Neighbor Effects in the Provision of Public Goods in a Young Democracy: Evidence from China

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Abstract

Fiscal mimicking and yardstick competition among neighboring jurisdictions have been widely documented in developed countries with long histories of democracy. However, there is very little empirical evidence for developing countries with young democracies. Using a primary panel of 86 rural Chinese administrative villages that have undergone transitions to democracy over the last two decades, we show that the neighborhood effect also exists in a young democracy, albeit in a lower magnitude than in mature democracy. Incumbent elected Chairs of the Village Committee positively respond to the provision of public projects in neighboring villages by both increasing the quantity of public projects and the funding allocated to undertake them. In contrast, incumbent appointed Party Secretaries are insensitive to neighbors' performance. In addition, village leaders are strategic in timing the arrival of public projects to increase the probability of reelection: in the year preceding elections, both the number and budget of public projects increase significantly. In this sense, politicians in young and old democracies behave alike.

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Introduction

Prior to the 1980s, local officials in China were appointed by higher-level authorities and were more concerned with satisfying superiors than villagers (Fan 2001). However, the introduction of democracy in Chinese villages in 1980 may have shifted the objectives of elected officials toward providing public goods to constituents for two reasons: first, the accountability of public officials increases with elections, influencing the allocation of public resources; second, a democratic government responds to public demand because it faces elections in which voters determine whether or not its leadership serves additional terms (Besley and Coate 2003).

Empirical evidence from China shows that local elections have in fact affected the level of public goods. For example, Rozelle et al. (2009) find that the provision of public goods is higher when village leaders are elected as opposed to being appointed. They argue that the reason behind this result is that village leaders implementing more public projects are more likely to be reelected. Similarly, Zhang et al. (2004) find that elections increase the share of public investment in total expenditures in villages. Finally, Wang and Yao (2007) find that village elections increase the share of public expenditures and reduce the share of administrative costs in government spending, which is consistent with the idea of elections significantly strengthening the accountability of village governments.[1] However, Wang and Yao (2007) also show that elections have reduced fiscal sharing across villages, which might affect the provision of public goods that are complementary across villages. As such, interactions among villages might play an important role in the provision of public goods in China.

This possibility has been established in the literature through theoretical models of fiscal mimicking and yardstick competition (e.g., Case, Hines, and Rosen 1993; Besley and Case 1995). In both cases, the fiscal behavior of a local government is affected by the fiscal behavior of neighbor jurisdictions, and the empirical evidence has supported the theoretical predictions. However, the evidence to date comes exclusively from developed countries with long histories of democracy. An interesting question, then, is whether the influence of neighbors is learned over time through repeated elections (in the case of yardstick competition), or whether it is simply a feature of democracy. Other institutional differences in culture or education between developed and developing countries may also impact interactions across jurisdictions.

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[1] The explanation is consistent with the results of Kennedy et al. (2004), who find that openly elected leaders are more accountable to their constituency as measured by the degree of satisfaction expressed by the villagers toward land management and re-allocation policies.

In this paper, we use a unique data set from a poor Chinese province that has recently begun village-level elections to provide evidence that neighboring villages influence the provision of public goods by local governments. In contrast to many previous studies, public goods – including projects such as irrigation, terracing, and landslide control – are both highly relevant and fully observable to constituents. Moreover, because farmers are usually unable to undertake such projects privately (Zhang et al. 2004), they may only be provided by local governments. Additionally, due to special institutional features of China, it is possible to investigate the different roles in the provision of public goods played by officials who are elected relative to those who are appointed.

Our results show that an increase of RMB 1 on per capita spending on public projects in neighboring villages increases the amount spent in the home village by between RMB 0.11 and RMB 0.20 on average, *cetris paribus*. Consistently, an increase in the number of public projects undertaken by neighbors by 1 increases the number of public projects undertaken in the home village by between 0.2 and 0.6. Additionally, we find evidence that the incumbency of elected officials plays a significant role on both the amount spent and the number of public projects implemented, while the incumbency of appointed officials does not. Finally, we find evidence of political cycles, with higher provision of public goods in the years immediately preceding elections.

The rest of paper continues as follows: Section 2 reviews the institution background, including China's political organization, village democracy, and the provision of public goods; Section 3 describes the unique survey data used in the analysis and the empirical specifications used in the analysis; Section 4 presents results; and section 5 concludes.

2. Institutional Background

Fiscal Federalism in China

China's governing hierarchy is comprised of five official levels – center, province, prefecture, county, and township. Each township is comprised of several "administrative villages;" although administrative villages do not constitute a formal level of government, they mirror the administrative structures of higher levels of government, with both a Communist Party branch

and an administrative office (Zhang et al. 2004). Each administrative village is then comprised of multiple "natural villages," each typically consisting of a few dozen households.

China's system of public finance may be referred to as "fiscal federalism," in which each level has varying authority over taxation and expenditures. Although China was centrally planned for its first 30 years, the rural fiscal system has undergone four major rounds of reforms since the start of the market reforms in the early 1980s. The first round focused on the decentralization of the planned economy in order to incentivize the generation of revenue among local governments (Luo et al. 2007). This reform resulted in significantly higher revenue for local governments, yet revenues accruing to the central government fell dramatically (Luo et al. 2007). The government thus "recentralized" the tax system in 1994, when fiscal revenues were divided between the central and local governments.

