



## **UP School of Economics**

### **Discussion Papers**

Discussion Paper No. 2012-01

January 2012

**The effects of term limits and yardstick competition on local government  
provision of health insurance and other public services:  
The Philippine case**

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\* This research is part of the Health Equity and Financial Protection in Asia (HEFPA) Project, with funding support from the European Union (EU-FP7 research grant HEALTH-F2-2009-223166-HEFPA). We gratefully acknowledge the overall technical and moral support of Adam Wagstaff, Eddy van Doorslaer, Owen O' Donnell and other members of the HEFPA consortium, and the data and institutional support from the Philippine Health Insurance Corporation. We are also greatly benefitted by the comments and suggestions on an earlier version of the participants in the Friday Seminar Series at the University of the Philippines School of Economics held on March 19, 2011 and in a session during the international conference of the International Health Economics Association held in Toronto, Canada on July 13, 2011. Last, we also thank Rhea Molato, Noel del Castillo and Filipinas Bundoc for their excellent research assistance. All errors are ours.

## **Abstract**

We investigate the effects of two accountability measures on the decisions of the local governments under decentralization. Using a panel of Philippine municipalities and cities in three election years, we find that term limits have negative but weak effects on the provision of health insurance coverage to poor families and on expenditures on local services. However, yardstick competition (i.e., more subsidized insurance coverage for the poor in neighboring local governments) induces them to cover more poor families, but also reduce other public expenditures. To respond to critiques of health decentralization, our results suggest that the objectives of local politicians can be aligned with those of the health sector. The key insight is the incumbent may extend health insurance coverage like a redistributive transfer to pursue re-election objectives. However, the resulting trade off between subsidized insurance coverage and other public services must be considered.

*Key words:* Local governments, term limits, yardstick competition, health insurance, poor, Philippines

*JEL Codes:* H72, I18, H4

## 1. INTRODUCTION

For decentralization to work, it has been emphasized that local authorities must be held accountable (e.g., Bardhan, 2002; World Bank, 2004). The argument is that accountable local officials internalize the objectives of their constituents or service clients in their exercise of wider powers and use of more resources under decentralization. Indeed where local governments are accountable, local provision of public services have improved (Deininger and Mpuga, 2005; Ravindra, 2004). If they are not answerable for their actions, local governments become more susceptible to elite capture or interest groups, at the expense of the larger constituency including the poor (Reinikka and Svensson, 2004; Bardhan and Mookherjee, 2000). To make local officials more responsible, various mechanisms have been proposed including better electoral institutions, financial transparency, democratic participation in local fiscal affairs, use of performance or governance indices, Citizen's Report Cards and satisfaction surveys, and media exposé (Blair, 2000; Devas and Grant, 2003; Paul, 1998; Ravindra, 2004; Reinikka and Svensson, 2003).

In this paper we investigate the effects of two measures, namely term limits and yardstick competition, that can potentially constrain local authorities from misusing their greater power and privileges. Term limits minimize the incumbent's susceptibility to elite capture since local elites and interest groups will not anymore benefit from supporting a politician who is out of power. Term limits can also provide a credible commitment for a politician to adopt unpopular, but necessary fiscal decisions; but can lead as well an incumbent in her final term to abuse her position since she is unlikely to reap the future rewards for good behaviour (Johnson and Crain, 2004; Besley and Case, 1995a; Escaleras and Calcagno, 2009). Therefore, term limits could have ambiguous effects on fiscal decisions.

In contrast, yardstick competition, which in this case is interpreted as the comparison of relative performance among politician peers, could induce local authorities to work harder to satisfy their constituent's greater demand or higher expectations formed based on their observations in adjacent jurisdictions. Because of the comparison with their peers, local authorities are forced to "compete" to the benefit of their respective constituents. With yardstick competition, local public provision has improved (Revelli and Tovmo, 2007; World Bank, 2005).

