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Local Public Goods Provision in the Post-Agricultural Tax Era in Rural China

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Local Public goods provision in the post-agricultural tax era in rural China

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Abstract
This paper investigates regional differences in local public goods provision in rural area in the 2000s, using large village sample surveys (CHIP 2002 and 2007 surveys, a survey in Ningxia). Focuses are on changes in the coverage of public investment projects, regional differences in the determinants of public investment projects, and changes in the coverage of public services provided by village collectives. The main findings are as follows. First, we confirmed that coverage of public investment projects had increased in the 2000s. Second, in spite of concentration of fiscal administration into county level as one of the pillars of the reform of taxation and local fiscal system, administrative villages still played indispensable roles in local public goods provision. Third, we found that incentive of peasants, financial ability of villages, and incentive of local government affect location decision and budget structure of public investment projects and that direction and strength of such factors were different by regions.
Keywords: Local public goods, village, local government, rural China
JEL classifications: H2, H4, R5

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1. Introduction

Setting the agenda

This paper investigates regional differences in the provision of local public goods in rural areas of China in the 2000s. The focus is on changes in the coverage of public investment projects, regional differences in the determinants of public investment projects, and changes in the coverage of public services provided by village collectives.

As the leaders of the Communist Party of China (CPC) have officially recognized, a major challenge for the party in the 2000s is to cross the great urban–rural divide in institutional and policy arrangements (see, for example, Hu 2007). A series of prorural public policies (*huinong zhengce*) applied in the 2000s consequently marked an important turning point in the structure of the Chinese economy. Therefore, it is valuable to investigate changes in the provision of local public goods in the 2000s, especially before and after the implementation of rural taxation reform (abolition of the agricultural tax) and the "new socialist countryside initiatives" enacted at the end of 2005 and the beginning of 2006.[1]

The remainder of the paper is structured as follows. To start with, in the remainder of this section, we describe the data utilized in the study. Section 2 provides a review of the relevant literature. In Section 3, we summarize the prorural policies existing in China in the 2000s. In Section 4, we first describe the changes in the coverage of public investment projects, and then examine the determinants of the budget structure for public investment projects. In Section 5,

[1] In Sato (2008b), we examined the impact of village-level factors, including the impact of local public goods on peasant income, using the CHIP 2002 survey.

we describe the changes in the role of the administrative village as provider of local public goods by focusing on the village budget structure and the agricultural services provided by village collectives. Section 6 concludes the paper.

Data

In this paper, we utilize three administrative village surveys. The first and second surveys are separate rounds of the rural household/administrative village surveys conducted by the China Household Income Project (CHIP) in 2002 and 2007 (hereinafter referred to as the CHIP 2002 and CHIP 2007 village data, respectively). The third survey comprises rural household and administrative village data in 2006 from the Ningxia Hui Autonomous District conducted by the Institute of Ethnology and Anthropology, Chinese Academy of Social Sciences (hereinafter referred to as IEA 2006 Ningxia village data).[2]

The CHIP 2002 and 2007 surveys are nationally representative surveys covering rural–urban households, rural–urban migrant households, and villages where the sampled rural households resided. The sampling frames of the CHIP surveys are subsamples of the official annual household surveys conducted by the National Bureau of Statistics; see Gustaffson, Li, and Sicular (2008) and Luo, Li,

[2] An international research team headed by the Institute of Economics, Chinese Academy of Social Sciences, and the China Academy of Income Distribution, Beijing Normal University, conducted the CHIP surveys in the 2002 and 2007 rounds, respectively. The CHIP survey is funded by several Chinese and foreign organizations, including the National Foundation of Social Sciences of China, the Beijing Normal University, the Ford Foundation, the Swedish International Development Agency, AusAID, the Japan Society for the Promotion of Science, Hitotsubashi University, the University of Western Ontario, and the Ontario Research Foundation. The survey in Ningxia was funded by the Institute of Ethnology and Anthropology, the Chinese Academy of Social Sciences, Hitotsubashi University, the Japan Society for the Promotion of Science, the Ministry of Education, Science, and Technology, and the Heiwa Nakajima Foundation.

Sicular, Deng, and Yue 2011 for detailed descriptions of the sampling framework, data collection, and sample representativeness. The administrative village surveys in the CHIP 2002 and 2007 surveys coincided with the household surveys and collected data on village budget structure and public service delivery by the village, as well as the basic geographical and economic conditions of villages where the sampled households resided.

The total number of sample villages in the CHIP surveys is 961 villages in 2002 and 800 villages in 2007. To ensure the comparability of regional coverage across the survey rounds, we utilize administrative village data from the nine provinces (Hebei, Jiangsu, Zhejiang, Guangdong, Henan, Anhui, Hubei, Chongqing, and Sichuan) that are included in both rounds (see Appendix Table 1 for the number of sample villages in each province). The survey coverage for these provinces is 404 villages in 2002 and 800 villages in 2007 (hereinafter referred to as CHIP 2002 and CHIP 2007survey villages). The Ningxia survey collected data on 1,200 rural households and 120 villages in 2006. The sampling frame in this survey is the same as in the CHIP surveys.

Table 1 provides details on the basic economic conditions in the sample villages, from which we can derive the following key points.[3] First, by considering the CHIP survey villages, we can see that average village size increased significantly between 2002 and 2007. This reflects village merger promoted by fiscal/administration system reform. Of the 800 sample villages in 2007, 333 villages (approximately 42 percent) experienced village merger. It is

[3] See Gustafsson and Ding (2009) for a detailed investigation of economic conditions in CHIP 2002 survey villages and a comparison of Han and ethnic minority villages.

notable that the proportion of villages that experienced merger is especially high in the southwestern region (109 villages, or approximately 68 percent of all southwestern villages, experienced merger).

<TABLE 1 ABOUT HERE>

Second, regarding the changes in employment structure, we confirm that the labor force mainly employed in agriculture decreased between 2002 and 2007 in CHIP survey villages, whereas it increased in villages experiencing out-migration. Third, there are large regional disparities in economic conditions between western region villages and those in other regions. Of the CHIP 2007 survey villages, villages outside the western region (coastal and central regions) generally have higher average income, a larger number of households that engage in nonagricultural self-employment (*getihu*), a lower proportion of the labor force mainly employed in agriculture, and a lower ratio of out-migration. We can also say the same of the Ningxia survey villages and nonwestern CHIP survey villages.[4]

2. Literature review

There have been several studies concerning rural public goods provision in the reform era.[5] Here we limit our literature review to recent quantitative studies that

[4] Previous studies based on village survey also found large regional disparities in economic conditions of villages. See, for example, Guowuyuan Fazhan Yanjiu Zhongxin Ketizu (2007).

[5] For comprehensive studies, see, for example, Fang, Zhang, and Zhang (2002), Xu

utilize village data and examine the conditions of village-level public investment projects and the structure of village budgets. From this viewpoint, the existing literature divides across three major lines of inquiry.

The first line of inquiry includes studies on the structure of village-level public investment projects before and after the rural tax and fee reform. Using panel data for 101 villages in five provinces from 1998 to 2007, Luo, Zhang, and Deng (2008) investigated changes in the structure of public investment projects at the village level. Their main findings are as follows. First, the number of public investment projects had decreased in the first half of the 2000s following the tax and fee reform, and subsequently recovered and increased after 2005.[6] Second, village budgets continued to play an indispensable role in public investment projects, even though there had been a downward trend in the proportion of village investment in total investment from 43 percent in the period 1998–2000 to 32 percent in the period 2005–07. The share of investment funded from village own-budgets also varied significantly by project, from 76 percent for cultural facilities, 50 percent for irrigation, 42 percent for roads, and 32 percent for schools down to just 20 percent for sloping land conversion. Third, the proportion of outside funds in total investment was also higher in poorer villages.

Using the same data as Luo, Zhang, and Deng (2008), Yi et al. (2008) examined the relation between the structure of public investment projects and peasant needs. They argued that in terms of road construction there was not a good match between

(2002), Lin (2003, 2007), Caizhengbu Nongyesi Ketizu (2004), Chen (2005), and Liu, Zhu, and He (2011). For the analysis of ethnic minority regions, see Wang and Zhu (2005).