However, cash-strapped local governments recouped fiscal losses by implementing a series of fees for services such as irrigation, terracing, and education, each of which was previously provided free of charge. New fees raised the potential for unrest in rural areas, spurring the central government to undertake additional reforms. Hence, at the end of the 1990s, the central government prohibited local governments from levying fees outside the standard taxation system (Tao and Liu 2005); to compensate for revenue shortfalls at the local level, county governments were compelled to increase direct transfers to townships and villages, generally by rebating surcharges on the agricultural tax (Yep 2004). The central government reduced peasants' tax burden further by eliminating the 1000-year-old agricultural tax altogether in 2005 (Meng and Meng 2007). Having lost the right to collect revenues, villages have turned to seeking project funding from upper levels of governments.

Village Democracy

Until the start of the economic reforms in the late 1970s, both the Party Secretary (i.e., head of the local branch of the Communist Party) and the Chair of the Village Committee (i.e., the head of the village administrative office) were appointed by People's Communes (Zhang et al. 2004), which also served as the main supplier of public goods. However, with the advent of the Household Responsibility System in 1978, the commune system in place since the 1950s began to dissolve, and "Village Committees" consisting of between three and seven appointed community members replaced production brigades as the predominant supplier of public goods

in villages, and township governments replaced People's Communes as the primary local administrative unit (Shen and Yao 2008).

Shortly thereafter, two counties in Guangxi Zhuang Autonomous Region began to experiment with electing Village Committee members as a means of addressing the broad political crisis associated with the breakdown of production teams (O'Brien and Li 2000). While Chair of the Standing Committee of the National People's Assembly, Peng Zhen promoted village elections as an efficient means of simultaneously making local leaders accountable and stabilizing Party rule in rural China (Wang and Yao 2007). Hence, the notion that Village Committees should be "self-governing bodies of villagers" was first written into the Constitution in 1982 (article 111), and the National People's Congress implemented the "Organic Law of Village Committees" in 1987, adopting it formally in 1998. This law mandated that Village Committees would henceforth be elected, although each Village Committee must include at least one woman and one member of the smallest ethnicity represented in the administrative village (Yao 2008). By the formal adoption of the Organic Law of Village Committees, elections had reached 25 out of the 31 Chinese provinces and 80% of all Chinese villages (Shen and Yao 2008). Since formal adoption of this law, popular election has become universal in Chinese villages (Wang and Yao 2007).

Candidates for the Village Committee must be endorsed by at least 10 residents to be on the ballot. The Chair of the Village Committee – elected by popular vote – is the executive and most influential member of the Village Committee. By law, the Village Committee is responsible for promoting public welfare through the provision of public goods, resolving disputes among villagers, assisting in maintaining social order, and communicating with upper level governments regarding the opinions of the villagers (O'Brien and Li 2000). The term is three years, with no term limits.

This grass-root democracy faces constrains from the authoritarian state bureaucratic structure. First, the Village Committee often shares decision-making authority within administrative villages with the local branch of the Communist Party, which may have different objectives than elected officials. Second, upper levels of government – including those at the township, county, and even prefectural level – may appoint "village-stationed officials" to supervise local decision making (Wu 2006). One key responsibility of these officials is to lobby upper levels of government for project funding. Third, while the nomination process for Chair of

the Village Committee rests in the hands of local villagers, some township governments continue to vet all candidates, and it is not uncommon for them to veto specific nominations.

Public Goods in Chinese Villages

While the purchasing power of peasants has risen as a result of China's recent tax reforms, the fiscal health of local governments has deteriorated since responsibility for taxation was returned to the central government in 1994 (Luo 2007). In rural areas where revenue collection is lowest, the comprehensive provision of public goods has also eroded as a result. To encourage public investment in critical areas such as agriculture, transportation, education, health, and community development, the central government introduced the *Zhengcun Tuijin* ("push the entire village") program in 1995 (Ren 2007). Under this program, Village Committees submit project proposals to county governments together with comprehensive strategic plans for their administrative villages. The best proposals are escalated to the prefecture and/or province governments, which funds them on a competitive basis. Money for funded projects is appropriated to the administrative village, where the Village Committee oversees implementation (the Party Secretary is often charged with monitoring the use of funds), and villagers are often required to supply labor without compensation for funded projects (Ren 2007).

The *Zhengcun Tuijin* program thus creates a bidding process in which villages within a county compete against each other for poverty-relief funds. Hence, Village Committees that are competent in designing high quality projects and/or well connected to decision makers in higher levels of government are more likely to see their proposals funded. In our survey data, transfers from this program account for 84% of revenues in administrative villages, on average. Other sources of revenue include operating income and fees from village-owned enterprises; operating income and rent from agricultural land, forests, and water owned by the village; fines for violating family planning and other social policies, and income from village accounts (Yang 2001).