We apply these insights to identify the factors that influence fiscal decisions of municipal and city governments in the Philippines. Local governments have enjoyed greater fiscal autonomy since 1991 when more spending responsibilities, including provision of local health services, and revenue shares were devolved to them. Starting in 1997, they were also given the added responsibility of enrolling the indigent families among their constituents in the country's social health insurance program. Local governments are also mandated to convene special consultative bodies for health and education; their performance are now tracked using several indicators and awards systems; and elected local officials are constrained to run for the same office after three consecutive terms. (Guevara, 2000; Manasan, 2007; Capuno, 2007)

The relative performances of the local governments in the provision of local public service, including the extension of insurance coverage and provision of devolved health services, vary widely in the twenty years of decentralization (1991-2010) (Manasan, 2007; Silva, 2005; World Bank, 2011). A few local governments like Marikina City, Naga City and Bulacan province lead others in innovative services (Galing Pook Foundation, 2006). Some rich LGUs like Makati City and Davao City have special social services programs for the elderly and poor. However, the remaining multitude is slow to catch up with respect to local service provision. In 1997, fewer than ten local governments extended coverage to poor families under the country's

social health insurance program. By 2007, nearly 92 percent of LGUs have extended coverage but the extent of coverage varied widely, from less than one percent to over 100 percent of the estimated number of poor families.

We use these variations in local government service provisions and participation in the social health insurance program to tease out the effects of term limits and yardstick competition on these decisions, controlling for membership in political clans and the usual fiscal variables. We find that both term limits and yardstick competition can lead to higher insurance enrolment of the poor. These results imply that politicians may be using the social health insurance program not only as a redistributive measure but also as a means to win supporters.. In this case, the objectives of the politicians are aligned with those of the health sector. However, while term limits have no effect on spending for local public services, yardstick competition tends to decrease these, an indication of a trade off between the provision of local public services and the provision health insurance coverage at the local level. This trade off may have to be tempered given that other local public services are important as well.

To provide the context, we briefly discuss the social health insurance program in next section. Then, in section 3, we present a formal model of incumbent political leader that builds on previous studies of local politics in the Philippines. The sources and structure of our panel data of cities and municipalities and the econometric model applied on the data are described in section 4. The results are analyzed in section 5. Section 6 concludes the paper.

## 2. SUBSIDIZED INSURANCE COVERAGE FOR THE POOR

With the enactment of the National Health Insurance Act of 1995 that created the National Health Insurance Program (NHIP), the Philippines commenced the expansion of insurance as a source of financing for health services. The Act created and mandated the Philippine Health Insurance Corporation (PhilHealth) to provide universal health insurance coverage for Filipinos by 2010, and ensure accessible, affordable and acceptable health care services for all Filipinos.

To fulfil this mandate, the PhilHealth has instituted several membership programs. The Sponsored Program (SP) initiated in 1997 provides insurance coverage to poor families. It is through the SP that local government units (LGUs) – including provinces, cities, and municipalities - participate in the NHIP. As a payor, LGUs, together with the national government, share in the 1,200-peso annual premium (roughly, US\$27) of each poor family they also choose to enrol. The LGU share in the premium increases progressively with their income class and the number of years that they have participated in the SP. According to the initial premium-sharing schedule, the richer LGUs (1<sup>st</sup> to 3<sup>rd</sup> income classes) start at once with the highest premium share of 50 percent while the poorer LGUs (4<sup>th</sup> to 6<sup>th</sup> income classes) start at ten percent and then progress to 50 percent from the sixth year onwards. This schedule was subsequently revised in 2004 such that the poorer LGUs progress towards the 50 percent share only at the tenth year of program participation. This was in recognition of the relatively low paying capacity of the lower class LGUs. Since 2001, more and more LGUs have also received additional partial subsidy from their provincial governments, representatives to Congress and the private sector.

Besides paying part of the premium, generating the list of eligible families is the responsibility of the LGU. While the implementation guidelines provide that the eligible poor family will be determined from family data collected as part of a survey implemented by the local social welfare offices, PhilHealth allows some leeway for LGUs to employ their own means test protocols. The enrolment and re-enrolment of sponsored families are done on an annual basis.

The other membership programs are the: (i) Employed Program which covers both government and private sector employees and their dependents, with premium payments shared by both employers and employees, (ii) Lifetime Member program for retirees, (iii) OFW program for overseas Filipino workers, and (iv) Individually Paying Program for self-employed individuals who pay for their own premiums.

