Li 2011; Landry 2011). These changes are in part driven by incentives for the economic development of prefectures; however, most of these changes affect only the size but not the number of county-level jurisdictions within a prefecture. Furthermore, changes of borders occurred infrequently during the period from1999 to 2006. In our robustness checks, we condition the effects of fiscal incentives by the prefecture government on the relationship between the intensity of interjurisdiction political competition and fiscal extraction.
[17] It is conceivable that bureau chiefs in prefecture departments are also the competitors for promotion, and the effective number of competitors can be larger than the observed number of county-level jurisdictions within a prefecture. However, each prefecture has approximately the same number of bureaus; hence, this potential measurement error in the effective number of competitors does not bias our empirical analysis in the next section. If anything, our empirical results would have been stronger had we corrected this measurement error in the analysis.

population size or economic importance, all municipalities have very similar number of high-ranking government positions at the prefecture level. Hence, the promotion rate largely depends on the number of contestants (county-level jurisdiction within a prefecture). In other words, the number of promotions (k) is relatively fixed across prefectures. When the pool is very small (i.e., k is close to n), the leadership tournament is not very meaningful because county officials know that the number of posts to be filled at the higher level is large enough virtually to guarantee their promotion. As the number of contestants at the county level increases, the intensity of political competition also increases because local officials know that not all of them can be promoted. They are thus more likely to signal their competence to municipal principals by generating more fiscal revenues than their peers and expect a promotion in return.

Although fiscal revenue is only one aspect in cadre performance evaluation for promotion at various levels of government in China, previous studies have indeed shown that fiscal revenues are "hard targets" and they play an important role in the political careers of local officials (e.g., Bo 2002; Edin 2003; Guo 2007; Shih et al. 2012; Tsui and Wang 2004). In fact, county governments are given a tax collection quota every year by the prefecture, but they also impose higher quotas for themselves. More economically developed counties are likely to have a higher quota than less developed counties; however, local officials always strike to extract more fiscal revenues exceeding the quota instead of simply fulfilling the quota, because only outperforming the benchmark (quota) allows them to stand out in the crowd of contestants. In sum, fiscal revenue could be a necessary but sufficient condition for promotion, but the necessary condition itself induces local officials to exert effort in fiscal extraction.

Note that tax collection is costly and local officials face constraints of potential political instability.[18] The fear of local instability is deeply rooted among Chinese politicians because a sanctioning regime has been institutionalized since the 1990s. If mass incidents occur under their watch, they face demotion or dismissal regardless of their performance in other domains (Chen 2012; Liu et al. 2012; O'Brien and Li 2006). This type of accountability, known as the cadre responsibility system, breeds very high degrees of risk aversion among officials posted in regions that they perceive to be politically and socially volatile (Edin, 2003). Because mass incidents are cause for dismissal, local politicians must temper their urge to engage fiscal predation in regions known to be unstable. In addition, if local political stability is a major concern to the national leadership, local politicians are first and foremost required to maintain order and prevent riots, demonstrations, and "collective incidents." In regions where the fear of political instability clearly outweighs concerns for fiscal extraction (such as Tibet, Xinjiang, and Ningxia, where ethnic strife has been recurrent), the cadre tournament for promotion may focus on securing political stability instead of fiscal extraction.

Empirical Strategy

In this section, we provide empirical evidence for our main argument that the intensity of political competition has an inverse U-shaped relationship with fiscal extraction by county-level governments in China. We first discuss the data source before outlining the identification strategy of the data analysis. Finally, we present the main results and evaluate them through several robustness checks.

Data

[18] The political instability when local businesses refuse to cooperate in paying taxes in the event of excessive taxation by local governments. At a minimum, local small business decided to close their shops ("bashi" or "quit the market").

Our panel dataset is based on the *National Prefecture and County Finance Statistics Compendium* (*Quanguo Di Shi Xian Caizheng Tongji Ziliao*) from 1999 and 2006, containing comprehensive coverage of government budgetary revenues and expenditure for all county-level jurisdictions.[19] These data are especially appropriate to our main hypotheses because they contain very detailed information on budgetary revenues at the county level. These data have not been widely used in academic research until recently (Guo 2009; Landry 2011; Lü 2013) largely because the information was not digitized and organized. The Barometer of China's Development project at the Universities Service Centre for China Studies at the Chinese University of Hong Kong digitized these yearbooks and conducted several rounds of consistency checks to ensure data quality. We further organized this dataset by combining it with the county population data from *National Prefecture and County Population Statistics*.

Our primary measure of local fiscal extraction is the sum of all local taxes and fees as well as the shared tax revenues remitted to upper-level government. We label this variable *All Tax 1*. We are aware that this measure does not reflect extra-budgetary revenues (EBR) collected by local governments, which usually consist of fees and sub-taxes. Although EBR is an important source of income for local governments after the 1994 fiscal reform (Zhan 2013), it is normally unreported in released government budgets and upper-level governments often have little information about local EBRs and related expenditures. Thus, EBRs cannot be used as a signaling mechanism to upper-level government, and omitting EBR in our dependent variable has little impact to the estimate of our key independent variable. Note that the central government has taken several steps to rein in extra-budgetary revenues. For example, local governments are gradually required to turn many extra-budgetary revenues into budgetary

[19] The yearbooks start in 1993, but many provinces report data only for counties but not for urban districts. The 1999 yearbook is the first issue that reports full fiscal statistics for both counties and districts.

revenues and report them in the government accounting books. In our dataset, some forms of the EBRs were reported after the year 2000 under the category of *Government Fund Revenues*, which consists of fees and sub-taxes collected by various local government bureaus. Hence, we generate a second measure of local tax extraction by adding this new source to our first measure *All Tax 1*, and we label it *All Tax 2.*

How large is the fiscal extraction by county-level governments in China? Table A1 in the appendix reports the means and standard deviations of the level (per capita) and degree (as % of GDP) of fiscal extraction by county-level jurisdictions in each province between 1999 and 2006. We detect significant variations in fiscal extraction both within and across provinces. For example, per capita tax collection ranges from 1807.36 RMB in Zhejiang (as measured by *All Tax 1*) to 342.76 RMB in Anhui. In terms of the degree of taxation measured by fiscal extraction as percent of GDP, Table A1 paints a somewhat different picture.[20] The top three fiscally extracted provinces are Jiangsu (10.65%), Shanxi (10.65%) and Liaoning (10.30%); and the lowest are Tibet (4.46%), Sichuan (4.81%), and Hebei (5.36%). Significant within-province variations exist, where Xinjiang, Ningxia, and Jiangsu have the highest within-province variation and Sichuan, Guizhou, and Anhui have the smallest within-province variation. Similar patterns are observed for our *All Tax 2* measure.