3. Data

The data come from the first two waves of the Public Policy and Rural Poverty Surveys, conducted jointly by Northwest Agricultural University and the International Food Policy

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Research Institute in 2004 and 2007 in Gansu Province in northwestern China. The 26 million people living in Gansu are primarily engaged in agricultural production, with three-fourths of the population officially designated as rural. With a rural income of RMB 2329 per capita in 2007, Gansu is China's poorest province, marked for its low productivity and low investment levels.

Three nationally designated poor counties – Huining, Weiyuan, and Tianzhu – were selected to represent Gansu's geographic diversity. Huining is east of the capital of Gansu, Lanzhou, and close to Ningxia Province. It suffers from serious water shortages which greatly inhibit agricultural production. Weiyuan lies to the south of Lanzhou. Home to the source of the Weihe River, the county is well known for its agricultural production, with wheat, potatoes, and maize as major crops, as well as high concentrations of *Angelica*, *Codonopsis*, and other Chinese herbs. Tianzhu is situated to the northwest of Lanzhou on the Qianghai border, and livestock production is the major source of income.

In each county, three townships were randomly chosen and all the villages in the selected township were surveyed. In total, the sample included 88 administrative villages, including 31 from Huining County, 22 in Tianzhu County, and 35 in Weiyuan County. Interviews, which were conducted in both 2004 and 2007, were administered to village leaders and to village accountants.

The survey included detailed questions on the socioeconomic status of each village, characteristics of Chair of the Village Committees and the Party Secretary, revenues and their sources, and the provision of public goods. The specific public goods considered include projects for fire suppression; drainage improvement; erosion and landslide control; terracing land for cultivation; improving environmental conditions; collecting solar energy; and connecting the village to electricity, telephone, and cable television grids, as well as programs promoted by the central government, including the Grain to Green program, the Grassland Development program, funding for animal husbandry projects, agricultural research and extension services, and development of cultural venues. Importantly – and in contrast to much of the literature that analyzes public goods provision – each of these projects is both observable (in contrast to, say, defense spending) and relevant to farmers. Moreover, funding for these projects is almost always provided by upper levels of government, unlike projects such as road construction, for example.

Based on the prevailing evidence on the determinants of public spending in other countries and the specific institutional details in rural China, we use the following econometric

specification to estimate the effects of each administrative village's neighbors' spending on public goods on own spending of public goods:

$$Gpc_{it} = \beta_0 + \beta_1 \sum_{j \neq i} w_{ij} Gpc_{jt} + \beta_2 Leaders_{it} + \beta_3 Concentration_i +$$
$$\beta_4 Shocks_{it} + \beta_5 Income_{it} + \beta_6 Elections_t + \alpha_i + u_{it}$$

(1)

where *Gpc* is the per capita spending on public projects in administrative village *i* at time *t*, *w* is a weight of the per capita spending on publically observable projects undertaken by each neighbor *j*, *Leaders* describe characteristics of the Chair of the Village Committee and the Party Secretary, *Concentration* measures heterogeneity within each village that may affect the cost of providing public goods and/or the mix of goods provided, *Shocks* are exogenous economic shocks that negatively affect income in the village, potentially reducing a village's ability to fund public goods, *Income* is a measure of average village income, and *Elections* describe political cycles that may affect public spending.

Because the level of spending on public projects in administrative villages may be difficult for individuals to assess, we also measure the quantity of public goods provided using a count variable. In this case, the econometric specification is non-linear:

$$\Pr\left(Projects_{it}\right) = f\left(\sum_{j \neq i} w_{ij} Projects_{jt}, Leaders_{it}, Concentration_i, Shocks_{it}, Income_{it}, Elections_t\right)$$ (2)

where *Projects* is the number of public projects undertaken in village *i* at time *t* and *w* is a weight of the number of publically observable projects undertaken by each neighbor *j*. Again, each of the projects that we consider is both observable and relevant to the local population.

Like most papers that have analyzed the effect of neighbor spending on public goods on own provision of public goods, we define neighbors by geography (e.g., Heyndels and Vuchelen 1998; Revelli 2002; Bordignon, Cerniglia and Revelli 2003; Geys 2006, Lundberg 2006; Sole-Olle 2006; Vermeir and Heyndels 2006), specifically shared borders. Although the literature has also experimented with defining neighbors by ethnicity and income, Bourginion et al. (2003)

argue that information flows most easily among areas that share borders.[2] Moreover, neither ethnicity nor income is an appropriate indicator of neighbors in the case of rural Gansu because 92% of Gansu's population is ethnically Han[3] and because all of the townships in our sample are ethnically homogenous. In addition, farmers normally frequent markets in nearby townships and the county seat, rarely venturing outside their own counties.[4] As such, people know their neighboring villages well.

Hence, the weight of the per capita spending on publically observable projects undertaken by neighbor *j* (or, alternatively, the number of projects) is calculated as:

$$w_{ij} = \begin{cases} \frac{1}{N_i} & \text{if } i \text{ and } j \text{ share a border} \\ 0 & \text{if not} \end{cases}$$

where N_i is the total number of villages that shares a border with Village *i*. We obtain the geographic boundaries based on local maps, and since we survey all of the administrative villages within each township, we are able to identify each administrative village's neighbors.