Membership in PhilHealth was initially sluggish until the turn of the new millennium. From around 3.29 million members (4 percent of the family population) enrolled in 2001, PhilHealth records show that the membership based expanded to around 22.44 million (120 percent of the family population) in 2010.<sup>1</sup> These figures correspond to about 16.45 and 69.98 million beneficiaries – members and their dependents – in 2001 and 2010, respectively. Several trends can be noted with respect to the SP enrolment (Figure 1). One is the sharp spikes in SP enrolment immediately before or during election years; for instance in the 2004 national and local elections, the 2007 local elections and the 2010 national and local elections. The sharpest annual increase was in 2004 when the Enhanced PCSO Greater Medicare Access (GMA) Program was implemented when the then President Gloria Macapagal Arroyo ran for re-election. As a national government initiative, the GMA program sought to enroll an additional five million families into the SP. Under this initiative, it was the national government that fully paid the

insurance premiums of the poor families that were identified by the LGUs. While the LGUs did not have to shell out their usual premium counterparts, they were involved in the distribution of the PhilHealth membership cards under the GMA program.

However, the peak enrollment attained in 2004 was not sustained as some of the GMA-enrolled families were not insured by their LGUs when their coverage lapsed in 2005. To prevent a further decline in membership, the national government adopted another initiative, the OPlan 2.5 Million, which provided additional funds to enroll 2.5 million indigent families. This initiative however was able to enroll around 10 percent of the target in 2005. While originally intended for 2005 only, the OPlan 2.5 Million was extended and additional funds provided for it until 2006. Effectively, thus, LGUs received partial premium subsidies for the indigent families they co-sponsored with the national government, and full premium subsidy for those enrolled under the GMA program and OPlan 2.5 Million. However, the SP membership again declined in 2007 and 2008, and it only started to rise again in 2009, a year before the national and local elections. The increase in coverage in recent years is perhaps also a result of PhilHealth's renewed marketing efforts to meet the deadline for attaining the universal coverage as provided for in the Act.

[Insert Figure 1 here.]

The sharp increases in the number of families that LGUs enrolled during the election years in many areas have pushed sponsored enrolment to exceed the number of eligible families, which by law should be limited to those that fall below the poverty threshold. Figure 2 shows the distribution of LGUs by the ratio of their own SP-enrolled households to the estimated number of poor families based on official poverty incidence rates in their respective jurisdictions. The figure indicates a growing number of LGUs covered more than the estimated number of poor

families in the SP. In 2001, for example, a significant majority of the LGUs had coverage rates less than 100 percent of the estimated poor families among their constituents. By 2003, a significant proportion was enrolling more than the targeted families, a trend that has become more pronounced in 2004 and 2007.

[Insert Figure 2 here.]

The divergence between the number of target families and actual number of families enrolled may be partly due to measurement problems. For one, official poverty estimates are based on income measures obtained from household surveys, while LGUs and other national government agencies could be using households' housing amenities and assets to identify the poor. LGUs also use different means-test protocols. Moreover, some LGUs may have also sponsored the “near poor” families (or those just above the poverty thresholds) in the informal sector. However, it is widely believed that many LGUs extended coverage to the so-called “political indigents” or those families that LGUs identified as poor for political ends but who otherwise would not qualify for SP enrolment. An indirect evidence of this is the severe over-enrolment in the SP immediately before or during election years. Using a national household survey data for 2004, Edillon (2008) estimated that as much as 72 percent of the poor were not covered under the GMA program. This suggests that many "political indigents" may have been among the reported five million indigent families enrolled under the GMA initiative.

Despite the drops in total sponsored enrolment after election years, the number of LGU-sponsored families has, on the net, increased since 2001. From about 1.1 million members in 2002, the number of LGU-sponsored families reached a peak of about 2.3 million members in 2006. These suggest that more and more LGUs participate in the SP, either by renewing the coverage of current member families, enlisting additional ones or both, even as their premium

shares rise through the years. Thus, in the light of rising fiscal cost of SP enrolment, local governments might have strong motivating factors to extend insurance coverage to indigent families.

