

Elections, Fiscal Reform and Public Goods Provision in Rural China

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Abstract

Public services provision in the developing world, including China, is crucial for rural development and poverty reduction. Although there has been much effort focused on public goods investment in China in recent years, there are still great differences among villages in the level of public goods investment. This study seeks to explain these differences by focusing on the effect of community governance on public goods provision at the village level, including investment into roads, water control and schools. During the recent past several years, village governance in rural China has undergone a series of fundamental reforms. Arguably, the advent of direct elections for village leaders and the rural Tax for Fee reform are two of the most important shifts in the ways that communities manage themselves. Using a nearly nationally representative sample of communities from survey data that includes information from more than 2400 villages in rural China, we find that the direct election of a village's leader leads to increased public goods investment in the village. The paper also demonstrates that rural Tax for Fee reform, *ceteris paribus*, has a negative effect on public goods, especially on investment by the village itself.

JEL classification: H41, H54, H71

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The World Development Report (2004) reports that in developing countries key services in education, water, sanitation, health and electricity fail poor people—in access, in quantity and in quality. Vulnerable populations often are unable to access services provided by the higher levels of government or the private sector. Rural residents often rely on public services provided by local communities for their survival and development (World Bank, 2000; Darja et al., 2004). No matter how they are provided (from higher level governments or their own collective efforts), according to Khan (2000), in almost all developing countries the public goods infrastructure in rural communities—including access to education, transport, drinking water and sanitation, health care and communications—are far worse than those of urban residents. Without improvements in public services, poor people will have little chance to escape poverty; there is a critical need to improve the provision of public goods in rural areas.

Although some progress was made in the development of China's rural infrastructure in the 1980s and 1990s, living conditions in rural areas are still poor after two decades of reform. According to the World Bank (2001), there are more than 100 million poor people in China; most live in rural communities. In many of these communities, public services are severely under funded (Unger, 2003; West, 1997). For example, by the end of the 1990s more than 30 million children of school age were not going to school (World Bank, 1999). As late as the 1990s, more than 13 percent of villages were still not connected by any road to the outside world; almost half of rural areas lacked telephones; nearly 83 percent of villages in rural China were unable to access to clean drinking water (Gao, 2003; Yu, 2003).

In recent years the investment into the community in terms of roads, irrigation, schools and drinking water has improved. According to a national representative survey of China's villages undertaken by the China National Statistical Bureau, during the past several years there has been more than one investment project per village per year (World Bank, 2005). The pace of investment accelerated in recent years (Liu et al., 2005). Fan et al. (2004) has shown that when public goods are improved, they help promote rural development and reduce rural poverty.

Although investment into public goods in rural China has improved in recent years, several factors demonstrate there are still many reasons to remain concerned. First, the level of investment on a per capital annual basis in rural China in recent years is far less than that of Korea and Japan in their rapid developing era (CCICED, 2004). Moreover, there is concern over whether or not upper level government officials and local leaders are delivering the types of services that are in demand by villagers (Sonntag et al., 2005). Public goods investments in rural China are uneven across regions. An Asian Development Bank study demonstrates that since 2000 some villages had more than 10 public projects while during the same period some villages did not have any projects (ADB, 2005). Finally, many policy changes, for example, Tax for Fee reform and local governance shifts, almost certainly have affected the ability and incentives of local leaders to provide their villages with public goods (Jia and Zhao, 2002; CCICED, 2004).

Despite the importance of the provision of public goods in rural areas, only a limited number of studies in developing countries have quantitatively examined the

effect of important policy efforts, such as governance and fiscal reforms, on rural infrastructure. According on one scholar, the lack of an empirical basis in the literature arises largely because of the absence of detailed information (Dethier, 1999). In the few empirical studies that do exist, economists have tended to investigate the links between governance and types of public goods provision. For example, Besley and Burgess (2001) use data from India to show that the election of local leaders has a positive effect on public food distribution and calamity relief. Duflo and Chattopadhyay (2004) find that the gender of the Pradhan (mayor) affects the provision of certain types of public goods more than others. Rosenzweig and Foster (2003) demonstrate that local democratization is positively correlated with the provision of local public goods in general. In sum, the literature that does exist suggests that good governance will enhance local public goods provision. Sound fiscal policy in developing and transition countries also has been shown to have an important effect on rural infrastructure development, in particular, and development, in general (Zhuravskaya, 2000; Parker et al., 1997; Rosenzweig and Foster, 2003).

There is a good reason to believe that changes in local governance in China in recent years also may have affected the provision of rural public goods. “The Organic Law of Village Committees” changed the way village leaders ascend to office. Originally local leaders were appointed. In recent years, most of them are supposed to be elected. While there are still leaders that are appointed, when leaders are elected, there is almost assuredly a change in the accountability of leaders in some villages,

which may affect rural infrastructure investment in general. Indeed, the study of Zhang et al. (2004) has found such an effect.

China's new rural Tax-for-Fee reform, a policy that seeks to introduce greater fiscal discipline at the local level, also may impose constraints on public goods provision in the same way that fiscal reform in the past affected the local economy. For example, the literature shows that changes in the way budgets are managed have sharp effects on rural China's investment and development (Oi, 1992; 1994). Qian and Weingast (1996; 1997) and Jin et al. (2005) argue that the fiscal reforms of the 1980s and early 1990s are among the most influential factors that triggered China's remarkable economic performance. Zhuravakaya (2000) argues that stronger fiscal incentives in China led to higher efficiency in the provision of public goods because a smaller portion of resource was being wasted. In this paper we are interested in the effect of China's newest effort to reform fiscal matters—the so-called Tax-for-Fee reforms. Although these policies ultimately will affect all villages in China, the magnitude of the effects in recent years on local community may differ due to the fact that these policies were implemented at different time in different areas.

Given this context, the overall goal of this paper is to discover whether or not local governance changes and fiscal policy reforms have influenced the provision of public goods in rural China. To meet this goal, we have three objectives. First, we provide a description of rural infrastructure projects that have been built in China's villages in recent years, the evolution of local governance and the fiscal reforms in rural China. Second, we build a profile of observed facts about the linkages among

public goods provisions, governance reform and fiscal policy shifts. Finally, we examine whether or not these factors, especially the rise of the direct election of village leaders and the implementation of Tax for Fee reform, have a causal impact on the provision of public goods in rural China.

The broad nature of our questions necessitates narrowing the focus of the paper. In particular, we focus our analysis completely on the village level. Although the empirical analysis of the determinants of village infrastructure is almost unique in the literature, we admit that we are not able to address the fiscal reforms and investment efforts at the town and county levels. In recent years there also have been many specific components of the rural Tax for Fee reform that have been implemented (for example, the reduction of the agricultural tax); we are only able to aggregate all of these individual factors into a single measure: the month in which the original Tax for Fee reform were formally implemented. Likewise, our measure of governance reforms is fairly rudimentary—focusing on whether or not the village leader was directly elected. In using such a measure, we almost certainly will miss the richness that characterizes some of the rest of the governance reforms. What we give up in richness, however, we gain in coverage, since our data cover more than 2000 villages and 5 years.

Governance and Fiscal Reforms in Rural China

Although the roots of governance reforms emerged early in China's general economic reforms, local elections actually only began to be implemented on a

widespread basis in the late 1980s and 1990s. In the years immediately following the initiative of the rural reforms in the early of middle 1980s, village leaders were appointed summarily by upper lever government. In the early years of transition, however, in part as a result of the institutional shifts, there was considerable confusion in the responsibilities over the provision of rural public goods and management of village affairs which in some cases the confusion resulted in significant strife within villages (Zhang, 2004). When the conflicts between local leaders and villagers became increasingly serious in some areas, the central government gradually began to embrace the idea of village elections (O'Brien and Li, 2000). Logically, the idea was that if villages elected their own leaders, the parties would be jointly responsible for managing their own affairs and would be more likely to create a collaborative solution rather than be angry at the state. Despite support at the national level, the nation-wide extension of direct elections for the members of village committees did not actually begin until the passing of the "Organic Law of Village Committees" in 1987.

With the implementation of the Organic Law, new electoral procedures began to emerge gradually. Although the national government often tried to create a national model, one of the most distinguishing characteristics of governance at the village level is that there are sharp differences among communities in implementing the election protocols. In fact, criteria for the selection of village leaders have never been specified clearly and have always varied from place to place and from time to time (Morduch and Sicular, 2000; Shi, 2004). Specifically, when examining a number of papers on China's local elections, it can be seen that there are a great number of different ways

that communities have used to produce the slate of candidates (Oi, 1989; Oi et al., 2000; Chan et al., 1992; Potter and Potter, 1990; Ho, 1994; Kelliher, 1997). While there are still disputes on why this heterogeneity exists, the fact that there are differences among villages actually is fortunate for the empirical social scientist since it gives us an opportunity to test whether or not village governance affects village outcomes.

Rural Fiscal Reforms

At the same time that village governance policies were first being developed, leaders also were launching a series of fiscal reforms in order to try to establish a more solid, rational basis for the rural economy's fiscal system. Although policies have gone through a number of major shifts, in the early 1980s officials promoted the fiscal contracting system. The core idea of the reforms was to encourage fiscal decentralization and improve incentives for revenue collection. However, as the first round of the fiscal reforms unfolded, the share of the revenues accruing to the central government fell dramatically; at the same time the revenues of local governments increased (Wong, 1991). There also was confusion during this time over the division of responsibilities for expenditures among levels of governments (Wong, 1997). In response to these problems, in 1994 a new round of fiscal reforms was introduced with the central idea focused on building a system of tax sharing.