Table 1 provides summary statistics for the data used in the empirical analysis. On average, administrative villages spend RMB 69 per capita on observable public goods, but there is a large variation across villages and over time (Figure 1), with per capita spending in any given year ranging from zero to RMB 2762. Restricting the data to administrative villages that undertook one or more of the public projects listed above, the mean spending per capita is RMB 167. The number of projects undertaken by administrative villages in any given year ranges between 0 and 6, with a mean of 0.4.

Leaders is measured via dummy variables that equal 1 if the Chair of the Village Committee and the Party Secretary have been in office for more than just the current term and 0 if the current term is his or her first. Nearly one-third of Chairs have served at least one term while nearly half of Secretaries have done so. *Concentration* includes Herfindahl-Hirschman Indices (HHI) that describe the type of land under cultivation and the share of the total population in the largest three natural villages in each administrative village. The former controls

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[2] In general, there are no significant changes when using different W matrices and geography fits the data better than other alternatives (Brueckner and Saavedra 2001; Edmark and Agren 2008).

[3] Moreover, the two largest minority groups in Gansu, Tibetans and Hui, largely reside in "autonomous" counties in which each forms the majority ethnic group.

[4] Indeed, most rural marriages occur within counties as well (Wei and Zhang 2009).

for the relative cost of providing public goods because economies of scale are higher if village land types are more homogenous, e.g., if all land is located in a valley. The latter controls for the distribution of population across natural villages within an administrative village. A high HHI index means that one natural village dominates village affairs because population is concentrated in one place. Under this situation, it is more likely to for the natural village to push its agenda in the Village Committee. The HHIs are 0.69 and 0.34, respectively, suggesting that while land type is rather homogenous, the population distribution among natural villages is more variable. *Shocks* is measured by the number of exogenous negative economic shocks affecting each administrative village in each year; on average, villages experience one shock per year, although this number demonstrates high variability. Because off-farm work has provided an increasing share of household income in Gansu, *Income* is measured via both nonfarm income and agricultural income. The mean nonfarm and agricultural incomes are RMB 328 and RMB 375, respectively. Finally, political cycles are measured via a dummy indicating the second year of the electoral cycle because that spending on public goods escalates in this year in anticipation of elections in the third year of the cycle.

Results

Table 2 shows the results of estimating Equation (1) for the total per capita spending on projects in the administrative village. All results include township fixed effects to control for unobserved heterogeneity that may affect all administrative villages within each township. While using village fixed effects may allow for even stronger inference than township fixed effects, it is not possible to obtain precise estimates given the relatively small sample size. Hence, random effects are implemented to control for unobserved heterogeneity across villages. Heteroskedasticity-robust standard errors are reported in parentheses.

The most interesting effects for the purpose of this paper are weighted per capita spending on public goods by neighbors, incumbency of the Chair of the Village Committee, and incumbency of the Party Secretary. The effect of neighbor spending is positive and significant (Specification 1), which is consistent with mimicking and/or yardstick competition among geographic neighbors. However, the effect is not large in magnitude compared to most results from developed countries. Specifically, an increase of RMB 1 in neighbors' per capita spending on public goods is associated with a RMB 0.11 increase in per capita spending in the

administrative village (significant at the 1% level), lower than the estimated elasticity of 0.63 for French municipalities (Foucalt et al. 2008), 0.67 for English non-metropolitan districts (Revelli 2002), and 1.00 for U.S. states (Baicker 2005). This finding may reflect the fact that China's democracy is young, i.e., it is plausible that these effects will grow over time, particularly for public goods that complement public goods in neighboring areas.

Incumbent Chairs of the Village Committee are associated with greater spending on public goods, an effect that is both large and statistically significant at the 5% level. On average, an administrative village with an incumbent Chair spends RMB 32.6 more on public goods than an administrative village with a new Chair, sugesting that an incumbent Chair of the Village Committee has stronger ties to upper levels of government. This result is consistent with Costa-i-Font et al. (2003), who show that Mexican municipalities receive greater appropriations for public projects when their mayors identify with the same political parties as higher level political authorities.

Specification (2) considers the additional effect of an incumbent Party Secretary on spending on public goods, but the point estimate is statistically indistinguishable from zero. This result shows that elected Chairs of the Village Committee have a greater impact on public spending than appointed Party Secretaries, even though the latter can also lobby higher levels of government for funding for public projects.

Unfortunately, both of the above specifications may suffer from simultaneity bias if spending on public goods in the administrative village influences neighbor spending as well as the reverse. To obtain consistent estimates of the effects of neighbor spending on public goods, Specifications (3) and (4) re-estimate Specifications (1) and (2) while employing instrumental variables to identify the level of spending in neighboring villages.[5] Specifically, the weighted number of negative economic shocks and the weighted per capita nonfarm and agricultural income are used to instrument for the weighted average of neighbors' per capita spending on public goods. The instruments are strongly significant in the first stage, by themselves as well as jointly, with an F-statistic for the joint significance of the instruments of 149.9 (full results from the first stage estimates are presented in Appendix 1).