[6] Luo, Zhang, and Deng (2008) reported that the number of public investment projects per village was 1.5 between 1998 and 2007.

the supply and demand for public investment projects (public investment was frequently supplied where peasant demand was not necessarily high).

Using a large village survey covering 2,459 villages across six provinces,[7] Zhang, Li, Luo, Liu, and Luo (2005) illustrated the structure of village-level public investment projects during the period 1997–2003. The findings indicated that the projects most frequently carried out by villages were infrastructure (such as roads, bridges, and irrigation systems), education, and sloping land conversion. They also found that in terms of budget structures, most projects were undertaken using funds from the village own-budget, then projects made possible by outside funds (mostly from upper-level governments), and finally projects jointly funded by the village own-budget and outside funds. They also found that the size and structure of project budgets varied across regions, and that poorer villages were more likely to obtain funding from outside budgets.

Employing the same data as Zhang, Li, Luo, Liu, and Luo (2005), Zhang, Luo, Liu, and Rozelle (2005) examined the determinants of local public goods provision by estimating Tobit regressions, specifying the number of public investment projects and the ratio of outside funds in village budgets to the total amount of investment as dependent variables. Variables representing peasant needs and government goals in local public goods provision served as explanatory variables. The main results were as follows. First, projects financed by upper-level government budgets tended to concentrate on poor, ethnic minority, and mountainous villages, and this reflected the political priority set for

[7] Provinces included were Jiangsu, Gansu, Sichuan, Shaanxi, Jilin, and Hebei.

disadvantaged villages.

Second, at the same time, political connections between the village and upper-level governments assisted villages to obtain outside-government funds. Finally, the development of local nonagricultural activities (measured by number of collective enterprises and nonagricultural self-employed households) had a positive effect on public investment from village own-budgets, whereas developments in out-migration (measured by the ratio of out-migrants to the total labor force) had a negative effect. This suggests that the needs of village core interest groups matter in the decentralized provision of local public goods.

The second line of inquiry in this area focuses on the impact of village governance and social conditions on local public goods provision. This includes work by Luo, Zhang, Huang, Luo, and Liu (2006), Luo, Zhang, Huang, and Rozelle (2007), Sato (2008a), Wang and Yao (2007), Yao and Gao (2007), Zhang, Luo, Liu, and Rozelle (2006), Zhang, Fan, Zhang, and Huang (2003), Zhang, Fan, Zhang, and Huang (2004). A frequent finding of this body of work is that the quality of village governance, more specifically, grassroots democracy (*jiceng minzhu*), has a positive impact on the level of public goods provision and consequently well-being of villagers. Conversely, Tsai (2007) emphasized that informal governance (traditional organizations or social networks, such as the solidarity among villagers created through religious activities) mattered for the level of local public goods provision. Combining CHIP 2002 village data with county-level fiscal data, Sato (2008a) also argued that not just village governance but also governance at the county level mattered for local public goods provision. This is

because the increase in intergovernmental fiscal transfers to the county budget following the tax and fee reform did not necessarily entail the provision of public improvements in rural areas by the county government.

The final line of inquiry in this area examines each village's own-budget and its impact on villager economic conditions. Using a survey of 138 villages in Zhejiang, Zhang and Li (2007) investigated changes in village budget structure before 2000 and after 2005, corresponding to the years of the tax and fee reform. They found that the contribution of transfers to village revenue from upper-level governments increased between 2000 and 2005, while in terms of village expenditures, approximately half of all expenditures were on infrastructure (mostly road construction) in both 2000 and 2005. Lastly, using the CHIP 2002 village survey and household survey, Sato (2010) showed that village expenditure on public services positively influenced the growth of per capita household income.

In sum, previous studies have shown that despite the concentration of fiscal administration at the county level following recent tax and fee reform, the administrative village still plays an indispensable role in the provision of local public goods in China. Moreover, socioeconomic factors at the village level, as well as fiscal conditions and the governance of local governments (mainly at the county level), also affect local public goods provision.

3. Prorural policies in the 2000s

We can divide the recent formulation of prorural policies in China into two main

phases. The first phase corresponds to the period from the end of the 1990s up until 2005. The second phase is associated with the post-agricultural tax era after 2006, as characterized by the nationwide abolition of agricultural taxes and the announcement of building the "New Socialist Countryside" or the Ninth "Article Number One" of the CPC Central Committee and the State Council.

<TABLE 2 ABOUT HERE>

Table 2 summarizes the major policy arrangements intended to promote rural development in the 2000s. The essence of these policies is expressed well in the slogan "giving more, taking less, and allowing more flexibility (*duoyu shaoqu fanghuo*)", which was advocated earlier in the Sixth Article Number One in 2004. The baseline policy for "taking less" comprised a program of tax and fee reform (*shuifei gaige*) that followed two main steps: first, the substitution of formal taxation (newly defined agricultural taxes) for local levies; and second, the implementation of fees (tax-for-fee reform, *feigaishui*) and the abolition of rural taxation. These reforms were completed at the end of 2005/beginning of 2006 (Sato, Li, and Yue 2008).[8] Another policy for "taking less" is the exemption from tuition/school fees and the subsidy for dormitory fees (*liangmian yibu*) for primary and lower-middle schools applied in 2006 for the western region and expanded to the central and eastern regions thereafter. This reform, in combination with the introduction of a county-based education budget system in the first phase,

[8] In addition to Sato, Li, and Yue (2008), see also Fang, Lu, and Yan (2005), Liu, Xu, Tao, and Su (2008), and Zhou and Chen (2005) for the redistributive consequences of tax and fee reform.

marks the start of a new epoch in basic education in China.[9] We should also note that the merger and reorganization of primary schools progressed alongside the restructuring of the education budget system after 2001, with the number of primary schools in rural areas decreasing from 512,993 in 1997 to 234,157 in 2009.[10]

We can categorize the policies for "giving more" into direct subsidies, welfare payments, social insurance, and the reinforcement of public investments. First, the direct subsidies for rural households include a food grain production subsidy (*liangshi zhibu*), a comprehensive subsidy for agricultural production materials (*nongzi zonghe butie*), a subsidy for improved seeds (*liangzhong butie*), a subsidy for the purchasing of agricultural machines (*gouzhi nongji butie*), and various kinds of crop- and region-specific subsidies. We can also classify the sloping land conversion (*tuigeng huanlin*) program as a direct agricultural subsidy policy.

Second, the welfare payments include the rural minimum living allowance (*nongcun zuidi shenghuo baozhang, dibao*) introduced nationwide in 2007. Although the level of allowance is very low, it represents a notable milestone in the system reforms aimed at addressing the rural–urban divide. Third, social insurance includes the new rural cooperative medical insurance (*xinxing nongcun hezuo yiliao baoxian*) that attained a participation rate of approximately 94 percent in 2009 and the pilot program for the social pension for the rural population (*nongcun shehui yanglao baoxian*) that started in 2009. Finally, the

[9] See Deng (2009), Wand and Wang (2006), and Zhao (2005) for peasant's burden of educational fee before and after the tax and fee reform.
[10] *China Youth Daily*, December 24, 2011.

reinforcement of public investments closely relates to the reforms in local fiscal and administration systems discussed below, that is, the increase in intergovernmental fiscal transfers and the concentration of fiscal responsibilities at the county level. Thus, we need to investigate to what extent the coverage and budget structure of rural public investments changed following the program of tax and fee reform.

In order to guarantee the principles of “taking less” and “giving more”, the Chinese central government began to expend efforts aimed at the adjustment of local fiscal and administration systems. These adjustments fall into the following three categories. The first category of adjustment is the change in the system of intergovernmental fiscal transfers between the central and provincial governments and those taking place within the provinces. In 2000, the central government introduced an intergovernmental fiscal transfer for tax and fee reform (*nongcun shuifei gaige zhuanxiang zhuanyi zhifu*) to cover the diminished revenue of the county and township governments following the rural tax and fee reform (*shuifei gaige*). In 2005, the Seventh Article Number One required that no less than 70% of the annual increase in the local budgets for education, health, and other public services should be below the county level.