### 3. A MODEL OF INCUMBENT BEHAVIOR

Here we present a two-period model of an incumbent local chief executive (city or municipal mayor) whose desire to stay in office is motivated purely by rents (or ego-rents) or perks. The LCE is empowered to make fiscal decisions affecting the welfare of the voters through the provision of local public goods and publicly-financed private goods (e.g., health insurance) and her own welfare via the amount of fiscal resources appropriated as rents. To get re-elected, the incumbent weighs the relative effectiveness of the two types of provisions in influencing a voter's decision. On the one hand, the publicly-financed private good is better targeted, but could be very costly. On the other, the local public goods has wider beneficiaries, even exhibits some economies of scale, but whose benefits may vary across voters. Hence, the private good may be a more effective vote-getter, but the public good may be a better source of rents.

In our setup, asymmetric information and weaknesses in the post-election commitment enforcement mechanisms characterize the relationship between the incumbent political agent and the multitude principals that elected her to office. However, the incumbent is restrained by two accountability mechanisms, namely term limits and yardstick competition. The incumbent thus still must show some achievements - in terms of providing local public goods and publicly-financed private goods - when she submits herself for re-election.

Our model builds on the literature concerning rents-motivated political agents and electoral accountability (e.g., Barro, 1973; Ferejohn, 1986; Rogoff, 1990; Persson, Roland and Tabellini, 1997), and term limits and yardstick competition (e.g., Besley and Case, 1995a, 1995b). However, it is adapted to the Philippine setting and builds on the insights of previous studies on Philippine politics that underscore factors that enable of many local politicians to continually hold power such as patronage and feudal relations, fear (bossism) and electoral fraud, and membership in political dynasties (e.g., Lande, 1965; Gutierrez, 1994; Lacaba, 1995; Sidel, 1997; Rivera, 1999; Coronel et al., 2004; de Dios, 2007; Solon, Fabella and Capuno, 2009).

To fix ideas, consider an incumbent that makes a fiscal decision in the first period to improve her chances of getting re-elected for another term, which is going to be her last. Let  $U_t$  be the incumbent's utility from office in period  $t$ ,  $t=1, 2$ . Further, assume that she derives positive but diminishing marginal utility from rents (or ego-rents),  $X$ , while in office. Her total utility is then the sum of her utility in the first period and the discounted value of her expected utility in the second period. That is,

$$U = U_1(X_1) + \delta\pi U_2(X_2), \quad (1)$$

where  $\delta$  is the discount factor,  $\pi$  is a probability of re-election, and  $0 \leq \delta, \pi \leq 1$ . An incumbent who faces a term limit at time 1 may be specified as somebody who totally discounts the future ( $\delta=0$ ).

In period  $t$ , the incumbent faces the following local government budget constraint,

$$I_t = pG_t + f_t H_t + X_t, \quad (2)$$

where  $I$  is a given amount of income (comprising of revenues from local sources and fiscal transfers),  $G$  is a public good,  $p$  is the unit price of the public good,  $H$  is a publicly-financed private good, and  $X$  is the amount of fiscal resources used for the incumbent's rents in office.

Assume further that the publicly-financed private good is provided on a per capita basis. In this case,  $H = \sum_i H^i$ , where  $i$  is the  $i$ th voter, with  $i=1, \dots, N$ , and  $N$  is the total population, all of whom are voters. Its effective unit price,  $f$ , is the nominal unit price ( $f_0$ ) net of the subsidy ( $s$ ) from the national government, of which there are two types. The first type is the regular, partial but positive subsidy, i.e.,  $0 < s < f_0$ . The second type is a special, full subsidy (i.e., i.e.,  $s = f_0$ ), but the number of beneficiaries enrolled under this type, say  $H^S$ , is constrained to be less than the total number of voters. Hence, where  $H^S > 0$ , the total number of voters left for the incumbent to win over with  $H$  would be  $N - H^S$ . The  $H^S$  is exogenous to the LGU, could vary across LGUs and time, and may depend, say, on the national government's own budget constraint and the incumbent's national leader's own agenda. Assuming that the local incumbent can claim credit for all  $H$  provided to the local population irrespective of who pays, an increase in the private good supplied by the national government would reduce the provision of the same by the local chief executive (i.e., mayor).