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[5] Kelejian and Prucha (1998) show that instrumental variables provide consistent estimates even in the presence of spatial error dependence. Indeed, instrumental variables have commonly been used to deal with this potential type of endogeneity, e.g., Ladd (1992); Kelejian and Robinson (1993); Brett and Pinske (2000); Heyndels and Vuchelen (1998); Figlio, Kolpin and Reid (1999); Frederickson and Millimet (2000); Buettner (2001); and Revelli (2001).

Using instrumental variables estimation and bootstrapped standard errors (with 500 replications), the point estimates for neighbor spending remain significant. Now, however, an increase of RMB 1 in neighbors' per capita spending on public goods increases own per capita spending on public goods by RMB 0.21. While the point estimate is twice the magnitude obtained without instrumenting,[6] it remains well below the estimated effects in developed countries. The estimated effects of incumbent Chairs of the Village Committee and Party Secretaries remain unchanged.

Point estimates for all other variables are quite robust and of similar magnitude across all four specifications. The HHI for the type of land under cultivation is positive and significant, with a 1% increase in land concentration being associated with a 0.73% increase in per capita spending on public goods, reflecting potential economies of scale in the production costs of public projects. The HHI describing the distribution of population across natural villages is positively correlated with spending on public goods, perhaps because collective action is more common in concentrated villages, although the effects are not quite statistically significant. The estimated effect of economic shocks on spending on public goods is negative, although the effect is not statistically significant. The income variables are both positive as expected, although the estimated effect of agricultural income is not significant, perhaps because a significant portion of agricultural income is comprised of crops that are eaten by the household. The income elasticity of nonfarm income on per capita spending on public goods in the administrative village is 0.43. Timing within the electoral cycle is also an important determinant of spending on public goods: in the year before elections are held, per capita spending on public projects increases between RMB 29 and RMB 33 on average, an impact of similar magnitude as having an incumbent Chair of the Village Committee instead of a newcomer. This result is consistent with Foucalt et al. (2008), who document that spending on public goods escalates sharply just before elections in French municipalities.

To allow for a separate data generating process in the second year of the election cycle relative to other years, we repeat the analysis by restricting the sample to the projects undertaken in 1997, 2000, 2003, and 2006 (Appendix 2). With the exception of the IV results shown in

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[6] Ravelli (2002) also finds that point estimates for the effects of neighbors increase with instrumental variables in the context of taxation.

Specifications (3) and (4), neighborhood effects continue to strongly influence spending in the home administrative village.

Because the level of spending on public projects in administrative villages may be difficult for individuals to assess, we also measure the provision of public goods by counting the number of observable projects undertaken (the full list of projects is provided in the previous section). Table 3 presents the results of estimating equation (2) using a Negative Binomial model with random effects.[7] Bootstrapped standard errors with 500 replications are reported in parentheses. As before, Specification (1) provides the main result while Specification (2) adds a measure of the incumbency of Party Secretary. Specifications (3) and (4) re-estimate these specifications using instrumental variables for the neighbors' numbers of projects (the F-statistic for the joint significance of the instruments is 62.3).

Results are qualitatively similar to those for per capita spending on public projects and are also very robust across specifications. Increasing the number of projects in neighboring villages by 1 is associated with an increase of between 0.51 and 0.60 projects in the home administrative village if the linear prediction of the model (reported in the table) is considered. If the nonlinear prediction (not reported) is used instead, the marginal effect of an additional project in neighboring villages is to increase the number of projects undertaken in the home administrative village by 0.20, based on the model assumptions that the expected value of the unobserved heterogeneity is zero. This result holds when the sample is restricted to the years in which election spending escalates (Appendix 3).

Villages with an incumbent Chair of the Village Committee have between 0.05 (nonlinear prediction) and 0.14 (linear prediction) more public projects than other villages, further demonstrating that the influence of a Chair of the Village Committee whose experience and connections with upper levels of government enable more projects to be undertaken. Although the magnitude of the point estimate is small, the average number of projects from our list undertaken in any given year is just 0.7, suggesting that having an incumbent Chair is both economically and statistically significant. On the contrary, an incumbent Party Secretary seems to play no role in the number of projects executed in a village: although the coefficient is negative, the effect is statistically not different from zero. Again, these effects hold in the restricted sample as well.

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[7] The Poisson model was rejected over the Negative Binomial model due to overdispersion.

The estimated effects for the HHI for the type of land under cultivation and the HHI for the distribution of population across natural villages are both positive and statistically significant at the 1% level. The marginal effect of increasing the concentration of land type is to increase the estimated number of projects by between 0.3 (nonlinear effect) and 0.8 (linear effect); the marginal effect of increasing the concentration of population is to increase the number of projects undertaken by between 0.5 (nonlinear effect) and 1.2 (linear effect). Economies of scale may explain the latter result, but it may also be the case that public projects undertaken in population dense areas are more likely to be funded by upper-levels of government.