Identification Strategy

Although using the county as the unit of analysis is natural, we start with prefecture as our unit of analysis. We label our measure of interjurisdiction political competition *Pool Size*, because the number of counties/districts approximates the size of the contestant pool in a

[20] Fiscal extraction measures are relatively low compared to the national average during this period because of the omission of prefecture, provincial, and central governments' fiscal revenues.

prefecture.[21] Because all county-level governments in any given prefecture are exposed to the same treatment of *Pool Size* at any given time, the average fiscal extraction by county-level government should be correlated with the *Pool Size* in the prefecture; therefore, little is lost by aggregating to the prefecture level. We use Equation (1) below to estimate the non-linear effects of interjurisdiction political competition at the prefecture level:[22]

$$\overline{y_{kpt}} = \gamma_1 PoolSize_{kpt} + \gamma_2 PoolSize_{kpt}^2 + \beta \overline{X_{kpt}} + \delta_p + \sigma_t + \theta \sum \delta_p \times \sigma_t + \varepsilon_{kpt} (1)$$

where overbars denote county averages for prefecture k in province p at year t. y_{kpt} is the average county fiscal extraction (*All Tax 1*). Our primary measure is *Log Tax Per Capita*, which captures the level of fiscal extraction. We also use *Tax as % of GDP* as an secondary measure for the degree of fiscal extraction, which is a common used when studying tax burden. Our key independent variables are $PoolSize_{kpt}$ and $PoolSize_{kpt}^2$. Therefore, the key parameters of interest are γ_1 and γ_2, which are the estimates to capture the inverse U-shaped relationship between *Pool Size* and local fiscal revenue.

X_{kpt} is a vector of variables controlling for local conditions. In our baseline specification, we use *Log(Population)* to control for local population size. Meanwhile, one may argue that the number of counties/districts within a prefecture is a function of the area size of the prefecture. Hence, we include *Log(Area Size)* in our specification. The level of local fiscal extraction is also

[21] Our independent variable, *Pool Size*, which shows little change between 1999 and 2006, captures only the cross-sectional variation but not necessarily temporal variation in intensity of interjurisdiction political competition. This is the limitation of our empirical analysis. The main objective of this paper is, however, the identification of an institutional feature that influences local government behavior, and institutions are often sticky in the sense that they do not change frequently. Thus, failing to capture the temporal variation in political competition does not invalidate our results.

[22] We do not consider a model with lagged dependent variable because our key independent variable, *Pool Size*, hardly varied during the period from 1999 to 2006. Essentially, *Pool Size* is equivalent to a prefecture-fixed effect, where adding a lagged dependent variable will bias the estimate (Wawro 2002).

a function of local human capital, and we measure it by using the percentage of rural residents in the population (*% of Rural Population*). We use *Log(GDP)* to proxy for the level of local economic development. Finally, we include both provincial dummies and year dummies to control for unobserved factors across provinces and time. On one hand, the fiscal arrangement designed by TSS is more clearly defined between the central and provincial governments but not as specific as the level of government below provinces. Thus, the provincial dummy variables capture the unobserved variation across provinces in the below-province fiscal arrangement;[23] Time dummies, on the other hand, help us control for economic shocks and the fiscal arrangement changes in any given year, such as the state-owned enterprises tax revenue sharing in 2002 and the abolition of agricultural taxes and fees in 2006. We also include the interaction of provincial dummies and time dummies in order to control for the unobserved time and province co-varying characteristics. For example, county governments may not face the same incentive from the provincial governments in some year in some provinces. Some provinces may introduce new fiscal and government policies that shape local governments' effort in fiscal extraction. Furthermore, this set of dummies also helps control for variation in regional inflation.

In our extended specification, we consider several potential omitted variables that account for local conditions. On one hand, politicians from minority counties and prefectures may be disadvantaged in the promotion process;[24] hence they may or may not want to exert more effort in local fiscal extraction in order to prove their competence. On the other hand, maintaining local

[23] We may want to include prefecture dummies to capture the unobserved characteristics of the prefecture in the model. However, because our key independent variable, *Pool Size*, has little variation across time during 1999−2006 in the prefecture, including the prefecture dummies introduces a significant correlation with *Pool Size* that attenuates the estimate of key independent variable. Alternatively, we include several measures of prefecture characteristics in our robustness checks.

[24] Members of minority cadres posted as heads of local governments are rarely promoted to Party Secretary, a position often held by a Han (Li 2008). The policy of appointing party secretaries from developed provinces as part of their training (particularly in Tibet) has further reduced the odds of promotion from county head to county secretary.

stability is a high-priority task in areas with large minority population; thus, signaling competence in maintaining stability may undermine fiscal extraction. We include two variables indicating the minority prefecture/county status. These two variables were coded as 1 when the name of the prefectures/counties indicates that they are autonomous (*zizhi*), and 0 otherwise.

Second, because Chinese GDP data is fraught with measurement error (Holtz 2004), we rely on an alternative measure of development that is entirely independent of the data produced by the Chinese statistical system. The DMSP-OLS Nighttime Lights Time Series[25] (commonly known as the Nightlight Project) makes available satellite images that capture stable electrical refraction of the earth at night on a scale of 0 to 63. These data have been shown to correlate with economic growth (Henderson et al. 2012); thus we used it as another indicator of local economic performance that is not captured by the Chinese GDP data. The data were intersected with the BOCD GIS model of China at the county-level, by assigning each observation (half arc-minute) to its proper county unit and allowing for the computation of each county's average glare in a given year.

Main Empirical Results

Table 1 reports the results based on the specification of Equation (1). First, we find strong evidence of an inverse U-shaped relationship between *Pool Size* and the level of fiscal extraction in our baseline model (Column 1). The estimate of *Pool Size* is positive and the estimate of *Pool Size*^{2} is negative; both are statistically significant at the 0.01 level.[26] Taken together, our model suggests that an increase from zero to one jurisdiction leads to 2.9 % greater in tax per capita, but an increase from one to two jurisdictions leads to 2.7 % greater in tax per capita. The marginal

[25] The raw data were downloaded from http://www.ngdc.noaa.gov/dmsp/downloadV4composites.html.
[26] In unreported analysis, we find consistent evidence when we restrict the analysis to *Pool Size* smaller than 20; therefore, the estimation of the non-linear effect is not driven extreme values of *Pool Size*.

effect diminishes as *Pool Size* increases, and it becomes negative when the number of county-level jurisdictions in a prefecture reaches around 14.

Next, we disaggregate our data in order to evaluate our argument that the logic of signaling competence is different between politically stable and unstable regions. Columns 2 and 3 in Table 1 suggest that this correlation in the pool sample is driven by observations in ordinary provinces but not in autonomous regions that face challenges in maintaining local stability.[27] The coefficient estimates for the model with all the county-level jurisdictions except Xinjiang, Tibet, and Ningxia are similar in magnitude to the baseline model, and they are statistically significant. The coefficient estimates of *Pool Size* and *Pool Size*^{2} in the model restricted to observations of Tibet, Xinjiang, and Ningxia do not have the expected signs and are not statistically significant. These results indicate that politicians do not signal competence through fiscal extraction in these autonomous regions with challenges in political stability. Hence, we find consistent evidence for our argument that maintaining political stability but not fiscal extraction is an important task in these politically unstable regions.

[Table 1 about here]

The results of the extended model specification (Columns 4–6) with additional control variables tell a similar story. The estimation results suggest a robust non-linear relationship between *Pool Size* and the level of fiscal extraction, and they remain consistent to the baseline model because coefficient estimates are similar in magnitude and statistically significant. Once again, the non-linear correlation is identified only among observations in provinces except for Tibet, Xinjiang, and Ningxia.