While it is clear that the tax sharing system achieved some success (for example, the share of revenue collected by the central government rose dramatically),

there were still a number of problems. Because tax revenues that accrued to the local governments fell as a result of the new tax-sharing system, new problems arose in the way public goods and services were financed. For example, the reforms did not address the issue of fees levied by local governments (Cai et al., 1999). In revamping the system, the incentives for raising revenue by the local governments were still present to promote economic development (World Bank, 2002). Moreover, expenditure mandates continued to emerge which gave implicit support to efforts of local officials to seek supplementary and informal fiscal resources in the form of fee levies on local residents. In many places local governments levied increasingly higher fees (Cai et al., 1999) and were taking up an ever-increasing share of per capita income of rural residents (Tao et al., 2005).

By the end of 1990s the heavy burden imposed on villages by local government became one of the most serious concerns of national leaders. During this time, there was a perception that rural income growth was stagnating (at least relative to that of urban residents) and inequality rising (Lü and Wang, 2001). At the same time there were increasing reports of conflicts between villagers and local governments (Bernstein and Lü, 2000). To assist in the raising of rural incomes and improve the relationship between villagers and local government, in the government's 2000 Work Report, the central leadership decided to take action to address this set of problems. In their initial effort, a pilot experiment of the Tax for Fee reform was implemented in several rural counties in Anhui province. According to the design of the initial reforms, there was supposed to be a standardized tax system that would gradually replace the

range of taxes, fees and levies that had previously been imposed on farmers. The experimental policies strictly limited the types and amounts of taxes and surcharges that farmers were allowed to pay. A number of other taxes and fees were abolished. In addition, the reform policies set restrictions on the corvee assessments that local officials could demand from farm households. In 2001 the pilot experiment was expanded. In 2002 the rural Tax for Fee reform was formally launched in almost all provinces—although the pace of implementation differed among regions (GUOBANFA, 2002).

Although rural Tax for Fee has been welcomed by villagers and its implementation has reduced their burdens, there also may have been a number of potentially adverse impacts (Jia and Zhao, 2002). While rural development requires that individual incomes increase, in the long run a healthy development path also needs investment into public goods. Public goods provision, in many cases, must be financed by the government—either through formal government channels from above or by local governments (or quasi government bodies). All investments, of course, require access to fiscal resources. Hence, while the fiscal reforms may have succeeded in helping ease the burdens of locally assessed taxes and fees, they also may have had the unintended effect of reducing the resources available for public goods investment. If so, it is necessary to examine whether this phenomenon and measure the size of the effect of Tax for Fee reform on rural public goods provision. The results from such analyses could be useful to policymakers as they decide to expand or limit their fiscal reform

program in the future as well as help them decide in what ways they can adjust their investment plans.

Data Source and Descriptive Statistics

The data used in this paper to examine the linkages between investment and governance and fiscal reforms were collected in a survey by the authors and their collaborators in late 2003. The field work team conducted the data collection effort in 6 provinces, 36 counties, 216 townships and 2459 villages and the final dataset can be considered a nearly nationally representative sample. In each of China's major agro-ecological zones, we randomly selected a sample province. Sample counties and sample townships were also selected randomly.¹ When there were 20 or less villages in a township, all villages were surveyed; if there were more than 20 villages in township, then 20 villages (also randomly selected) were surveyed. In all of the sample townships, more than 90 percent of villages were surveyed. On average, enumerators surveyed 11 villages in each township.²

The survey collected a great deal of information about village affairs. In addition to survey blocks enumerating the basic characteristics of villages, there were three sections of the survey that collected information that forms the basis of this analysis. First, there was a long section on public goods investment in the village. During this part of the survey, enumerators asked the respondent to recount all investment projects made during the five year period (1998-2003). The sizes, dates of execution of all projects (including the starting and ending dates), sources of funding

(solely from above; solely from the village; and jointly funded), coverage (number of households; amount of physical area in hectares) and other characteristics were enumerated. Second, the survey had a section that examined the governance systems in the sample villages. After creating a list of all leaders that had been in office since 1991, we then asked how each leader took office—by direct election or by appointment.³ Finally, the survey also had a section about the general regulatory environment of the village, including policies that affected the village’s fiscal management (including the exact date—month/year—of the start of Tax for Fee reform in each village) and the number of regulations through which the township government managed its villages, in general, and the elections in the villages, in particular.

Village Investments on Public Goods Projects

On the basis of our data, villages invested in a wide variety of different types of public goods projects and there was also a great deal of heterogeneity in the number of and investments levels into projects across villages. While villages invested in projects that can be categorized into more than 20 different types of projects (e.g., office construction; loud-speaker systems; drinking water; etc.), about half of public goods projects fell into one of three categories of projects: roads and bridges (henceforth, *roads*), irrigation and drainage systems (henceforth, *irrigation*) and *schools* (Table 1, columns 1 and 3). According to our data, roads accounted for 21.2 percent of all public goods projects. More than 800 villages invested in irrigation projects. Almost the same number invested into school construction.⁴ When measured in value terms, roads,

irrigation and schools accounted for an even larger share of total investment (60 percent). Henceforth, we call roads, irrigation and schools, rural China's *major public goods projects* and make these the focus of most of the rest of this paper.

While public goods in many countries are almost entirely the responsibility of upper level governments, it is not difficult to see that in China villages also contribute a large share of funding to the public goods investment. To show this, we divide all projects into three sub-categories according to their funding sources—projects that are solely funded from above, projects that are solely funded by the village itself and projects that are jointly funded by both the village and the upper-level government. While 36 percent of projects are fully funded from above (as is the rule in most countries), nearly half (46 percent) are funded with matching funds from the villages and upper level government (Table 2, row 8). Eighteen percent 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 percent of their public goods investments; only a little less than the contribution of funds came from above. Moreover, the level of investment in our study does not count the investment by China's villagers in in-kind labor contributions. If the labor days that villagers invested into projects were monetized (at any rate—say 10 yuan per day, less than half of the going daily, unskilled wage rate), the overall contribution of the local village into their community's public goods investment would far exceed 50 percent (and, in fact, would be almost 60 percent).

Governance and Public Goods Investment

One of the most notable findings of our survey of villages across China is that governance is changing rapidly and differs across our sample villages. According to our survey, of the more than 2400 sample villages, there were 7261 village leaders that took up leadership positions between 1998 and 2003.⁵ Since according to national policy, village leaders are supposed to be chosen anew each three years (henceforth, *governance terms*), on average, each village experienced at least two governance terms during the study period. During these terms, there were 5606 (or about 77%) village leaders that were elected directly (Table 3, row 7). Although it can not be seen from Table 3, the proportion of village leaders that acceded to office by election rose from 70 percent in 1998 to 85 percent in 2003.

In addition to changes over time, our data also show that the incidence (measured in governance terms) of village leaders acceding to office through direct election differs across space. In Jiangsu and Hebei provinces, between 1998 and 2003 more than 30 percent village leaders were appointed, less than 70 percent were directly elected (Table 3, rows 1, 6). In contrast, the percentage of directly elected village leaders in Sichuan and Jilin provinces (around 90%) was higher than the other provinces (Table 3, rows 3 and 5).⁶

While in no way suggesting causality (since this section is based on descriptive statistics), our data show a degree of systematic correlation between the way that the village leader ascended to his/her office and total public goods investment activity (Table 4). For example, in 25 percent of the villages with directly elected leaders there

was at least one road project, slightly more than in villages without direct elections (23 percent). Direct elections were similarly correlated with irrigation and school projects according to our data (Table 4, rows 4 and 7). The correlations are even more evident in the case of public goods projects funded by the village-only (rows 2, 5 and 8).

There were even greater differences when looking at the levels of investment (measured in 1000 yuan). Regardless of the type of project, the level of all three types of investment into villages that had direct elections was higher than in those villages without (Figure 1, Panel A). For example, in villages that elected their village leaders, there was on average 30 thousand yuan invested into the three public goods; only 23 thousand yuan was invested into villages without public goods. Importantly, the same pattern of results holds up when we consider differences in village funded only investments and above funded only investments (Figure 2, Panels A and C).

Fiscal Reform and Public Goods Investment

Fiscal reform, although pushed by the national government, has affected different villages at different times. According to our data, leaders in 460 villages reported that fiscal reforms began as early as 2001. These villages, after checking with county and prefectural officials, were found to be part of their area's pilot program. With the onset of the effort to promote Tax for Fee reform nationally, the number of villages implementing the program accelerated. The other villages began to implement Tax for Fee at different times during 2002.

Taking advantage of the heterogeneity in the implementation of the reforms overtime, our data can be used to demonstrate that the implement of public goods

investment projects in a village may have been affected systematically by Tax for Fee reform. In examining the incidence of investment in a village before and after the time that Tax for Fee reform was implemented, it can be seen that investment—especially the part contributed by the villages—systematically falls. For example, before rural Tax for Fee reform, 27 percent of villages implemented at least one road project; 15 percent implemented at least one school project; and 18 percent implemented at least one irrigation projects (Table 5, rows 1, 4 and 7). After Tax for Fee reform, however, the percent of villages implementing roads, schools and irrigation projects all fell (to 24, 10 and 14 percent, respectively). The effect was even more evident for village funded-only projects (Table 5, rows 2, 5 and 8); although in part this was offset after Tax for Fee reform by increased funding of above-funded only road and school projects (Table 5, rows 3 and 9). In the case of irrigation projects, however, like the case of village-only funded projects, the number of above-funded only irrigation projects also fell.