Point estimates for negative economic shocks are consistently negative, but not statistically distinguishable from zero. Nonfarm income has a statistically significant and positive effect, as expected, with a linear (nonlinear) marginal effect of approximately 0.30 (0.11) in the project count, on average. Agricultural income has a very small positive effect, but it is not statistically significant. Finally, the estimated effect of timing within the electoral cycle confirms the political cycle found above: as the number of projects undertaken in the administrative village increases by between 0.12 (nonlinear effect) and 0.30 (linear effect), on average, in the year preceding an election, all else constant.

The results presented here are quite robust to alternative specifications. In particular, they are robust to different functional forms and to including other variables, the age and education of the village leadership, the concentration of family clans in the administrative village, and other measures of political cycles. We also considered instrumental variables for the incumbency of the Chair of the Village Committee and Party Secretary. However, the point estimates for the newly added variables were not statistically significant, and their inclusion did not change substantively change any of our results.

Conclusion

Fiscal mimicking and yardstick competition among neighboring jurisdictions have been widely documented in developed countries with a long history of democracy. However, no studies of which we are aware have provided empirical evidence for developing countries with young democracies. Using a primary panel of 86 rural Chinese administrative villages that have undergone transitions to democracy over the last two decades, we find that the neighborhood

effect persists, albeit in lower magnitude than in mature democracies. Incumbent elected Chairs of the Village Committee positively respond to the provision of public projects in neighboring villages by both increasing the quantity of public projects and the funding allocated to undertake them. In contrast, incumbent appointed Party Secretaries are insensitive to neighbors' performance.

Apart from the neighborhood effect, our results also show that elected Chairs are strategic in timing the arrival of public projects so as to increase their chance of reelection: in the year prior to election, both the number and budget of public projects jump significantly, suggesting that politicians in young democracies do not act much differently from those in mature democracies.

Given that China will likely extend local elections to upper levels of government in the future, findings at the village level may shed important light on the behavior of elected and appointed leaders. As a future research project, it would be interesting to study whether the neighborhood effect increases over time to a level as observed in developed countries.

Appendix 1: First State Regression for Weighted Per Capita Spending in Neighboring Areas

	Unrestricted Sample	Unrestricted Sample	Restricted Sample	Restricted Sample
Incumbent Chair of the	4.372	4.279	10.411	10.212
Village Committee	(9.84)	(9.80)	(13.25)	(13.28)
Incumbent Party Secretary		9.289		-4.332
		(9.25)		(12.65)
Herfindahl Index for Type of	-33.103	-32.259	-3.717	-4.178
Land Under Cultivation	(21)	(20)	(27)	(27)
Herfindahl Index for Share of	-4.127	-2.626	8.021	7.287
Population in Each Natural Village	(37)	(37)	(48)	(48)
Village Level Income Shocks	-6.677	-7.059	6.051	6.312
	(7.68)	(7.67)	(9.71)	(9.76)
Log Nonfarm Income	7.088	6.997	20.452**	20.666**
	(6.61)	(6.58)	(8.74)	(8.77)
Log Agricultural income	11.628	10.972	14.669	14.925
	(8.23)	(8.20)	(10.48)	(10.52)
Year 2 of Electoral Cycle	29.044***	29.088***		
	(9.16)	(9.18)		
Weighted number of Village Level Income Shocks	45.265***	45.552***	24.373	23.931
in Neighboring Areas	(14.16)	(14.15)	(17.65)	(17.72)
Weighted Log Nonfarm Income	82.252***	82.100***	46.493***	46.286***
in Neighboring Areas	(8.38)	(8.36)	(10.71)	(10.74)
Weighted Log Agricultural income	-78.637***	-78.422***	-31.544***	-31.280***
in Neighboring Areas	(7.71)	(7.69)	(10.09)	(10.13)
N	911	911	332	332
F-statistic for joint significance of the instruments	149.87	150.85	63.15	62.26

Source: Authors' calculations

Notes: Heteroskedasticity robust standard errors are presented in parentheses.

* significant at the 1% level; ** significant at the 5% level; *** significant at the 10% level

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Appendix 2: Spending Per Capita, Restricted Sample

	(1)	(2)	(3)	(4)
Weighted Per Capita Spending	0.246***	0.245***	0.062	0.056
in Neighboring Areas	(0.07)	(0.08)	(0.17)	(0.21)
Incumbent Chair of the	54.566*	54.422*	55.504*	55.312**
Village Committee	(29.98)	(29.66)	(29.04)	(22.02)
Incumbent Party Secretary		-4.334		-6.503
		(21.48)		(18.43)
Herfindahl Index for Type of	89.363**	88.851**	89.631**	88.870**
Land Under Cultivation	-43.133	(42.71)	-45.203	(41.16)
Herfindahl Index for Share of	26.141	25.339	23.851	22.591
Population in Each Natural Village	(85.50)	(86.58)	(81.81)	(80.43)
Village Level Income Shocks	-6.968	-6.707	-6.41	-6.004
	(11.76)	(11.73)	(10.83)	(11.49)
Log Nonfarm Income	39.138***	39.318***	44.620***	45.025***
	(11.72)	(11.88)	(13.96)	(10.98)
Log Agricultural income	3.183	3.458	7.159	7.67
	(14.55)	(14.70)	(18.54)	(18.26)
N	332	332	332	332
R^2	0.094	0.094	0.082	0.081
Wald χ^2	32.68	32.62	24.84	24.83

