Governance Decentralization and Infrastructure Provision in Indonesia

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Abstract: This paper examines the recent decentralization of governance in Indonesia and its impact on local infrastructure provision. The decentralization of decision-making power to local authorities in Indonesia has created the dependency of local public infrastructures on local resources. However, due to the difference in initial endowments, this may result in the divergence in local public infrastructures. The divergence may also happen due to differences in preference within communities. Using a village-level survey conducted in 1996, 2000, and 2006, this paper finds that (i) though local public infrastructure depends on local resources and preferences, (ii) decentralization has improved the availability of local public infrastructures, and (iii) communities are converging to a similar level of local public infrastructures.

1. Introduction

Decentralization refers to the devolution of political decision making power to elected local-level, small-scale entities (Bardhan 2002). With the fall of planned economies and centralized states, the decentralization of governance and the delivery of public services by local authorities have taken the centre stage of policy experiments favored by development agencies and donor communities (World Bank 2000). Like many other countries, Indonesia also has embarked on the path to decentralization in the late 1990s following the economic and financial crisis.

Decentralized services can be a way to achieve allocative efficiency since they should reflect the preference of the actual users of the services and the cost of the service should be reflected in the user fee for such services. Decentralization can also reduce information asymmetry that prevails otherwise between the central planner and the actual users of services. Decentralization however also makes local public services dependent on local resource availability leading to the possibility of divergence in the amount of local public good available between rich and poor communities. Since decisions are taken at local level, difference in preference within communities over different public goods may also result in the divergence in the type of public goods available.

In this paper, the objective is to answer two questions: first, does decentralization lead to a divergence in the amount of local infrastructure availability between rich and poor communities? Since due to decentralization investment on local public infrastructure

depends largely on local resources, differences in local resource endowment across communities may result in the differences in the amount of investment on public infrastructure. Second, does preference heterogeneity within a community lead to the divergence in the type of local infrastructure provision? Since the type of public infrastructure chosen depends on preferences at local level, differences in the preference within a community may result in the difference in the type of local public infrastructure provision.

Three distinct characteristics made Indonesia an attractive test-case to answer the two research questions at hand: first, the relative exogeneity of the decentralization experiment; second, large internal variations in the availability of resources among local government jurisdictions; and third, the availability of both pre- and in-decentralization data on infrastructure at local level, which is discussed in more details in Section 4.

In Indonesia, the decision to decentralize was exogenous, at least to the local communities, and the implementation of decentralization was relatively quick –as opposed to gradualism a big-bang approach was followed. Starting from the Dutch colonial role, for most of its modern history, Indonesia was governed by a centralized system where the local governments mostly functioned as implementing agencies of policies and programs designed by the central government. The reform agenda formulated by the multilateral donors and development agencies following the Asian financial crisis paved the devolvement of fiscal and political authorities from the central to the regional governments. Through the enactment of Law 22/1999 on regional governance, responsibility for much of the government expenditures was decentralized to local (district) governments.

The sweeping legislative and administrative changes in local governments introduced in 1999 have brought momentous changes on what local public infrastructures/goods will be financed and how they will be financed. Though all major tax bases, e.g., value added taxes, personal and corporate income tax, are still controlled by the central government, the local governments receive a united transfer over which they have full discretion. Barring five functions – security and defense, law and judiciary, monetary and macroeconomic policies, religious affairs, and foreign relations – local governments are responsible for all other functions including the financing and management of local public infrastructures, health and educational services. In the fiscal year 2002, the local government financed 44.3% of transportation development, 21% of health and social services, and 16% of education development (Eckardt and Shah 2006). Needless to say that transportation infrastructure, health and education constitute the major expenditure outlay for the local governments.

Large variations in local resource availability and resource potentials among local government jurisdictions make Indonesia an attractive test case for the current research. In 2000 prior to the implementation of decentralization, the per capita income in the top quartile of the districts was US$ (Reno), while it was US$ (Reno) in the bottom quartile. Similarly the poverty rates also differed significantly among local jurisdictions (poverty figures for top and bottom in 2000 – Reno). These reflect the uneven distribution of

economic activities as well as natural resource endowments among local government jurisdictions. Though a conditional intergovernmental transfer program based on the fiscal needs addresses the heterogeneity of local governments, fiscal disparities still persist. Even after equalization transfers, for instance, the richest district has roughly 70 times as much as per capita revenue as the poorest district (Eckardt and Shah 2006).

Our work complements the recently developed theoretical literature that focuses on the link between decentralization and welfare (see for instance, Bardhan and Mookherjee 2006, Besley and Coate 2003 and the reference therein). It also complements the cross-country empirical literature on the link between democratization and economic growth (Barro 1996 and the literature that follows it). While the theoretical literature in the past emphasized on the trade-of between the uniformity of service delivery under centralization, and uneconomic scale and cross-regional externalities under decentralization, the recent literature emphasizes on the limited accountability of local government officials and capture by local elites and interest groups. The current debate on the relative responsiveness of centralized versus decentralized delivery of public goods needs to be tested empirically, and the current work is an attempt in this direction.

The remainder of this paper proceeds as follows: Section 2 builds a model that links decentralization of decision making to local resources and preferences. The main implications are that without progressive subsidy from the central government, decentralization may increase cross-community inequality in public goods provision, and heterogeneous preferences may increase investment favorable to large groups within a community.

Section 3 describes the empirical approach followed in this paper that maps the initial village endowments and preferences to subsequent allocation on local public goods during pre- and in-decentralization periods. The parametric approach followed here should be capable of distinguishing the relative responsiveness of public infrastructures provision during pre- and in-decentralization periods.

Section 4 describes the data used to construct the village-level panels for the two periods – pre- and in-decentralization, and gives the summary statistics of the variables used. Section 5 describes the empirical results on the impact of local income and preferences on public goods provision in pre-decentralization and in-decentralization periods. Section 6 concludes the paper with some possible policy implications.

2. Model

2.1. Basic Setting

This section sets up the environment in which the community decides on public good investment and allocation. Assume for simplicity that there is one public good. Also assume that the community allocates its resource into consumption and investment on public good, and receives returns (services) from such public good investment. For simplicity, assume that there is no subsidy from the central government. The community

taxes the residents to raise funds for building the public good. The tax rate is assumed to be unique within the community. Therefore, community residents have to decide the rate following some mechanism. Before discussing the mechanism, let us describe individual decision problem.

Assume a degenerate income distribution in the community. Income y_i is given to individual i. With tax rate t, the per-capita public good q is formed through $q = tE(y)$ if $q \geq -q$ (or $t \geq \frac{-q}{E(y)}$) where $E(y)$ is the average community income, which is exogenous to each individual in the community, and $-q$ is the minimum sufficient level of the public good. Assume that $q = 0$ if $tE(y) < -q$. Meanwhile, we assume that this condition holds.

We write the utility for household as

$$V(t; y_i) = u((1-t)y_i) + \beta f(q)$$

where $u(.)$ and $f(.)$ are utility functions for the consumption and public good service respectively, and β is the discount factor ($\beta \in (0,1)$). Assume that both utility functions are strictly increasing and concave. Since the problem is single-peaked, the first order condition for agent i, $u'(c_i)y_i = \beta E(y) f'(q)$ provides the most preferred tax rate for i. In other words, the most-preferred tax rate is determined by

$$MRS(y_i) = \frac{u'(c_i)}{\beta f'(q)} = \frac{E(y)}{y_i}.$$

The relative income position affects the individually most-preferred tax rate.

Let $t(y_i)$ denote the tax rate, i.e., $t(y_i) \equiv \text{argmax} V(t; y_i)$. Given the non-degenerate income distribution, we also have a non-degenerate distribution of the most preferred tax rate. The community uses majority voting to decide the community's tax rate. By median voter theorem, the tax rate t^* is equal to

$$t(y^m) = \text{argmax} V(t; y^m)$$

where y^m is the median income in the community. In this autarky case, since community income level (median, thus the distribution) affects investment in public good. The distribution of the community median income (across communities) will generate the distribution of public good investment.

Proposition 1:

(i) Investment in public good depends on community income level.

(ii) Cross-community income distribution generates the distribution (inequality) of public good investment across communities.

In short, a higher average (median) community income makes it possible to collect higher local tax to build more local public goods. Therefore, without progressive subsidy from the central government, cross-community inequality in public goods may increase through decentralization.