When comparing the level of public goods investment (measured in 1000 yuan) before and after the Tax for Fee reform, systematic variation also can be found. With the exception of roads, the level of investment into public goods (that is, irrigation and schools) before Tax for Fee reform exceeded that of the level after the implementation of the reform (Figure 1, panel B). The differences in the level of public investment before and after Tax for Fee reform are even more striking when looking at village funded-only projects (Figure 2, Panel B). In the case of roads, irrigation and schools the level of investment was significantly higher before reform. This trend, however, is

not the same when looking at above funded-only investments on road and school projects (Figure 2, Panel D).

In summary, we find the relationship between public goods investment and recent policy initiatives in rural China to be complex. From the descriptive analysis, there is largely a positive correlation between direct elections and investment into three of the major types of public goods, especially on the part of investment that comes from the villagers' themselves. Although we so far have been unable to assess the mechanism by which the correlation is created, it may be that when elections produce a legitimate leader, he/she both has an incentive and mandate to invest in public goods and, above all, is better able to mobilize resources within the village. In contrast, Tax for Fee is even more complicated. Although after the first round of fiscal reforms investment from above increased for roads and schools, investment from the village itself declines fairly sharply for all three investment types. One explanation that is consistent with the facts is that Tax for Fee officials not only cut the taxes of farmers and capped their fees that could be assessed by local leaders, they also increased the amount of funding coming from above. However, the restrictions on the fund-raising initiative of local leaders that came with Tax for Fee appear to have partly negated the gains from additional investments since they are either unable or unwilling to mobilize as many resources from the village itself.

Multivariate Analysis

In order to examine whether direct elections and rural Tax for Fee reform have significant effects on public goods provision in rural China, we conduct a series of regression analyses. To do so, we use probit analysis to test whether local governance policies and Tax for Fee reform impact the implementation of roads, irrigation or school projects (that is: yes or no—was there a project?). Next, we use tobit analysis to test whether governance policy and Tax for Fee reform have also affected the level of public goods investments in villages (measured in 1000 yuan). Based on the descriptive analysis in the previous section, our most basic hypotheses are: direct election will increase public goods provision; Tax for Fee reform will have a negative impact on public goods provision (especially on village funded-only investment projects).

Since village funded-only projects and above funded-only projects may be determined by different factors (or be affected differently by a given set of factors), we run regressions separately using total investment (projects), above funded-only investment (projects) and village funded-only investment (projects) as the dependent variables. Thus, in our analysis for each type of project (roads, irrigation and schools), we have six different dependent variables: a.) whether or not a village had an investment (funded from any source) between 1998 and 2003 during each official election term; b.) whether or not a village had an above funded-only; c.) whether or not a village had a village funded-only project; d.) the level of investment (in yuan) into a project (funded from any source) between 1998 and 2003 during each official term; e.)

the level of investment into above funded-only projects; and f.) the level of investment into village funded-only projects. At the heart of our analysis, then, we seek to understand the effect on public goods investment of village elections (measured as a dummy variable: “Was the village leader elected directly?”) and Tax for Fee form (measured as a dummy variable: “Was Tax for Fee reform in place when the investment made?”).

In order to control for the effects of other factors when explaining the effect of local rural governance policies on public goods investment, we assume that there are two sets of explanatory variables in addition to our measures of local governance policy. First, we include a set of socio-economic factors that should be expected to affect the level of public goods investment—for example: net per capita income—in linear and squared form (in 1997); the size of the village’s population (in 1997); the share of the population that is of a minority ethnic origin (in 1997); per capita land size (in 1997); the number of people from the village that are working in either the township or county (in 1997); and the rate of illiteracy of the village’s labor force (in 1997). Second, we include a set of location and geographical factors—for example, the share of total cultivated land that is effectively irrigated land in village (in 1997); the share of the village’s total land area that is mountainous (that is land over 25 degrees in 1997); the distance between the village’s center to the nearest road (in 1997); a measure of the size (in land area) of the village (measured as the distance—in kilometers—between the two small groups within each village that are furthest away

from each other); and the distance (in kilometers) between the office of the village committee and township seat (in 1997).

In summary, then, the model to be estimated can be written as:

(1) Public goods investment = f(Village elections; Tax for Fee reform; Other factors)

where the dependent variable is one of the six types of investments (as discussed above); the variable measuring the village election is a dummy variable (which is equal to 1 if the village leader was directly elected; and 0 otherwise); the Tax for Fee reform variable also is a dummy variable (which is equal to 1 if the election term in which an investment was made was after the implementation of Tax for Fee reform; and 0 if before) and the other factors matrix includes all of the socio-economic and location/geographical variables discussed above.

In order to estimate the equation 1, we organized the data so we could match the term of office of the elected (or appointed) village leader with the period of time in which the project was begun. Hence, the number of observations in each of the regressions should have been equal to the total number of election terms (that is 7261).⁷ In the case of schools, the number of observations is lower (only 4564), because many villages did not have a school (and so were not included in the sample—how could a village invest in the school if the school district did not have one in the village?).

Results of Multivariate Analysis

In reporting the findings, we examine two sets of results. The first set will be the basic probit and tobit results. The two variables of interest—direct election and Tax

for Fee reform—will be considered to be exogenous to the decision making authority of the village. More specifically, we will assume that there will not be any correlation between the direct election or Tax for Fee reform variable and the residual of the investment equation. While there is some validity to the assumption, given the fact that township and county level government officials are making the election and fiscal reform decisions (and in many cases they are imposed on the village from above without regards to the level of public investment volume), this assumption will be relaxed in the next section.

Probit and Tobit Regression Results

In running the model in equation 1 (in its six different versions for each type of investment project), the regression equations appear to perform well. For example, in the case of roads, a number of the control variables behave as expected. If the village has its own villager (one or more) in a government position in the township or county government, it is more likely to have a road project (as well as have higher levels of investment in roads—especially from above—Table 6A, columns 1, 2, 5 and 6, rows 13). Likewise, villages that are richer, tend to invest more in village funded-only projects (columns 3 and 4, rows 3 and 4). While the Pseudo R-square statistics are low, this is not unusual for cross section analysis.

Although the signs and levels of statistical significance may vary for a number of the control variables when they appear in equations using the different specifications of the dependent variables (e.g., yes/no project or level of investment), the source of investment (all sources; above funded-only; village funded-only) and type of

investment (roads, irrigation, schools), the sign on the direct election variable is consistently positive and significantly different from zero in 16 of the 18 models (Tables 6A, 6B and 6C, row 1). The positive coefficients mean that, everything else held equal, villages that directly elect their village leaders have higher levels of public investment. The coefficients on the direct election variables in the village funded-only equations are all positive and the t-ratios are particularly high. The interpretation of this finding (given the assumptions of the model) is that there is something about the election process that is boosting investment in villages that have directly elected their leaders. It could be that directly elected leaders are more responsive to villager demands for public investment. It also could be that the legitimacy bestowed on leaders by the election process gives them a greater ability to lobby those from above as well as organize funding from the village.

But while direct elections increase public goods investment—especially from village funded-only sources for irrigation and schools (but also for irrigation and school investment from all sources), the Tax for Fee reforms are limiting it. According to Tables 6B and 6C (row 2), *ceteris paribus*, in the election term after Tax for Fee reform, the propensity and level of investment by the villagers in their own village funded-only projects fall. This drag in investment from the village itself may be holding down investment from all sources. Apparently, the increased controls put on the actions by village leaders to collect fees and assessments from villagers (as well as limits on ability to draft corvee labor) has led to a reduction in investment, other things

held constant. Certainly, this is an unintended consequence of the Tax for Fee reforms which were supposed to improve the lives of rural individuals and their environment.

The case of roads is somewhat different, perhaps because the Tax for Fee reforms came right before the government launched its major “road to every village” campaign (Table 6A). As part of this national effort, the central government has invested tens of billions of yuan annually into road building projects during the past several years. It is likely that because of this effort, roads from all investment and those from above funding-only rose significantly (columns 1, 2, 5 and 6, row 2).

Interestingly even though, unlike the case of irrigation and schools, the sign on the Tax for Fee reform variables in the village only-funded models are not significantly different from zero. The fact that they are zero (instead of negative as in the case of irrigation and schools) is important because this means that there is no increase in village funding of road despite the official requirement of most projects that villages contribute to their own road building projects. Such a finding suggests that Tax for Fee is limiting the ability of villages from meeting these obligations and increasing their own investment into roads.

Accounting for the Endogeneity of Direct Elections

While in the first stage of our estimation, we ignored the possible presence of endogeneity (as a way to establish a baseline and examining the uncorrected relationship among the main variables), it is possible that the coefficient on the direct election variable is biased from several sources.⁸ First, it is possible that there is reverse causality. Directly elected village leaders may not only generate more

investment; investment activity could make it attractive enough to become village leader so more candidates would find it worth it to announce their candidacy and compete for a leadership position. Second, there could be a set of unobserved factors that both affect the level of investment and are correlated with presence of direct elections. In either of these cases, the coefficient on the direct election variable could be biased.

In order to account for the endogeneity of the direct election variable we adopt a Bivariate Probit approach. While the village has considerable authority over and plays a role in deciding how its leaders are elected, as seen in the discussion above, policy also plays a role. Our strategy relies on the assumption that election rules and effort exerted by the part of the township government responsible for managing village elections will have some effect on the propensity of the village to elect its leader. There is no reason to believe, however, that the effort of this part of the township government apparatus will have any independent effect on the amount of investment activity.