Source: Authors' calculations

Notes: Heteroskedasticity robust standard errors are presented in parentheses in Specifications (1) and (2).
Bootstrapped standard errors are reported in parentheses in Specifications (3) and (4).
* significant at the 1% level; ** significant at the 5% level; *** significant at the 10% level

Appendix 3: Number of Projects Completed, Restricted Sample

	(1)	(2)	(3)	(4)
Weighted Number of Projects	0.595***	0.594**	0.601**	0.587**
in Neighboring Areas	(0.19)	(0.23)	(0.26)	(0.27)
Incumbent Chair of the	0.340*	0.337**	0.263*	0.255*
Village Committee	(0.19)	(0.15)	(0.16)	(0.15)
Incumbent Party Secretary		-0.139		-0.133
		(0.16)		(0.30)
Herfindahl Index for Type of	0.923***	0.908***	0.930***	0.914***
Land Under Cultivation	(0.22)	(0.34)	(0.31)	(0.34)
Herfindahl Index for Share of	1.011**	0.983**	0.952*	0.927
Population in Each Natural Village	(0.46)	(0.44)	(0.51)	(0.66)
Village Level Income Shocks	-0.002	0.007	0.028	0.039
	(0.21)	(0.11)	(0.11)	(0.20)
Log Nonfarm Income	0.255**	0.264***	0.296*	0.304**
	(0.10)	(0.04)	(0.16)	(0.13)
Log Agricultural income	0.188**	0.192	0.198*	0.204
	(0.09)	(0.14)	(0.11)	(0.21)
N	332	332	332	332
Wald χ^2	72.84	73.32	37.90	38.39

Source: Authors' calculations

Notes: Bootstrapped standard errors are reported in parentheses.

* significant at the 1% level; ** significant at the 5% level; *** significant at the 10% level

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Figure 1. Mean Number of Projects Undertaken in Surveyed Areas, by Township and Year

Graphs by township
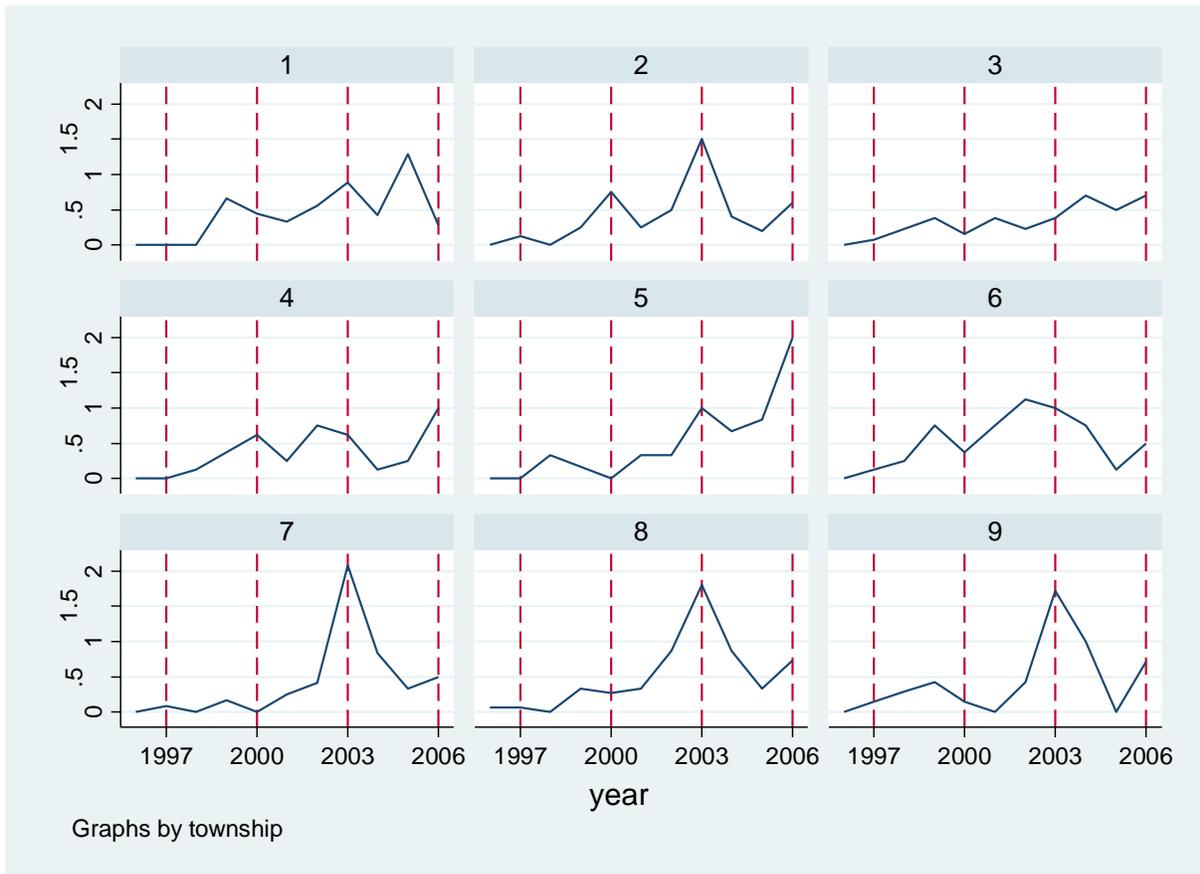
Table 1. Summary Statistics