[27] We define autonomous regions with stability challenge as those with large Tibetan and Uighur populations: Tibet, Xinjiang, Ningxia.

We simulate the marginal effect of *Pool Size* based on model in Column 4, and Panel 1 in Figure 4 shows a clear pattern of diminishing marginal return of *Pool Size* on the *level* of fiscal extraction in ordinary provinces. The positive effect of interjurisdiction political competition reaches its peak when the *Pool Size* is around 14, which is 0.68 standard deviation away from the mean of *Pool Size*.

[Figure 4 about here]

Next, we evaluate the effect of political competition on the *degree* of fiscal extraction. We measure the degree of extraction by calculating fiscal revenue as percent of GDP. We use the same model specification—Equation (1)—and Table 2 reports the estimation results. Again, we find consistent evidence of an inverse U-shaped relationship between *Pool Size* and the degree of fiscal extraction (Columns 1 and 4). Yet again, this result holds only in provinces excluding Tibet, Xinjiang, and Ningxia (Columns 2, 3 5, and 6). We simulate the marginal effect of *Pool Size*, and Panel 2 in Figure 4 suggests a consistent pattern with Panel 1 that uses a different dependent variable—a diminishing marginal return of *Pool Size* on the degree of fiscal extraction.

[Table 2 about here]

Competing Explanations and Concerns

The variation in subnational fiscal extraction has not been unnoticed in the literature; thus we must account for a number of competing explanations. First, previous theories suggest that heterogeneity in local endowment for tax potential may affect the *effective* promotion rate, which then shapes local officials' efforts in fiscal extraction. Although the assumption underlying our theoretical framework is that the tournament is within the prefecture where counties are geographically close and similar, difference in local endowments may still generate different tax potentials. To account for the heterogeneity of county tax potential, we followed Cai and

Treisman (2005) and constructed an index of initial endowments in 1993 for each county.[28] In our model, we include the standard deviation of 1993 endowments for counties within the prefecture as the measure of heterogeneity of initial endowment, and its interaction with *Pool Size*.

Table 3 below reports the results. We show that the inversed U-shaped relationship between *Pool Size* and fiscal extraction remain intact for observations in ordinary provinces because the estimates for *Pool Size* and its squared term have the consistent signs and are statistically significant (Column 1). Again, we find no statistical relationship between *Pool Size* and fiscal extraction in Tibet, Xinjiang, and Ningxia (Column 2). One caveat of the measure of 1993 endowment is that some Chinese counties have gone through redistricting since the mid-1990s, thus a county's "competitor" in 1993 could be different in 2003 because this county could be been moved to a nearby prefecture. As a result, the heterogeneity of endowment in 1993 that a county faces could be inconsistent with the heterogeneity of endowment this county faces in later years. To address this limitation, we use the current year's heterogeneity of endowment instead of the 1993 one in our model, and our main results remain consistent (Columns 3 – 4).

[Table 3 about here]

Note that contrary to Cai and Treisman (2005), we find little evidence for the conditional effect of heterogeneous county endowment on *Pool Size*. The lack of statistical significance could result from the measurement error of heterogeneity. Alternatively, our interpretation is that county governments receive tax quota from upper-level governments, suggesting that county

[28] Obtaining complete data on natural resources and human capital for all counties is a challenging task. Given the data limitation, we choose three variables as the basis of constructing the index of endowment. We use the area size of county to represent the endowment of land, percentage of urban population to represent the endowment of human capital, and satellite images of night time brightness to represent the density of infrastructure. The index of endowment is the sum of standardized values of these three variables in each prefecture.

governments have benchmarks to outperform. Given that different counties have different quotas based on their economic development, counties are effectively homogenous.

A second concern is that the 1994 TSS reform, instead of interjurisdiction competition, is the main mechanism shaping local officials' incentives for fiscal extraction because TSS dramatically shifted the fiscal burden to the localities, leaving local governments with little choice but to raise taxes and fees in order to meet unfunded spending mandates. In addition, local officials' effort in fiscal extraction could be driven by the fiscal revenues quota set by the prefecture government instead of the promotion tournament.

This alternative explanation has merit, but it does not explain why counties that were treated by the same national policy shift would result in vastly different *effective* taxation, even after controlling for local economic conditions. Empirically, we incorporate this alternative mechanism of fiscal institution through two additional sets of analyses: 1) alternative dependent variables and 2) different model specifications. Our first alternative dependent variable is *All Tax 2*. This measure is only available for 2000−2006, but it includes some extra-budgetary revenues (EBRs). We re-analyze the data using the model specification as Equation (1). Panel 1 in Table A2 in the online appendix shows that the coefficient estimates of our key independent variables, *Pool Size* and *Pool Size*^{2}, are consistent with main results when we use this alternative dependent variable. The marginal effects are slightly larger in magnitude, and statistically significant for ordinary provinces. Again, we do not find any evidence for the models that analyze observations in Xinjiang, Tibet, and Ningxia.

We created a second set of dependent variables by dividing the primary dependent variable, *All Tax 1*, into two categories: 1) tax revenues shared with upper-level governments, and 2) tax revenues belong entirely to county governments. If county governments' effort in fiscal

extraction primarily devote to their own tax revenues but not in shared tax revenues, it indicates that the incentives for tax collection are for financing local spending instead of signaling competence to upper-level governments. Panels 2 and 3 in Table A2 report the results, showing that estimates of our key independent variables, *Pool Size* and *Pool Size*^{2}, remain statistically significant for both models, especially in the models where shared tax revenues are the dependent variables.

Next, we explore different model specifications by including three potential omitted variables that shape local government's taxation behaviors as a result of TSS. Table A3 in the online appendix report the results. First, the fiscal extraction effort by county-level governments could be a function of explicit fiscal demand of their corresponding prefecture government. Specifically, if the prefecture government requires more fiscal revenues from district/county governments by setting a higher fiscal revenue quota, and rewards those who comply, all the counties/districts should respond to this demand. To measure fiscal demand from prefecture governments, we include a variable that measures the revenues collected only by prefecture governments themselves but not counties within the same prefecture. The results based on this alternative model remain consistent that we find evidence for ordinary province observations but not in Tibet, Xinjiang, and Ningxia (Table A3, Columns 1–2). In addition, prefecture governments' own fiscal revenues have a positive correlation with fiscal extraction, contradicting the hypothesis that prefecture governments' own fiscal needs lead to greater fiscal extraction at the local level.

Second, receiving fiscal transfers may influence county governments' behaviors in tax collection. In some cases, transfers reduce county governments' effort in fiscal extraction because of unearned income. In other cases, provincial governments may use matching funds

through transfers to incentivize county governments to collect more fiscal revenues. To evaluate this claim, we include a variable measuring the transfers received by counties, and find that they have little impact on the estimate of our key independent variables. Interestingly, this variable has a positive correlation with county-level fiscal extraction in ordinary provinces but a negative one in Xinjiang, Tibet, and Ningxia (Table A3, Columns 3–4), and both are statistically significant. In other words, transfers reduce efforts in fiscal extraction in politically unstable areas but actually increase it elsewhere. The positive correlation between transfers and fiscal extraction in ordinary provinces provide some supporting evidence that provincial governments may offer small fiscal incentives for local governments to collect taxes.