2.2. Two goods, two groups: (1,2) - potential conflict between groups

Suppose there are two groups in the community. Let ϕ denote the fraction of group 1 (so $(1-\phi)$ is the fraction of group 2). Public goods are

$$(q^1, q^2)$$

Let α denote investment share for the public good 1, given the total investment is q,

$$q^1 = \alpha q$$
$$q^2 = (1-\alpha)q$$

The utility from services or next period returns is

$$f(q^1, q^2)$$

Therefore, each individual attempts to maximizes his/her value, as in the previous section

$$V(t; y_i) = u((1-t)y_i) + \beta f(q^1, q^2)$$

Here the community can have a potential conflict between the two groups in determining the investment share α_k^*. Each group tries to equalize marginal products from the two public goods, i.e.,

$$f_1 = f_2$$

The most-preferred tax t for individual i with income y_i is given by, given α

$$u'(c_i)y_i = \beta\mu\left[\alpha f_1 + (1-\alpha) f_2\right]$$

Here we assume α is determined through bargaining between the two groups, influenced by group proportions in the community population.

$$\alpha = \phi\alpha_1^* + (1-\phi)\alpha_2^* \in \left(\alpha_1^*, \alpha_2^*\right)$$

Note that it is single peaked, so we obtain $t_i^*(y_i)$. By median voter theorem, the median income determines tax rate. Then, community composition determines resource allocation.

Proposition 2:
Greater proportion of one group increases investment share favorable to the group.

For example, gender of village head, men/female proportions among voters, and particular occupation or social group may matter in the allocation of public good investments.

3. Empirical Approach

We have followed a parametric approach that focuses on the relationship between initial village resource and preference and subsequent stock of local public infrastructures. This approach can help to map the changes in stock of local public infrastructures – an increase, no change, and deterioration – with the local resource availability and preferences.

The main specification is:

$$\Delta INF_i = \alpha + \beta \bullet INC_{0,i} + \varphi \bullet INF_{0,i} + Z_i^{'}\delta + \varepsilon_i \qquad (1)$$

The change in infrastructure stock between two period in village i, ΔINF_i, is defined as a categorical variable and is our primary variable of interest. Initial measures of local resources, $\Delta INC_{0,i}$, is one of the primary explanatory variables, where "0" denotes the initial period resource availability for village i. In addition, village characteristics such as population, existence of port/ and topography are included in Z_i as further controls.

The first measure of local public infrastructure considered here is the village road – the road that connects a village with the regional road network. As discussed, after the devolution of power, financing and maintenance of this type of roads falls under the purview of local authorities. Intuitively, villages with more resources are likely to invest more and maintain their roads better. However, investment in roads could be endogenously determined since the initial stock of village roads may affect the current income and subsequent investments in roads. This is accounted for by incorporating $INF_{0,i}$ that indicates infrastructure for village i in period 0.

The second measure of local public infrastructure considered here is village road lightening. A specification similar to road is followed here, and intuitively, it should follow the same rationale.

The third measure of local public goods considered here is the distance to school – both primary and junior high school. And the fourth measure of local public goods considered here is the healthcare infrastructure, namely if a village possesses polyclinic and puskesmas. These are the two primary healthcare giving facilities in Indonesia. Unlike schools, the distances to these facilities were not available in all rounds of PODES data considered here. As a result, we opted for the discrete states.

Four public infrastructures considered here – road, road light, health and education – constitute, on an average, the major expenditure outlay for the local governments in Indonesia as discussed in Section 1. There changes between pre- and in-decentralization periods should be a benchmark for measuring the relationship between decentralization and local infrastructure provision in Indonesia.

In estimating the equation (1), we have some concerns. First, decentralization was implemented at the district level, so that observed and unobserved investment behavior should differ across districts. We compare results with and without district fixed effects to see how district-level unobservables affect public good investment behavior in both periods. Since we think that investment behavior is more homogeneous within a district than across districts, it is reasonable to control district fixed effects. However, we are not sure of possible direction of bias if the fixed effects are not controlled.

Second, resource constraint and demand for services may differ across different types of infrastructure and villages. These factors change parameters of our interest. For example, demand for roads depends on economic activities in the village, which is correlated with the initial income level (and also road conditions). This makes it difficult to identify resource constraint against demand heterogeneity. However, if economic conditions are stable between pre-and in-decentralization periods, the comparison of parameters between the periods enables us to identify the role of resource constraint.

For the preference heterogeneity within a village, the gender of the village head, his/her education, age and duration are considered. The rationale is similar to Chattopadhyay, Duflo (2004) where they found the evidence of gender differentiated preference for infrastructures. This gives us the following specification:

$$\Delta INF_i = \alpha + \gamma \bullet PRE_{0,i} + \beta \bullet INC_{0,i} + \varphi \bullet INF_{0,i} + Z_i^{'}\delta + \varepsilon_i \qquad (1')$$

While the first specification should allow us to see the impact of local resource availability on local public goods, the second specification should allow for the preference heterogeneity within a local area controlling for resource constraints.

We examine the roles of village head characteristics (age, gender, education and tenure) and, in some year, gender composition of voters in the village. The latter measure could be correlated with economic activities in the village, since migration opportunities change the composition. In the equation (1'), controlling the initial income and infrastructure condition also mitigates this potential bias.

Besides the points we discussed above, we are concerned with exogeneity of village preference measure since it can be correlated with unobserved component of infrastructure condition. However, this possibility is mitigated in the above equation as we examine changes in infrastructure over time, not at a given point in time.

One issue not discussed so far is the macro shock of the economic crisis that had taken place during the first period of our analysis. Being a major shock, it had affected all villages and districts irrespective of rich or poor. It is not unrealistic to assume that the effects of the shock were randomly distributed and there is no reason to believe a priori that there was any systematic relation between the shock and the resource availability between the rich and the poor villages. As a result, we do not need to control for the shock. Even if the shock had different effects on different districts, it should not matter for our estimation as long as it is not systematically correlated with district specific unobservables.

4. Data

The data for this study has come from the Village Potential Statistics (PODES) community (*desa*) survey conducted periodically by Indonesia's Central Bureau of Statistics (BPS). The PODES survey contains detailed information on the stock of public infrastructures at village in addition to the characteristics of villages, their geography and topography, the natural disaster that they faced in the past years.

We have used three round of PODES survey – 1996, 2000, and 2006, and were able to match (part of the) communities across survey rounds for the PODES for the pre- and in-decentralization periods. Since the decentralization started in 2001, we have used the first two rounds, 1996 and 2000, for the pre-decentralization period, and compared 2000 with 2006 to examine changes due to decentralization (before and after analysis).

We have matched the 1996 and 2000 rounds by village (i) recovering province, district and sub-district from codes that have changed from round to round and (ii) constructing unique codes for these administrative units, taking into account their mergers and splits. In this process, we have kept (recorded) village names to match the data, so some observations were missed if they changed village names (along with their splits). In this process, nearly 84 percent of the 1996 villages were matched between 1996 and 2000. It is about 81 percent of the 2000 villages between 2000 and 2006.

Two public infrastructures that are available and chosen for the current study are village road and village street lighting. These are non-excludable as well as non-rival, and externalities are limited within a village. The PODES survey includes information on the type of village road (soil, hardened, paved etc), and state of street lighting [Table 1]. Since we were comparing two periods (1996 and 2000, and 2000 and 2006), for road there could be 16 different states, and for street lighting there could be four different states. In stead of all these combinations, we have used three states for both road and lighting – improvement, no change, and deterioration [Table 2]. In addition, for school

and health infrastructures, distance to the nearest primary school and junior high school, and the presence (or absence of it) of polyclinic and puskesmas are considered, respectively.[1]

[Insert Table 1 and 2 here]

For the estimation purpose, for the local road and road lightening, three states – deterioration (e.g., from hardened road to soil road or from having road light to no light), no change, and improvement (e.g., from soil road to paved road) are constructed as a categorical variable (1, 2, 3, respectively). Similarly changes in health infrastructures between two periods are categorized as one and three depending on if the changes were positive or negative, and no change is categorized as two. This is conditioned on the initial state at (t-1) period, which appears as a lagged dependent categorical variable, and both ordinary least squares (OLS) as well as ordered probit are used for the estimation purpose. For schools, the distance is a continuous variable, and the current distance to schools is conditioned on the past distance, and the OLS is used after controlling for fixed effects.