The second category of adjustment is the concentration of fiscal responsibility at the county level. From the beginning of the 2000s, the State Council repeatedly demanded the establishment of a county-based (*yi xian weizhu*) education budget system to guarantee certain education spending (including teacher salaries). In 2006, the Eighth Article Number One proposed the expansion of the direct

administration of township government budgets by county governments (*xiangcai xianguan*). Similar reform at the below-township level, that is, the direct administration of village budgets by the township government (*cunzhang xiangguan*), was also introduced in the latter half of the 1990s, and subsequently expanded in the 2000s. The final category of adjustment is the restructuring of the below-county level administrative apparatuses, including the merger of township and administrative villages (*chexiang bingzhen bingcun*) previously advocated in the Sixth Article Number One in 2004 (Dang 2010).

These adjustments took place against the background of the fundamental reform of the local fiscal/administration system in China, that is, the transition from a prefecture-level city-based system (*shi guan xian*) to a province- and county-based system (*sheng zhiguan xian*) by 2012.[11] The prefecture-level city-based system was introduced at the beginning of the 1980s as a form of decentralized fiscal/administration system intended to stimulate economic competition between core regional cities and to promote regional development through the trickle down of growth from regional centers (prefecture-level cities) to rural areas (counties administratively belonging to the prefecture-level cities). Fiscal redistribution within prefecture-level cities and subordinate counties was also expected.

Certainly, there are some successful examples of the earlier prefecture-level city-based system (mostly in coastal developed areas such as Suzhou and Ningbo).

[11] Caizhengbu (2009) "Guanyu tuijin sheng zhijie guanli xian caizheng gaige de yijian" (the official web site of the central government of the People's Republic of China). http://www.gov.cn/zwgk/2009-07/09/content_1360963.htm (accessed January 17, 2012).

However, in many middle- and low-income regions where the financial capacity of both the prefecture-level cities and the subordinate counties is weak, there has been a scramble for fiscal resources that has led to many subordinate counties, especially poorer counties, experiencing serious budget deficits (Han 2010). Instead, the province- and county-based system subordinates the county government budget directly to the province while also reinforcing the fiscal authority of the county government. In doing so, the intention of the new system is to facilitate intergovernmental fiscal transfers directly from provinces to the counties and to block the budget flows from subordinate counties to prefecture-level cities. This system also promotes the expansion of prefecture-level cities through the merger of subordinate counties.

4. Determinants of public investment projects in 2005–07

This section examines the coverage and budget sources of public investment projects immediately before and after the post-agricultural tax era. We conduct our investigation by geographical region by comparing western and nonwestern (eastern and central) regions. We compare these regions because differences in policy treatments (for example, the launch of the “Great Western Region Development” program in 2001) and the overall level of socioeconomic development can be found between these regions, and therefore there may also be differences in the conditions associated with public investment projects in both regions. In this section, we first examine the coverage of public investment projects during the period 2005–07. We then conduct multinomial logit estimation

of the determinants of the budget structure of public investment projects using the examples of road construction/management and primary school projects.

Coverage

Table 3 details the percentage of sample villages with public investment projects in 2005–07, from which we derive the following key points. First, road construction/maintenance projects exhibit the highest level of coverage (approximately half of the villages engaged in these sorts of projects) and there is little evidence of any significant change in coverage. Irrigation projects follow road projects in terms of the level of coverage. We can thus confirm that conventional infrastructure-type projects remain the main pillar of public investment projects at the local level after the recent program of tax and fee reform.[12]

Second, projects related to primary education and public health increased considerably in 2007 (from less than 20 percent to 36 percent for primary school projects).[13] Third, irrigation, primary education, and public health projects in the southwestern region (Chongqing and Sichuan) contributed much to the overall increase in the coverage of public investment projects in 2007. This and the earlier points made above suggest the reinforcement of public investment for social

[12] By comparing the preferences for local public services of peasants, village cadres, township officials, and county officials, Yi et al. (2008) found a mismatch between the structure of public investment projects and peasant needs arising from a local government bias in favor of infrastructure construction projects. As the subjective questions necessary for assessing peasant needs for local public services are not included in our survey, we are unable to investigate the presence of a similar possible mismatch.

[13] In contrast to our findings, Luo, Zhang, and Deng (2008) concluded that a decrease in education and public health projects followed the program of tax and fee reform.

development in the inland region under the New Socialist Countryside and Great Western Region Development schemes.

<TABLE 3 ABOUT HERE>

Budget sources

In the 2007 CHIP village survey, we can categorize the budget sources in village own-budgets as including labor contributions by villagers (*cun zichou zijin*) and outside budgets. Outside budgets include public funds obtained from upper-level governments, comprising county, province, and central governments, and nongovernmental funds, including funding from enterprises, nongovernmental organizations, and international organizations. Funds for poverty alleviation and regional development in underdeveloped areas donated from other administrative units (organizations) in developed areas in China are also included as outside-budget sources of funding. One difficulty with our data here is that we do have a larger number of missing values in 2007.[14] However, as the budget structures in 2005 and 2006 are relatively similar, we gain useful insights by summarizing the budget structure for 2006 in Table 4.

<TABLE 4 ABOUT HERE>

Using the details provided in Table 4, we derive the following insights into budget structures. First, relatively few projects depend totally on outside-budget

[14] The 2007 data has a relatively large number of missing values because we intended to collect information on the approximate amount of investment from each budget source. In contrast, we have fewer missing values in 2005 and 2006 because we only asked for information on budget sources, not the size of investment from each budget source.

funding. This is because the contribution of matching funds (*peitao zijin*) by the village (including the contribution of labor by the villagers) is usually required. Second, village own-budgets exclusively finance a relatively large number of projects. Third, in terms of regional patterns in budget structure, it is notable that the funding for road, primary education, and public health projects in the southwestern region also tends to be from village own-budgets. Overall, we suggest that the financial capacity of individual villages still matters in terms of large-scale projects, and that regional disparity in the financing of public investment in rural China has persisted, even after the recent program of tax and fee reform. These findings beg the question as to the exact nature of the determinants of funding sources for public investment projects.[15]

Determinants of public investment projects: estimation framework

Here we examine the factors that determine the budget structure of village-level public investment projects using multinomial logit estimation following the analytical framework in Zhang, Luo, Liu, and Rozelle (2005). In our chosen context, village-level public investment projects are projects from which villages benefit, as derived from the responses to questions posed to village cadres. More specifically, we conduct estimations for road construction/maintenance and primary school projects. We choose the former as it is a typical sort of infrastructure project conducted in rural areas, and the latter because it is an

[15] Previous studies also emphasized large regional disparities in the structure of public investment projects at the township and village levels (see for example, Zhang, Li, Luo, Liu, and Luo 2005, Luo, Fan, Wang, and Zhang 2006).

example of a social development project. We should note that although the consolidation of primary schools through merger and closure has progressed in the 2000s, villages continue to contribute as beneficiaries to the construction and improvement of primary schools that village children attend. Therefore, we employ all villages, including those with and without primary schools, in our estimation by specifying a dummy variable indicating whether a village has a primary school.

The dependent variable is a categorical variable indicating the budget source structure of public investment projects in 2005–06. The three categories are as follows. First, villages with a project funded outside budget in both 2005 and 2006 (i.e. a village depends on funding from outside its budget for public investment projects). Second, villages with a project totally financed by the village own-budget or where outside-budget funding is received for only one year (i.e. the village relies relatively more on the village own-budget for public investment projects). We specify the final category, villages without any public investment projects in 2005–06, as the reference category.

We categorize the explanatory variables in the regression into two groups as follows. The first group comprises variables that represent incentives and financial capacity at the village level.

(a) Size of village budget measured by per capita revenue of village budget (figure of 2007 for CHIP 2007 survey villages, figure of 2006 for Ningxia survey villages). This variable measures the fiscal capacity of the village to conduct its own investment projects or to make financial contributions to projects carried out

by upper-level governments. Thus, we expect a positive correlation between the size of the village budget and the likelihood of public investment projects.

