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Village Elections, Public Goods Investments and Pork Barrel Politics, Chinese-style

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ABSTRACT *A key issue in political economy concerns the accountability that governance structures impose on public officials and how elections and representative democracy influence the allocation of public resources. In this paper we utilise a unique set of survey data set from nearly 2450 randomly selected villages describing China's recent progress in village governance reforms and its relationship to the provision of public goods in rural China between 1998 and 2004. Two sets of questions are investigated using an empirical framework based on a theoretical model in which local governments must decide to allocate fiscal resources between public goods investments and other expenditures. The empirical analysis – both in the descriptive and econometric analyses – suggests that when the village leader is elected directly, ceteris paribus, the provision of public goods rises (compared to when the leader is not elected directly by villagers). Thus, in this way it is possible to conclude that democratisation – at least at the village level in rural China – appears to increase the quantity of public goods investment. Second, we seek to understand the mechanism that is driving the results. Also based on the survey data, we find that when village leaders (who had been directly elected) were able to implement more public projects during their terms of office, they, as the incumbent, were more likely to be re-elected. In this way, we argue that the link between elections and investment may be a rural China version of pork barrel politics.*

I. Introduction

In recent years, a number of theoretical studies have addressed issues of the links between democracy and development in the developing world. A part of the literature has focused on studying countries in the early stages of democratic transition, public resource allocation and public goods investment. Theoretically, some studies ask the question of whether or not (and how) local governance affects

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An Online Appendix is available for this article which can be accessed via the online version of this journal available at www.informaworld.com/fjds

the provision of public goods (Bardhan and Mookherjee, 2000a, 2000b, 2001; Besley and Coate, 2003). Unfortunately, much of the literature seems to indicate that the exact nature of the linkage between democracy and public goods investment is ambiguous. One exception is a paper by Rosenzweig and Foster (2003). In this paper, Rosenzweig and Foster (2003) embed a two-party voting model of democracy in a general-equilibrium model of the rural economy and find that increasing the population weight of the poor segment of the population in a democracy induces public resource allocations in a direction that increases the welfare of the poor. From this Rosenzweig and Foster (2003) derive a strong link between the election process and public goods investment.

Although there is a need to explore this issue empirically, until recently a lack of detailed information precluded researchers from studying the linkages between democracy and public goods (Dethier, 1999). However, in recent years this log jam has been broken. For example, a research team working in India showed that increasing the number of representatives of a specific sub-group (or interest group) on the village council (through some mechanism, such as affirmative action or the reservation system) in a fair election process will increase the allocation of public resources to favour the group with the largest voting block (Chattopadhyay and Duflo, 2004). Finally, building on their theoretical work, Rosenzweig and Foster (2003) demonstrate that local democratisation is positively correlated with the provision of local public goods. They demonstrate that when the constituency of the leaders is composed mostly of farmers (in the case of India – large land owners in a governance system that is based on hereditary leadership), local leaders tend to allocate more investment funding to irrigation. In contrast, when the local voting population is made up mostly of landless labourers, local leaders tend to invest more in roads.

Social scientists have examined similar sets of issues in China, where most rural villages are now into their fifth or sixth round of local elections. However, despite attention from political scientists (for example, O'Brien, 1994; Kelliher, 1997; O'Brien and Li, 2000; and so on), there has been relatively little effort by economists to study the linkages between elections and public goods investment in rural China. In some sense this is curious because China seems to be an ideal place to study this issue. Although China began holding village-level elections in the 1980s, the pace of emergence and quality of elections vary both over time and across space (Zhang et al., 2004). Moreover, while there seems to be a high return to investment in public goods (Fan et al., 2004), village-to-village differences in investment is great (Zhang et al., 2005). Hence, in China there appears that there is an opportunity to study how the rise of elections and difference in public goods investment are related over time and across China's vast rural landscape.

In fact, while in-depth, nationwide studies of elections and investments have not occurred, economists have begun to examine a number of related issues. For example, Brandt and Turner (2003) find that village elections provide a strong disincentive to rent-seeking. While this may mean that leaders might use less of a village's fiscal revenues on activities that improve their own personal welfare, Brandt and Turner do not attempt to measure the effect. Zhang et al. (2004) is the only published paper we know of to address the issue of the linkage between elections and public service provision in rural China (a concept somewhat broader than public goods investment). Using survey data from 60 villages in Eastern China, it is found

that when villages hold elections (regardless of the nature of the election), the village's leadership tends to tax constituents less and allocate more local resources to public service provision. The Zhang et al. (2004) paper, however, is based on data from only one region of China and it does not differentiate between directly-elected and indirectly-elected village leaders. In addition, it does not seek to quantify the mechanism driving the election-investment relationship.¹

In short, in a country – China – that has held more than four million local elections during the past two decades, there are a number of fundamental questions that have not been answered. When rigorous statistical sampling is used at the national level, can we find any relationship between the emergence of elections and public goods investments? Holding all other factors constant, when villagers directly elected their leaders, does the leader increase investment into public goods during his/her term of office? When leaders are in office, do they increase investment into public goods such that it aids their effort to extend their terms in office?

The overall goal of this paper is to answer some of these questions as a way to better understand the relationship between rural governance reforms in China and investment into public goods. To meet this goal, we have three specific objectives: first, using survey data from a nearly national representative sample, we provide a profile of village elections, public goods investments and chart the way that they move together (or not). Second, we seek to understand if elections, all other things constant, lead to higher levels of public goods investment. Finally, we seek to explain empirically the mechanism through which elections operate by testing whether or not leaders in office are able to enhance their chances for re-election by investing in public goods.

II. Local Governance and Public Goods Investment: a Conceptual Framework

In this section the main goal is to establish a conceptual framework we can use to study the relationship between elections and public goods investments in rural China. Our conceptual framework parallels closely with the theoretical model of the Rosenzweig and Foster (2003) paper. As discussed above, in the Rosenzweig and Foster (2003) model there is a two-party representative democracy with a voting model in which the only election issue is how the local government allocates public resources. The voting model is built in such a way that it includes a parameter, which when set at one extreme value produces an environment governed by democratic voting, and which when set at the other extreme value produces an environment governed by an aristocracy. Rosenzweig and Foster (2003) use comparative statics that are produced from the model to establish the relationship between the form of governance in the village and the public resource allocation decision.