To measure the effect of the township government on the election process we use two variables from our data. During the survey, we asked local officials and villages whether or not the township election committee had a rule about whether or not the slate of village candidates needed to have the official approval of township leadership. 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 prowess) of the village. Control over the nomination process also was often a way in which the

township could directly appoint a leader (by approving one candidate but not the other—which essentially left only one candidate on the ballot—a township appointee). Of the 726 elections that were held in our sample villages, 68% were subject to township approval of the nomination slate. Although the correlation coefficient between the presence of the approval rule and direct elections was small, only -0.05, it was significant at 1%.

We also asked the township informant how many official meetings were convened to plan village elections. Specifically, we made a count of 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 (which came down from the county's bureau of civil affairs) 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). On average, township and county officials held 5.30 meetings, ranging from 0 to 10. The correlation coefficient between the number of meeting variable and direct election was +0.034, and was significant at 1%.

Descriptive statistics from our data and statistical tests both suggest that the choices of instrumental variables (IVs) are satisfactory. Because we are looking for a variable that is correlated with the endogenous variable (direct election) but is not correlated with the outcome variable (investment) except through its impact on direct elections, we would like to look at the correlations between the IVs and the unobservables that are causing the endogeneity. By definition, of course, this is

impossible. But if any of the unobservables are correlated with the variables that we do observe (and included as control variables in the analysis), one way to examine the validity of the IVs is to see if there is any correlation between the IVs and the control variables. In Appendix Table 1, we show that when we divide the sample into those villages that have nomination approval rules (column 1) and those that do not (column 2), there is little difference in the level of the control variables (rows 1 to 8). The same is true when we divide the sample into those villages in which county and township officials had less than five meetings (column 3) and those in which there were more than five meetings (column 4). In addition, the Hausman overidentification test also supports the notion that the IVs are not correlated with the residual from the investment equation (See Appendix Table 2—rows 1-4 for road project investments; rows 5-8 for irrigation project investments; and rows 9-12 for school project investments). In other words, by logic and from our statistical analysis the identification strategy appears to be sound.

Bivariate Probit Results

The bivariate probit estimates of the coefficients of the effects of direct election and Tax for Fee reform on investments from all sources and investments from village funded-only projects are reported in Table 7. For the most part they are consistent with the probit and tobit estimates in Tables 6A, 6B and 6C—although the levels of significance of some of the coefficients have fallen.

According to our results, direct elections continue to have some positive effect on investment (Table 7, row 1). In all of the six regressions, the sign on the coefficient

of the direct election variable is positive. It is significant (at the 10% level, at least) in four of the six equations. It is interesting that all of the coefficients in the village funded-only equation (columns 4 to 6) are positive (although the coefficient in the irrigation equation is not significant). Even after controlling for the endogeneity of the election process, there appears to be a positive effect of direct elections on investment. The marginal effects are between 1% and 15% (Table 7, row 1—see the figures inside the brackets).

In contrast, except for the roads variables (as was discussed above), the signs on all of the coefficients of the Tax for Fee variables are negative (and they are significant in the irrigation and school equations). Clearly the finding in the probit and tobit analysis above remains. The Tax for Fee reforms, for all of the benefits that the policy has brought to villages through reduced taxes and fees, are coming at a cost to public goods investment in the village. It is almost certain that only the large increase in the volume of investment into roads by the central government in recent years has kept the total level of investment into roads from falling (as it has happened in the case of the other types of investment projects)

Conclusions

Rural China has recently undertaken broad policy changes in both the areas of local governance and fiscal management. We have seen that across both time and space that the implementation of local governance policies—for elections and fiscal management—have not been uniform or necessarily smooth. The results of our paper

suggest that the start and stop nature of the local reforms have an effect on the public infrastructure of rural villages. On the one hand shifts in policies that promote elections, while slow in getting started and not universal, appear to be creating an atmosphere that is conducive for more investment. When villages elect their own leader, for some reason, there is a significant amount of new investment effort that arises in the village. If public goods investment can be raised by improvements in the ways that villages choose their leaders, continuing reforms to provide local leaders with more legitimacy may lead to an even more vibrant village development environment.

However, at the same time that the promotion of village elections are helping improve the village's public goods environment, the Tax for Fee reforms appear to be reducing the ability or willingness of villages to invest in themselves. That is not to say that villagers do not like Tax for Fee reform. In a fundamental way, officials are giving farmers a tax cut and this is almost certainly leading to higher current incomes. Our results demonstrate, however, that the individual benefits of Tax for Fee reform could be coming at a cost—reduced investment from the villagers themselves. The exact mechanism has not been found (certainly an interesting topic for future research), but it is likely to have something to do with restrictions on leader's ability to raise assessments for projects, specifically, and the deterioration of the fiscal health of villages that has generally been caused by Tax for Fee (Zhang et al., 2005).

There also may be an additional adverse effect of Tax for Fee reform that could actually lead to a reduction in the positive effect that appears to have been induced by more competitive election. Recent research by World Bank (2005) shows that in recent

years, the years after Tax for Fee reform, fiscal health and public goods investment by villages have not only fallen, it also appears as if the restrictions imposed by the Tax for Fee reforms are discouraging more capable villagers from seeking or staying in village leadership positions. Between 2002 and 2004, the average education of leaders has fallen. Their age has risen. Their experience in the migrant labor force and as entrepreneurs working in self-employed enterprises also has fallen. In other words, the overall human capital of village leaders is falling and it may be due to the Tax for Fee reforms. If so, then large transfers (such has been done with roads) may not be enough. Even if there is enough fiscal resources present, the investments from above need to be managed better, which will become more difficult if the human capital of those willing to serve as leaders falls. Clearly, a reassessment of the way that Tax for Fee reforms are being implemented is needed.

Table 1. Number and size of public goods projects in rural China, 1998-2003.

Project	Number of projects	Average size (1000 yuan)	Accumulated percentage of projects
Roads and bridges	1266	112	21.2
Grain for Green	892	67	36.1
School construction	850	99	50.3
Irrigation & drainage	819	65	64.1
Drinking water	636	75	74.7
Loudspeaker for village committee	379	60	81.0
Recreation center	262	50	85.4
Build clinic	163	25	88.2
Beautify environment	157	24	90.8
Watershed management	151	298	93.3
Forest closure	140	34	95.6
Land Leveling	124	136	97.7
Eco-forest	55	34	98.6
Land improvement	52	110	99.5
Build pasture	19	134	99.8
Other public project	10	244	100.0
N / mean ^a	5,975	108	--

Data source: Authors' survey.

^a The number and average size of projects were weighted by population weights.

Table 2. Source of funding for public goods projects by province in rural China, 1998-2003.

Province	Total	Above funded only	Village funded only	Jointly funded	Value of investment from above	Value of investment by village
	(Number of projects)				(Percent) ^a	
Jiangsu	1,646	436	392	818	26	74
Gansu	1,085	481	67	537	77	23
Sichuan	1,037	567	92	378	64	36
Shaanxi	1,352	525	142	685	72	28
Jilin	1,130	420	135	575	45	55
Hebei	1,473	318	557	598	50	50
	(Number of projects)					
Total ^b	7,723	2,747	1,385	3,591	--	--
	(Percent)					
Percent of total ^c	100	36	18	46	53	47

Data source: Authors' survey.

^a Percent 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.

^b Total is sum of rows 1 to 6.

^c Percent in row 8, columns 1 to 4 measures share of total number of projects for each source of funding (for example $36=100*2747/7723$); percent in column 5 and 6 measures the weighted average of rows 1 to 6; value of investment does not include value of in-kind labor investment by villagers.

Table 3. Process by which village leader (*cunzhuren*) assumes leadership position in China's rural villages, 1998-2003.

<i>Process by which village leaders acceded to office between 1998 and 2003</i>				
Province	Elected directly ^a	Not elected directly ^b	Total number of times village leader acceded to office (column1+2)	Percent of directly elected (column1/3)
Jiangsu	1279	578	1857	69
Gansu	562	117	739	76
Sichuan	879	113	992	89
Shaanxi	912	232	1144	80
Jilin	907	85	992	91
Hebei	1067	470	1537	69
Total	5606	1655	7261	77

Data source: Authors' survey.

^a Village leader counted as "directly elected" if he/she assumed office by means of direct vote of villagers through the ballot process.

^b If village leader not directly elected, the process by which village leader assumed the leadership position was a.) appointed by above (761 times); b.) appointed by the village committee (680 times); c.) some other channel (214 times). In other words, in all of our sample sites between 1998 and 2003, in 1655 cases, village leader assumed the position without being directly elected by balloted election (761+680+214=1655).

Table 4. The method of accession of village leader to his/her position and investment into public goods projects in rural China, 1998-2003.

<i>Share of villages that have at least one of following projects</i>	<i>Village leader was elected directly (%)</i>	<i>Village leader was not elected directly (%)</i>
Roads		
Total ^a	25.4	23.3
Village funded only	9.5	8.2
Above funded only	3.9	3.0
Irrigation		
Total ^a	13.6	13.4
Village funded only	5.7	5.4
Above funded only	3.5	3.8
Schools		
Total ^a	17.7	15.5
Village funded only	6.7	4.4
Above funded only	3.6	2.9

Data source: Authors' survey.

^a "Total" means funds of the project came from any source: funded from above + funded by village (including jointly funded projects).

Table 5. Rural tax reform and investment into public goods projects in rural China, 1998-2003.