(b) Proportion of out-migrant to total labor force in the village (average of 2005-2007 for CHIP 2007 survey villages, average of 2004-2006 for Ningxia survey villages). This variable reflects the changes in peasant needs for local public goods combined with the rapid increase in social mobility discussed in Zhang, Luo, Liu, and Rozelle (2005). We assume that the development of out-migration may weaken villager interests in local socioeconomic conditions. If this is the case, a higher proportion of out-migrants will negatively influence the likelihood of public investment projects.

The second group of explanatory variables in our regression model is variables that capture the incentives for local government to allocate funds to public investment projects. In the context of this study, local governments are county (county-level city) governments mainly responsible for managing local public goods provision in the post-agricultural tax era. Specifically, we introduce the following variables into our specification.

First, we regard the size of the village budget specified earlier as an indicator of the mixed incentives for local governments. On the one hand, local governments have an incentive to allocate funds to poorer villages to produce political gains in poverty alleviation. On the other hand, because of the needs for matching financial/labor contributions by villages, local governments would prefer to mobilize only those villages with sufficient own-budgets to engage in public investment projects. Second, in addition to village budget size, we include the

following variables to measure local government incentives.

(c) Village size measured by number of households (figure of 2007 for CHIP 2007 survey villages, figure of 2006 for Ningxia survey villages). This reflects the size of the population covered by public investment. We expect a positive effect of village size on the probability of having projects financed outside budget because local government can increase population coverage by making larger villages the beneficiaries of public investment projects.

(d) Dummy variable for provincially designated township for poverty alleviation (*fupin gongjian xiang*). County governments assign priority to these townships in public investment projects and therefore we expect a positive correlation between this variable and the probability of obtaining funding from outside budgets.

(e) County dummies. We employ county dummies to capture the fiscal capacity of county government, the policy preferences of county officials, and various other politico-economic factors affecting public fund allocation.

In addition to these variables, we employ the following three case-specific variables.

(f) Distance from the nearest transportation station (road construction/maintenance projects). We assume that consideration of investment efficiency and political attention to villages remote from transportation thoroughfares will affect the location decisions of county governments concerning road construction/maintenance projects. Distance from the nearest transportation station should reflect both of these political considerations.

(g) Dummy variable for whether the primary school village children attend has a "dangerous building (*weifang*)" problem (primary school projects). As both central and provincial governments consider this an urgent problem requiring urgent rectification, county governments will give priority to primary schools affected. We expect a positive effect of this variable on the probability of villages having primary school projects financed from an outside budget.

(h) Distance from the nearest township (primary school projects). Considering the major reorganization of primary schools in the 2000s, school location policy at the county and other upper-government levels will affect the allocation of primary school projects. Given every township generally has a full-grade "central primary school (*zhongxin xiaoxue*)" the children of surrounding villages attend, the distance from the township will reflect school location policy.

Lastly, we introduce the following two case-specific control variables: (i) when the village road connected the village to the township (only in the estimation of road construction/maintenance projects), and (j) a dummy variable indicating whether a primary school (including full-grade and others) is located in the village (only in the estimation of primary school projects).

Determinants of public investment projects: estimation results

Tables 5 and 6 provide the estimation results. Summary statistics for the variables used in the estimations are in Appendix Table 2. In sum, we find evidence that both incentive/capacity at the village level and the incentives of local governments affect the probability of public investment projects. In addition, regional

differences between western and nonwestern regions influence the effects of each determinant. We summarize the major findings as follows.

<TABLE 5 ABOUT HERE>

<TABLE 6 ABOUT HERE>

First, the estimation results for the size of the village budget appear to reflect regional differences in the effect of local government incentives and financial capacity at the village level. In the nonwestern region, village budget size positively and significantly correlates with the probability of road construction/maintenance projects and the coefficients are almost the same for villages that depend on outside budgets and those that rely more on village own-budgets. In contrast, in the western region, village budget size has a negative and statistically significant correlation with the probability of road construction/maintenance projects depending on outside budgets, whereas there is no significant correlation for projects mainly funded by village own-budgets. In terms of primary education projects, there are also positive and significant correlations between village budget size and the probability of a project in the nonwestern region relying more on village own-budgets. Conversely, in the western region, there are no significant correlations. In summarizing these findings, we suggest that local governments in the western region express concern in fund allocation for poverty alleviation as a political objective, whereas local governments in the nonwestern region are more likely to consider the availability

of resources at the village level.[16]

Second, regional differences in the socioeconomic impact of labor mobility between western and nonwestern regions influence the development of out-migration effects. We find that the ratio of out-migrants to the total labor force negatively and significantly affects the probability of having road construction/maintenance projects that rely more on village own-budgets in the nonwestern region. In contrast, the ratio of out-migrants to the total labor force has positive and statistically significant effects on the probability of road construction/maintenance projects financed solely by outside budgets in the western region. The former supports our inference that developments in out-migration tend to weaken the interest of villagers in the provision of local public goods. Conversely, the latter suggests that, at least in the western region where the promotion of out-migration is one of the pillars of regional development strategy, infrastructure investment by local government positively correlates with the degree of out-migration. In contrast to road construction/maintenance projects, we find no statistically significant correlations in both the western and nonwestern regions between developments in out-migration and the probability of primary school projects. We explain this by suggesting that as many of the children of out-migrants remain behind in villages, the level of out-migration does not affect peasant interests in the improvement of local school conditions.

Third, we also find regional differences in the influence of village size. Village

[16] Luo, Zhang, and Deng (2008) also argued that public investment by local government became more concentrated on poorer villages.

size positively and significantly correlated with the probability of consistently obtaining funds outside budget for road construction/maintenance projects in both the western and nonwestern regions. This finding reflects the incentive of local government to increase the population coverage of public investments. In the nonwestern region, it also positively and significantly increased the probability of projects relying more on village own-budgets for both road and primary school projects, whereas we found no such significant effects in the western region. This finding suggests that village size potentiality reflects the capacity of villages to mobilize their own resources, a contributing factor especially prevalent in the nonwestern region.

Fourth, the dummy variable for villages located in provincially designated townships for poverty alleviation has a stronger positive effect in the nonwestern region than in the western region. In the case of primary school projects, a village associated with a provincially designated township for poverty alleviation positively and significantly increases the probability of projects being financed consistently outside budget in both the western and nonwestern regions. This finding evidences the increasing concern for basic education in rural areas in the 2000s. In the case of road construction/maintenance projects, this variable positively and significantly correlates with the probability of projects both with and without outside-budget funding in the nonwestern region, whereas there is no significant correlation in the western region. This finding may thus reflect the disparity in the fiscal abilities of local governments found in the western and nonwestern regions.

Fifth, the estimation result for the distance from the nearest transportation station suggests that local government location decisions for road construction/maintenance projects have a stronger influence in the western region than in the nonwestern region. In the western region, the correlation between the distance from the nearest transportation station and the probability of a road construction/maintenance project with financial support outside budget exhibits a U-shaped curve. That is, greater probabilities for villages located near a transportation station (less than 5 kilometers) than villages located far from a transportation station (more than 20 kilometers). This finding supports our assumption that the location decisions of county governments on road construction/maintenance projects will consider both investment efficiency and political attention to villages remote from transportation thoroughfares. By contrast, we find no such association in the nonwestern region.

Sixth, unlike the evidence concerning the location decisions of road construction/maintenance projects, the influence of school reorganization policy appears to exert a stronger influence in the nonwestern region than in the western region. In the nonwestern region, the correlation between the distance from the nearest township and the probability of a primary school project financed outside budget exhibits a U-shaped curve similar to that found for the distance from the nearest transportation station. That is, greater probabilities for villages located near a township (less than 2 kilometers) than villages located far from a township (more than 20 kilometers). This U-shaped relationship suggests local governments in the nonwestern region tend to allocate fiscal resources to schools located in

townships (central primary schools, *zhongxin xiaoxue*) or to schools located far away from townships. We find no such associations in the western region, suggesting the distribution of school location is more even in the western region than in the nonwestern region. Finally, the consideration given to primary schools with a "dangerous building" problem is stronger in the western region than in the nonwestern region, with such primary schools also more likely to obtain the necessary funds outside budget.