In arguing that their theoretical model fits the case of rural India, Rosenzweig and Foster (2003) make several assumptions. First, in rural India they assume that there are two kinds (or strata) of households, landowner and landless. Second, households in the different strata have different utility functions and preferences. Specifically, it is assumed that landowners prefer land-oriented expenditures, such as irrigation investment. In contrast, it is assumed that the landless can benefit more from investment in road construction because it will increase labour demand (which will result in higher wages). Finally, it is argued that elections empower the landless, since

in villages without elections the landowners are the aristocracy which means that they exercise the most power. In other words, when making decisions, the aristocrats only consider the demands of the landowners, meaning most village resources go to irrigation. In making the assumption that elections empower the landless, it is assumed that there is a mechanism which pushes leaders to act at least in part according to the wishes of the landless voters (which comprise a majority of the voting population). Based on this, Rosenzweig and Foster (2003) make the final deduction that forms the basis of their hypothesis: as elections emerge, village leaders will begin to allocate more of the village's budget towards roads (investments that are demanded by the landless) and away from irrigation (land-oriented investments). In their empirical work, evidence is found that supports their hypothesis: elections lead to greater investment into roads and the investment is demanded by the citizens who are empowered by elections.

III. Adapting the Framework to Rural China

We need to do two things to adapt the Rosenzweig and Foster (2003) conceptual model to China. First, we need to show that there are two distinct classes or strata. This is needed primarily because the distinction between landed and landless does not pertain to China, where virtually 100 per cent of households in every village receive equal plots of land (Brandt et al., 2002).

But this does not mean that all households are created equal. According to Yan (1992), there are several types of households in rural villages which can be segregated into two distinct groups. On the one hand there is a category that we call the *elites*. The elites include cadres (both former and current ones that work in the village and in upper levels of government) and their family members, relatives and close friends. In addition, there are the ordinary villagers (henceforth, simply called *villagers*), which constitute the rest of the people in the village. In villages that do not have elections, the strata are characterised mainly on the basis of the access that each group – the elites and villagers – has to public resources. Elites, who mostly accede to their positions by appointment (or who have ‘inherited’ their positions because of access to *guanxi*, or connections), control the budget and prefer to spend the budget on those things that benefit the elites (for example, on banquets, office supplies, travel and office buildings). According to a World Bank report (Fock and Wong, 2005), even during the 2000s village leaders spent about half of village fiscal expenditures (44%) on official salaries, entertainment, administrative expenses and other related expenses (henceforth, called *entertainment expenditures* for short). Clearly, these kinds of expenditure do not benefit ordinary villagers. In our paper we assume that these types of expenditures are the counterpart to expenditures on irrigation in the Rosenzweig and Foster (2003) paper.

The second assumption that we need to make to establish the validity of our conceptual framework concerns the spending preferences of villagers who gain a voice through elections. The first question to answer is whether there are any ‘third categories of spending’ besides entertainment and public infrastructure. According to Fock and Wong (2005), public good infrastructure spending constitutes the other main spending category of villagers. In fact, as a share of total spending, allocations to public goods investment account for 43 per cent in the early 2000s – which is just a

bit less than the share spent on entertainment. There are only minor amounts of spending on other categories, such as social security (4%); militia training (2%); environmental protection (1%). Since there is almost no change in total fiscal revenues or expenditures during our study period (Fock and Wong, 2005), if we find that elections lead to greater spending on public goods, this means that there is less spending on entertainment.

With such little spending on the other categories, the remaining question is whether or not villagers have a strong preference for spending on public infrastructure. In fact, our survey (which is described in detail below) contains evidence that villagers have a strong demand for spending on village public goods infrastructure.² According to the data, 70 per cent of our sampled households responded that they believed that there had been an improvement in the level of public goods infrastructure between 1998 and 2004. Despite these improvements, nearly 80 per cent of households stated that they were still dissatisfied with the current level of infrastructure. This suggests there is support for our assumption that rural residents in rural China have high demand for infrastructure investments.

Our data also contain more direct evidence. In our sample, villagers also appear willing to direct their own resources towards those things they are dissatisfied with. In our survey, we asked villagers if the upper level government gave 50,000 yuan to the village how would they best want to spend the funds. Villagers were given unlimited choices of answers (including infrastructure investments; investment into village office space; environmental projects and social welfare-oriented projects). In response, by far the most villagers (90%) stated that they would prefer that the funds be spent on public goods investments (including investment into roads, irrigation, drinking water, schools and health clinics).

Based on our assumption and the logic of the Rosenzweig and Foster (2003) model, we can state our own version of the election-investment hypothesis. When there are no elections (or when leaders are not directly elected), elites have control over the (fixed) village budget and spend more on non-public goods infrastructure expenditures. When elections emerge, villagers gain more of a say over village affairs and village leaders begin to allocate more spending towards the things villagers demand, which in our case is public goods infrastructure. In short, the hypothesis to be tested is: when the leader is directly elected, villages spend more money on public goods infrastructure.

IV. Data Sources and Empirical Model Specification

To test the effect of village governance on public goods infrastructure we conducted a survey in rural China at village level in 2003. Although China has initiated reforms aimed at transforming village governance towards self-governance over the past two decades, the promulgation of the PRC Organic Law for Villager Committees formally took place in 1998 (Shi, 2004). One of the most salient features of the Organic Law is the clear message that village leaders are supposed to be elected. Because of this timing, we collected village information (based on both accountant records and village official recall) in 1997 as a baseline. The survey itself was conducted in late 2003, so the survey period covers six years – from 1998 to 2003.

To ensure the national representative nature of our sample, we used a systematic procedure to choose the sample villages. In each of China's major agro-ecological zones, we randomly selected a sample province (Jiangsu, Hebei, Jilin, Shaanxi, Gansu and Sichuan). Sample counties and sample townships were also selected randomly. Within each township, we included all villages in the survey (except if there were more than 25 villages in the township, wherein we randomly chose 20 villages).³ In total, we surveyed 2448 villages in six provinces, 36 counties and 216 townships.

In the survey form we mainly asked the respondents (in general, the party secretary and/or the accountant of village) three sets of questions about the sample villages. First, the survey included a section that elicited information about the general characteristics of the village (such as, its resource base (human and land), the economic structure of the village, income, geography, location of the village, the timing of other major reforms, ties to government officials in the township and county government, and so on). In the second part of the survey, we asked a number of questions about public goods investment in the village. For each year of the survey, the size, timing, and source of funding of each public goods investment were enumerated.⁴ Finally, the survey had a section that examined the system of governance that prevailed in each year in each sample village. For example, we recorded the name, level of education and tenure of each village leader. Most importantly, we also asked how each village leader took office – by *direct election* or *not by direct election*. In this paper, a *direct election* is defined as one in which villagers vote for two or more candidates using the secret ballots and the winner becomes the village leader. All other village leaders are considered to be *not directly elected*.⁵ Among other things, this information allowed us to 'count' how many different people served as village leader between 1998 and 2003 and enabled us to create a list of 'village leader terms of office'.⁶

V. Empirical Model, Variable Definition and Estimation Approach

In the analysis we will have two broad sets of equations. The first, called the *baseline analysis*, will be estimated by Ordinary Least Squares (OLS) and will include a number of time-invariant (as well as time-varying) variables. We also will take advantage of the panel nature of our data set and estimate a *fixed effects model*. When estimating a fixed effects model we must drop off the time invariant variables since they will be subsumed into the 2448 village dummy variables.