Third, county economic structure is another important factor in the level of fiscal extraction after TSS. In particular, more industrial regions have greater potentials for fiscal extraction than more agricultural regions. We control for the shares of GDP from agricultural production and from industrial production in our models. Note that our data only have consistent measures of these two variables since 2001, restricting our analysis to 2001−2006. As shown in Table A3 (Columns 5 – 6), our main results remain consistent after controlling for local economic structure.

Finally, some scholars argue that factional politics is a key determinant of local governments' behavior instead of the signaling of competence through fiscal revenues (Cai and Treisman 2006; Nathan 1973; Shih et al. 2012). If local officials align with factions that are formed in the upper echelon of the Party, the relationship between formal structures of authority and observable outcomes should be weak. Poor fiscal performers who happen to have the right patrons need not worry about their careers; furthermore, they are not compelled to increase fiscal extraction. Among the strong performers, those who lack factional support should end up with lackluster political careers, passed over for promotion by better connected peers. Unfortunately, factions in

local politics are largely unobservable. Our claim is that our estimates of interjurisdiction political competition are biased downward when we fail to account for the unobserved factional politics because the unobserved factional ties are likely positively correlated with the size of the pool (a greater number of competitors implies more factions) and negatively correlated with taxation (factional loyalty reduces the pressure to demonstrate competence through revenues collection). Controlling for factional politics would only strengthen our estimate of *Pool Size*.

Interjurisdiction Competition and Spatial Interdependence

To this point, the empirical results support our argument that interjurisdiction political competition among county-level governments has an inverse U-shaped relationship with fiscal extraction. In the prefecture-level analysis, however, the dynamics of inter-dependence among county-level governments may be overlooked. One alternative mechanism could be peer pressure instead of the intensity of interjurisdiction competition. To address this concern, we employ a spatial model to analyze county-level observations. We first discuss the theoretical underpinning of the empirical model specification, then present the analytical results based on county-level data.

The key motivation behind a spatial model is that the outcome variable is interdependent among spatial units because of factors such peer pressure or emulation. For example, researchers have empirically explored spatial interdependence on issues such as economic liberalization (Simmons and Elkins 2004) and tax competition (Franzese and Hays 2006). Neglecting this relationship may introduce omitted variable bias in the analysis, particularly if a variable serves as a common shock to all the spatial units (Franzese and Hays 2007). In the context of fiscal extraction in China, the level of a county's tax collection is likely to be correlated with the other counties within the prefecture. If one county exerts more effort in tax collection, other counties

are under peer pressure in their own tax collection. Because our key independent variable—the number of counties/districts under a prefecture—is fixed for all county units under the same prefecture, the estimate of this variable could be susceptible to the omitted variable bias if we fail to account for spatial interdependence when analyzing county-unit observations.

To properly take into account this dynamic when analyzing county-level observations, we adopt the spatial 2SLS model discussed in Franzese and Hays (2007). This model specification provides consistent estimates of a spatial lag parameter. The model specification is as follows:

$$y_{ipkt} = \rho W y_{-ipkt} + \gamma_1 PoolSize_{pkt} + \gamma_2 PoolSize_{pkt}^2 + \beta X_{ipkt} + \delta_p + \sigma_t + \theta \sum \delta_p \times \sigma_t + \varepsilon_{ipkt} \quad (2.1)$$

$$W y_{-ipk\,t} = \tau_1 WPoolSize_{ipkt} + \tau_2 WPoolSize_{ipkt}^2 + \alpha WX_{-ipkt} + \vartheta_{-ipkt} \quad (2.2)$$

where y_{ipkt} is the dependent variable for county *i* in prefecture *k* of province *p* at year *t*. Because we are modeling political competition among county-level jurisdictions under the same prefecture *k*, the only relevant spatial units for county *i* are the remaining county-level jurisdictions under prefecture *k*. Hence Wy_{-ipkt} is the spatial lag, which is calculated as the weighted average of y_{-ipkt} for all the other county-level jurisdictions –*i* within prefecture *k*. In the first stage, Wy_{-ipkt} is instrumented by the spatially weighted values of the exogenous variables in the second stage. The exogenous variables, X_{-ipkt}, are the same as Equation (1), which controls for demographic and economic conditions. We use clustered standard errors at the county level to account for serial correlation of our dependent variable across time.

Table 4 reports the result based on Equations 2.1 and 2.2. We first investigate spatial lags in models without including our measure of political competition in order to gauge the degree of

inter-dependence among county governments. Results in Columns 1–2 as well as 5–6 suggest that spatial inter-dependence exists only in the model with ordinary province observations and the *level* of fiscal extraction as the dependent variable. The coefficient estimate for the spatial lag is positive and statistically significant in Column 1, suggesting a positive correlation between the level of tax collection by a county and its competitors (all other counties) within the same prefecture. This pattern does not change when we include our key independent variables of political competition into the model (Columns 3–4 and 7–8). This suggests that county-level jurisdictions use the total amount of fiscal revenues as the benchmark in their competition with their peers. They are not competing on the *degree* of fiscal extraction among themselves because the level of fiscal revenues, not the degree of fiscal extraction was actually the number reported to the upper-level government.

More importantly, the estimates of our key independent variables remain consistent with the prefecture-level analysis reported in Tables 1 and 2. First, we only observe strong evidence for the inverse U-shaped relationship between *Pool Size* and fiscal extraction in ordinary provinces except Xinjiang, Tibet, and Ningxia (Columns 3 and 7). The coefficient estimates of our key independent variables are strikingly similar in magnitude when compared to the models at the prefecture-level in Tables 2 and 3, and they are statistically significant. Meanwhile, the estimates of *Pool size* remain statistically insignificant when analyzing observations in Tibet, Xinjiang, and Ningxia (Columns 4 and 8).

[Table 4 about here]

In sum, we detect spatial interdependence for the level of fiscal extraction among county-level jurisdiction but not in the degree of fiscal extraction. In addition, *Pool Size* retains its inverse U-shaped relationship with both the level and degree of fiscal extraction for ordinary

provinces but not in Tiber, Xinjiang, and Ningxia. These results show that the existence of the inverse U-shaped relationship between interjurisdiction political competition and fiscal revenues, even controlling for peer pressure among county-level governments.

Conclusion

Using a novel measure to capture the intensity of interjurisdiction political competition, we find strong evidence that subnational political competition engenders greater fiscal extraction among county-level governments in China. These results shed light on the recent debate about the re-orientation of central–local fiscal and political institutional arrangements in China. Wang and Hu (2001) argue that the TSS initiated in 1994 has been a successful reform because it strengthened central government fiscal capacity, tied the fate of local politicians to the fiscal goals of the regime through revenue-sharing and generated more fiscal revenue to the central and provincial governments. However, this scheme may result in over taxation through two mechanisms: first, over eagerness to signal loyalty and competence through fiscal extraction may force local officials to tax beyond what the population is willing and bear and thus risk tax revolts. Second, the lack of local fiscal resources to implement unfunded mandates forces officials to seek alternatives sources of revenues, lawful or not. These difficulties have been magnified by various initiatives to increase the decree of administrative centralization. In the 1990s, China shifted from prefecture–county government (*shi guan xian*) to a new system of province–county government (*sheng guan xian*) in several regions. This may exacerbate fiscal predation because a larger number of local leaders now compete for a now smaller number of jobs at a higher level. Without electoral constraints, further political centralization can engender fiscal weakness.