5. Public services provided by villages in 1998–2007

In the previous section, we found that the financial capacity of a village matters as to whether it is a beneficiary of public investment projects. Here we turn our attention to the structure of village budget and public services provided directly by villages. Regarding the CHIP survey villages, we consider the situations that existed in 1998, 2002, and 2007. For the Ningxia villages, we illustrate the situation in 2006.

Table 7 details the size and structure of village expenditures from 1998 to 2007, in which we can discern the changes in the delivery of public services from village own-budgets. We make two key points using the information in this table. First, per capita expenditure in village budgets remained relatively constant between 1998 and 2002, and then substantially increased between 2002 and 2007 (associated with an increase of approximately 22 percent).[17] The lack of change in per capita expenditure between 1998 and 2002 mainly reflects the reduction of

[17] The large increase in village expenditure between 2002 and 2007 also reflects the process of village merger after 2002 (see also Table 1).

village budgets associated with the program of tax and fee reform (abolition of local levies and fees) after 2000. In contrast, the system of intergovernmental fiscal transfers from counties (either directly from the county or via the township) enabled the increase in per capita expenditure between 2002 and 2007.[18] Second, the ratio of expenditure on public services to total expenditure exhibited an increasing trend from 1998 to 2007, whereas the proportion of administrative expenditure (mostly village official allowances) decreased between 2002 and 2007.

<TABLE 7 ABOUT HERE>

Table 8 illustrates the changes in the proportion of villages providing services for agricultural production between 2002 and 2007. We make two points using the information in this table as follows. First, even though there was a consistent disparity between nonwestern and southwestern provinces at the time, the proportion of villages providing agricultural services increased in southwestern provinces between 2002 and 2007, especially in terms of irrigation and evacuation services. The Ningxia data also displays relatively large proportions in 2006. Second, out-migration-related services had developed in the western region by the 2000s, with the proportion of villages providing organization and intermediation of out-migration increasing from approximately 5 percent to 14 percent between 2002 and 2007 in the southwestern provinces. It is also notable that the proportion

[18] If we examine the changes in village expenditure between 1998 and 2002 according to the status of tax and fee reform, we find that per capita village expenditure decreased from 110 yuan in 1998 to 95 yuan in 2002 (in 2002 prices) in postreform villages. Subsequently, per capita fiscal transfers from upper-level authorities increased from 131 yuan in 2002 to 164 yuan in 2007 (in 2002 prices).

of villages providing organization and intermediation of out-migration is very high in Ningxia (70 percent).

<TABLE 8 ABOUT HERE>

To summarize, public services provided by villages in China still matter in the post-agricultural tax era. In fact, we find that the village budget structure became more public service oriented between 2002 and 2007. After considering the fact that during this time villages had lost their own pseudo-local tax (*cun tiliu*) and other levies and fees collected directly from villagers because of the program of tax and fee reform, we can see that the system of intergovernmental fiscal transfers enabled the provision of public services.

6. Concluding remarks

The main conclusions of this paper are as follows. First, we confirmed that the coverage of public investment projects increased in the 2000s. In this sense, the beginning of the post-agricultural tax era and the launch of the “Socialist New Countryside” program represent a new phase in rural public policy in China. However, a quantitative increase in the provision of public goods does not necessarily equate with a qualitative improvement. In fact, our data show some signs of increased concern over the changes in the quality of local public goods. Table 9 summarizes the evaluation of village cadres of the quality of public goods provision after the program of tax and fee reform. In particular, as shown, village cadres in the southwestern region are more likely to believe that the quality of

local road and irrigation systems deteriorated following these fiscal reforms (Table 9A).[19] We should also note that village cadres in Ningxia are less optimistic about the quality of primary education after the reform (Table 9B).

<TABLE 9 ABOUT HERE>

Second, despite the concentration of fiscal administration at the county level as one of the pillars of the taxation and local fiscal system reforms, administrative villages still play an indispensable role in local public goods provision. We found most public investment projects are jointly financed from outside budgets (mostly local government budgets) and village own-budgets (including labor contributions by villagers). At the same time, the proportion of villages providing agricultural services increased between 2002 and 2007. Thus, the financial capacity of villages remains critical in the delivery of local public services in China.

Third, we found that the incentives of peasants, the financial capacity of villages, and the incentives of local government all affect location decisions and the budget structure of public investment projects, and that the direction and influence of these factors differ by region. Regarding the incentive structure for peasants, it is notable that the development of out-migration has different impacts in western and nonwestern regions. Concerning the incentive of local (county and county-level city) governments to carry out public investment, we found that factors relating to political objectives, such as population coverage, investment

[19] The CHIP 2002 village survey indicated a similar problem in that village cadres generally believed that the actual amount of funds allocated to local public goods tended to decrease following tax and fee reform (see Sato 2008a).

efficiency, the possibility of mobilizing local resources, and concern over poverty alleviation, influenced the location decisions for public investment projects.

Of course, this analysis also helped identify a number of interesting areas for future research. One of these is that it would be interesting to investigate further the regional patterns of local public goods provision from a different angle. Consequently, as a next step, we intend to conduct a comparison of local public goods provision in ethnic minority and Han villages using recent data sets.[20]

[20] Gustafsson and Ding (2009) undertook a comparative analysis of economic conditions in Han and ethnic minority villages using the CHIP 2002 village and household surveys.

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(All Chinese authors are ordered last name first)

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Table 1 Basic economic condition of sample villages

A. CHIP 2002/2007 survey villages and Ningxia survey villages

	N	2002 CHIP survey villages	N	2007 CHIP survey villages	N	2006 Ningxia survey villages
Population (persons)	404	1,860	788	2,346	120	2,127
Number of household (households)	404	497	788	644	120	486
cultivated land (mu)	397	1,863	800	2,110	120	5,743
per capita cultivated land (mu)	397	1.1	788	1.0	120	3.1
Irrigated land/total cultivated land (%)	397	73.8	789	70.9	120	54.2
Proportion of labor force mainly employed in agriculture (%)	404	60.9	800	50.4	116	63.1
Proportion of labor force who work outside township (%)	404	17.1	786	26.3	116	35.5
Proportion of households who engage in nonagricultural self-employment (*getihu*) (%)	388	5.6	763	5.7	120	5.9
Per capita disposable income (yuan , in 2002 price)	395	2,983	800	4,507	116	2,127

Table 1 Continued

B. Comparison of Eastern/central and Southwestern villages in CHIP 2007 survey

	N	Non-Western (Eastern and Central)	N	Southwestern
Population (persons)	630	2,337	158	2,377
Number of household (households)	630	626	158	713
cultivated land (mu)	635	2,184	160	1,812
per capita cultivated land (mu)	629	1.04	158	0.85
Irrigated land/total cultivated land (%)	629	76.0	160	50.8
Proportion of labor force mainly employed in agriculture (%)	635	48.7	158	57.2
Proportion of labor force who work outside township (%)	628	24.3	158	34.3
Proportion of households who engage in nonagricultural self-employment (*getihu*) (%)	610	6.2	153	3.8
per capita disposable income (yuan , in 2002 price)	640	4,797	160	3,347

Notes:

1. Eastern and Central villages denote villages in Hebei, Jiangsu, Zhejiang, Guangdong, Anhui, Henan, and Hubei. Southwestern village denotes villages in Chongqing and Sichuan.
2. N denotes number of effective observations for each indicator.
3. Per capita disposable income is adjusted to 2002 price by national rural CPI (regional price differences are not adjusted).

Sources: CHIP 2002 and 2007 village data; Ningxia village data; China Statistical Yearbook, various years.