In order to empirically test the hypothesis associated with the China-version of the Rosenzweig and Foster (2003) model, we assume that public goods investments are a linear function of village governance and other factors and the relationship can be written as:

$$y_{ijt} = \beta_0 + \beta_1 D_{it} + \beta_2 V_i + \beta_3 V_{it} + \mu_i + \varepsilon_{it} \quad \text{for each } j, \quad (1)$$

where the β 's are parameters to be estimated and y_{ijt} is a measure of the level of village public goods investment (measured either as the number of projects per year or investment level per year) in village i for investments from source j during village leader's term t . Because not all investments are from the same source, we need to be careful to understand the effect of governance on investments from different sources

(identified by j). Specifically, according to our survey, individuals in Chinese villages contribute a large share of the funding to public goods investment (Zhang et al., 2006). Therefore, in equation 1, we specify the dependent variable in one of four ways. First, we estimate equation (1) for *total investment* which we will identify as sum of all sources of funds ($j=1$). We also will run separate regressions for projects that are funded in one of three ways: projects that are solely funded by the village itself ($j=2$); projects that are jointly funded by both the village and the upper-level government ($j=3$); and projects that are solely funded from above ($j=4$).⁷

On the right hand side of the estimated equation the main variable of interest is D_{it} , the variable that represents the governance mode of village. As discussed above, we use the variable ‘Was the village leader elected directly (one if the village leader was elected directly)?’ We use this in part because there is little error in this formulation of the governance variable and in part because it is argued in the political science literature that the direct election of the village leader is one of the most salient features of China’s village governance (Louie, 2001). Although our measure of governance reforms is fairly rudimentary, what we give up in richness, we believe we gain in coverage. In our data set we observe the mode of governance in 7041 terms (in the 2448 villages and six years time period). We also have at least two observations for each village.

To obtain more consistent estimates of the coefficient D_{it} , in the baseline analysis we also add a number of control variables (V_i and V_{it}) to the right-hand-side of equation (1). These variables come from our data set and they (or similar variables) have been used by others that are empirically estimating similar equations (Rosenzweig and Foster, 2003; Besley and Case, 1995a; Chattopadhyay and Duflo, 2004; Banerjee et al., 2005; Miguel and Gugerty, 2005). In our equation the vector of time-invariant variables (V_i) includes socio-economic, locational/geographical and other factors.⁸ We also include a number of time-variant variables (V_{it}), including the level of education of the village leader (measured in years of attainment); the age of the village leader (measured in years); the occupation of the village leader (where the variable is equal to one if the village leader has never held an off farm job – or is a ‘pure farmer,’ and zero otherwise); and a policy variable that is equal to one if the election term occurred after China’s Tax for Fee reform (a policy that has had a major effect on local fiscal management – Fock and Wong, 2005), and zero otherwise.

While the baseline analysis provides us with important information (it at least shows us correlations), it is necessary to use caution when interpreting the results. The coefficient of interest (D_{it}) may still be affected by unobserved heterogeneity. For example, the unobserved heterogeneity is caused by the presence of unobserved village time-invariant factors. Although these factors may be difficult to measure, they still may affect both whether or not there is a direct election and the level of investment. To get a consistent estimation of the coefficient of variable D_{it} , we add a set of village dummy variables μ_i on the right hand side of estimated equation to control for all village fixed effects. Fixed effects estimation can account for large part of unobserved heterogeneity because we also add a time trend variable in our analysis (which is measured as the first year of the village leader’s term). Even after accounting for all time invariant effects, we also will attempt to account for any

possible time-variant unobserved heterogeneity. To do so, we also estimate the model using an IV/GMM approach by using lagged values of the direct election variable and a set of instruments (that are described below).⁹

VI. Empirical Results: Descriptive and Multivariate

Despite the fact that villages are required to elect the village leader, there are still a significant number of villages that do not elect the village leaders directly (Table 1). Over the entire study period (1998 to 2003), 79 per cent of villages elected their leaders and 21 per cent did not. In some of these villages, township and county officials still appointed leaders by policy as a matter of course. Some villages just did not allocate the time to run an election (Table 1, row 1).¹⁰ In other villages, the village leader is nominated or elected by a slate of representatives instead of through direct election. Our data also show that there are notable differences in the propensity of villages to directly elect their leaders across space and time (rows 2 to 7).

Despite the incomplete record on directly electing the village leader, the share of villages that do elect their leaders directly has risen over time (Table 1, rows 8 to 16).

Table 1. The way in which village leaders acceded to their office in rural China, 1998–2003 (%)^a

Province	Elected directly	Not elected directly	Number of observation
Jiangsu	72	28	1352
Gansu	77	23	931
Sichuan	89	11	1072
Shaanxi	81	19	1090
Jilin	93	7	1071
Hebei	68	32	1522
Total	79	21	7041
The difference in the ways village leaders acceded to their office by election cycles (over time)			
Starting year, election term cycle	Elected directly	Not elected directly	Number of observation
Term cycle 1			
1995	77	23	1451
1998	84	16	412
2001	86	14	447
Term cycle 2			
1996	73	27	1038
1999	79	21	809
2002	83	17	624
Term cycle 3			
1997	62	38	1254
2000	74	26	627
2003	79	21	379

Data source: Authors' survey.

Notes: ^aBased on 7041 village leaders terms in 2448 villages. In our survey, some villages belong to the 1995–1998–2001 term cycle, and the other villages belong to the other two term cycles.

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Because the village leaders are, by policy, supposed to serve three-year terms, to look at the rise in the propensity of villages to choose their leaders over time, we divide our sample into three distinct sets of villages, based on the starting year of the normal term of the village leader election cycle.¹¹ According to our data, no matter if we look at villages that run their regular elections during election cycle 1 (that is, those villages that hold their direct elections in 1995; 1998 and 2001) or election cycle 2 or election cycle 3, the share of villages that directly elect their leaders rises (from 77 to 86%; from 73 to 83%; from 62 to 79%).