Our results also have important implications for the dynamics of authoritarian endurance. Our theory suggests a non-linear relationship between the degree of political decentralization and fiscal revenues, which is in turn likely to impact regime durability. When the administrative system is centralized—in the sense that many local agents are accountable to the same principal—excessive fiscal extraction and lack of effort in fiscal extraction could co-exist because more competitive politicians are likely to engage in too much fiscal extraction while less competitive politicians are likely to shirk. However, in regimes with the ability to restructure local governments in ways that the bureaucratic ladder ties smaller clusters of agents to their principals, fiscal predation is less likely to occur and most local politicians would exert reasonable amount of effort in collecting fiscal revenues and promoting economic development. At the extreme ends of the spectrum, excessively decentralized regimes will fail to incentivize officials by making it too easy to obtain political promotions and thus produce insufficient revenue streams needed to meet the needs of the central authorities.

We are aware that some of the features of the Chinese regime are not necessarily generalizable to all autocracies. One-party rule facilitates monitoring of local agents, something that is lacking in many autocracies. This may make officials more responsive to the center's needs than elsewhere, but regimes that lack this sort of supervisory authority may struggle to link local taxation with the promotion of local officials. Our main point, however, is that the way in which the multilevel structure of local governments is organized has critical impact on the behavior of local agents in authoritarian regimes where in sharp contrast to democracies, greater political competition *increases* taxation.

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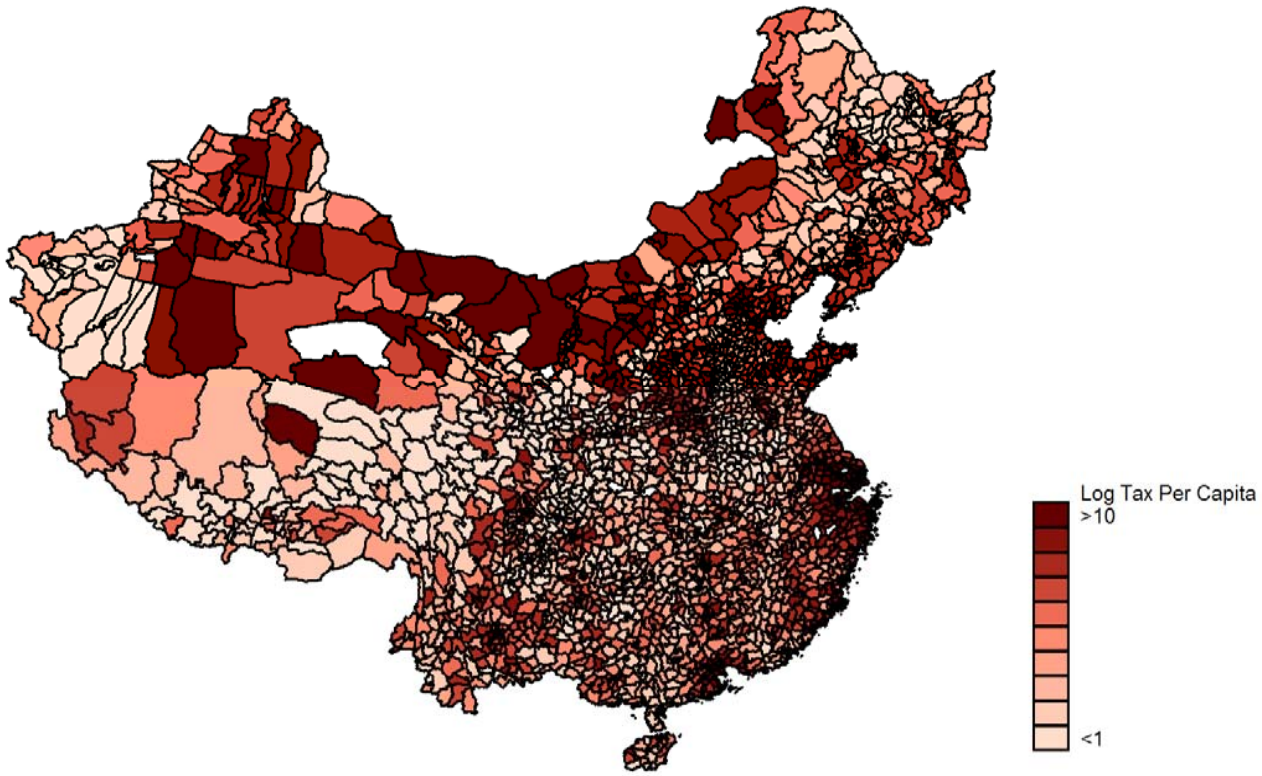
Figure 1: County-level Fiscal Extraction in China (2005)



Data source: Authors' Database. This map is drawn on county boundaries.