Table 2 Overview of pro-rural policies in the 2000s

	Phase 1 (–2005)	**Phase 2 (2006–)** **Post-agricultural tax era**
Major policy documents	2001 Launch of the "Great Western Region Development" program. 2002 The 16th Congress of the CPC pointed out to tackle on the "dual structure of urban and rural areas (*chengxiang eryuan jiegou*)". 2003 CPC Central Committee Conference on rural work advocated "agriculture, rural, and peasant issues" as the most important task for the party. 2004 CPC Central Committee and the State Council (CC/SC), "Comments on several policies to promote increase in peasant income (The 6th Article Number One) claimed the retention of "giving more, taking less, and allowing more flexibility (*duoyu shaoqu fanghuo*)" policies. 2004 CPC Central Committee Conference on economic work advocated "helping the agricultural sector by promoting the manufacturing sector (*yigong zhunong*)" and "promoting rural areas by developing urban areas (*yicheng dainong*)". 2005 CC/SC, "Comments on several policies for strengthening of rural work and improvement of comprehensive agricultural production ability" (The 7th Article Number One). 2005 CPC Central Committee Conference on rural work confirmed the policy agenda of "the manufacturing sector repays the agricultural sector (*gongye fanbu nongye*), urban area supports rural area (*chengshi zhichi nongcun*)" during the 11th FYP.	2006-2010 The 11th FYP. 2006 CC/SC, "On the building of new socialist countryside (*shehuizhuyi xinnongcun jianshe*)" (The 8th Article Number One). 2007 CC/SC, "Several comments on development of modern agriculture and promoting the building of new socialist countryside" (The 9th Article Number One). 2007 The 17th Congress of the CPC emphasized the harmonized planning and development of urban and rural areas (*tongchou chengxiang*). 2008 CC/SC, "Several comments on strengthening of agricultural infrastructure building, promotion of further agricultural development, and increase of peasant income" (The 10th Article Number One). 2008 The 3rd Plenum of CPC Central Committe, "Decision on several critical issues on promoting rural reform and development". 2009 CC/SC, "Several comments on promoting stable development of agriculture and continuing increase of peasant income" (The 2009 Article Number One). 2010 CC/SC, "Several comments on strengthening of the harmonized development of urban and rural areas and establishing a basis of agricultural and rural development" (The 2010 Article Number One). 2011 CC/SC, "Several comments on acceleration of reform and development of irrigation" (The 2011 Article Number One).

Taxation and local fiscal system (tax and fee reform, *shuifei gaige*)	2000-2003 Tax-for-fee (*feigaishui*) reform. Substitution of formal taxation for local levies and fees. 2000- Introduction of inter-governmental fiscal transfer for tax and fee reform (*nongcun shuifei gaige zhuanxiang zhuanyi zhifu*). 2004-2005 Gradual abolition of agricultural taxes (agricultural tax (*nongyeshui*), special agricultural tax (*nongye techan shui*), livestock farming tax (*muyeshui*), and additional fee for agricultural taxes (abolished in 22 provinces by the end of 2005). 2004 The 6th Article Number One proposed restructure of below-county level administrative apparatuses including township-level departments and merger of townships and administrative villages (*chexiang bingzhen bingcun*). 2005 The 7th Article Number One claimed that no less than 70% of annual increase in local budget for education, health, and other public services should be invested to below-county level (rural area). Direct administration of village budget by township government (*cunzhang xiangguan*) introduced in the latter half of 1990s and expanded in the 2000s.	2006 Declaration of total abolition of agricultural taxes. 2006 The 8th Article Number One proposed to expand the direct administration of county budget by province (*sheng zhiguan xiancaizheng*) and the direct supervision and administration of township government budget by county government (*xiangcai xianguan*). 2008 CC/SC, "Comments on the reform of local governmental apparatuses" 2009 The 2009 Article Number One declared to promote expansion of purview of county government owning strong economic foundation (*kuoquan qiangxian*) and direct supervision and administration of county by province (*sheng zhiguan xian*). 2009 Ministry of Finance declared to complete the transition of local fiscal system from administration of county budget by prefecture-level city (*shiguanxian*) to direct administration of county budget by province (*shengzhiguan xian*) by 2012.
Price support policy	1998-2001 Procurement of food grain by government supporting prices in the wake of declining market prices. 2001 Accession to the World Trade Organization. 2001-2004 Liberalization of food grain prices. Newly implementation of minimum procurement prices (*zuidi shougou jiage*) system.	

Direct subsidy and welfare payments	2002 Nationwide expansion of the sloping land conversion (*tuigeng huanlin*) program, which provides subsidy (grain and cash) to fallow land /reforestation (25 provinces covered). 2004 Nationwide introduction of food grain production subsidy (*liangshi zhibu*). Subsidy for improved seeds (*liangzhong butie*), and subsidy for purchasing of agricultural machines (*gouzhi nongji butie*) also introduced.	2006 Nationwide introduction of the comprehensive subsidy for agricultural production materials (*nongzi zonghe butie*). 2007 Nationwide introduction of the rural minimum living allowance (*nongcun zuidi shenghuo baozhang, dibao*) in rural area (47.6 million persons, 22.9 million households received allowance in 2009). 2007 The State Council announced to continue the sloping land conversion program.
Social insurance	2003 Nationwide introduction of the new rural cooperative medical insurance (*xinxing nongcun hezuo yiliao baoxian*).	2009 The State Council started pilot program of the social pension for rural population (*nongcun shehui yanglao baoxian*), which covered 10% of the total number of counties. 2009 Participation rate of the new rural cooperative medical insurance reached 94%.
Compulsory education	2000-2003 Abolition of additional tax for education (*jiaoyufei fujia*) 2001 The State Council "Decision on reform and development of basic education" declared reform of education budget system and reorganization of school locations. 2003 The State Council declared to accelerate completion of rural compulsory education and county-based (*yixianweizhu*) education budget system. 2005 The State Council declared to strengthen central government's responsibility as well as county-based budget system for rural compulsory education	2006 Compulsory education law advocated completion of nine-years compulsory education free of charge. 2006 Exemption of tuition/school fees and subsidy for dormitory fee (*liangmian yibu*) for primary and lower middle schools in Western region. 2007 Tuition/school fees exemption and subsidy for dormitory fee expanded to Central and Eastern regions. 2008- Large increase in intergovernmental transfer for compulsory education from central budget.

Sourcse: *Guowuyuan Gongbao* [The State Council Bulletin], various issues; Dang(2010); Ikegami (2009); Sato (2008a);Sato, Li, and Yue (2008).

Table 3 Proportion of villages having public investment project 2005-2007 (%)

A. CHIP 2007 survey villages

	2005	2006	2007
Road construction/management			
Non-Western (Eastern and Central) region	53.1	49.3	49.8
Southwestern (not including Ningxia) region	46.3	49.4	49.4
Total	51.8	49.4	49.8
Irrigation			
Non-Western (Eastern and Central) region	40.0	39.5	47.0
Southwestern (not including Ningxia) region	33.1	35.1	55.6
Total	38.6	38.7	48.8
Primary education			
Non-Western (Eastern and Central) region	20.6	17.4	31.7
Southwestern (not including Ningxia) region	15.0	15.0	53.1
Total	19.5	17.0	36.0
Public health			
Non-Western (Eastern and Central) region	19.7	21.4	35.3
Southwestern (not including Ningxia) region	15.0	15.0	60.0
Total	18.8	20.1	40.3

B. Ningxia survey villages

	2004	2005	2006
Road construction/management	18.6	23.5	25.7
Irrigation	29.4	33.0	42.6
Primary education	14.0	13.8	22.1
Public health	11.6	13.7	43.9

Note: Numbers of observations are 640 for Eastern and Central region, 160 for Southwestern region, and 120 for Ningxia.
Sources: CHIP 2007 village data; Ningxia village data.

Table 4 Budget structure of public investment projects in 2006

(%)

A. CHIP 2007 survey villages

	No project at all	Having project financed by:		
		Village budget only	Jointly financed by village and outside budgets	Outside budget only
Road construction/management				
Non-Western region (Eastern and Central)	50.7	22.3	23.9	3.1
Southwestern region	50.6	28.1	15.0	6.3
Total	50.6	23.5	22.1	3.8
Irrigation				
Non-Western region (Eastern and Central)	60.5	21.7	15.5	2.3
Southwestern region	64.9	16.3	11.9	6.9
Total	61.3	20.6	14.8	3.3
Primary education				
Non-Western region (Eastern and Central)	82.6	11.4	4.1	1.9
Southwestern region	85.0	10.6	3.1	1.3
Total	83.0	11.3	3.9	1.8
Public health				
Non-Western region (Eastern and Central)	78.6	14.2	5.8	1.4
Southwestern region	85.0	10.6	2.5	1.9
Total	79.9	13.5	5.1	1.5

Table 4 continued

B. Ningxia survey villages

	No project at all	Having project financed by:		
		Village budget only	Jointly financed by village and outside budgets	Outside budget only
Road construction/ management	74.3	4.8	9.5	11.4
Irrigation	57.4	10.2	20.4	12.0
Primary education	77.9	2.1	3.2	16.8
Public health	56.1	2.0	10.2	31.6

Notes: Number of observations same as the previous table.
Sources: CHIP 2007 village data; Ningxia village data.