VII. Public Goods Investments

On the basis of our data, during the time that elections were beginning to spread across China, villages were investing in a wide variety of different types of public goods projects. There was also a great deal of heterogeneity in the number of and investments levels into projects over time and across villages.¹² Public goods investment in China's villages can be categorised into more than 20 different types of projects (for example, roads and bridges, school construction, irrigation and drainage – henceforth called total investment). By far most of these projects (60% of them) can be considered core public goods projects (roads and bridges; schools; irrigation and drainage systems; drinking water and clinics). Investment into these activities has been rising over time. According to our data, the average village invested 60,000 yuan into 0.63 projects per year between 1998 and 2000. Between 2001 and 2003, investment in the average village rose to 71,000 yuan into 0.67 projects per year.

While public goods in many countries are almost entirely the responsibility of upper level governments, it is not difficult to see that households in Chinese villages also contribute a large share of funding to the public goods investment (Table 2). While 36 per cent of projects are fully funded from above (as is the rule in most countries), nearly half (46%) are funded with matching funds from the villages and upper level government (Table 2, row 8). Eighteen per cent of all public goods projects were funded solely by the village itself. In terms of total investment levels (denominated in real yuan), villages in China were funding 47 per cent of their public goods investments, only a little less than the contribution of funds came from above (53%). The number of projects and level of investments (and split among the sources) also differs by province (rows 1 to 6).

VIII. Elections and Investments

While there are other factors that explain differences in the level of investment across villages (Zhang et al., 2006), our data suggest that investment is somewhat higher in villages that directly elect their leaders. When looking at the average number of projects per year, villages that directly elect their village leaders have more projects overall (0.68/year) than those with leaders that were not directly elected (0.59/year). The differences appear for all types of investments. The same pattern also appears when looking at the level of investment. Villages that directly elected their leaders invest more in yuan – in total and in all different types of investments. Importantly, the differences in investment are significant in a statistical sense at least at the 10 per cent level.¹³

Table 2. Sources of funding of village public goods projects by province in rural China, 1998–2003

Province	Total	Funded by Above only	Funded by Village only	Jointly funded	Value of investment from above ^b	Value of investment by village ^b	
		(Number of projects)				(%) ^a	
Jiangsu	1646	436	392	818	26	74	
Gansu	1085	481	67	537	77	23	
Sichuan	1037	567	92	378	64	36	
Shaanxi	1352	525	142	685	72	28	
Jilin	1130	420	135	575	45	55	
Hebei	1473	318	557	598	50	50	
Total	7723	2747	1385	3591	–	–	
Per cent of total ^c	100	36	18	46	53	47	

Notes: ^aPer cent measures share of total value of investment from above – which is investment from any non-village source – and share of total investment of value from village. ^bValue of investment does not include value of in-kind labor investment by villagers. ^cPer cent in column 5 and 6 measures the weighted average of rows 1 to 6.

Data source: Authors’ survey.

The relationship between elections and public goods investment becomes even clearer when looking at differences over time.¹⁴ When a village went from a directly elected leader to a directly elected leader (or from a leader that was not elected to one that was also not directly elected), there was little change in total investment (although still relatively small, the change is larger in terms of number of projects than in term of level of investment – Table 3, rows 1 and 4). Likewise, there was little change in village-funded only projects, above-funded only or co-funded projects.¹⁵ However, when a village went from a leader that was not directly elected to a leader who was directly elected, the number of projects per year and the level of investment per year both grew (Table 3, rows 2 and 5). In contrast, when a village went from a having a directly elected leader to a leader that was not directly elected, the number of projects and level of investment fell (for both total investment and village funded-only projects).

IX. Multivariate Analysis

Because descriptive statistics do not account for the impact of other observed and unobserved factors, we first use equation 1 to assess the effect of direct elections on public goods investment. In the first set of results, using the baseline model, we produce an initial set of estimates that indicate whether or not directly elected village leaders have an effect on village public goods investment, while holding a number of other observables (V_i) constant. The sample for use with the baseline model includes more than 7000 pairs of direct election/not direct election-investment observations from 2448 villages. There are eight different versions of the baseline model equation, which use eight different measures of the dependent variables: four using the number of public goods (total number; from village fund-only projects; jointly fund projects and above fund-only projects) and four using the level of investment.

Table 3. The differences in the number (value) of annual public goods projects (investments) and the way in which village leaders acceded to the offices over time in rural China, 1998 and 2003

	Total projects	Village funded projects	Above funded projects	Co-funded projects
The difference in the number of annual public goods projects between two terms				
No difference ^a	0.15	0.03	0.07	0.06
From not direct elected to direct elected village leader	0.31	0.07	0.12	0.12
From direct elected to not direct elected village leader	-0.07	-0.07	0.03	-0.03
The difference in the amount of public goods investments between two terms				
No difference ^a	4.5	0.04	3.0	1.4
From not direct elected to direct elected village leader	42.4	3.2	9.3	29.8
From direct elected to not direct elected village leader	-24.3	-2.4	1.2	-23.1

Data source: Authors' survey.

Notes: ^a'No difference' means that in between the two election terms there was no difference in the way that village leaders acceded to office. This includes that case when a directly elected leader followed a directly elected leader and when a not direct selected leader followed a not direct selected leader, and there are no significant differences in public goods projects/investments between these two types of 'No difference'.

In running the model in equation 1 (in its eight different versions), the regression equations appear to perform well. First, as also found in Zhang et al. (2006), poorer villages in China receive more projects that are funded from above while richer villages invest more of their own funds into public goods projects (row 2, columns 2, 4, 6 and 8). Villages with higher levels of out migration, as expected, have lower levels on public goods investment, potentially because there is little incentive to invest when a large number of the villagers are living outside the village (row 7, columns 2 and 6). The results also imply that political connections are important ways to raise investment: villages with more fellow villagers working in town and county governments have more public goods investments (Table 4, row 9).