Figure 2: The Hierarchy of Chinese Multilevel Government System

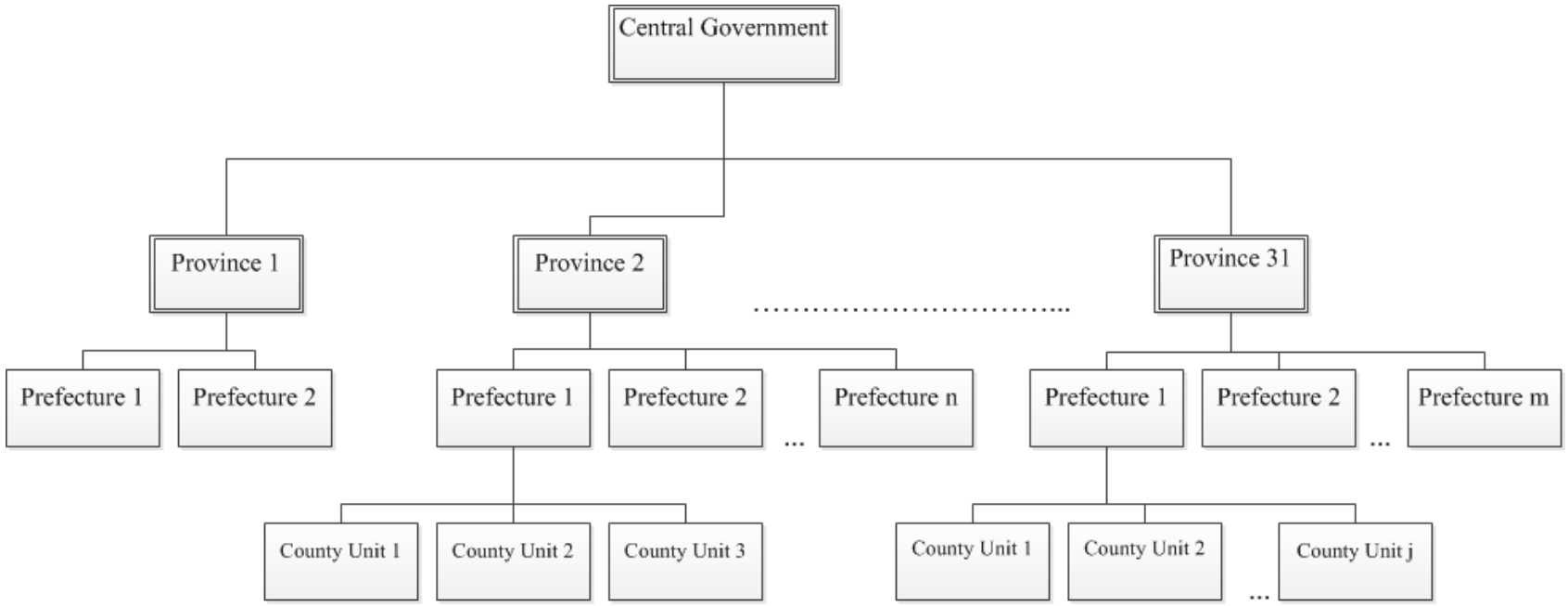
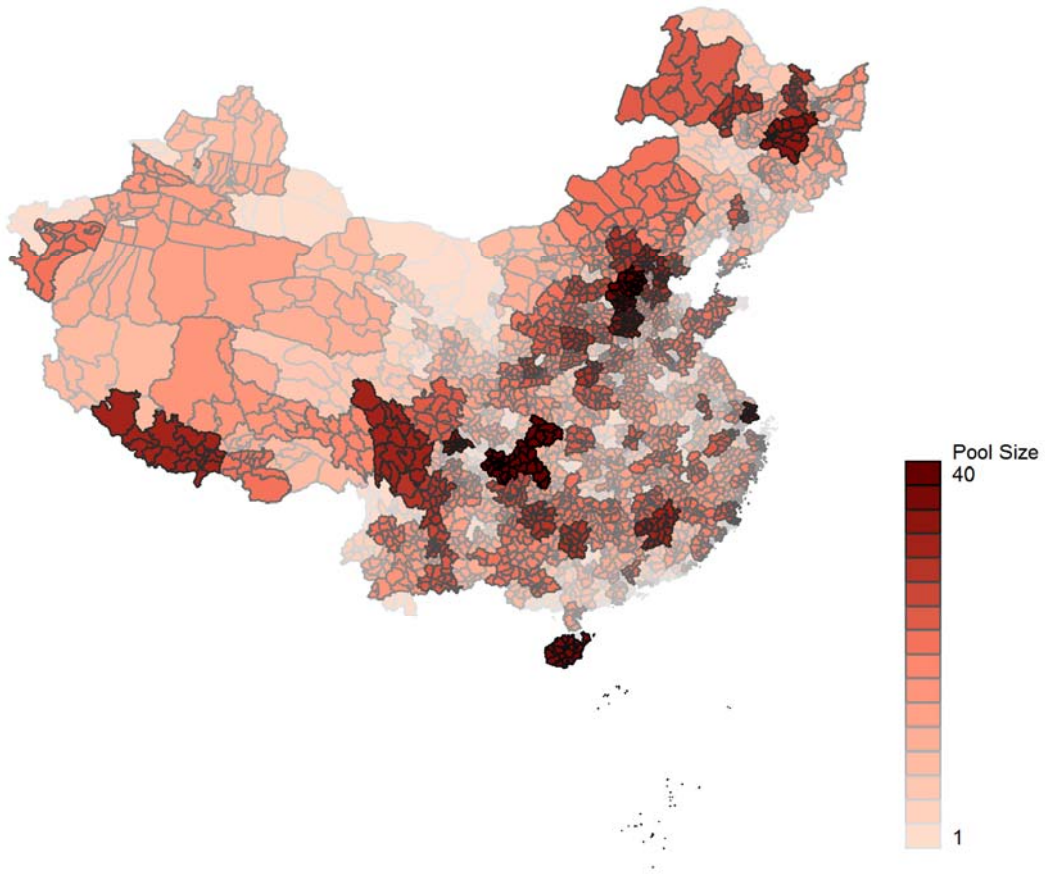


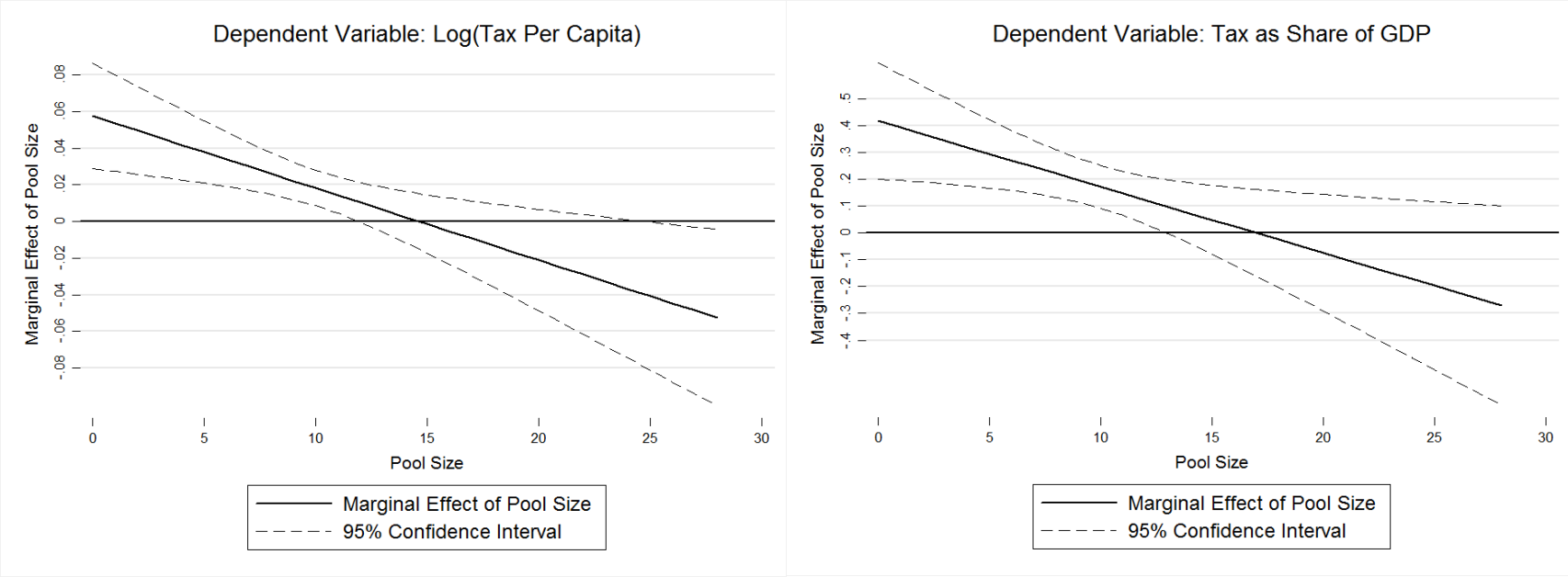
Figure 3: County-Level Interjurisdiction Political Competition in China (2005)



Data source: Authors' Database. This map is drawn on county boundaries.

Figure 4: Marginal Effect of Pool Size on County Fiscal Extraction

Panel 1 **Panel 2**



Note: The marginal effect of *Pool Size* in Panel 1 is based on model in column 4 in Table 2. The marginal effect of *Pool Size* in Panel 2 is based on model in column 4 in Table 3.