Table 5 Determinants of road construction/maintenance projects, 2005-2006

A. Non-Western region (Eastern and Central regions)

Categorical dependent variable: Budget sources of road construction/maintenance projects in 2005-2006

Reference category: No project at all	Village budget only or receiving outside budget only in one year		Received outside budget in both years	
	Coefficient	Standard error	Coefficient	Standard error
Located in provincially designated township for poverty alleviation (dummy)	0.7740*	0.4611	1.0844*	0.6554
Village size (number of households)	0.0007*	0.0004	0.0014***	0.0005
Per capita village revenue (yuan)	0.0008*	0.0004	0.0009*	0.0005
Proportion of out-migration to total labor force	-2.4833***	0.9105	-1.1677	1.2311
Distance from the nearest transportation station (omitted category less than 2 kilometers)				
2-5 kilometers	0.3996	0.2789	0.4633	0.3763
5-10 kilometers	0.4192	0.3523	0.6780	0.4857
10-20 kilometers	0.3981	0.4580	0.7144	0.6541
More than 20 kilometers	-0.1585	0.6560	0.7184	0.9381
Time of road connected to township (omitted category before 1969				
Not yet connected	-2.3087*	1.1837	-16.6177	2747.83
1970-79	0.0701	0.3436	0.5237	0.4313
1980-89	-0.2568	0.3817	0.0210	0.5090
1990-98	-0.2129	0.3764	-0.0399	0.5281
1999-	-0.6590*	0.3766	-0.4896	0.5114
County dummies	Yes		Yes	
Constant	-1.0092	0.8150	-18.7690	2567.89
Pseudo R squared	0.2629			
LR chi squared	332.27			
Prob>chi squared	0.0000			
Number of observations	617			

Table 5 continued

B. Western region

Categorical dependent variable: Budget sources of road construction/maintenance projects
in 2005-2006

Reference category: No project at all	Village budget only or receiving outside budget only in one year		Received outside budget in both years	
	Coefficient	Standard error	Coefficient	Standard error
Located in provincially designated township for poverty alleviation (dummy)	-0.4996	0.6028	-0.9586	0.7517
Village size (number of households)	0.0009	0.0008	0.0021*	0.0012
Per capita village revenue (yuan)	0.0018	0.0020	-0.0200**	0.0095
Proportion of out-migration to total labor force	1.8916	1.3244	3.9723**	1.6232
Distance from the nearest transportation station (omitted category less than 2 kilometers)				
2-5 kilometers	-0.0508	0.5263	1.0151	0.7338
5-10 kilometers	-1.4801	0.5997	-1.9002**	0.8652
10-20 kilometers	-0.6509	0.7693	-1.9875*	1.1919
More than 20 kilometers	1.5414	1.3410	1.0137	1.6839
Time of road connected to township (omitted category before 1969				
Not yet connected	-1.4625	1.5080	-19.2007	3351.589
1970-79	-0.0754	0.5708	-1.5015	0.9807
1980-89	-0.6690	0.6032	-1.2437	0.8505
1990-98	0.0184**	0.6445	-1.5434	0.9621
1999-	0.6819	0.6546	-0.6535	0.9153
County dummies				
Constant	-18.5664	7670	-17.8222	12096.21
Pseudo R squared	0.3719			
LR chi squared	197.68			
Prob>chi squared	0.0000			
Number of observations	266			

Notes:
1. See Appendix Table 2 for descriptive statistics of variables used in this table.
2. ***, **, * denote the level of statistical significance at the 1%, 5%, and 10% levels respectively.
Sources: CHIP 2007 village data; Ningxia village data.

Table 6 Determinants of Primary school projects, 2005-2006

A. Non-Western region (Eastern and Central regions)

Categorical dependent variable: Budget sources of primary school project in 2005-2006

Reference category: No project at all	Village budget only or receiving outside budget only in one year		Received outside budget in both years	
	Coefficient	Standard error	Coefficient	Standard error
Located in provincially township for poverty alleviation (dummy)	0.1389	0.5789	1.6967*	0.9973
Village size (number of households)	0.0014***	0.0005	0.0006	0.0007
Per capita village revenue (yuan)	0.0006*	0.0003	0.0005	0.0005
Proportion of out-migration to total labor force	-0.4504	1.1425	-4.1061	2.6624
Primary school (full-grade or other types) located within the village	1.1625***	0.4233	2.1753**	0.8870
"Dangerous building" problem in primary school	0.4055	0.4108	0.7413	0.8589
Distance from the township(omitted category less than 2 kilometers)				
2-5 kilometers	0.3483	00.4274	-2.1069***	0.7648
5-10 kilometers	0.6648	0.4670	-1.5709**	0.7775
10-20 kilometers	-0.1504	0.6522	-1.6927*	1.0172
More than 20 kilometers	1.7161	1.7013	16.0843	1743.591
County dummies	Yes		Yes	
Constant	-3.6590	0.9345	-19.3313	4417.155
Pseudo R squared	0.3980			
LR chi squared	316.32			
Prob>chi squared	0.0000			
Number of observations	617			

Table 6 continued

B. Western region

Categorical dependent variable: Budget sources of public investment project in 2005-2006

Reference category: No project at all	Village budget only or receiving outside budget only in one year		Received outside budget in both years	
	Coefficient	Standard error	Coefficient	Standard error
Located in provincially township for poverty alleviation (dummy)	-0.3613	1.0648	1.3817*	0.7913
Village size (number of households, 2006)	0.0014	0.0012	-0.0007	0.0015
Per capita village revenue (yuan)	-0.0016	0.0057	-0.0059	0.0065
Proportion of out-migration to total labor force	0.8324	2.2708	-1.1796	1.7489
Primary school (full-grade or other types) located within the village	-0.4399	0.8325	1.9428	1.2773
"Dangerous building" problem in primary school	-0.4621	1.1167	1.6052*	0.8839
Distance from the nearest transportation (omitted category less than 2 kilometers)				
2-5 kilometers	1.5462	1.0464	-0.5748	0.8331
5-10 kilometers	0.9657	1.0655	-1.001	0.8170
10-20 kilometers	0.9970	1.1663	-0.4213	0.8225
More than 20 kilometers	-15.8778	6647.962	-18.0600	4889.936
County dummies				
Constant	-20.1422	18409.43	-20.5875	16318.2
Pseudo R squared	0.4916			
LR chi squared	160.11			
Prob>chi squared	0.0000			
Number of observations	266			

Notes:

1. See Appendix Table 2 for descriptive statistics of variables used in this table.
2. ***, **, * denote the level of statistical significance at the 1%, 5%, and 10% levels respectively.

Sources: CHIP 2007 village data; Ningxia village data.