Most importantly, the baseline results show the positive relationship between directly electing a village's leader and the number of projects and level of investment into public goods (Table 4, row 1). All of the coefficients are positive and most of them are significant at 10 per cent level. Above all, when village leaders are elected directly, there are more village-funded-only projects and higher levels of investment (and the t-ratios of the coefficients are high – row 1, columns 2 and 6). Importantly, although there is a positive coefficient, the average magnitude of the effects are relatively small (about 0.1 project more per year and around 10000 yuan more investment – a level equal to about 10% of the mean number of projects and level of investment).¹⁶

Table 4. Baseline analysis (OLS) of the impact of directly electing the village leader on rural public investment in rural China (1998–2003)

	Yearly public goods projects in village leader's term				Yearly public goods investment in village leader's term			
	All sources	Village funded	Co-funded	Above funded	All sources	Village funded	Co-funded	Above funded
The way village leader accessed to office (0 = not elected directly, 1 = elected directly)	0.09 (4.22)***	0.06 (5.18)***	0.01 (0.78)	0.02 (1.66)*	10.1 (1.53)	3.0 (2.85)***	3.9 (0.63)	3.2 (1.81)*
Time invariant social-economic factors								
Net per capita income in 1997 (1000 yuan)	-0.012 (0.99)	0.049 (7.31)***	-0.039 (4.68)***	-0.022 (3.50)***	7.9 (2.05)**	5.3 (8.71)***	5.2 (1.44)	-2.6 (2.44)**
Total population in 1997 (1000 people)	0.04 (3.57)***	0.01 (0.99)	0.02 (3.00)***	0.01 (1.91)*	14 (4.19)***	2.4 (4.58)***	7.1 (2.28)**	4.5 (4.99)***
Percentage of minority population in 1997 (%)	-0.0003 (0.90)	-0.0001 (0.39)	-0.0003 (1.13)	0.00003 (0.15)	0.32 (2.73)***	0.03 (1.40)	0.23 (2.12)**	0.06 (2.00)**
Per capita land in 1997 (mu)	-0.01 (2.27)**	-0.01 (2.49)**	-0.003 (1.01)	-0.001 (0.44)	2.9 (1.94)*	0.1 (0.29)	2.1 (1.52)	0.7 (1.77)*
The illiterate rate of village labor force in 1997 (%)	-0.03 (0.49)	-0.04 (1.34)	-0.01 (0.18)	0.02 (0.71)	31.1 (1.68)*	-1.4 (0.47)	19.1 (1.11)	13.4 (2.68)***
The migrant ratio of village labor in 1997 (%)	-0.19 (2.67)***	-0.14 (3.66)***	-0.02 (0.42)	-0.03 (0.74)	0.7 (0.03)	-9.0 (2.55)**	18.5 (0.89)	-8.8 (1.46)
The number of village/group enterprise in 1997 (each)	0.02 (2.70)***	0.02 (4.98)***	0.0003 (0.06)	-0.0005 (0.12)	50.7 (21.26)***	2.7 (7.12)***	48.3 (21.78)***	-0.3 (0.50)
Number of fellow villagers working in township or county governments (each)	0.005 (4.22)***	0.0003 (0.45)	0.004 (4.88)***	0.001 (1.30)	1.3 (3.34)***	0.1 (1.33)	0.9 (2.42)**	0.3 (3.23)***
Time invariant locational-geographical factors								
Hilly land over 25 degree in total land area in the village in 1997 (%)	0.0006 (1.54)	0.00002 (0.08)	0.0002 (0.80)	0.0004 (1.83)*	0.15 (1.30)	0.00003 (0.00)	0.04 (0.34)	0.11 (3.63)***
Percentage of effectively irrigated land in 1997 (%)	-0.001 (4.04)***	-0.0001 (0.56)	-0.0002 (0.74)	-0.001 (6.23)***	-0.04 (0.38)	0.04 (2.61)***	-0.04 (0.47)	-0.04 (1.32)
The distance of the nearest road to the village seat in 1997 (km)	-0.002 (1.97)**	-0.002 (3.59)***	0.0001 (0.16)	-0.0001 (0.23)	-0.40 (1.72)*	-0.08 (2.04)**	-0.36 (1.67)*	0.04 (0.57)

(continued)

Table 4. (Continued)

	Yearly public goods projects in village leader's term			Yearly public goods investment in village leader's term		
	All sources	Village funded	Above funded	All sources	Village funded	Above funded
The farthest distance between two small groups within this village in 1997 (km)	0.004 (1.44)	-0.001 (0.65)	0.002 (1.13)	-1.1 (1.12)	-0.1 (0.94)	-1.1 (1.25)
The distance between village committee and township seat in 1997 (km)	-0.001 (0.75)	0.001 (0.60)	-0.0004 (0.38)	-0.20 (0.36)	-0.03 (0.32)	0.12 (0.24)
Time variant factors						
Tax-for-Fee reform (after = 1, before = 0)	-0.34 (11.92)***	-0.06 (3.90)***	-0.17 (8.70)***	-35.5 (3.94)***	-3.7 (2.58)**	-25.3 (3.01)***
Age of village leader	0.001 (1.21)	0.002 (2.86)***	-0.001 (1.15)	0.41 (1.09)	0.12 (1.98)**	-0.05 (0.14)
Education of village leader	0.02 (1.48)	0.02 (3.51)***	-0.01 (1.64)	-1.9 (0.48)	0.9 (1.41)	-5.1 (1.37)
Prior occupation of village leader (pure farmer = 1, others = 0)	-0.04 (2.15)**	-0.03 (2.58)***	-0.02 (1.81)*	-7.6 (1.33)	-2.6 (2.85)***	-3.9 (0.73)
Province dummy	yes	yes	yes	yes	yes	yes
Time trend	yes	yes	yes	yes	yes	yes
Constant	-130 (15.78)***	-16 (3.49)***	-56 (10.02)***	-6180 (2.38)**	157 (0.38)	-3844 (1.59)
Observations	7041	7041	7041	7041	7041	7041

Notes: Absolute value of t statistics in parentheses, *significant at 10 per cent; **significant at 5 per cent; ***significant at 1 per cent. Data source: Authors' survey.

Fixed Effects Model

Although the baseline analysis controls for a number of village-specific characteristics, it is still difficult, if not impossible, to control for all of the effects. If the unobserved factors also help explain public goods investment, and if the unobservables are in some way correlated with the propensity of a village to directly elect their leader, the baseline results could be subject to endogeneity bias. Because our sample contains multiple observations on elections and investment over time, we can use a fixed effects model by including a set of 2448 village dummy variables on the right hand side. The village fixed effects control for village-specific factors that are fixed over time. We also include a time trend to control common time-varying factors.

Despite the potential problem of endogeneity, when comparing the estimated coefficients from the baseline model with those of the fixed effects models, there is little change in sign or level of significance (and the magnitudes are about the same or, at most, only a bit lower – Table 5, row 1). In other words, we find strong evidence that in villages that have directly elected leaders, the number of public goods projects and the level of investment are both higher. Moreover, the effect appears in all eight versions of the equations (although the t-ratio is low when looking at the level of investment into village funded-only and above funded-only public goods). In this way, our results are somewhat like those of Rosenzweig and Foster (2003), Pande (2003) and Chattopadhyay and Duflo (2004) in that they find positive effects of changes in elections and political democracy (the effect is significant, albeit, the magnitude of the effect is not very large).