<i>Share of villages that have at least one of following projects</i>	<i>Before the rural tax reform (%)^b</i>	<i>After the rural tax reform (%)^b</i>
Roads		
Total ^a	27.0	24.3
Village funded only	9.2	8.9
Above funded only	3.3	4.3
Irrigation		
Total ^a	15.1	10.2
Village funded only	6.2	4.7
Above funded only	4.0	2.7
Schools		
Total ^a	18.2	14.0
Village funded only	6.9	3.8
Above funded only	3.4	3.6

Data source: Authors' survey.

^a "Total" means funds of the project came from any source: funded from above + funded by village (including jointly funded projects).

^b Investments are counted as "before" and "after" if the investment project was started (month/year) before or after the date (month/year) that Tax for Fee reform began to be implemented in the village..

Table 6A. Ordinary Least Squares regression analysis of the impact of village leader election and Tax for Fee reform on road project investment in rural China, 1998-2003.

	All funding sources		Village funded only		Above funded only	
	Have or no road project	Road project investment level	Have or no road project	Rroad project investment level	Have or no road project	Road project investment level
	(Probit)	(tobit)	(Probit)	(tobit)	(Probit)	(tobit)
Village leader elected directly(yes=1,no=0)	0.14 (3.38)***	5.14 (3.20)***	0.15 (2.74)***	5.76 (3.13)***	0.16 (2.20)**	12.40 (2.01)**
Dummy of rural Tax for Fee reform(before=0,after=1)	0.12 (3.19)***	4.76 (3.10)***	-0.02 (0.45)	0.18 (0.10)	0.14 (2.19)**	12.40 (2.30)**
Net per capita income in 1997(yuan)	-1E-06 (0.02)	-0.004 (1.96)**	2E-04 (2.54)**	-0.001 (0.64)	-1E-04 (0.71)	-0.001 (0.05)
Net per capita income square in 1997	-4E-09 (0.31)	1E-06 (2.96)***	-1E-08 (0.74)	2E-06 (4.08)***	-5E-08 (1.28)	-5E-06 (1.56)
Total population in 1997 (person)	3E-05 (1.34)	0.0021 (2.80)***	-3E-05 (1.14)	0.0008 (0.97)	8E-07 (0.02)	-0.0032 (1.03)
Percentage of minority population in 1997(%)	0.002 (2.45)**	0.07 (2.16)**	0.001 (1.34)	0.03 (0.73)	0.004 (3.39)***	0.27 (2.69)***
Per capita land in 1997(mu)	-0.017 (1.66)*	-0.64 (1.55)	-0.033 (1.98)**	-1.03 (1.71)*	-0.010 (0.58)	-1.10 (0.77)
Percentage of effectively irrigated land in 1997(%)	0.001 (1.12)	0.088 (3.57)***	0.001 (1.53)	0.092 (3.32)***	-0.001 (0.54)	0.047 (0.53)
Hilly land over 25 degree in total land 1997(%)	0.002 (2.87)***	0.072 (2.35)**	0.001 (0.73)	0.027 (0.75)	0.004 (3.44)***	0.211 (2.04)**
The distance of the nearest road to the village in 1997(Km)	-0.002 (1.12)	-0.11 (1.64)	-0.006 (2.51)**	-0.28 (3.02)***	-0.002 (0.53)	-0.07 (0.27)
The farthest distance between two in 1997(Km)	-0.007 (0.99)	-0.48 (1.79)*	-0.002 (0.29)	-0.07 (0.24)	-0.022 (1.57)	-1.67 (1.45)
The distance between village and township seat in 1997(Km)	0.0021 (0.56)	0.15 (0.99)	-0.0015 (0.31)	-0.05 (0.31)	-0.0043 (0.63)	-0.31 (0.54)
Number of fellow villagers working county governments(person)	0.006 (2.92)***	0.37 (4.41)***	0.002 (0.54)	0.07 (0.74)	0.007 (1.90)*	0.63 (2.00)**
The illiterate rate of village labor force in 1997(%)	-0.13 (1.00)	-6.64 (1.28)	-0.72 (3.92)***	-31.70 (4.54)***	0.44 (2.33)**	31.80 (2.01)**
major road passing by village (yes=1, no=0)	-0.05 (1.18)	-1.01 (0.66)	0.01 (0.16)	0.79 (0.47)	-0.11 (1.47)	-9.05 (1.54)
Province Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-6E-01 (5.75)***	-35.6 (8.72)***	-2E+00 (11.6)***	-58.3 (11.90)***	-1E+00 (7.23)***	-126 (7.37)***
Observations	7261	7261	7261	7261	7261	7261
Pseudo R2	0.03	0.02	0.04	0.03	0.05	0.02

Absolute value of t statistics in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%

Data source: Authors' survey.

Table 6B Ordinary Least Squares regression analysis of the impact of village leader election and Tax for Fee reform on irrigation project investment in rural China, 1998-2003.

	All fund source		Village funded only		Above funded only	
	Have or no irrigation project	Irrigation project investment level	Have or no irrigation project	Irrigation project investment level	Have or no irrigation project	Irrigation project investment level
	(Probit)	(tobit)	(Probit)	(tobit)	(Probit)	(tobit)
Village leader elected directly(yes=1,no=0)	0.14 (3.01)***	4.7 (3.23)***	0.15 (2.49)**	2.42 (2.48)**	0.08 (1.09)	1.95 (0.63)
Dummy of rural Tax for Fee reform(before=0,after=1)	-0.24 (5.54)***	-7.7 (5.54)***	-0.18 (3.09)***	-3.12 (3.39)***	-0.15 (2.20)**	-7.19 (2.37)**
Net per capita income in 1997(yuan)	-0.0001 (1.02)	-0.003 (1.61)	0.00010 (1.38)	-0.0004 (0.34)	0.0001 (0.66)	0.005 (0.92)
Net per capita income square in 1997	1E-09 (0.09)	0.0000004 (1.20)	-3E-09 (0.21)	5E-07 (2.61)***	-5E-08 (1.57)	-2E-06 (1.42)
Total population in 1997 (person)	-6E-05 (2.67)***	0.000 (0.45)	-0.0001 (4.43)***	-0.001 (2.75)***	-2E-05 (0.67)	-0.0004 (0.27)
Percentage of minority population in 1997(%)	0.000 (0.44)	0.08 (2.31)**	-0.002 (0.89)	-0.05 (1.52)	0.003 (2.24)**	0.16 (2.45)**
Per capita land in 1997(mu)	-0.02 (1.24)	-0.76 (1.55)	-0.036 (1.37)	-0.26 (0.67)	-0.014 (0.64)	-0.60 (0.64)
Percentage of effectively irrigated land in 1997(%)	0.0036 (5.19)***	0.084 (3.72)***	0.005 (5.24)***	0.08 (4.96)***	-0.002 (2.13)**	-0.10 (2.04)**
Hilly land over 25 degree in total 1997(%)	-0.003 (2.99)***	-0.09 (3.00)***	-0.0034 (2.31)**	-0.06 (2.51)**	-0.0020 (1.41)	-0.07 (1.04)
The distance of the nearest road to the village in 1997(Km)	-0.0056 (2.30)**	-0.20 (2.54)**	-0.010 (2.04)**	-0.14 (1.90)*	-0.005 (1.34)	-0.15 (0.99)
The farthest distance between two in 1997(Km)	-0.022 (2.26)**	-1.03 (3.23)***	-0.015 (0.99)	-0.30 (1.24)	-0.02 (1.10)	-1.04 (1.59)
The distance between village and township seat in 1997(Km)	-0.005 (1.06)	-0.17 (1.09)	-0.003 (0.44)	-0.10 (0.85)	-0.009 (1.09)	-0.08 (0.24)
Number of fellow villagers county governments(person)	0.004 (1.62)	0.11 (1.36)	-0.006 (1.41)	-0.13 (1.87)*	0.003 (0.72)	0.16 (0.96)
The illiterate rate of village labor force in 1997(%)	-0.46 (2.85)***	-1E+01 (2.26)**	-0.32 (1.32)	-3.85 (1.01)	-0.26 (1.14)	-8.29 (0.81)
Province Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.75 (6.67)***	-28.90 (7.89)***	-1.53 (9.87)***	-25.48 (9.67)***	-1.32 (7.08)***	-66.0 (7.41)***
Observations	7261	7261	7261	7261	7261	7261
Pseudo R2	0.06	0.02	0.13	0.08	0.03	0.02

Absolute value of t statistics in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%

Data source: Authors' survey.

Table 6C Ordinary Least Squares regression analysis of the impact of village leader election and Tax for Fee reform on school project investment in rural China, 1998-2003.