Turning to the explanatory variables, for the availability of local resource at village level, the proportion of households that live in poverty (welfare I and welfare II) are taken as the indicator of income assuming that the higher the proportion of households in poverty, the lower the availability of resources for public goods. Though transfer from the central government via districts may reduce it, it does not necessarily eliminate the resource constraint and cross-community differences in resource availability still prevails as discussed in Section 1. Note that due to the possible endogeniety between income and public goods, the income taken is a one period lag or income at the beginning of the period.

The second explanatory variable of interest is the preference. Here a set of characteristics of the head of the village such as gender, age, education and duration, and the gender composition of the voters are considered. Note that the proportion of villages with female heads is very small though the total number is not.

Table 2 provide summary statistics of all the above and other variables utilized in the estimation.

5. Empirical Results

Local income and changes in local public goods

Table 3 to Table 6 show the estimation results where the availability of local public goods –roads, road lightening, schools, and health facilities - is regressed on local income

[1] In the case of health infrastructure, the information on distance was not available for all rounds.

controlling for other factors described in equation (1) including the initial stock of public goods. Estimated coefficients are derived from ordinary least square (OLS), OLS with district fixed effects (FE), and ordered probit with district fixed effects (FE) (except Table 5). Results are shown for both pre- (1996-2000) and in-decentralization (2000-2006) periods. Except for Table 5, a negative coefficient for village income indicator shows the dependence of local public goods on local income. For Table 5, it is the opposite by construction.

As can be seen in the table, the results show a significant dependence of public goods – both public infrastructures and public schools and health care facilities – on local income/resource. For the local roads, villages with more poor households have experienced either deterioration or less improvement in road condition compared to villages that have few poor households. Note that the reverse causality of road/public goods to income has been controlled for in the estimation. It is therefore the local income, in addition to other factors, that determines the local public goods here. Results similar to the local roads are found for all public goods considered here.

[Insert Table 3, Table 4, Table 5, Table 6 here]

Local government authorities in Indonesia are not financially self-sufficient and their revenue-raising capabilities vary widely depending on local economic activities and resources. This inequality among local jurisdictions prevails even after financial transfers from the national government, and for the poor jurisdictions, local revenues fall well short of their expenditure responsibilities forcing them to have less public goods. This is true for all the public goods discussed here. Though one should expect such dependency of local public goods on local income not to exist in pre-decentralization period, the empirical findings show otherwise.

How the decentralization has changed this dependence? A comparison between the estimated coefficients (β) of income between the two periods – pre- and in-decentralization suggests that the dependency of local public infrastructures on local income has substantially declined following the decentralization. While it should rather increase in in-decentralization period compared to pre-decentralization period, to our surprise, it has in fact decreased! This finding remains equally valid across public goods and across estimation methods. Though the addition of district fixed effects reduces the size of the income coefficient, it does not change the pre- and in-decentralization differences.

This finding is counter-intuitive and goes against our initial prediction. It seems that the decentralization has eased the local resource constraints. Among the plausible explanations, competition among local government jurisdictions may have enhanced efficiency of local governments (Tiebout 1956, Oates 1972). Alternatively, this may have happened due to linking of local benefits with local costs, and local governments may now tailor the public goods and services to local circumstances (Musgrave 1959). Decentralization might have changed the priority among competing public goods that are locally financed, and the local public goods considered here might get more priority of

local citizens compared to other alternative use of resources available to the local government jurisdictions. This issue of priority/preference is discussed further in the next section.

It seems that decentralization has led to an improvement in the local public goods availability. While the divergence in local public goods still exists to a large extent, the dependency on local income, which was initially thought to be the main impediment against convergence in in-decentralization period, seems not to exist. Horizontal inequalities among local jurisdictions are not uncommon in other countries and vertical transfers may not be sufficient to ensure equality. Nonetheless local jurisdictions provide public goods according to local demand and capabilities including fiscal and financial capabilities. The Indonesian experience also supports to this direction.

Local preference and changes in local public goods

As discussed in the previous section, the preference of different groups within a village may vary between alternative public goods and the possibility of rank ordering of these alternatives may enable them to choose one public good over others. Table 7 to Table 10 present the estimation results for the impact of local preference on changes in local public goods availability over time where the availability of local public goods –roads, road lightening, schools, and health facilities - is regressed on a set of preference indicators controlling for other factors described in equation (1′) including the initial stock of public goods and local resource availability. Estimated coefficients are derived from the ordinary least square (OLS), OLS with district fixed effects (FE), and ordered probit with district fixed effects (FE) (except Table 9a and Table 9b). Results are shown for both pre-(1996-2000) and in-decentralization (2000-2006) periods.

[Insert Table 7, Table 8, Table 9, Table 10 here]

Two explanatory variables that are of most interest for the preference proxies are gender of the head of the village, and voter composition of the village. For the local road, gender of the village head does not have any significant impact. While voter composition does not have any significant impact in pre-decentralization period, it has become significant in in-decentralization period implying that more women voters results in better local roads. One plausible explanation is that the benefits of local roads are widely shared and known to the voters, and the road ranks very high at the preference list of women voters. This is not surprising given the findings of other studies (Jacoby 2000, Gibson and Rozelle 2003) on the benefits of rural roads for all households, particularly to the poorer ones, and women headed households (Chowdhury et al 2005).

Unlike roads, the road lightening is significantly affected by the gender of the village head being the case that female village heads prefer road lightening more compared to male village heads. In addition, years of schooling of village head have a positive impact while the village head's duration has a negative impact. Note that the size of the effect of female heads has in fact increased during the decentralized period when the devolution of

power to local authority has made it possible to reflect their preferences. Similarly, higher the percentage of women voters in a village, higher is the likely hood of road lightening in the village. This finding of gender-differentiated preference in public good allocation is similar to that found in Chattopadhyay and Duflo (2004). One plausible reason for this is the security and mobility of women at nighttime that may improve with village road lightening.

In the case of educational infrastructure, female village head has a positive impact on the supply of junior high school. However, effect becomes insignificant once controlled for district fixed effects. Similarly years of schooling have a positive impact but becomes insignificant once controlled for district fixed effects. Note that Indonesia has a quite diverse educational system with general education, technical education, religious education, public and private institutions - all co-existing together. Therefore allocating public funds at local government jurisdictions could be quite complex and not all of them are considered here.

In the case of health infrastructure, the impact of gender differentiated preference indicators is either mixed or insignificant during in-decentralization period. Two plausible explanations are: first, unlike road and road lightening, the health (and educational) infrastructures are more complex to build and require resources beyond building physical structures such as doctors and nurses (teachers). Attracting and retaining such resources require policies and plans not considered here. Second, the typical free-riding and coordination problem of public goods due to externalities may arise that go beyond local resources and preferences. While externalities for local roads and road lights are easy to capture within a local community, health (and education) infrastructures are not easily excludable[2].
Why duration of elected local government officials is related negatively with local public goods provision? One plausible explanation is that elected representatives in Indonesia have a short time horizon that discounts the long-term prospects in favor of more immediate payoffs. If reelection prospect diminishes with duration in the office, the goal of public officials might systematically diverge from maximizing citizen welfare, especially in their second terms (Brennan and Buchanan 1980). Since the introduction of decentralization, Indonesian local government selection process, in addition, has also experienced some experimentation, which may have created some uncertainty about the future on public officials.

6. Conclusions

In this paper, we have examined the impact of recent decentralization of governance in Indonesia on local infrastructure provision where unobserved heterogeneity and initial conditions are appropriately accounted for. The decentralization of decision-making power to local authorities in Indonesia has created the dependency of local public

[2] Of course mechanisms, such as discriminatory pricings, can be designed for the out of community beneficiaries.

infrastructures on local government jurisdictions. Horizontal inequality that pre-exists among local government jurisdictions allows the possible divergence in local public good provision. The decentralization, in addition, has also allowed local preferences to be accounted for. If, for instance, women as a group prefer a particular public good to other alternatives, it may get financed in in-decentralization period.

To model the dynamics of public good provision, we have introduced state dependence of public goods by conditioning the supply of public good in period t on the lagged public good stock in period t-1. The availability of pre- and in-decentralization period data at the level of local government jurisdictions has facilitated this empirical exercise. In addition, the information on income indicators at village level, village administration and voters' composition has allowed us to account for local level resources and preferences.