To control for possible time varying unobservables (as well as time invariant effects), we estimate the model using a GMM approach (Wooldridge, 2002). In this paper we use two instrumental variables. First, we lag the independent variables (which reduces our usable observations from 7041 to 4593). Second, we include two instruments which we believe reflect township-level election policy and hence may be expected to affect if a village directly elects their leader, but will not likely have a direct effect on public goods investment.¹⁷ Like the baseline and fixed effects results in Tables 4 and 5, the estimated coefficients are all positive and most of them have the same relative magnitude (although in several cases the magnitude and level of significance falls – results not shown due to space restrictions). While the somewhat weaker results might be due to a somewhat more fragile actual relationship between elections and public goods investment, Wooldridge (2002) also points out the standard errors that could rise if we have relatively weak instruments (for example, if there is not a high correlation between the instrumental variables and the endogenous variable). In fact, whether using the baseline model, a fixed effects model or the IV/GMM approach, the results are robust.¹⁸

X. Pork Barrel Politics, Chinese Style

While there are a number of reasons why village leaders that are directly elected might invest more into public goods, we examine if village leaders are doing so as part of their strategy to get re-elected. The assumption behind our test of motivating behaviour is that village leaders gain utility (in some way) from holding their position. If, as shown above, villagers that vote demand public goods, then leaders

Table 5. Fixed effect analysis of the impact of directly electing village leader on rural public investment in rural China (1998–2003)

	Yearly public goods projects in village leader's term				Yearly public goods investment in village leader's term			
	All sources	Village funded	Co-funded	Above funded	All sources	Village funded	Co-funded	Above funded
The way village leader accessed to office (0 = not elected directly, 1 = elected directly)	0.16 (4.67)***	0.04 (2.55)**	0.08 (3.38)***	0.04 (2.40)**	35.5 (3.83)***	2.2 (1.55)	29.0 (3.39)***	4.2 (1.52)
Age of village leader	-0.001 (0.44)	0.001 (1.59)	-0.003 (2.23)**	0.0005 (0.51)	0.10 (0.19)	0.25 (3.26)***	-0.31 (0.67)	0.15 (1.02)
Education of village leader	0.005 (0.20)	-0.01 (0.46)	-0.01 (0.36)	0.02 (1.34)	-1.1 (0.18)	-0.3 (0.36)	-1.3 (0.23)	0.5 (0.29)
Prior occupation of village leader (pure farmer = 1, others = 0)	-0.03 (0.77)	-0.0005 (0.03)	-0.03 (1.40)	0.01 (0.34)	-6.4 (0.68)	-3.2 (2.22)**	2.9 (0.33)	-6.0 (2.15)**
Tax-for-Fee reform (after = 1, before = 0)	-0.30 (9.99)***	-0.05 (3.36)***	-0.14 (7.12)***	-0.11 (7.31)***	-24.7 (3.09)***	-3.2 (2.55)**	-15.4 (2.08)**	-6.1 (2.55)**
Village fixed effect	yes	yes	yes	yes	yes	yes	yes	yes
Time trend	yes	yes	yes	yes	yes	yes	yes	yes
Constant	-129 (15.3)***	-18 (4.27)***	-52 (9.36)***	-59 (14.1)***	-4805 (2.17)**	-245 (0.71)	-2144 (1.05)	-2416 (3.62)***
Observations	7041	7041	7041	7041	7041	7041	7041	7041

Notes: Absolute value of t statistics in parentheses, *significant at 10 per cent; **significant at 5 per cent; ***significant at 1 per cent. Data source: Authors' survey.

who are able to influence the direction of spending and increase allocations to public goods should be expected to enhance their re-election hopes.

While most of the literature focuses on the actions that leaders take to improve their chances for re-election (for example, Barro, 1973; Nordhaus, 1975; Ferejohn, 1986; Besley and Case, 1995b), it is still not clear whether these effects exist in countries that are in the early stages of democracy. China provides an especially interesting case for several reasons. First, there are formal legal provisions in China that are pushing villages to hold direct elections. Second, there also are sharp differences between villages in how they select their leaders (Oi, 1989; Kelliher, 1997; Morduch and Sicular, 2000; Oi and Rozelle, 2000; Kennedy, 2002; Tsai, 2002; Shi, 2004; Tan, 2004). This diversity of governance environment is a benefit to econometricians who are interested in exploring these questions empirically. Third, since there are no term limitations on village leaders in rural China, all incumbents will always face incentives to deliver those things demanded by their constituents.

The first step to testing whether or not an incumbent's re-election depends on his/her ability to deliver public goods is to create a subsample of election cycle terms in which the village leader who was elected runs for office again and faces an election. Of the 5553 election terms in which the village leader was directly elected (which as shown above account for 79% of election terms), we need to drop a number of them. First, nearly 12 per cent of the election terms were prematurely interrupted because the leader resigned or was asked to step down. Second, around 7 per cent of village leaders were promoted to party secretary so they did not run in the next direct election. After dropping these election terms, the election terms that remain in our sample include village leader incumbents that ran for office and won and incumbents that ran for office and lost. For comparisons purposes, we also look at a sample of village leaders that were not directly elected in one term and subsequently either became leader again (not through a direct election) or not.

In looking the empirical relationship between public goods investment behaviour and the propensity of a leader to be re-elected, we also will look at two time periods – the first three years of our data (1998–2000) and the last three years (2001–2003). This dimension of the analysis is needed because it is possible that before 2000 villagers were more concerned about issues such as tax reform and family planning policy implementation (Yep, 2004; Li, 2006). Villagers started to become highly interested in public goods investment after 2000 after many of the tax and fee burdens began to be reduced.