Table 1: The Level of Fiscal Revenue Extraction (Prefecture)

	Log(Tax Per Capita)					
	All	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia
	(1)	(2)	(3)	(4)	(5)	(6)
Pool Size	0.042***	0.050***	-0.007	0.047***	0.058***	-0.005
	(0.015)	(0.015)	(0.053)	(0.015)	(0.015)	(0.057)
Pool Size^2	-0.001**	-0.002**	-0.002	-0.002**	-0.002***	-0.002
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Log(Population)	-0.917***	-0.930***	-0.820***	-0.836***	-0.825***	-0.840***
	(0.063)	(0.057)	(0.231)	(0.064)	(0.059)	(0.233)
Log(Area Size)	0.036	0.036	-0.032	0.199***	0.246***	0.007
	(0.033)	(0.034)	(0.148)	(0.050)	(0.055)	(0.170)
% of Rural Population	-0.011***	-0.010***	-0.015	-0.009***	-0.009***	-0.010
	(0.002)	(0.002)	(0.009)	(0.002)	(0.002)	(0.010)
Log(GDP)	0.876***	0.876***	0.890***	0.786***	0.770***	0.819***
	(0.046)	(0.045)	(0.219)	(0.049)	(0.047)	(0.219)
Log(Brightness per capita)				0.159***	0.192***	0.087
				(0.029)	(0.034)	(0.055)
Minority Prefecture				0.053	0.012	0.107
				(0.069)	(0.077)	(0.200)
Minority County				0.068	0.030	-0.010
				(0.116)	(0.119)	(0.895)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,673	2,465	208	2,661	2,453	208

Note: Clustered standard errors at the prefecture level are reported in the parentheses. We did not report the coefficient estimates of the constant as well as provincial and yearly dummies. *** p<0.01, ** p<0.05, * p<0.1

Table 2: The Degree of Fiscal Revenue Extraction (Prefecture)

	Tax as % of GDP					
	All	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia
	(1)	(2)	(3)	(4)	(5)	(6)
Pool Size	0.379***	0.372***	0.553	0.410***	0.418***	0.532
	(0.120)	(0.108)	(0.740)	(0.122)	(0.110)	(0.829)
Pool Size^2	-0.011**	-0.011**	-0.028	-0.013**	-0.012**	-0.031
	(0.006)	(0.005)	(0.030)	(0.006)	(0.005)	(0.033)
Log(Population)	0.126	0.358	-1.242	0.637	1.028**	-1.335
	(0.468)	(0.429)	(2.339)	(0.503)	(0.439)	(2.490)
Log(Area Size)	-0.131	-0.141	-0.573	0.955**	1.185***	-0.647
	(0.246)	(0.243)	(1.784)	(0.387)	(0.436)	(2.138)
% of Rural Population	-0.078***	-0.078***	-0.078	-0.067***	-0.071***	0.001
	(0.016)	(0.015)	(0.096)	(0.016)	(0.015)	(0.119)
Log(GDP)	-0.599*	-0.761**	0.352	-1.211***	-1.432***	-0.622
	(0.362)	(0.348)	(2.054)	(0.383)	(0.337)	(2.097)
Log(Brightness)				1.053***	1.214***	1.150*
				(0.246)	(0.295)	(0.632)
Minority Prefecture				0.099	0.065	1.072
				(0.726)	(0.537)	(3.140)
Minority County				0.503	0.202	8.307
				(1.029)	(0.953)	(13.951)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,673	2,465	208	2,661	2,453	208

Note: Clustered standard errors at the prefecture level are reported in the parentheses. We did not report the coefficient estimates of the constant as well as provincial and yearly dummies. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Robustness Check with County Heterogeneity (Prefecture)

Panel 1	**Log(Tax Per Capita)**			
	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia
	(1)	(2)	(3)	(4)
Pool Size	0.104***	-0.052	0.087***	-0.024
	(0.026)	(0.099)	(0.023)	(0.141)
Pool Size^2	-0.003***	-0.004*	-0.003***	-0.004
	(0.001)	(0.002)	(0.001)	(0.003)
1993 County Tax Potential Heterogeneity	0.163*	-0.540**		
	(0.084)	(0.198)		
Pool Size × 1993 County Tax Potential Heterogeneity	-0.020	0.074*		
	(0.012)	(0.037)		
County Tax Potential Heterogeneity			0.134	-0.265
			(0.091)	(0.237)
Pool Size × County Tax Potential Heterogeneity			-0.009	0.040
			(0.013)	(0.052)
Controls	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes
Observations	2214	172	2,288	197
Panel 2	**Tax as % of GDP**			
Pool Size	0.650**	0.700	0.663***	0.185
	(0.207)	(2.006)	(0.169)	(1.612)
Pool Size^2	-0.017***	-0.072	-0.016***	-0.062
	(0.006)	(0.047)	(0.006)	(0.046)
1993 County Tax Potential Heterogeneity	0.973	-6.114		
	(0.657)	(4.711)		
Pool Size × 1993 County Tax Potential Heterogeneity	-0.088	0.473		
	(0.114)	(0.741)		
County Tax Potential Heterogeneity			1.157*	-3.426
			(0.614)	(2.572)
Pool Size × County Tax Potential Heterogeneity			-0.105	0.554
			(0.092)	(0.677)
Controls	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes
Observations	2214	172	2,288	197

Note: Clustered standard errors at the prefecture level are reported in the parentheses. We did not report the coefficient estimates of the constant as well as provincial and yearly dummies. We also did not report the coefficient estimates for control variables, which include *Log(Population), Log(Area Size), % of Rural Population, Log(GDP), Minority Prefecture Status, Minority County Status, Log(Brightness per capita).* *** p<0.01, ** p<0.05, * p<0.1

Table 4: Fiscal Revenue Extraction (County-level Spatial Analysis)

	Log(Tax Per Capita)				Tax as % of GDP			
	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Spatial Lag	0.132***	-0.014	0.131***	-0.038	0.001	-0.137	0.005	0.001
	(0.021)	(0.082)	(0.021)	(0.086)	(0.064)	(0.263)	(0.062)	(0.310)
Pool Size			0.045***	0.009			0.400***	0.745
			(0.008)	(0.050)			(0.078)	(0.734)
Pool Size^2			-0.002***	-0.002			-0.011***	-0.038
			(0.000)	(0.002)			(0.003)	(0.029)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,159	1,250	20,159	1,250	20,159	1,250	20,159	1,250

Note: Clustered standard errors at the county level are reported in the parentheses. We did not report the coefficient estimates of the constant as well as provincial and yearly dummies. We also did not report the coefficient estimates for control variables, which include *Log(Population), Log(Area Size), % of Rural Population, Log(GDP), Minority Prefecture Status, Minority County Status, Log(Brightness per capita).* *** p<0.01, ** p<0.05, * p<0.1