Variable	Unit	Mean	S.D.	Min.	Max
Per Capita Spending on Projects	RMB	69.08	183.29	0	2762.43
Weighted Per Capita Spending on Projects in Neighboring Areas	RMB	57.48	146.33	0	3512.88
Number of Projects Completed	#	0.77	1.09	0	6
Weighted Number of Projects Completed in Neighboring Areas	#	0.67	0.82	0	6.5
Incumbent Chair of the Village Committee	1/0	0.32	0.47	0	1
Incumbent Party Secretary	1/0	0.48	0.50	0	1
Herfindahl Index for Type of Land Under Cultivation	Index	0.69	0.28	0	1
Herfindahl Index for Share of Population in Each Natural Village	Index	0.34	0.16	0	1
Village Level Income Shocks	#	0.96	0.65	0	5
Nonfarm Income	RMB	327.70	186.96	0	1200
Agricultural income	RMB	374.52	199.09	20	1200
Year 2 of Electoral Cycle	1/0	0.36	0.48	0	1

Source: Public Policy and Rural Poverty Surveys

Table 2: Spending Per Capita, Full Sample

	(1)	(2)	(3)	(4)
Weighted Per Capita Spending	0.109***	0.109***	0.217*	0.213*
in Neighboring Areas	(0.04)	(0.03)	(0.13)	(0.11)
Incumbent Chair of the	32.653**	32.526**	32.853**	32.714**
Village Committee	(15.56)	(15.56)	(15.96)	(13.05)
Incumbent Party Secretary		-5.375		-5.544
		(12.65)		(12.34)
Herfindahl Index for Type of	72.705*	72.186*	74.872**	74.253***
Land Under Cultivation	(38.01)	(38.35)	(31.19)	(26.22)
Herfindahl Index for Share of	68.747	68.002	67.827	67.094
Population in Each Natural Village	(56.93)	(57.42)	(58.10)	(47.00)
Village Level Income Shocks	-5.663	-5.473	-5.176	-4.999
	(8.85)	(9.04)	(8.40)	(10.15)
Log Nonfarm Income	29.917***	30.117***	26.984***	27.304***
	(5.77)	(5.73)	(9.28)	(8.95)
Log Agricultural income	7.944	8.318	6.574	7.012
	(9.17)	(9.21)	(8.60)	(10.90)
Year 2 of Electoral Cycle	33.068***	33.025***	29.278**	29.380**
	(12.61)	(12.59)	(12.36)	(12.99)
N	911	911	911	911
R^2	0.207	0.212	0.200	0.205
Wald χ^2	59.07	59.21	55.74	55.78

Source: Authors' calculations
Notes: Heteroskedasticity robust standard errors are presented in parentheses in Specifications (1) and (2).
Bootstrapped standard errors are reported in parentheses in Specifications (3) and (4).
* significant at the 1% level; ** significant at the 5% level; *** significant at the 10% level

Table 3: Number of Projects Completed, Full Sample

	(1)	(2)	(3)	(4)
Weighted Per Capita Spending	0.606***	0.601***	0.547**	0.510***
in Neighboring Areas	(0.03)	(0.11)	(0.26)	(0.15)
Incumbent Chair of the	0.136***	0.129***	0.115***	0.102*
Village Committee	(0.05)	(0.03)	(0.03)	(0.06)
Incumbent Party Secretary		-0.227		-0.227
		(0.31)		(0.29)
Herfindahl Index for Type of	0.828***	0.808***	0.799***	0.775**
Land Under Cultivation	(0.19)	(0.19)	(0.23)	(0.34)
Herfindahl Index for Share of	1.289***	1.274***	1.234***	1.211***
Population in Each Natural Village	(0.40)	(0.38)	(0.35)	(0.35)
Village Level Income Shocks	-0.068	-0.052	-0.038	-0.020
	(0.12)	(0.08)	(0.08)	(0.07)
Log Nonfarm Income	0.299***	0.311**	0.348***	0.361***
	(0.07)	(0.12)	(0.07)	(0.11)
Log Agricultural income	0.067	0.085	0.085	0.104
	(0.10)	(0.10)	(0.12)	(0.13)
Year 2 of Electoral Cycle	0.292*	0.291**	0.340*	0.343***
	(0.16)	(0.12)	(0.18)	(0.11)
N	911	911	911	911
Wald χ^2	136.99	140.09	69.32	72.94

Source: Authors' calculations

Notes: Bootstrapped standard errors are reported in parentheses.

* significant at the 1% level; ** significant at the 5% level; *** significant at the 10% level