Although in looking at the raw descriptive statistics there is not much evidence of a relationship between investment and being re-elected, when we divide the sample into villages that have relatively few (Table 6, Panel A) and many projects (Table 6, Panel B) and those that have relatively small (Table 6, rows 1 and 3) and large (Table 6, rows 2 and 4) sized projects, we find that the descriptive statistics do in fact suggest that there is a relationship between public goods investment and re-election. In villages with few projects, when the average size of project was small, leaders got re-elected 62 per cent of the time (Table 6, row 1). In contrast, when there were more projects, and the average size of project was small, the re-election rate of men rose to 73 per cent (and was statistically significant). When the average size of project was large, however, the share of terms in which leaders got re-elected actually fell (from 66 to 61) as the number of projects increased (Table 6, rows 2 and 4). One

Table 6. Relationship between public goods investment, size of the project and re-election in rural China, 1998–2003

Average size (level) of the average public goods investment (per project)	Re-elected directly (%)	Not re-elected directly (%)	Frequency
Panel A. In villages that implemented 0.5–1 public investments projects per year			
Low ^a	62	38	224
High ^a	66	34	223
Panel B. In villages that implemented more than 1 public investment projects per year			
Low ^a	73	27	200
High ^a	61	39	200

Notes: ^aA project's average size investment was considered 'low' if it fell beneath the median (about 50000 yuan per project); it was considered 'high' if the average size of project fell above the median.

Data source: Authors' survey.

interpretation of this finding is that while villagers like more projects (and reward leaders with re-election if there are more investment projects), they do not like it when the size of the project is too big (since perhaps there is a perception that money and labour was being wasted). Hence, in those villages where projects were kept relatively small, villagers re-elected those leaders that allocated more funding to public goods investment.

XI. Multivariate Analysis

To understand whether or not investment into public goods helps village leaders become re-elected, we use a similar empirical strategy as Besley and Case (1995a) to test for the nature of the re-election incentives. The empirical model is as follows:

$$p_{it} = \gamma_0 + \gamma_1 I_{it-1} + \gamma_2 V_{it} + \mu_i + \mu_t + \varepsilon_{it} \quad (2)$$

Where p_{it} is an indicator variable measuring if the incumbent leaders was re-elected/reappointed (equaling one if the incumbent in village i during term $(t-1)$ was re-elected as village leader in term t , and otherwise was zero). On the right hand side of the equation (2), I_{it-1} is a variable that is a measure of the number of public goods projects (or level of investment) that the incumbents in village i during term $(t-1)$ implemented. In this section γ_1 is the coefficient of interest. We also include a number of control variables, V_{it} , such as the age and education of the village incumbent, etc. We also add village fixed effects and year effects (trend variables) in order to hold constant all non-time varying unobservables.

According to our estimations on the effect of public goods investment on the possibility of being re-elected, there is a positive relationship. Although the magnitude of the coefficient is small, it is statistically significant in the re-election equations (Table 7, row 1, columns 1 and 3). In other words there is evidence that villagers rewarded incumbents with re-election if they implemented more public goods projects. And, while the level of investment is not statistically significant (Table 7, column 2, row 5), when we hold the average size of the project constant

Table 7. Fixed effects estimation of the effect of the annual number of public goods projects (amount of investments) in latest term and the re-election (re-selection) of village leader in rural China

	Re-elected directly (1 = yes, 0 = no)				Not re-elected directly (1 = yes, 0 = no)			
	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7	Equation 8
Public projects number	0.04 (1.72)*		0.04 (1.96)**		-0.02 (0.54)		-0.02 (0.56)	
Above funded public projects number			0.09 (2.05)**					0.08 (0.75)
Village funded public projects number			0.08 (1.84)*					-0.17 (2.20)**
Co-funded public projects number			0.01 (0.37)					0.03 (0.55)
Public investment level		-0.0001 (0.70)			0.00000 (0.00)			
Average investment level per project			-0.0002 (1.75)*				0.00002 (0.17)	
Average investment level of above funded public projects				-0.0001 (0.70)				0.0004 (0.91)
Average investment level of village funded public projects				-0.0004 (1.07)				-0.0003 (0.40)
Average investment level of co-funded public projects				-0.0001 (1.69)*				0.00001 (0.12)
Age of incumbent	-1.66 (12.70)***	-1.68 (12.83)***	-1.67 (12.75)***	-1.68 (12.80)***	-0.75 (4.35)***	-0.74 (4.32)***	-0.75 (4.34)***	-0.72 (4.20)***
Education of incumbent	0.25 (1.20)	0.25 (1.19)	0.25 (1.19)	0.24 (1.17)	0.45 (1.34)	0.46 (1.36)	0.45 (1.34)	0.47 (1.39)
Year dummy	yes	yes	yes	yes	yes	yes	yes	yes
Village fixed effect	yes	yes	yes	yes	yes	yes	yes	yes
Constant	6.82 (10.53)***	6.89 (10.63)***	6.83 (10.55)***	6.90 (10.64)***	3.03 (4.15)***	3.00 (4.11)***	3.03 (4.14)***	2.91 (4.00)***
Observations ^a	2686	2686	2686	2686	875	875	875	875

Notes: Absolute value of t statistics in parentheses, * significant at 10 per cent, ** significant at 5 per cent, *** significant at 1 per cent. ^athis is unbalanced panel data with some villages have one observation and the other have two observations.

(Table 7, rows 7 to 9), the number of above funded-only projects and village funded-only projects become a significant determinant of re-election (Table 7, rows 2 and 3). In the same way as seen in the descriptive statistics, villages apparently do not like village leaders to invest in frivolously large projects, but when accounting for the size of the project, the higher the number of projects, the higher the probability that incumbents will be re-elected. In other words, our results are consistent with the story that China's rural leaders also are engaged in pork barrel politics.

Interestingly, when looking at the relationship between public goods investment and the propensity to be reappointed (or become village leader again without being directly elected), it is absent (Table 7, Columns 5–8). Unlike the case of direct election where leaders are trying to please villagers that demand public goods projects, it seems that public goods projects/investments are not a major concern in villages where leaders are not being directly elected. When village leaders are reappointed (or leaders accede to office without being directly elected), there appears to be less of an imperative to deliver 'pork' to their villagers – at least in the form of public goods investments.

XII. Conclusion

The purpose of this paper has been to provide empirical evidence pertinent to theories of democratisation using survey data in rural China. Based on a theoretical framework developed by Rosenzweig and Foster (2003) and an adaptation to China of the conceptual model they developed, we give evidence on the effect of the direct election of village leaders in rural China on village resource allocation. After that, we seek to identify the mechanism that disciplines the behaviour of village leaders.

There are two major findings from our analysis of a nearly national representative data set (about 2450 villages in rural China) describing the public goods investments and local governance. First, compared to the traditional governance mode in rural China, the shift toward democracy results in the implementation of policies from which villagers benefit more (in the case of rural China, this means more public goods projects/investments). In particular, we find that when village leaders were elected directly, they implemented more public goods projects/investments compared to the villages in which leaders were not directly elected. When we measure the effect on projects funded from different sources, our analysis shows the results are consistent for every type of project.