Online Appendix

Table A1: Descriptive Statistics of County Fiscal Revenue Extraction by Province

	All tax 1 (1999-2006)				All tax 2 (2000-2006)			
	Per Capita		As % of GDP		Per Capita		As % of GDP	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
TIBET	190.62	196.82	4.46	4.33	190.62	196.82	4.46	4.33
SICHUAN	341.45	443.10	4.81	2.85	365.93	484.50	5.10	2.94
HEBEI	490.62	590.80	5.36	5.35	533.10	635.62	5.78	5.51
FUJIAN	970.30	1346.72	5.89	4.05	1020.41	1402.71	6.22	4.17
HAINAN	422.12	360.36	6.27	5.21	432.33	361.52	6.44	5.22
GUANGDONG	998.13	3148.52	6.48	4.90	1029.58	3474.02	6.58	4.94
SHANDONG	846.59	980.21	6.42	4.08	881.22	1032.14	6.65	4.10
JILIN	390.69	303.05	6.50	5.96	406.91	322.61	6.69	6.01
GANSU	365.44	609.00	6.39	4.59	382.24	634.52	6.70	4.69
HUNAN	580.57	1465.98	6.77	6.79	596.83	1469.75	7.04	6.83
ANHUI	342.76	313.99	6.27	3.76	392.07	335.10	7.23	3.78
HENAN	453.64	872.71	7.12	8.86	464.80	882.61	7.28	8.89
JIANGXI	358.96	233.10	7.15	4.21	370.70	245.09	7.34	4.23
QINGHAI	471.06	1086.63	7.23	6.12	480.29	1100.85	7.36	6.15
HEILONGJIANG	391.81	674.01	7.25	7.12	410.45	721.14	7.48	7.21
CHONGQING	672.46	845.00	7.17	3.64	706.22	888.81	7.49	3.68
HUBEI	488.38	847.06	6.74	6.54	558.04	877.80	7.74	6.80
NEIMENGGU	999.51	1535.13	6.98	4.36	1142.67	1741.23	7.95	4.40
GUIZHOU	348.51	473.26	8.09	3.23	359.23	502.52	8.28	3.28
GUANGXI	414.90	317.25	8.12	5.01	430.59	324.76	8.44	5.00
SHAANXI	504.77	1002.03	8.87	8.92	509.83	1003.40	9.01	9.00
NINGXIA	565.17	602.66	8.51	9.73	602.28	632.28	9.05	9.70
YUNNAN	455.54	524.94	9.23	7.92	473.19	549.84	9.53	7.98
XINJIANG	851.19	1866.43	10.03	15.48	876.81	1878.03	10.39	15.51
ZHEJIANG	1807.36	2121.48	9.35	6.04	2062.16	2337.64	10.53	6.19
LIAONING	724.43	803.72	10.30	7.72	761.38	857.03	10.59	7.73
SHANXI	648.44	730.88	10.65	6.91	669.58	751.94	10.96	6.98
JIANGSU	1512.57	1985.73	10.65	9.38	1655.18	2183.19	11.37	9.49
TIANJIN	1718.74	1688.65	11.93	5.94	1807.74	1808.65	12.33	5.94
BEIJING	3548.58	2159.88	18.57	16.58	3574.18	2170.11	18.68	16.60
SHANGHAI	5551.19	4172.71	28.83	14.64	5572.50	4204.85	28.88	14.61
National Average	683.96	1364.47	7.58	7.27	724.84	1449.22	7.96	7.34

Table A2: Robustness Check with Alternative Taxation Measure (Prefecture)

	Log(Tax Per Capita)			Tax as % of GDP		
	All	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia
	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1			***All Tax 2***			
Pool Size	0.049***	0.059***	-0.002	0.434***	0.443***	0.553
	(0.015)	(0.015)	(0.056)	(0.125)	(0.114)	(0.831)
Pool Size^2	-0.002**	-0.002***	-0.002	-0.014**	-0.013**	-0.032
	(0.001)	(0.001)	(0.002)	(0.006)	(0.005)	(0.033)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,661	2,453	208	2,661	2,453	208
Panel 2			***Taxes Shared with Upper-Level Government***			
Pool Size	0.061***	0.072***	0.040	0.224**	0.239***	0.137
	(0.021)	(0.019)	(0.096)	(0.097)	(0.075)	(0.852)
Pool Size^2	-0.003***	-0.003***	-0.007*	-0.008*	-0.008**	-0.008
	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.034)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,660	2,453	207	2,660	2,453	207
Panel 3			***Taxes belong Completely to County Government***			
Pool Size	0.036**	0.045***	-0.021	0.158***	0.180***	-0.018
	(0.015)	(0.015)	(0.038)	(0.053)	(0.054)	(0.172)
Pool Size^2	-0.001	-0.001	-0.001	-0.004	-0.004*	-0.006
	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.007)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,658	2,451	207	2,658	2,451	207

Note: Clustered standard errors at the prefecture level are reported in the parentheses. We did not report the coefficient estimates of the constant as well as provincial and yearly dummies. We also did not report the coefficient estimates for control variables, which include *Log(Population), Log(Area Size), % of Rural Population, Log(GDP), Minority Prefecture Status, Minority County Status, Log(Brightness per capita).* *** p<0.01, ** p<0.05, * p<0.1

Table A3: Robustness Check with Potential Omitted Variable Biases (Prefecture)

	Log(Tax Per Capita)					
	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia	All but Tibet, Xinjiang, Ningxia	Tibet, Xinjiang, Ningxia
	(1)	(2)	(3)	(4)	(5)	(6)
Pool Size	0.074***	-0.016	0.055***	0.029	0.064***	-0.003
	(0.016)	(0.076)	(0.015)	(0.049)	(0.016)	(0.063)
Pool Size^2	-0.003***	-0.002	-0.002***	-0.003*	-0.002***	-0.002
	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.003)
Log(Prefecture Own Revenue Per Capita)	0.084***	-0.038				
	(0.027)	(0.066)				
Log(Transfers Per Capita)			0.104***	-0.364***		
			(0.037)	(0.140)		
Agricultural Production Share of GDP					-0.010***	0.007
					(0.002)	(0.009)
Industrial Production Share of GDP					0.004***	0.006
					(0.002)	(0.007)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,313	199	2,302	207	1,838	155
	Tax as % of GDP					
Pool Size	0.528***	0.084	0.399***	0.869	0.423***	1.285
	(0.120)	(1.223)	(0.112)	(0.856)	(0.118)	(0.791)
Pool Size^2	-0.017***	-0.019	-0.012**	-0.043	-0.013**	-0.062*
	(0.006)	(0.045)	(0.005)	(0.034)	(0.006)	(0.034)
Log(Prefecture Own Revenue Per Capita)	0.845***	-1.165				
	(0.194)	(1.068)				
Log(Transfers Per Capita)			1.064***	-3.593**		
			(0.335)	(1.458)		
Agricultural Production Share of GDP					-0.053***	0.056
					(0.012)	(0.094)
Industrial Production Share of GDP					0.025**	0.087
					(0.012)	(0.065)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,313	199	2,013	207	1,838	155

Note: Clustered standard errors at the prefecture level are reported in the parentheses. We did not report the coefficient estimates of the constant as well as provincial and yearly dummies. We also did not report the coefficient estimates for control variables, which include *Log(Population), Log(Area Size), % of Rural Population, Log(GDP), Minority Prefecture Status, Minority County Status, Log(Brightness per capita)*. *** p<0.01, ** p<0.05, * p<0.1