Table 7 Size and structure of village expenditure

A. CHIP survey villages, 1998-2007

Size of village expenditure (yuan, in 2002 price)	1998	2002	2007
Total amount of village expenditure	160,180	176,231	344,895
N	391	394	783
Per capita village village expenditure	112.3	111.5	136.4
N	391	394	777
Structure of village expenditure (%)			
Investment on collective economic entities	4.3	4.8	3.7
Road, irrigation, and other infrastructure	12.5	15.3	24.8
Expenditure for education	6.8	4.5	2.1
Medical care and public health	0.7	0.6	3.1
Other public services	11.9	11.9	12.3
Village official's allowance	34.9	35.8	28.4
Other administrative expenditures	10.5	10.0	10.6
Other expenditures	18.3	17.0	14.9
Total	100.0	100.0	100.0
N	391	394	781

Table 7 continued

B. Ningxia, 2006

Size of village expenditure (yuan)	
Total amount of village expenditure	61,057.25
N	120
Per capita village village expenditure	26.00
N	120
Structure of village expenditure (%)	
Investment on collective economic entities	6.6
Road, irrigation, and other infrastructure	18.7
Expenditure for education	1.3
Medical care and public health	0.2
Other public services	NA
Village official's allowance	44.8
Other administrative expenditures	13.8
Other expenditures	14.6
Total	100
N	118

Notes:

1. Data for 1998 and 2002 are from CHIP 2002 survey, data for 2007 are from CHIP 2007 survey.
2. N denotes number of effective observations for each indicator.
3. Amount of expenditure deflated into 2002 price using national rural CPI.
4. Zero values converted to missing values for 1998 and 2002, keeping zero for CHIP 2007 villages and Ningxia villages.

Sources: CHIP 2002 and 2007 village data; Ningxia village data.

Table 8 Proportion of villages providing agricultural services

A: CHIP survey villages 1998-2007 (%)

	Non-Western (Eastern and Central)	Southwestern	Total
Irrigation and evacuation service			
1998	46.4	20.0	42.1
2002	45.8	17.1	41.1
2007	37.8	33.1	36.9
Mechanized cultivation service			
1998	12.3	4.3	11.1
2002	11.4	2.9	10.1
2007	12.2	8.8	11.5
Prevention of diseases and insects			
1998	17.1	18.6	17.5
2002	15.0	7.1	13.8
2007	13.1	18.8	14.3
Organization and intermediation of out-migration			
1998	4.5	5.7	4.9
2002	5.1	5.7	5.4
2007	9.8	32.5	14.4

B: Ningxia survey villages, 2006 (%)

Irrigation and evacuation service	44.2
Mechanized cultivation service	20.8
Prevention of diseases and insects	15.0
Organization and intermediation of out-migration	70.0

Note: Numbers of observations are 640 for Eastern and Central region, 160 for Southwestern region, and 120 for Ningxia.

Sources: CHIP 2002 and 2007 village data; Ningxia 2006 village data.

Table 9 Village cadre's evaluation of the quality of local public goods provision after the tax and fee reform

A. CHIP 2007 survey villages (%)

	Decreased/ deteriorated	No change	Increased/ improved	Total
Quality of road construction/management				
Non-Western (Eastern and Central)	10.1	32.8	57.1	100.0
Southwestern	16.4	37.1	46.5	100.0
Total	11.4	33.7	54.9	100.0
				Pr=0.023
Quality of irrigation				
Eastern and Central	13.3	48.7	37.9	100.0
Southwestern	22.6	44.0	36.4	100.0
Total	15.2	47.8	37.0	100.0
				Pr=0.014
Quality of primary education				
Non-Western (Eastern and Central)	12.2	50.0	37.9	100.0
Southwestern	12.1	51.5	36.4	100.0
Total	12.1	50.2	37.7	100.0
				Pr=0.971

B: Ningxia survey villages, 2006 (%)

Quality of primary education	Decreased/ deteriorated	No change	Increased/ improved	Total
	17.5	46.5	36.0	100.0

Notes:

1. Data for quality of road management and irrigation management are not available for Ningxia.
2. Pr indicates probability level of chi-square test for independence in each contingency table.

Sources: CHIP 2007 village data; Ningxia 2006 village data.

Appendix Table 1 Distribution of sample villages

	CHIP2002 survey villages	CHIP2007 survey villages/Ningxia survey villages
Non-Western (Eastern and Central) region		
Hebei	37	50
Jiangsu	44	100
Zhejiang	53	100
Guangdong	53	90
Anhui	44	100
Henan	53	100
Hubei	52	100
Western region		
Chongqing	20	50
Sichuan	50	100
Ningxia		120
Total	406	910

Sources: CHIP 2002 and 2007 village data; Ningxia 2006 village data.

Appendix Table 2 Descriptive statistics for multinominal logit estimation (Tables 5, 6)

A. Non-Western region (Eastern and Central)

	Mean	Standard Deviation	Minimum	Maximum
Categorical dependent variables: budget structure of public investment projects 2005-2006				
Road construction/maintenance projects				
No project at all	0.3598	0.4803	0	1
Village budget only or receiving outside budget only in one year	0.4700	0.4995	0	1
Received outside budget in both years	0.1702	0.3761	0	1
Primary school projects				
No project at all	0.7780	0.4160	0	1
Village budget only or receiving outside budget only in one year	0.1750	0.3803	0	1
Received outside budget in both years	0.0470	0.2118	0	1
Located in provincially designated township for poverty alleviation	0.0891	0.2852	0	1
Village size (number of households)	629.0438	404.7998	50	3183
Per capita village revenue (yuan)	224.9570	545.1268	0	5557.7610
Proportion of out-migrants to total labor force	0.2191	0.1498	0	0.7894
Distance from the nearest transportation station				
Less than 2 kilometers	0.4214	0.4942	0	1
2-5 kilometers	0.2917	0.4549	0	1
5-10 kilometers	0.1524	0.3597	0	1
10-20 kilometers	0.0843	0.2780	0	1
More than 20 kilometers	0.0502	0.2186	0	1
Time of road connected to township				
Before 1969	0.2788	0.4488	0	1
1970-79	0.2204	0.4149	0	1
1980-89	0.1378	0.3449	0	1
1990-98	0.1556	0.3628	0	1
1999 and after	0.1896	0.3923	0	1
Not yet connected	0.0178	0.1324	0	1
Primary school located in the village	0.6175	0.4864	0	1
“Dangerous building” in primary school	0.1086	0.3114	0	1
Distance from the township				
Less than 2 kilometers	0.1621	0.3688	0	1
2-5 kilometers	0.4165	0.4934	0	1
5-10 kilometers	0.3112	0.4634	0	1
10-20 kilometers	0.0973	0.2965	0	1
More than 20 kilometers	0.01297	0.1132	0	1
Number of observations used in the estimation	617			

Appendix Table 2 continued

B. Western region (Southwestern and Ningxia)

	Mean	Standard Deviation	Minimum	Maximum
Categorical dependent variables: budget structure of public investment projects 2005-2006				
Road construction/maintenance projects				
No project at all	0.4893	0.5008	0	1
Village budget only or receiving outside budget only in one year	0.3643	0.4821	0	1
Received outside budget in both years	0.1464	0.3542	0	1
Primary school projects				
No project at all	0.8036	0.3980	0	1
Village budget only or receiving outside budget only in one year	0.0857	0.2804	0	1
Received outside budget in both years	0.1107	0.3143	0	1
Located in provincially designated township for poverty alleviation	0.2143	0.4111	0	1
Village size (number of households)	614.6835	342.449	84	2209
Per capita village revenue (yuan)	41.9943	90.5644	0	958.6895
Proportion of out-migration to total labor force	0.3362	0.1778	0	0.1778
Distance from the nearest transportation station				
Less than 2 kilometers	0.3855	0.4876	0	1
2-5 kilometers	0.3127	0.4644	0	1
5-10 kilometers	0.1818	0.3864	0	1
10-20 kilometers	0.0764	0.2661	0	1
More than 20 kilometers	0.0436	0.2047	0	1
Time of road connected to township				
Before 1969	0.1782	0.3834	0	1
1970-79	0.2691	0.4443	0	1
1980-89	0.1636	0.3706	0	1
1990-98	0.2145	0.4113	0	1
1999 and after	0.1636	0.3706	0	1
Not yet connected	0.0109	0.1041	0	1
Primary school located in the village	0.6182	0.4867	0	1
“Dangerous building” problem in primary school	0.1164	0.3212	0	1
Distance from the township				
Less than 2 kilometers	0.2364	0.4256	0	1
2-5 kilometers	0.3745	0.4849	0	1
5-10 kilometers	0.2327	0.4233	0	1
10-20 kilometers	0.1345	0.3419	0	1
More than 20 kilometers	0.0218	0.1464	0	1
Number of observations used in the estimation	266			