	All fund source		Village funded only		Above funded only	
	Have or no school project	School project investment level	Have or no school project	School project investment level	Have or no school project	School project investment level
	(Probit)	(tobit)	(Probit)	(tobit)	(Probit)	(tobit)
Village leader elected directly(yes=1,no=0)	0.18 (3.31)***	21.00 (3.47)***	0.23 (2.88)***	5.23 (3.06)***	0.22 (2.36)**	17.60 (2.73)***
Dummy of rural Tax for Fee reform(before=0,after=1)	-0.15 (2.71)***	-14.90 (2.54)**	-0.31 (3.89)***	-6.25 (3.67)***	0.05 (0.63)	5.12 (0.91)
Net per capita income in 1997(yuan)	-8E-05 (0.96)	-0.035 (3.83)***	-3E-05 (0.27)	0.001 (0.27)	-3E-04 (1.44)	-0.013 (1.04)
Net per capita income square in 1997	-1E-08 (0.55)	8E-06 (3.88)***	2E-08 (1.01)	4E-07 (0.79)	-4E-09 (0.09)	-1E-06 (0.49)
Total population in 1997 (person)	3E-05 (1.10)	0.0060 (1.98)**	2E-05 (0.57)	0.0014 (1.88)*	-4E-05 (0.83)	-0.0010 (0.32)
Percentage of minority population in 1997(%)	0.001 (0.64)	0.22 (1.62)	-0.004 (1.90)*	-0.09 (1.75)*	0.003 (1.43)	0.18 (1.53)
Per capita land in 1997(mu)	-0.035 (2.74)***	-3.73 (2.62)***	-0.073 (2.85)***	-1.35 (2.51)**	0.016 (1.14)	0.97 (1.02)
Percentage of effectively irrigated land in 1997(%)	0.0002 (0.22)	-0.016 (0.17)	-0.00002 (0.02)	-0.008 (0.33)	0.0039 (2.66)***	0.304 (3.09)***
Hilly land over 25 degree in total land 1997(%)	-0.0020 (1.77)*	-0.188 (1.55)	-0.0009 (0.58)	-0.035 (1.04)	0.0007 (0.38)	0.090 (0.74)
The distance of the nearest road to the village in 1997(Km)	-0.0007 (0.30)	-0.07 (0.27)	-0.0044 (1.16)	-0.08 (1.05)	-0.0003 (0.07)	-0.06 (0.23)
The farthest distance between two in 1997(Km)	0.011 (1.09)	0.22 (0.20)	-0.002 (0.11)	-0.24 (0.74)	0.021 (1.28)	1.07 (0.94)
The distance between village and township seat in 1997(Km)	0.0062 (1.17)	-0.27 (0.47)	0.0163 (2.31)**	0.27 (1.89)*	-0.0083 (0.86)	-0.89 (1.35)
Number of fellow villagers working county governments(person)	0.005 (1.93)*	0.45 (1.56)	0.006 (1.59)	0.09 (1.17)	0.011 (2.87)***	0.73 (2.90)***
The illiterate rate of village labor force in 1997(%)	-0.07 (0.42)	-6.64 (0.36)	-0.27 (1.01)	-4.17 (0.74)	0.13 (0.50)	8.66 (0.51)
Duration since last school maintenance(year)	0.009 (5.20)***	0.69 (3.69)***	0.007 (2.92)***	0.12 (2.24)**	0.005 (1.62)	0.31 (1.66)*
Province Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-9E-01 (6.24)***	-101 (6.33)***	-2E+00 (9.16)***	-43.5 (9.37)***	-2E+00 (6.51)***	-117 (6.42)***
Observations	4564	4564	4564	4564	4564	4564
Pseudo R2	0.04	0.01	0.08	0.04	0.07	0.04

Absolute value of t statistics in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%

Data source: Authors' survey.

Table 7. Biprobit analysis of the impact of village leader elections and Tax for Fee reform on road, irrigation and school project in rural China, 1998-2003

	<i>All source funded project</i>			<i>Village funded project only</i>			<i>Other controls</i>
	Road	Irrigation	School	Road	Irrigation	School	
Coefficient (and marginal effect) on direct election of village leader (yes=1,no=0)	0.86[0.15] (1.79)*	1.22[0.1] (5.05)***	0.04[0.01] (0.06)	1.30[0.07] (5.07)***	0.35[0.02] (0.47)	1.64[0.04] (13.2)***	Geography, Society and economic factors
Coefficient (and marginal effect) on Tax for Fee reform (after=1,before=0)	0.12[0.03] (3.13)***	-0.2[-0.02] (4.46)***	-0.15[-0.03] (2.71)***	-0.02[-0.001] (0.38)	-0.18[-0.01] (3.10)***	-0.18[-0.01] (3.09)***	
F test value of the instrument variable	17.65	33.37	9.81	16.45	30.68	10.64	

Marginal effect in bracket; Absolute value of t statistics in parentheses

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

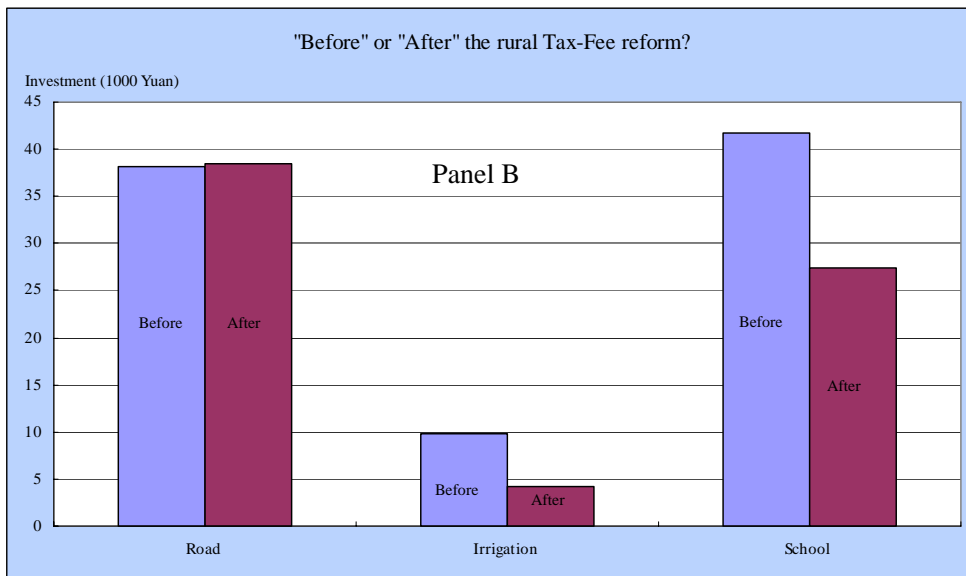
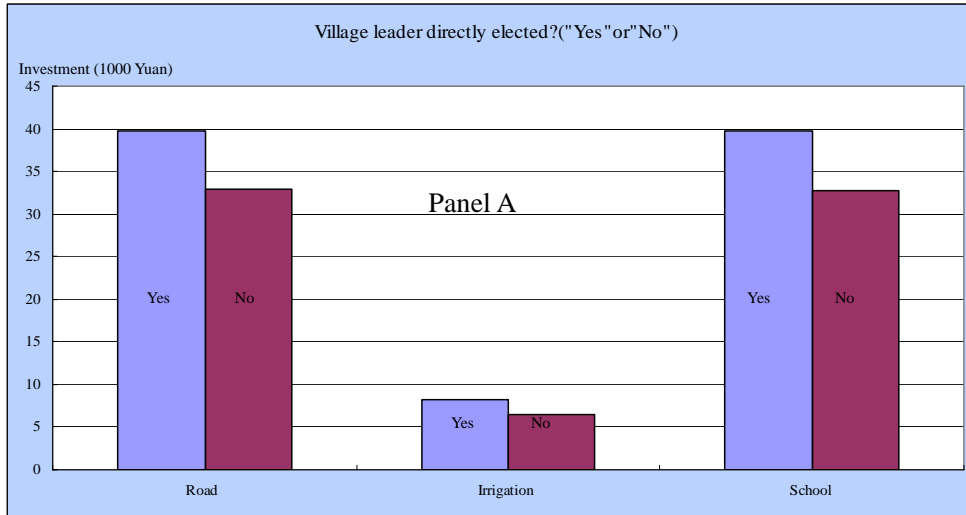


Figure 1. The relationships between direct election, the rural Tax for Fee reform and the average investments on road, irrigation, school.

Note: Investment includes value of investment from village funded only, above funded only and joint funded;

Data source: Authors' survey.