The empirical findings of this paper support the notion that the decentralization has linked local public goods to local government endowments; the local public goods such as local road, road lightening, schools, and health facilities at village level depend on local resources. Despite the transfer of resources from the central government to the district government following the decentralization, the local public goods still depend on local resource availability, and poorer communities have less public goods than richer communities. This finding remains valid even after controlling for district fixed effects.

However, contrary to our predictions, decentralization in Indonesia that has linked local public goods provision to local resources has also improved the availability of local public goods across communities. Though cross-community difference exists, they are converging to a situation with similar access to local public goods. This may happen due to the inter-jurisdictional competition and efficiency gain that economists have long been argued in decentralized states.

Given the resource availability, the supply of some of the public goods considered here also depends on local preferences. It is found that women village heads and women voters have a strong preference for local roads improvement and village road lightening. However, for educational and health infrastructures, preferences are not explained well, and there might be coordination and free-riding problems due to externalities that are not well accounted here.

Based on Indonesian experiences, the current decentralization and democratization trend observed in developing countries deserves cautious optimism. The devolution of decision-making power to local government jurisdictions in developing countries and the delivery of local public goods by them can enhance efficiency and reflect local preferences better than a centralized system. However, for some public goods, such as education and health, local authorities might not have the sufficient capacity, or may require inter-jurisdictional coordination to capture the externalities, that currently lacks.

References

Bardhan, Pranab, 2002, "Decentralization of governance and development," Journal of Economic Perspectives, 16: 185-205.

Bardhan, P. and Mookherjee, D. 2006. Decentralization and Accountability in Infrastructure Delivery in Developing Countries. Economic Journal, 116(January): 101-127.

Barro, Robert J, 1996. Democracy and Growth. Journal of Economic Growth, 1(1): 1-27.

Besley, T. and Coate, S. 2003. Centralized versus Decentralized Provision of Local Public Goods: A Political Economy Analysis. Journal of Public Economics, 87(12): 2611-37.

Brennan, Geoffrey and Buchanan, James. 1980. The Power to Tax. New York: Cambridge University Press.

Chattopadhyay, R., and E. Duflo. 2004. Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica*, 72 (5): 1409-1443.

Chowdhury, S., M. Torero, Ali, A M M S., Rana, M., Garrett, J., Jahan, I., Islam, M. Sherman, T.2005. Urban-Rural Linkages in Bangladesh: Impact of infrastructure and the food value chain on the livelihoods and migration of landless households, women and girls in the Northwestern Region. Manuscript. IFPRI.

Eckardt, S., and A. Shah. 2006. "Local Government Organization and Finance: Indonesia." In *Local Governance in Developing Countries*, ed. A. Shah, 233-274. Washington, DC: The World Bank.

Gibson, John and Scott Rozelle. 2003. Poverty and Access to Roads in Papua New Guinea. Economic Development and Cultural Change, 52(1) October 2003, 159-185.

Jacoby, Hanan. 2000. Access to Markets and the Benefits of Rural Roads. Economic Journal, 110 (465) July: 713-737.

Musgrave, Richard. 1959. Public Finance. New York: McGraw Hill.

Oates, Wallace. 1972. Fiscal Federalism. New York: Harcourt Brace Jovanovich.

Tiebout, Charles. 1956. A Pure Theory of Local Expenditures. Journal of Political Economy, 64: 416-24.

World Bank, 2000. World Development Report: Entering the 21st Century. Oxford University Press.

Tables and Figures

Table 1: Road and Village Lightening (in %) and Changes: 1996 – 2000, and 2000 – 2006

	1996	2000	2006	1996-2
Road				
Paved	57.51	55.42	58.03	-
Hardened	25.02	28.88	25.77	-
Soil	17.12	15.26	15.77	-
Other	0.35	0.45	0.54	-
Improved	-	-	-	13.7
No change	-	-	-	74.0
Deteriorated	-	-	-	12.2
Road Light				
Yes	42.90	40.55	57.24	
No	57.10	59.55	42.76	
Improved	-	-	-	12.3
No change	-	-	-	73.8
Deteriorated	-	-	-	13.7
School				
Distance to primary school (in Km)	0.225	0.282	0.394	
Distance to junior high school (in Km)	5.313	5.162	5.034	
Health Facilities				
Puskesmas (yes-1)	0.043	0.056	0.121	
Improved				2.3
No change				95.9
Deteriorated				1.68
Polyclinic (yes-1)	0.109	0.116	0.107	
Improved				3.1
No change				95.0
Deteriorated				1.7

Table 2: Summary Statistics

Variable Name	Variable Description	1996-2000		2000-2006	
		Mean	Std. Dev.	Mean	Std. Dev.
Road_Change	Change in village road between (t-1) and t periods. Three possible states are: deterioration-1, no change-2, and improvement-3.	2.014	0.509	2.067	0.562
Road_hard	If type of village road was hardened in (t-1) period equals 1, else 0	0.250	0.433	0.289	0.453
Road_paved	If type of village road was paved in (t-1) period equals 1, else 0	0.575	0.494	0.554	0.497
Light_Change	Change in village lightening between (t-1) and t periods. Three possible states are: deterioration-1, no change-2, and improvement-3.	1.986	0.448	2.181	0.484
Light(t-1)	If village had road lightening in (t-1) equals 1, else 0	0.429	0.495	0.404	0.491
Primary school	Distance to the nearest primary school in km	0.282	3.130	0.536	5.682
Primary school (t-1)	Distance to the nearest primary school in km in (t-1) period	0.225	2.546	0.404	4.041
Junior high school	Distance to the nearest junior high school in km	5.162	11.812	5.064	13.993
Junior high school (t-1)	Distance to the nearest junior high school in km in (t-1) period	5.313	12.084	6.169	13.754
Polyclinic_Change	Change in polyclinic between (t-1) and t periods. Three possible states are: deterioration-1, no change-2, and improvement-3.	2.0134	0.2214	2.053	0.3121
Polyclinic(t-1)	If village had a polyclinic in (t-1) equals 1, else 0	0.0418	0.2002	0.0546	0.2271
Puskesma_Change	Change in puskesmas between (t-1) and t periods. Three possible states are: deterioration-1, no change-2, and improvement-3.	2.0066	0.2005	2.0056	0.2022
Puskesmas(t-1)	If village had a puskesmas in (t-1) equals 1, else 0	0.1064	0.3084	0.1111	0.3142
Income(t-1)	The availability of local resource at village level in the (t-1) period. If a village had 50% or more families in welfare equals 1, else 0.	0.606	0.489	0.495	0.500
Head's Gender	Gender of village head (male –1, female-0)	0.980	0.139	0.977	0.149
Age of village head	Age of village head in years	44.655	8.683	44.424	8.926
Education of village head	Not completed –1, else 0	0.026	0.160	0.040	0.197
Education of village head	Primary school –1, else 0	0.259	0.438	0.171	0.377
Education of village head	Junior high school –1, else 0	0.276	0.447	0.281	0.449
Education of village head	High school –1, else 0	0.350	0.477	0.392	0.488
Education of village head	Academy –1, else 0	0.039	0.193	0.035	0.184
Education of village head	University –1, else 0	0.046	0.210	0.075	0.264
Duration of village head	Duration of village head in years	5.692	5.054	4.637	5.113
% of women voters	% of women voters in village among total voters	49.067	8.869	50.169	4.453
Population(t-1)	The size of village population in (t-1) period	2,985	8,574	2,871	3,762
Station_Port(t-1)	If the village had any station/terminal/airport/seaport in period (t-1) periods equals 1, else 0	0.057	0.231	0.068	0.252
Disaster(t-1)	Any disaster in the last three years: yes 1, no-2	0.534	0.499	0.394	0.489
Topography	Village topography	0.715	0.451	0.715	0.451

Table 3: Local Income and Change in Local Public Goods - Village Road

Dependent Variable- Change in village road: deterioration-1, no change -2, improvement -3