Second, this paper also tests whether the re-election incentive – a mechanism used by villagers to discipline the incumbents during voting, exists or not in the early phases of democratisation. Our results indicate that even in the early stages of democratisation, re-election incentives still affect the behaviour of incumbents because villagers (voters) reward those incumbents that give them what they want.

Notes

1. There are two unpublished working papers (to the best of our knowledge) that examine related issues. One (Shen and Yao, 2006) examines the impact of elections on income distribution; the other (Li et al., 2006) looks at how an elected leader treats families that have incurred a large debt due to some catastrophic illness.

2. We draw on a 100-village subset of the full data set and ask 2000 households to investigate the attitude and willingness of villagers on public goods investments and their demand on public goods, the following paragraph is the results of our subset analysis.
3. On average, only about 6 per cent of villages in sample townships were not surveyed because some sample townships had more than 25 villages.
4. In China, villages are responsible for the public investment in local community. In general, local communities have public projects that can be categorised into about 20 different types (for example, roads and bridges, school construction, irrigation and drainage, grain for green, community public address systems, community recreation centre, build clinic, beautify environment, watershed management, forest closure, land levelling, eco-forest, land improvement and other public projects).
5. In general, there are a number of reasons why village leaders are not elected directly (Manion, 1996; Li, 2001). There are paralysed village committees so that township governments dismantle them and appointed a new village leader. Sometimes leaders actually stood for election but ran uncontested, because township governments function as selectorates by monopolising candidate vetting, so that there is only one measured up candidate finally. Sometimes the election is organized to restrict free choice of electorate through the use of non-secret ballots or voting by clapping or raising hand. There are also times when village elections did not succeed so that an election can be declared void, and a village leader sometimes be appointed. And in some villages, villagers nominated or elected a slate of representatives and the village leader was chosen from among the group by the group members themselves. Because of this heterogeneity, the measure used in the paper must be recognized as fairly crude and must be interpreted with caution.
6. A term in this paper is defined as the interval of time during which a person serves as village leader. A full election term in most villages is three years. If a leader served for three years and then was re-elected for three more years, he would be said to have served for two terms. If a leader served for one (or two) years of his full term and then left office (for whatever reason), the one year would be counted as one term. The time (one or two years) for which the person who replaced the leader that left office served would also be counted as one term.
7. According to our survey, 36 per cent of projects are fully funded from above (as is the rule in most countries), nearly half (46%) are funded with matching funds from the villages and upper level government, and 18 per cent of all public goods projects were funded solely by the village itself. In terms of investment levels (denominated in real yuan), villages in China were funding 47 per cent of their public goods investments; only a little less than the contribution of funds came from above (53%).
8. The time invariant control variables (V_i) include the following socio-economic factors: net per capita income (measured in real 1000 yuan); the size of the village's population (measured in 1000 people); the share of the population that is of minority ethnic origin (%); per capita land size (in mu, which is 1/15th of a hectare); the rate of illiteracy of the village's labour force (%); the migrant ratio of village labour force in 1997 (%); the number of collective enterprises that are operating in the village (each); the number of people from the village that are working in either a township or county (each). Meanwhile, there are also a number location and geographical factors: the share of the village's total land area that is mountainous (that is land over 25 degrees – measured as per cent); the share of total cultivated land that is effectively irrigated land in the village (%); the distance between the village's centre to the nearest road (in kilometres); a measure of the size of the village (measured as the furthest distance between the two small groups within village – in kilometres); and the distance between the office of the village committee and township seat (in kilometres).
9. The IV we used in the estimation also include 'whether or not the slate of village candidates must be approved by township government' (Our logic is that such a rule may increase the probability that there be an appointed village leader since the township government election committee is taking control away from the village and reducing the choice (decision-making powers) of the village.), and 'the number of meetings for each village that were attended by both township/county officials and village leaders during the period of time between the official notification of a new round of elections and the day of the election' (The logic of this variable is that the more meetings that were held, the more closely the village would have to follow county election protocol (which was designed to end in a direct election)).
10. During our interviews and periods of survey we were told a number of stories by officials and villagers about why there was no election. In some villages that refused to elect their leaders it was because no

one would run. In some villages officials and farmers told us that because there was so much control from the township (because the township controlled the nomination process), villagers decided that they did not want to have an election.

11. In counting the number of village leaders that acceded to their positions, if a village leader was elected in 1999 and re-elected in 2002, we counted this as '2.' Though a large amount of village leader turnover occurred in 1995, 1998 and 2001, there were still some village leaders acceded to the office in other years for the times of village leader turnover were different between regions. In addition, there were still some (about 10%) irregular terms because of reasons such as village leaders resigned, died or were fired, and so on. In these cases, some villages replaced their village leaders by running a new election or just appointed a new village leader. Thus to account for these irregular terms, we use the average public goods investment in the term (per year) instead of the total public goods investment in one term.
12. More detail information is available in the Online Appendix, Table 1.
13. More detail information is available in the Online Appendix, Table 2.
14. According to our survey, there are about 22 per cent of sample villages (or 536 villages) that actually changed their mode of selection for village leader, in which 17 per cent (or 409 villages) changed from appointment to direct election. For those villages in which the mode of selection for village leader changed, we can not find any evidence that these villages are proportionately concentrated in particular provinces and very few villages have more than one switch.
15. For public goods projects/investments from all sources, when we divide the 'no difference across terms in the mode of governance' into two groups (direct elected-to- direct elected and not direct elected-to-not direct elected), there is almost no difference.
16. The results are almost the same when using the year (or term) fixed effects instead of the time trend variable in baseline and following specification, and the significant level and T value for the independent variables are almost the same when using the clustered and robust standard errors.
17. The definition of the instrument variables see note 9, according to our estimates, the IVs in the first stage regression have a significant effect on the endogenous variable, in this case, the Hansen over-identification test also suggests that the IVs are all valid, detailed information is available in the Online Appendix, Table 3.
18. The detailed information for first difference GMM is available in the Online Appendix 4. As there is potential serial correlation in the error term, after the static panel data model (the fixed effect and first difference GMM), we also use the dynamic panel data model to test the robustness of the results. In the dynamic panel data model, a lag dependant variable is included in the right hand side of the equation. By using the two periods lagged level of variable (the way the village leader acceded to office) as the instrument for the difference of that variable, we only have 2194 observations in the dynamic panel data model (Anderson and Hsiao, 1981, 1982; Bond, 2002). In addition we also added another two instrument variables used in the static panel data (first difference GMM) model. The results are similar to that of static panel data model, which is available in the Online Appendix, Table 5.

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