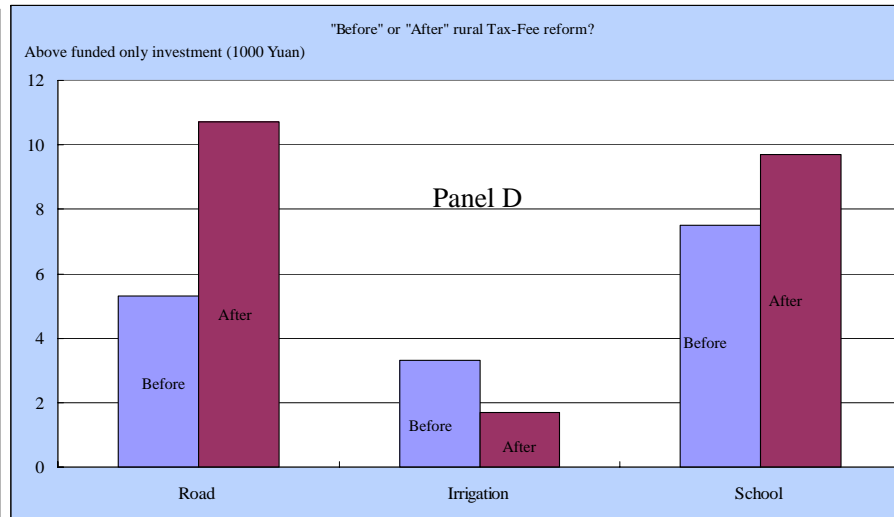
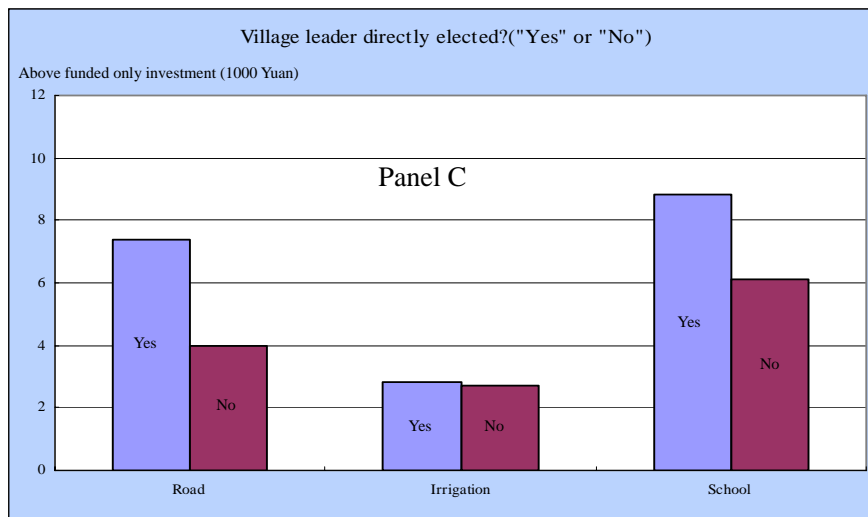
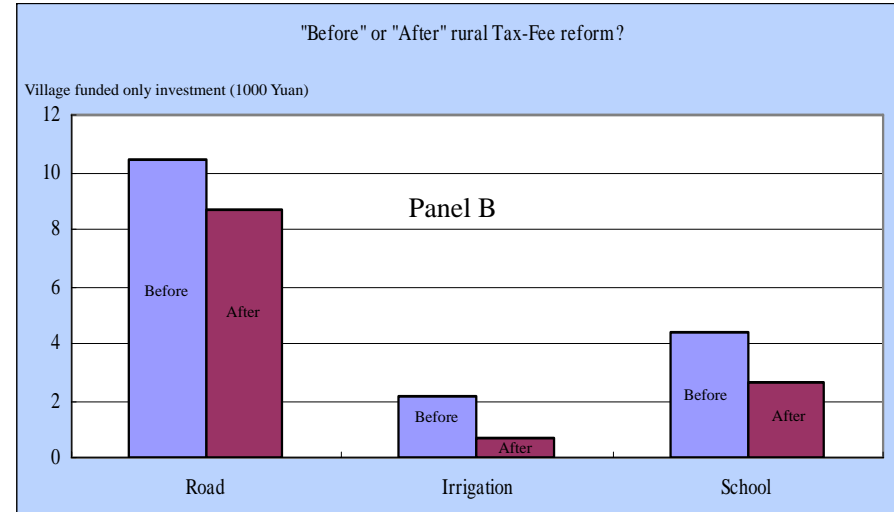
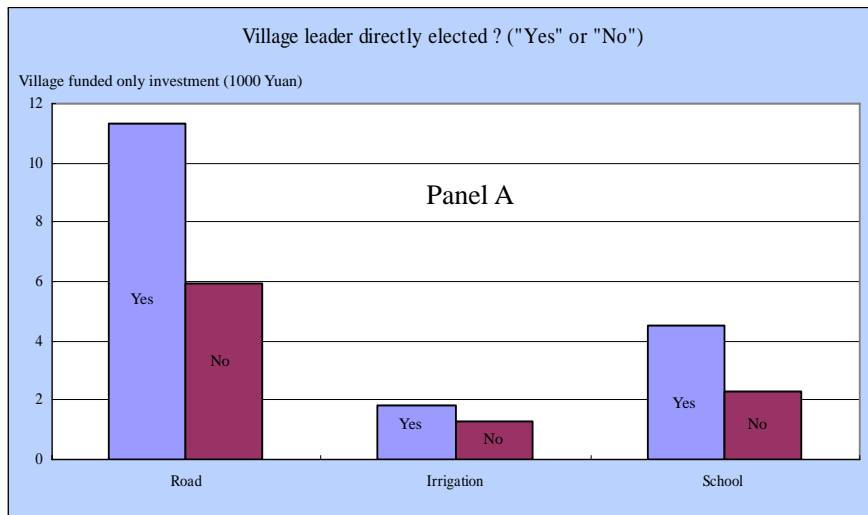


Figure 2. The relationship between direct election, the rural Tax for Fee reform and the average investments on village funded and above funded only road, irrigation, school.

Data source: Authors' survey.

Reference

- Asian Development Bank (ADB), 2005. Public Investment and the Poor in Rural China. Report of Asian Development Bank, Beijing Office, Beijing, China.
- Bernstein, Thomas P., Lü, Xiaobo, 2000. Taxation without representation: Peasants, the central and the local states in reform China. *The China Quarterly* 163, 742-763.
- Besley, Timothy, Burgess, Robin, 2001. The political economy of government responsiveness: Theory and evidence from India. Working Paper, London School of Economics.
- Cai, Pengyi, Zhou, Jiehong, Xie, Jiaqi, 1999. Empirical study on the rational peasant burden. *Problems of Agricultural Economy (in Chinese)* 12, 41-45.
- China Council for International Cooperation on Environment and Development (CCICED), 2004. *China's Agricultural and Rural Development in the New Era: Challenges, Opportunities and Policy Options.*
- Chan, Anita, Madsen, Richard, Unger, Jonathan, 1992. *Chen Village Under Mao and Deng.* University of California Press, Berkeley.
- Darja, Jesse, Suryadarma, Daniel, Suryahadi, Asep, Sumarto, Sudarno, 2004. The state of village-level infrastructures and public services in indonesia during the economic crisis. SMERU Working Paper, The SMERU Research Institute, Jakarta, Indonesia.
- Dethier, Jean-Jacques, 1999. Governance and economic performance: A survey. ZEF Discussion Paper on Development Policy No.5, Center for Development Research (ZEF), Bonn, Germany.

- Duflo, Esther, Chattopadhyay, Raghavendra, 2004. The impact of reservation in the panchayati raj: Evidence from a nationwide randomized experiment. *Economic and Political Weekly*, February 28, 979-986.
- Fan, Shenggen, Zhang, Linxiu, Zhang, Xiaobo, 2004. Reforms, investment, and poverty in rural China. *Economic Development and Cultural Change* 52, 395-421.
- Gao, Feng, 2003. The under-funding of rural public goods provision. *Theoretic study* (in Chinese) 3, 28-29.
- GUOBANFA (Office of State Council), 2002. Guanyu Zuohao 2002 Nian Kuoda Nongchu Shuifei Gaige Shidian Gongzuo De Tongzhi [Circular on Expansion of Pilot Experiments on Rural Tax for Fee Reforms in 2002] (in Chinese). 25, Office of State Council, Beijing, China.
- Ho, Samuel P., 1994. *Rural China in Transition: Non-Agricultural Development in Rural Jiangsu, 1978-1990*. Clarendon Press, Oxford.
- Jia, Kang, Zhao, Quanhou, 2002. New issues facing rural Tax for Fee reforms and the countermeasures. *Journal of Public Finance Research* (in Chinese) 1, 16-22.
- Jin, Hehui, Qian, Yingyi, Weingast, Barry R., 2005. Regional decentralization and fiscal incentives: Federalism, Chinese style. *Journal of Public Economics* 89(9-10), 1719-1742.
- Khan, Mahmood H., 2000, *Rural poverty in developing countries: Issues and policies* (April). International Monetary Fund Working Paper No. 00/78, International Monetary Fund, Washington DC.
- Kelliher, Daniel, 1997. The Chinese debate over village self government. *China Journal* 37, 63-86.

- Liu, Chengfang, Rozelle, Scott, Zhang, Linxiu, Luo, Renfu, 2005. Can good projects be implemented in bad villages? Explaining the quantity and quality of public investment in rural China. Working Paper, Department of Agricultural and Resource Economics, University of California, Davis.
- Lü, Yao, Wang, Zhaoyang, 2001. An empirical analysis of income levels of rural inhabitants and distributional differentials. *Chinese Rural Economy* (in Chinese) 6, 18-24.
- Morduch, Jonathan, Sicular, Terry, 2000. Politics, growth and inequality in rural China: Does it pay to join the party? *Journal of Public Economics* 77, 331-356.
- O'Brien, Kevin, Li, Lianjiang, 2000. Accommodating "democracy" in a one-party state: Introducing village elections in China. *China Quarterly* 162, 465-489.
- Oi, Jean C., 1989. *State and Peasant in Contemporary China*. University of California Press, Berkeley.
- Oi, Jean C., 1992. Fiscal reform and the economic foundations of local state corporatism in China. *World Politics* 45, 99-126.
- Oi, Jean C., 1994. *Rural China Takes Off: Incentives for Reform*. University of California Press, Berkeley.
- Oi, Jean C., Rozelle, Scott, 2000. Elections and power: The locus of decision-making in Chinese villages. *China Quarterly* 162, 465-489.
- Parker, Stephen, Tritt, Gavin, Woo, Wing Thye, 1997. Some lessons learned from the comparison of transition in Asia and eastern Europe. In: Woo, Wing Thye, Parker, Stephen, Sachs, Jeffrey D. (Eds.), *Economies in Transition: Comparing Asia and Eastern Europe*, MIT Press, 1997, 3-16.