	1996-2000			200
	OLS	OLS with District FE	Ordered Probit with District FE	OLS wit
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0835	-0.0645	-0.1949	-0.052
	(0.0105)***	(0.0070)***	(0.0212)***	(0.0129)***
Road_hardended in (t-1) period equals 1, else 0	-0.2876	-0.3036	-0.8878	-0.2181
	(0.0223)***	(0.0214)***	(0.0555)***	(0.0276)***
Road_paved in (t-1) period equals 1, else 0	-0.6679	-0.7437	-2.328	-0.7238
	(0.0217)***	(0.0215)***	(0.0676)***	(0.0250)***
Population of village in (t-1) period	0	0	0	0
	(0.0000)***	(0.0000)**	(0.0000)**	(0.0000)***
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0566	0.0649	0.2059	0.0477
	(0.0099)***	(0.0095)***	(0.0298)***	(0.0119)***
Village topography (hill area -0, flatland-1)	0.0503	0.0564	0.1702	0.0767
	(0.0109)***	(0.0101)***	(0.0298)***	(0.0143)***
Any disaster in last three years: y-1, no-2	-0.0148	-0.0325	-0.1026	-0.0358
	(0.0108)	(0.0103)***	(0.0303)***	(0.0112)***
Constant	2.4997	2.7056		2.4813
	(0.0253)***	(0.0244)***		(0.0293)***
Observations	49168	49168	49168	51995
R-squared	0.23	0.27		0.25

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 4: Local Income and Change in Local Public Goods - Roadlight

Dep. Variable: Change in vill roadlight: deteriortation-1, nochange-2, improved-3

	1996-2000			
	OLS	OLS with District FE	Probit with District FE	OLS
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0856	-0.0751	-0.3076	-0.0173
	(0.0115)***	(0.0074)***	(0.0009)***	(0.0135)
Village road lightening in (t-1) period: yes-1, no-0	-0.4654	-0.6373	-12.3672	-0.5567
	(0.0143)***	(0.0117)***	(0.0052)***	(0.0169)***
Population of village in (t-1) period	0	0	0	0
	(0.0000)***	(0.0000)**	(0.0000)***	(0.0000)***
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0525	0.098	0.4305	-0.0261
	(0.0125)***	(0.0097)***	(0.0017)***	(0.0123)**
Village topography (hill area -0, flatland-1)	0.0997	0.0989	0.408	0.0957
	(0.0122)***	(0.0092)***	(0.0013)***	(0.0188)***
Any disaster in last three years: y-1, no-2	-0.0449	-0.0019	-0.0041	-0.0096
	(0.0131)***	(0.0087)	(0.0008)***	(0.0118)
Constant	2.1898	2.3227		2.3159
	(0.0158)***	(0.0108)***		(0.0227)***
Observations	52127	52127	52127	55129
R-squared	0.23	0.35		0.28

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 5: Local Income and Change in Local Public Goods - Distance to Primary and Junior Schools

Dep. Variable:	Change in Distance to the primary school				Change in Distance to
	1996-2000		2000-2006		1996-2000
	OLS	OLS with District FE	OLS	OLS with District FE	OLS with
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	0.0976	0.0476	0.1072	0.0756	0.9447
	(0.0282)***	(0.0288)*	(0.0571)*	(0.0357)**	(0.1460)***
Distance to school in (t-1) period	0.4237	0.3799	0.645	0.537	0.6499
	(0.1027)***	(0.1011)***	(0.0462)***	(0.0497)***	(0.0465)***
Population of village in (t-1) period	0	0	0	0	0
	(0.0000)**	(0.0000)**	(0.0000)***	(0.0000)**	(0.0000)**
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	-0.015	-0.0578	0.2796	0.1118	0.184
	(0.0339)	(0.0438)	(0.1731)	(0.1072)	(0.2338)
Village topography (hill area -0, flatland-1)	-0.0318	-0.0361	-0.2896	-0.1235	-0.7811
	(0.0380)	(0.0300)	(0.0987)***	(0.0679)*	(0.2391)***
Any disaster in last three years: y-1, no-2	0.0748	0.0141	-0.0679	-0.0457	0.6622
	(0.0651)	(0.0355)	(0.0710)	(0.0344)	(0.1599)***
Constant	0.0727	0.1978	0.4505	-0.005	1.2469
	(0.0410)*	(0.0504)***	(0.1098)***	-0.0693	(0.3010)***
Observations	52127	52127	55129	55129	52127
R-squared	0.09	0.14	0.23	0.3	0.48

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 6a: Local Income and Change in Local Public Goods - Healthcare infrastructure

Dep. Variable: Change in the availability of polyclinic in village

	1996-2000			
	OLS	OLS with District FE	Ordered with District FE	OLS
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0298	-0.0243	-0.3411	-0.
	(0.0039)***	(0.0032)***	(0.0011)***	(0.0059
If the village had a polyclinic in (t-1) period: yes-1, no -0	-0.5092	-0.5897	-13.8308	-0.
	(0.0230)***	(0.0225)***	(0.0151)***	(0.0200
If the village had a pushkesmas in (t-1) period: yes-1, no-0	0.0828	0.073	0.6132	0.0
	(0.0074)***	(0.0057)***	(0.0022)***	(0.0076
Population of village in (t-1) period	0	0	0	
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0536	0.054	0.4112	0.0
	(0.0072)***	(0.0068)***	(0.0027)***	(0.0095
Village topography (hill area -0, flatland-1)	0.0119	0.0101	0.1801	0.0
	(0.0029)***	(0.0026)***	(0.0016)***	(0.000
Any disaster in last three years: y-1, no-2	-0.004	0.0029	0.04	-0.0
	(0.0034)	(0.0027)	(0.0011)***	(0.00
Constant	2.0264	2.0082		2.0
	(0.0048)***	(0.0034)***		(0.0077
Observations	52127	52127	52127	55
R-squared	0.20	0.25		0

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 6b: Local Income and Change in Local Public Goods - Healthcare infrastructure

Dep. Variable: Change in the availability of puskesmas in village

	1996-2000			
	OLS	OLS with District FE	Ordered Probit with District FE	OLS
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0099	-0.011	-0.1427	-0.0
	(0.0021)***	(0.0022)***	(0.0008)***	(0.002
If the village had a pushkesmas in (t-1) period: yes-1, no-0	-0.1948	-0.1942	-11.0575	-0.2
	(0.0119)***	(0.0102)***	(0.0123)***	(0.0100
If the village had a polyclinic in (t-1) period: yes-1, no -0	0.0462	0.036	0.2865	0.0
	(0.0082)***	(0.0084)***	(0.0031)***	(0.01
Population of village in (t-1) period	0	0	0	
	(0.0000)***	(0.0000)**	(0.0000)***	(0.0000
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0429	0.044	0.3638	0.0
	(0.0053)***	(0.0058)***	(0.0024)***	(0.0060
Village topography (hill area -0, flatland-1)	0.0033	0.0038	0.0525	0.0
	(0.0020)	(0.0020)*	(0.0014)***	(0.00
Any disaster in last three years: y-1, no-2	0.0015	0.001	0.0191	0.0
	(0.0018)	(0.0021)	(0.0009)***	(0.002
Constant	2.0232	2.0236		2.0
	(0.0026)***	(0.0031)***		(0.0030
Observations	52127	52127	52127	55
R-squared	0.09	0.10		0

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 7: Local Preference and Change in Local Public Goods - Village Road

Dependent Variable- Change in village road: deterioration-1, no change -2, improvement -3

	1996-2000					2000-		
	OLS	OLS with District FE	OLS with District FE	Ordered Probit with District FE	Ordered Probit with District FE	OLS	OLS with District FE	OL with Dist
Village head's gender in t-1 period (male-1, female-0)	-0.0004	-0.0045	-0.0034	-0.0093	-0.006	-0.0315	-0.011	
	(0.0147)	(0.0132)	(0.0132)	(0.0412)	(0.0414)	(0.0153)**	(0.0137)	(
% of women voter in village			-0.0001		-0.0004			
			(0.0004)		(0.0014)			(0.0
Village head's age in (t-1) period	0.0022	0.0016	0.0015	0.0048	0.0045	0.0027	0.002	
	(0.0004)***	(0.0003)***	(0.0003)***	(0.0010)***	(0.0010)***	(0.0005)***	(0.0003)***	(0.0
Village head's education in (t-1) period								
Not completed	0.0074	-0.0309	-0.0331	-0.1067	-0.1104	0.0306	-0.0309	
	(0.0562)	(0.0483)	(0.0518)	(0.1475)	(0.1592)	(0.054)	(0.0481)	(
Primary school	0.084	0.0196	0.028	0.0417	0.0664	0.0208	-0.0557	
	(0.0562)	(0.045)	(0.0459)	(0.1387)	(0.1425)	(0.0565)	(0.051)	(
Junior high school	0.1012	0.0449	0.0519	0.122	0.1425	0.0626	-0.0295	
	(0.0569)*	(0.0459)	(0.047)	(0.1409)	(0.1457)	(0.0576)	(0.0504)	(
High school	0.1307	0.0721	0.0792	0.2019	0.223	0.1229	0.0133	
	(0.0573)**	-0.046	(0.0470)*	(0.1416)	(0.1458)	(0.0574)**	(0.0502)	
Academy	0.1791	0.1101	0.1176	0.3216	0.3441	0.1547	0.0349	
	(0.0575)***	(0.0472)**	(0.0475)**	(0.1454)**	(0.1475)**	(0.0586)***	(0.0515)	(
University	0.1446	0.0775	0.0852	0.2131	0.235	0.155	0.0307	
	(0.0569)**	(0.0460)*	(0.0472)*	(0.1415)	(0.1468)	(0.0582)***	(0.0505)	(
Village head's duration in years	-0.0016	-0.0003	-0.0002	-0.001	-0.0007	-0.004	-0.0003	
	(0.0006)***	(0.0005)	(0.0005)	(0.0015)	(0.0016)	(0.0008)***	(0.0006)	(
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0752	-0.0599	-0.0587	-0.1816	-0.1795	-0.045	-0.0477	
	(0.0104)***	(0.0071)***	(0.0071)***	(0.0212)***	(0.0217)***	(0.0125)***	(0.0091)***	(0.0
Road hardended in (t-1) period equals 1, else 0	-0.2925	-0.3062	-0.2998	-0.8979	-0.8829	-0.2294	-0.3392	
	(0.0218)***	(0.0213)***	(0.0219)***	(0.0553)***	(0.0569)***	(0.0263)***	(0.0217)***	(0.0
Road_paved in (t-1) period equals 1, else 0	-0.6795	-0.7511	-0.7482	-2.3548	-2.3611	-0.7421	-0.8989	
	(0.0214)***	(0.0215)***	(0.0220)***	(0.0676)***	(0.0695)***	(0.0237)***	(0.0215)***	(0.0
Population of village in (t-1) period	0	0	0	0	0	0	0	
	(0.0000)**	(0.0000)**	(0.0000)**	(0.0000)*	(0.0000)*	(0.0000)***	(0.0000)***	(0.0
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0507	0.0609	0.0606	0.1947	0.195	0.0433	0.069	
	(0.0097)***	(0.0095)***	(0.0094)***	(0.0296)***	(0.0295)***	(0.0114)***	(0.0093)***	(0.0
Village topography (hill area -0, flatland-1)	0.0472	0.052	0.051	0.1571	0.1543	0.0698	0.0707	
	(0.0107)***	(0.0101)***	(0.0102)***	(0.0297)***	(0.0302)***	(0.0137)***	(0.0106)***	(0.0
Any disaster in last three years: y-1, no-2	-0.0123	-0.0318	-0.0346	-0.1007	-0.1088	-0.0331	-0.0114	
	(0.0107)	(0.0102)***	(0.0103)***	(0.0302)***	(0.0305)***	(0.0109)***	(0.0090)	(
Constant	2.3061	2.6157	2.6129			2.3439	2.8148	
	(0.0675)***	(0.0544)***	(0.0582)***			(0.0746)***	(0.0538)***	(0.0
Observations	49168	49168	46954	49168	46954	51995	51995	
R-squared	0.23	0.28	0.28			0.26	0.34	

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 8: Local Preference and Change in Local Public Goods - Village Roadlight

Dependent Variable- Change in village road light: deterioration-1, no change -2, improvement -3

	1996-2000							2
	OLS	OLS with District FE	OLS with District FE	Probit with District FE	Probit with District FE	OLS	OLS with District FE	wit
Village head's gender in t-1 period (male-1, female-0)	-0.0361	-0.0183	-0.018	-0.0733	-0.0715	-0.0506	-0.0192	
	(0.0140)**	(0.0119)	(0.0119)	(0.0009)***	(0.0008)***	(0.0124)***	(0.0103)*	
% of women voter in village			0.0001		0.0003			
			(0.0004)		(0.0000)***			
Village head's age in (t-1) period	0.0007	0.0012	0.0012	0.0053	0.0052	0.0021	0.0022	
	(0.0004)*	(0.0003)***	(0.0003)***	(0.0000)***	(0.0000)***	(0.0005)***	(0.0003)***	
Village head's education in (t-1) period								
Not completed	0.0302	0.024	0.0427	0.1929	0.3195	0.0562	-0.0107	
	(0.0302)	(0.0263)	(0.0259)	(0.0014)***	(0.0014)***	(0.0362)	(0.0202)	
Primary school	0.0562	0.0267	0.0454	0.2071	0.3301	0.0918	-0.0031	
	(0.0306)*	(0.0257)	(0.0254)*	(0.0017)***	(0.0017)***	(0.0372)**	(0.0191)	
Junior high school	0.0792	0.0487	0.0676	0.2981	0.4208	0.1542	0.0242	
	(0.0304)***	(0.0256)*	(0.0250)***	(0.0015)***	(0.0015)***	(0.0380)***	(0.0192)	
High school	0.1401	0.0812	0.1001	0.4292	0.551	0.2167	0.0581	
	(0.0311)***	(0.0259)***	(0.0252)***	(0.0018)***	(0.0018)***	(0.0387)***	(0.0196)***	
Academy	0.2059	0.1326	0.1513	0.6533	0.7724	0.2531	0.0897	
	(0.0322)***	(0.0278)***	(0.0268)***	(0.0022)***	(0.0021)***	(0.0399)***	(0.0215)***	
University	0.1939	0.1044	0.1216	0.5462	0.6576	0.2454	0.0698	
	(0.0319)***	(0.0269)***	(0.0266)***	(0.0020)***	(0.0019)***	(0.0402)***	(0.0207)***	
Village head's duration in years	0.002	0	0	0	0	-0.0044	-0.0011	
	(0.0007)***	(0.0004)	(0.0004)	(0.0001)	(0.0001)	(0.0009)***	(0.0005)**	
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0765	-0.0701	-0.0722	-0.2879	-0.2954	-0.0098	-0.0415	
	(0.0113)***	(0.0072)***	(0.0075)***	(0.0006)***	(0.0005)***	(0.0128)	(0.0060)***	
Village road lightening in (t-1) period: yes-1, no-0	-0.4857	-0.6441	-0.6525	-12.4429	-12.4711	-0.5809	-0.8172	
	(0.0140)***	(0.0117)***	(0.0106)***	(0.0054)***	(0.0051)***	(0.0167)***	(0.0115)***	
Population of village in (t-1) period	0	0	0	0	0	0	0	
	(0.0000)***	(0.0000)**	(0.0000)**	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0477	0.0948	0.096	0.4172	0.42	-0.0266	0.0694	
	(0.0120)***	(0.0094)***	(0.0097)***	(0.0015)***	(0.0015)***	(0.0117)**	(0.0087)***	
Village topography (hill area -0, flatland-1)	0.0958	0.0951	0.0968	0.3934	0.3973	0.0912	0.0706	
	(0.0118)***	(0.0091)***	(0.0093)***	(0.0009)***	(0.0009)***	(0.0183)***	(0.0089)***	
Any disaster in last three years: y-1, no-2	-0.0391	-0.0012	0.0006	-0.0011	0.0053	-0.0065	0.0165	
	(0.0130)***	(0.0087)	(0.0081)	(0.0006)**	(0.0006)***	(0.012)	(0.0061)***	
Constant	2.0822	2.2711	2.2258			2.136	2.0265	
	(0.0382)***	(0.0210)***	(0.0347)***			(0.0505)***	(0.0275)***	
Observations	52127	52127	49850	52127	49850	55129	55129	
R-squared	0.24	0.35	0.35			0.3	0.51	

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 9a: Local Preference and Change in Local Public Goods - Primary school