- Potter, Sulamith Heins, Potter, Jack M., 1990. *China's Peasants: The Anthropology of a Revolution*. Cambridge University Press, New York.
- Qian, Yingyi, Weingast, Barry R., 1996. China's transition to markets: markets-preserving federalism, Chinese style. *Journal of Policy Reform* 1, 149-186.
- Qian, Yingyi, Weingast, Barry R., 1997. Federalism as a commitment to reserving market incentives. *Journal of Economic Perspectives* 11, 83-92.
- Rosenzweig, Mark R., Foster, Andrew D., 2003. Democratization, decentralization and the distribution of local public goods in a poor rural economy. BREAD (Bureau for Research and Economic Analysis of Development) Working Paper, No.010, Harvard University, Cambridge, Massachusetts.
- Rozelle, Scott, 1990. *Economics of Village Leaders in Rural China*. Unpublished PhD dissertation, Department of Agricultural Economics, Cornell University, New York.
- Rozelle, Scott, 1996. Stagnation without equity: Patterns of growth and inequality in China's rural economy. *The China Journal* 35, 63-96.
- Shi, Weimin, 2004. The development of grassroots democratic elections in China. *Social Science in China, Special Issues: Peasant Worker Migration to China's Cities* 1, 113-125.
- Sonntag, Brnard H., Huang, Jikun, Rozelle, Scott, Skerritt, John H. (Eds.), 2005. *China's Agricultural and Rural Development in the Early 21st Century*. Australian Centre for International Agricultural Research, Canberra.
- Tao, Ran, Liu, Mingxing, 2005. Urban and rural household taxation in China--measurement, comparison and policy implications. *Journal of the Asia and Pacific Economy* 10(4), 486-505.

- Unger, Jonathan, 2003. Entrenching poverty: The drawbacks of the Chinese government's policy programs. *Development Bulletin* 61, 29–33.
- West, Loraine A., 1997. Provision of public services in rural PRC. In: Wong, Christine P.W. (Ed.), *In Financing Local Government in the People's Republic of China*, Oxford University Press, Hong Kong, 1997, 213-282.
- Wong, Christine P.W., 1991. Central-local relations in an era of fiscal decline: The paradox of fiscal decentralization in post-Mao China. *China Quarterly* 128(12), 691-715.
- Wong, Christine P.W. (Ed.), 1997. *Financing Local Government in the People's Republic of China*. Oxford University Press, Oxford.
- World Bank, 1999. *Accelerating China's Rural Transformation*. Report of the World Bank, Washington D.C.
- World Bank, 2000. *Attacking Poverty*. World Development Report, Washington D.C.
- World Bank, 2001. *China: Overcoming Rural Poverty*. World Bank Country Study, Washington D.C.
- World Bank, 2002. *China: National Development and Sub-National Finance---A review of Provincial Expenditures*. Document of the World Bank, Washington D.C.
- World Bank, 2004. *Making Services Work for Poor People*. World Development Report, Washington D.C.
- World Bank, 2005. *Tax for Fee Reform and Public Investment in China's Rural Communities*. Report of the World Bank, Beijing Office, Beijing, China.

- Xu, Jintao, Cao, Yiyi., 2002. Efficiency and Sustainability of Converting Cropland to Forest and Grassland in the Western Region. Draft report to CCICED Forest and Grassland Task Force.
- Yu, Limin, 2003. On the insufficient supply of the rural public goods. *Taxation and Economy* (in Chinese) 4, 33-34.
- Zhang, Huidong, 2004. An analysis of the transition of local governance in rural China. *Study of Economic issues* (in Chinese) 10, 79-83.
- Zhang, Linxiu, Rozelle, Scott, Brandt, Loren (CCAP/UC Davis/University of Toronto Research Team), 2005. Tax for Fee Reform, Village Operating Budgets and Public Goods Investment, Report of the World Bank, Beijing Office, Beijing, China.
- Zhang Xiaobo, Fan, Shenggen, Zhang, Linxiu, Huang, Jikun, 2004. Local governance and public goods provision in rural China. *Journal of Public Economics* 88, 2857-2871.
- Zhuravskaya, Ekaterina V., 2000. Incentives to provide local public goods: fiscal federalism, Russian style. *Journal of Public Economics* 76, 337-368.

Appendix Table 1. The relationship between IV and other control variables

	The candidate should be approved by upper government		Meetings hold by county and township for election	
	Yes	No	More than fifth	Less than fifth
Per capita land in 1997	1.9	2.3	1.9	2.1
Net per capita income in 1997	1621	1352	1751	1412
The illiterate rate of village labor force in 1997	0.1	0.1	0.08	0.11
Number of fellow villagers working in township or county governments	5.6	4.9	6	5
% of hilly land over 25 degree in total land in the village in 1997	21	25	21	24
The distance of the nearest road to the village seat in 1997	6.5	5.6	5.2	6.7
The distance between village and township seat in 1997	5.3	5.2	5.0	5.4
The farthest distance between two small groups in this village in 1997	2.7	2.5	3.2	2.4

Data source: Authors' survey.

Appendix Table 2. The hausman test and the over identification test of the IV

<i>Dependant variable</i>		<i>Have or no road project</i>	<i>Have or no Village funded road project</i>
Hansen-Sargan over identification Test	Chi-sq(1)	1.98	0.295
	P-value	0.1598	0.587
Hausman Test	Chi-sq(1)	0.0526	1.503
	P value	0.8226	0.2202

<i>Dependant variable</i>		<i>Have or no irrigation project</i>	<i>Have or no Village funded irrigation project</i>
Hansen-Sargan over identification Test	Chi-sq(1)	2.63	0.237
	P-value	0.105	0.626
Hausman Test	Chi-sq(1)	1.029	0.014
	P value	0.311	0.906

<i>Dependant variable</i>		<i>Have or no school project</i>	<i>Have or no Village funded school project</i>
Hansen-Sargan over identification Test	Chi-sq(1)	0.01	0.20
	P-value	0.931	0.656
Hausman Test	Chi-sq(1)	0.414	4.90
	P value	0.520	0.03

Note: Variable with endogeneity is “Is the village leader elected directly” and the instrument variable is “Should the candidate be approved by upper government” and “How many meetings hold by county and township for election”.

¹ The sample villages come from six representative provinces. Jiangsu represents the eastern coastal areas (Jiangsu, Shandong; Shanhai, Zhejiang, Fujian and Guangdong); Sichuan represents the southwestern provinces (Sichuan, Guizhou and Yunnan) plus Guangxi; Shaanxi represents the provinces on the Loess Plateau (Shaanxi and Shanxi) and neighboring Inner Mongolia; Gansu represents the rest of the provinces in the northwest (Gansu, Ningxia; Qinghai and Xinjiang); Hebei represents the north and central provinces (Hebei; Henan; Anhui; Hubei; Jiangxi; and Hunan); and Jilin represents the northeastern provinces (Jilin, Liaoning and Heilongjiang). While we recognize that we have deviated from the standard definition of China's agroecological zones, the realities of survey work justified our compromises. Pretests in Guangdong demonstrated that data collection was extraordinarily expensive and the attrition rate high. One of our funding agencies demanded that we choose at least two provinces in the northwest. Our budget did not allow us to add another central province (e.g., Hunan or Hubei) to the sample. The sample villages were selected by a process that the survey teams implemented uniformly in each of the sample provinces. Six counties were selected from each province, two from each tercile of a list of counties arranged in descending order of per capita gross value of industrial output (GVIO). GVIO was used on the basis of the conclusions of Rozelle, 1990 and Rozelle, 1996 that GVIO is one of the best predictors of standard of living and development potential and is often more reliable than net rural per capita income. Within each county, we also chose six townships, following the same procedure as the county selection. When our enumerator teams visited each of the 216 townships (6 provinces \times 6 counties \times 6 townships) officials asked each village to send two representatives (typically the village head and accountant) to a meeting in the township.

² On average, the attrition rate was only 6 percent. In order to examine if the villages that were not enumerated (due to attrition) were systematically different from those that participated, we collected a set of variables about no-show villages from the township and ran a probit regression with the dependent variable represented as an indicator variable where the variable equaled one if the village did not come and zero otherwise. There were no variables that were **significant**.

³ In some villages, leaders were elected directly by villagers using ballots. Henceforth, these village leaders are called "elected by direct election." In other villages, village leaders were either appointed by the village committee or nominated by the village representative body or directly appointed by officials in the township government. Henceforth, these village leaders are deemed "appointed."

⁴ Many villages also invested into Grain for Green, a large national forestry program begun in 1999 which was designed to pay farmers to set aside cultivate land and plant forest or grasslands. In total between 1999 and 2003, more than 5 million hectares nationally were converted from cultivated land to forests and grasslands (Xu and Cao, 2002). Since the main beneficiaries of such projects were located in downstream areas, Grain for Green can not be considered a public goods investment project of the traditional kind.

⁵ 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." If we only counted re-election as "1," there would have been 5779 instead of 7261.

⁶ We were concerned that the nature of accession to the position of village leader may have been associated mostly with some crisis in a village and that most of the appointments were mainly for filling open village leader positions for partial terms (which might have implications for the effect on public investment). However, when we compare the average length of the term of a village leader

that was elected (2.96 years) with that of a village leader than was appointed (3.01 years), there is little difference (and the difference is not statistically significant).

⁷ When measuring public goods investment as the incidence of investment (that is: public goods investment = 1, if an investment was made during an election term and 0 otherwise), it was possible that there were two projects implemented in a village during the same election term. If so, we still included just a dummy variable. Fortunately, this rarely happened (1 percent in the case of roads; 0.6 percent in the case of irrigation projects; 0.5 percent in the case of schools).

⁸ There is less reason to believe that the implementation of Tax for Fee is endogenous. This clearly is an example of a top-to-down policy if there ever was one, being one of the most high profile initiatives of China's central government. The differences in timing are mostly a function of differences in the length of time that policy planning and execution took to move from the provincial Tax for Fee reform commission to the prefecture, county, town and village.