Dep. Variable: Change in Distance to the primary school

	1996-2000			2000-2006		
	OLS	OLS with District FE	OLS with District FE	OLS	OLS with District FE	OLS with District FE
Village head's gender in t-1 period (male-1, female-0)	0.0602	0.0096	0.0083	0.1214	0.0155	0.0155
	(0.0294)**	(0.0207)	(0.0210)	(0.0971)	(0.0771)	(0.0770)
			-0.0027			-0.0067
			(0.0017)			(0.0104)
Village head's age in (t-1) period	-0.0061	-0.0044	-0.0039	-0.0113	-0.0023	-0.0023
	(0.0018)***	(0.0013)***	(0.0012)***	(0.0063)*	(0.0022)	(0.0022)
Village head's education in (t-1) period						
Not completed	-1.254	-0.8409	-1.2014	-2.0489	-0.0991	-0.0965
	(0.7737)	(0.8873)	(0.9166)	(2.8114)	(1.6539)	(1.6533)
Primary school	-1.4715	-0.7941	-1.2276	-2.7284	-0.4334	-0.431
	(0.8124)*	(0.8597)	(0.8518)	(2.8384)	(1.5906)	(1.5899)
Junior high school	-1.6002	-0.8416	-1.2698	-3.0327	-0.5588	-0.5567
	(0.8335)*	(0.8558)	(0.847)	(2.8121)	(1.5681)	(1.5676)
High school	-1.657	-0.8551	-1.2762	-3.1254	-0.5705	-0.5683
	(0.8303)**	(0.8498)	(0.8435)	(2.8242)	(1.5758)	(1.5754)
Academy	-1.7113	-0.899	-1.3155	-3.0756	-0.5248	-0.522
	(0.8419)**	(0.857)	(0.853)	(2.8176)	(1.5764)	(1.5758)
University	-1.6962	-0.8792	-1.2952	-3.1355	-0.5766	-0.5742
	(0.8380)**	(0.8543)	(0.8501)	(2.815)	(1.5763)	(1.5757)
Village head's duration in years	0.0035	0.0007	0.0001	0.0036	-0.01	-0.0101
	(0.0027)	(0.0022)	(0.0023)	(0.0029)	(0.0050)**	(0.0050)**
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	0.0651	0.0396	0.0359	0.0658	0.0682	0.0679
	(0.0206)***	(0.0282)	(0.0287)	(0.0472)	(0.0352)*	(0.0351)*
Distance to school in (t-1) period	0.4179	0.3792	0.3697	0.6341	0.5355	0.5354
	(0.1018)***	(0.1009)***	(0.1036)***	(0.0461)***	(0.0502)***	(0.0502)***
Population of village in (t-1) period	0	0	0	0	0	0
	(0.0000)**	(0.0000)**	(0.0000)**	(0.0000)***	(0.0000)***	(0.0000)***
If the village had any terminal/station/port in (t-1) period: yes-1, no-0						
	-0.0026	-0.0513	-0.0468	0.2853	0.1216	0.1213
	(0.0325)	(0.0429)	(0.0442)	(0.1769)	(0.1079)	(0.1078)
Village topography (hill area -0, flatland-1)	-0.0175	-0.0295	-0.0219	-0.2592	-0.1137	-0.1132
	(0.0366)	(0.0291)	(0.0285)	(0.0879)***	(0.0672)*	(0.0670)*
Any disaster in last three years: y-1, no-2	0.0611	0.0148	0.008	-0.0766	-0.048	-0.048
	(0.0621)	(0.036)	(0.0364)	(0.0708)	(0.0347)	(0.0347)
Constant	0.6128	0.3578	1.7507	3.7724	0.636	0.9662
	(0.2070)***	(0.1894)*	(0.8432)**	(2.8045)	(1.5498)	(1.7417)
Observations	52127	52127	49850	55129	55129	55129
R-squared	0.09	0.14	0.14	0.23	0.31	0.31

Robust standard errors in parentheses ; *** significant at 1%

Distrcit specific constants are not reported in the table

Table 9b: Local Preference and Change in Local Public Goods - Junior high school

Dep. Variable: Change in Distance to the junior high school

	1996-2000			2000-2006		
	OLS	OLS with District FE	OLS with District FE	OLS	OLS with District FE	OLS with with District FE
Village head's gender in t-1 period (male-1, female-0)	0.3232	0.1061	0.0918	0.4493	0.2462	0.2462
	(0.1261)**	(0.1159)	(0.1174)	(0.2120)**	(0.2017)	(0.2019)
% of women voter in village			-0.009			-0.0169
			(0.0097)			(0.0165)
Village head's age in (t-1) period	-0.0393	-0.0285	-0.0277	-0.0488	-0.0245	-0.0244
	(0.0083)***	(0.0060)***	(0.0061)***	(0.0108)***	(0.0070)***	(0.0070)***
Village head's education in (t-1) period						
Not completed	-0.8724	0.3254	-0.6903	-2.3884	1.8498	1.8565
	(1.4674)	(2.0081)	(1.7897)	(2.3287)	(1.6034)	(1.6023)
Primary school	-2.7183	-0.8125	-1.9581	-3.7459	1.3899	1.3957
	(1.876)	(2.2241)	(2.0527)	(2.4823)	(1.5372)	(1.5364)
Junior high school	-3.3947	-1.2712	-2.4263	-4.9169	0.8491	0.8543
	(1.8702)*	(2.1821)	(2.0019)	(2.4232)**	(1.5318)	(1.5311)
High school	-3.8523	-1.5168	-2.6553	-5.5817	0.4837	0.4888
	(1.8913)**	(2.1877)	(2.017)	(2.4636)**	(1.5232)	(1.5225)
Academy	-4.2518	-1.9315	-3.0455	-5.6503	0.305	0.3116
	(1.9139)**	(2.1998)	(2.0361)	(2.4561)**	(1.5305)	(1.5298)
University	-4.1994	-1.6818	-2.8067	-5.702	0.4029	0.4087
	(1.9099)**	(2.1919)	(2.0264)	(2.4506)**	(1.523)	(1.5222)
Village head's duration in years	0.0322	0.0213	0.0212	0.0703	0.0212	0.0212
	(0.0124)**	(0.0109)*	(0.0111)*	(0.0195)***	(0.0145)	(0.0145)
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	0.7668	0.6515	0.6525	0.4683	0.4806	0.4798
	(0.1262)***	(0.1174)***	(0.1197)***	(0.1857)**	(0.1735)***	(0.1734)***
Distance to school in (t-1) period	0.6378	0.586	0.5838	0.6502	0.5402	0.5401
	(0.0471)***	(0.0451)***	(0.0461)***	(0.0245)***	(0.0237)***	(0.0237)***
Population of village in (t-1) period	0	0	0	-0.0001	-0.0001	-0.0001
	(0.0000)**	(0.0000)*	(0.0000)*	(0.0000)***	(0.0000)***	(0.0000)***
If the village had any terminal/station/port in (t-1) period: yes-1, no-0						
	0.2651	-0.3088	-0.3226	0.3858	-0.4129	-0.4136
	(0.2279)	(0.1496)**	(0.1495)**	(0.2642)	(0.2504)	(0.2504)*
Village topography (hill area -0, flatland-1)	-0.7228	-0.8164	-0.7768	-0.8216	-0.6574	-0.6562
	(0.2324)***	(0.2054)***	(0.2087)***	(0.2648)***	(0.2563)**	(0.2561)**
Any disaster in last three years: y-1, no-2	0.5901	-0.0482	-0.1004	-0.4822	-0.3481	-0.3481
	(0.1526)***	(0.1163)	(0.1109)	(0.1665)***	(0.1460)**	(0.1459)**
Constant	5.1753	3.7378	4.9847	8.8085	-0.6833	0.1562
	(1.2804)***	(1.0102)***	(2.1574)**	(2.5609)***	(1.5605)	(1.7506)
Observations	52127	52127	49850	55129	55129	55129
R-squared	0.48	0.52	0.52	0.43	0.49	0.49

Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Distrcit specific constants are not reported in the table

Table 10a: Local Preference and Change in Local Public Goods - Healthcare Infrastructure

Dep. Variable: Change in the availability of polyclinic in village

	1996-2000							
	OLS	OLS with District FE	OLS with District FE	Probit with District FE	Probit with District FE	OLS	OLS with District FE	wi
Village head's gender in t-1 period (male-1, female-0)	-0.0066	-0.0091	-0.0093	-0.1136	-0.117	-0.0104	-0.0095	
	(0.0072)	(0.0074)	(0.0073)	(0.0013)***	(0.0011)***	(0.0081)	(0.008)	
% of women voter in village			-0.0002		-0.0016			
			(0.0002)		(0.0000)***			
Village head's age in (t-1) period	0.0004	0.0004	0.0004	0.0064	0.0062	0.0007	0.0007	
	(0.0001)***	(0.0001)***	(0.0001)***	(0.0000)***	(0.0000)***	(0.0003)**	(0.0002)***	
Village head's education in (t-1) period								
Not completed	-0.0702	-0.0543	-0.0698	-0.52	-0.6037	-0.0459	-0.0094	
	(0.0414)*	(0.0365)	(0.0396)*	(0.0023)***	(0.0021)***	(0.0297)	(0.0241)	
Primary school	-0.0705	-0.0491	-0.0657	-0.4608	-0.5731	-0.0327	0.0023	
	(0.0416)*	(0.0364)	(0.0391)*	(0.0024)***	(0.0024)***	(0.029)	(0.0231)	
Junior high school	-0.0656	-0.0452	-0.0612	-0.3599	-0.4677	-0.035	0.0028	
	(0.0419)	(0.0366)	(0.0393)	(0.0024)***	(0.0024)***	(0.0298)	(0.0231)	
High school	-0.0581	-0.0396	-0.0556	-0.256	-0.3676	-0.0278	0.0082	
	(0.0417)	(0.0362)	(0.039)	(0.0026)***	(0.0025)***	(0.0301)	(0.023)	
Academy	-0.0274	-0.0119	-0.0271	-0.0125	-0.1167	-0.0068	0.0296	
	(0.0425)	(0.037)	(0.0397)	(0.0025)***	(0.0023)***	(0.0318)	(0.0244)	
University	-0.032	-0.0284	-0.0452	-0.1365	-0.2519	-0.0121	0.0245	
	(0.0426)	(0.0368)	(0.039)	(0.0021)***	(0.0020)***	(0.0309)	(0.0236)	
Village head's duration in years	-0.0002	0	0	-0.0003	0.0003	-0.0001	-0.0001	
	(0.0003)	(0.0002)	(0.0002)	(0.0001)***	(0.0001)***	(0.0005)	(0.0003)	
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0268	-0.0228	-0.0223	-0.3172	-0.3046	-0.0231	-0.0215	
	(0.0038)***	(0.0032)***	(0.0032)***	(0.0012)***	(0.0011)***	(0.0057)***	(0.0035)***	
If the village had a polyclinic in (t-1) period: yes-1, no-0	-0.5133	-0.5912	-0.5952	-13.8751	-13.8217	-0.684	-0.7229	
	(0.0232)***	(0.0225)***	(0.0231)***	(0.0151)***	(0.0155)***	(0.0200)***	(0.0163)***	
If the village had a puskesmas in (t-1) period: yes-1, no-0	0.0801	0.0716	0.0722	0.6009	0.6037	0.0502	0.0585	
	(0.0073)***	(0.0057)***	(0.0057)***	(0.0019)***	(0.0019)***	(0.0076)***	(0.0066)***	
Population of village in (t-1) period	0	0	0	0	0	0	0	
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0526	0.0531	0.0535	0.3975	0.4022	0.0371	0.0478	
	(0.0071)***	(0.0067)***	(0.0067)***	(0.0025)***	(0.0024)***	(0.0096)***	(0.0074)***	
Village topography (hill area -0, flatland-1)	0.0103	0.0089	0.009	0.1616	0.1658	0.0114	0.0194	
	(0.0028)***	(0.0026)***	(0.0026)***	(0.0011)***	(0.0010)***	(0.0063)*	(0.0045)***	
Any disaster in last three years: y-1, no-2	-0.0026	0.0032	0.0033	0.0481	0.0476	-0.0023	0.0002	
	(0.0033)	(0.0027)	(0.0028)	(0.0007)***	(0.0007)***	(0.0041)	(0.0033)	
Constant	2.0754	2.0477	2.0723			2.0326	1.9484	
	(0.0433)***	(0.0378)***	(0.0410)***			(0.0362)***	(0.0244)***	
Observations	52127	52127	49850	52127	49850	55129	55129	
R-squared	0.21	0.25	0.26			0.22	0.28	

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table

Table 10b: Local Preference and Change in Local Public Goods - Healthcare Infrastructure

Dep. Variable: Change in the availability of puskesmas in village

	1996-2000						
	OLS	OLS with District FE	OLS with District FE	Probit with District FE	Probit with District FE	OLS	OLS with District FE
Village head's gender in t-1 period (male-1, female-0)	-0.0051	-0.0069	-0.0071	-0.0791	-0.082	-0.0057	-0.0063
	(0.0054)	(0.0055)	(0.0056)	(0.0011)***	(0.0010)***	(0.0054)	(0.0054)
% of women voter in village			0.0001		0.0017		
			(0.0001)		(0.0000)***		
Village head's age in (t-1) period	0.0004	0.0004	0.0004	0.0053	0.0051	0.0003	0.0004
	(0.0001)***	(0.0001)***	(0.0001)***	(0.0000)***	(0.0000)***	(0.0001)***	(0.0001)***
Village head's education in (t-1) period							
Not completed	0.0215	0.0219	0.0152	0.3603	0.2756	-0.0011	0.0021
	(0.0124)*	(0.0121)*	(0.0117)	(0.0015)***	(0.0015)***	(0.0117)	(0.0117)
Primary school	0.0236	0.0284	0.0212	0.4524	0.362	0.0023	0.0067
	(0.0119)**	(0.0116)**	(0.0108)**	(0.0020)***	(0.0020)***	(0.0112)	(0.0112)
Junior high school	0.0248	0.0319	0.0254	0.501	0.4192	0.0007	0.0103
	(0.0120)**	(0.0117)***	(0.0107)**	(0.0022)***	(0.0023)***	(0.0111)	(0.011)
High school	0.031	0.0386	0.0318	0.595	0.5082	0.006	0.0154
	(0.0120)**	(0.0118)***	(0.0108)***	(0.0023)***	(0.0023)***	(0.0111)	(0.0111)
Academy	0.0472	0.0536	0.046	0.7508	0.6579	0.0095	0.0199
	(0.0128)***	(0.0125)***	(0.0113)***	(0.0021)***	(0.0020)***	(0.012)	(0.0122)
University	0.0309	0.0377	0.0317	0.5982	0.5219	0.0106	0.0217
	(0.0123)**	(0.0122)***	(0.0112)***	(0.0026)***	(0.0025)***	(0.0114)	(0.0116)*
Village head's duration in years	0	0.0001	0.0001	0.0015	0.0021	0	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0001)***	(0.0001)***	(0.0002)	(0.0002)
Villages with 50% or more families in pre-welfare and welfare 1 in (t-1) period: yes -1, no-0	-0.0083	-0.0098	-0.0098	-0.128	-0.127	-0.004	-0.0029
	(0.0022)***	(0.0022)***	(0.0022)***	(0.0007)***	(0.0007)***	(0.0019)**	(0.0018)
If the village had a puskesmas in (t-1) period: yes-1, no-0	-0.1962	-0.1953	-0.1957	-11.0382	-11.0578	-0.2067	-0.2073
	(0.0119)***	(0.0103)***	(0.0104)***	(0.0125)***	(0.0124)***	(0.0101)***	(0.0094)***
If the village had a polyclinic in (t-1) period: yes-1, no-0	0.0447	0.0349	0.0362	0.2728	0.2839	0.0167	0.0147
	(0.0081)***	(0.0084)***	(0.0084)***	(0.0029)***	(0.0027)***	(0.0142)	(0.0125)
Population of village in (t-1) period	0	0	0	0	0	0	0
	(0.0000)***	(0.0000)**	(0.0000)**	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
If the village had any terminal/station/port in (t-1) period: yes-1, no-0	0.0422	0.0433	0.0448	0.3535	0.3673	0.0339	0.0298
	(0.0053)***	(0.0057)***	(0.0054)***	(0.0022)***	(0.0021)***	(0.0060)***	(0.0058)***
Village topography (hill area -0, flatland-1)	0.0027	0.0028	0.0031	0.0394	0.0442	0.0012	0.0054
	(0.002)	(0.002)	(0.0021)	(0.0010)***	(0.0009)***	(0.0025)	(0.0027)**
Any disaster in last three years: y-1, no-2	0.002	0.0011	0	0.021	0.0061	0.0038	-0.0008
	(0.0018)	(0.0021)	(0.0021)	(0.0007)***	(0.0006)***	(0.0021)*	(0.0019)
Constant	1.9835	1.9812	1.9818			1.9989	1.9852
	(0.0135)***	(0.0136)***	(0.0138)***			(0.0128)***	(0.0129)***
Observations	52127	52127	49850	52127	49850	55129	55129
R-squared	0.09	0.1	0.1			0.09	0.11

Robust standard errors in parentheses

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

Distrcit specific constants are not reported in the table