Further, assume that while the incumbent can legally provide any nonnegative amount of  $H$ , she must at least provide a minimum positive level of the public good,  $G^0 > 0$ , to avoid a legal or administrative case.<sup>2</sup> Possibly, the minimum expenditures may include only the salaries of regular, tenured government employees, who then provide a minimum amount of public services. Thus, providing  $G^0$ , irrespective of  $H$ , satisfies the institutional requirement, but, not necessarily the voters' preferences.

Voters derive utility from  $G$  and  $H$ . For simplicity, assume that they pay a lump-sum tax to their local governments. While they vote rationally, they are not well informed of the incumbent's decisions. Although they can observe  $G^0$ , they know it is an ambiguous measure of relative performance since  $G^0$  may be peculiar to each jurisdiction. Assume that the voters

instead use an exogenously set benchmark, say  $H^0 > 0$ , to assess the incumbent's performance.

This benchmark could be based on the achievements of the previous incumbent in the area or of those in the adjacent jurisdictions. In this case, the incumbents will have an incentive to expand  $H$  as they are forced to engage in one-upmanship against each other. Thus, the yardstick competition could lead to higher  $H$  even in those places where  $H^S$  may already be high.

The fiscal budget constraint,  $G^0$ , and  $H^0$  together determine the maximum rents that the incumbent can appropriate in the first period. Assume that the utility of the rents she can appropriate over two periods exceed that of the maximum rents possible in the first period. That is, for  $0 < \delta \leq 1$ ,

$$U_1(I_1 - pG^0 - fH_1) + \delta\pi U_2(I_2 - pG^0) > U_1(I_1 - pG^0). \quad (3)$$

To secure the second-period rents, she has to be re-elected first by providing  $G$  and  $H$  to voters. Let the relationship between public expenditures and probability of re-election be denoted by the following function:

$$\pi = \pi(H, G; H^S), \quad 0 \leq \pi \leq 1, \quad \pi_H, \pi_G, \pi_{H^S} > 0. \quad (4)$$

It is assumed further that any positive amount of public good or private good contributes to the probability of getting re-elected, regardless of the amount provided of the other good.

Given the all assumptions, the incumbent's problem then is to choose the optimal level of  $G$  and  $H$  to maximize her utility, given the fiscal budget constraint (2), the restriction concerning  $G^0$  and the exogenous benchmark  $H^0$ . Note that in the second period, after which she is not allowed to run for the same office anymore, the incumbent will maximize her rents by providing  $G^0$  and  $H_2=0$ . Then, her choice problem reduces to

$$\text{Max}_{\{H,G\}} U = U_1(I_1 - pG_1 - (f_0 - s)H_1) + \delta\pi(H_1, G_1; H^S)U_2(I_2 - pG^0). \quad (5)$$

The necessary conditions for a maximum are:

$$U'_{H_1} = U'_{1H_1}(-f_0 + s) + \pi'_{H_1} \delta U_2 = 0,$$

$$U'_{G_1} = U'_{1G_1}(-p) + \pi'_{G_1} \delta U_2 = 0.$$

Let the solution to these equations be the following pair of demand functions for  $H$  and  $G$ , respectively:

$$H^* = H(\delta, H^0, f_0, s, H^S, I_1, I_2, G^0), \quad (6')$$

$$G^* = G(\delta, H^0, f_0, s, H^S, I_1, I_2, G^0) \quad (6'')$$

The model yields the following testable hypotheses:

- An increase in the discount factor will increase  $G$  or  $H$  (i.e.,  $G_\delta > 0, H_\delta > 0$ ); as future rents become more valuable, the incumbent will try secure her re-election with greater public provisions of either good or both.
- A higher benchmark  $H^0$  will increase  $H$  and reduce  $G$ ; since a higher  $H$  implies a lower residual budget, the incumbent may decide to reduce  $G$ .
- An increase in the unit price of public good will decrease  $G$  and increase  $H$  (i.e.,  $G_p < 0, H_p > 0$ ); this means that the own price effect is negative on  $G$  and this may induce a substitution towards  $H$ .
- An increase in the nominal price or fall in the subsidy for the publicly provided private good will decrease  $H$  and will increase  $G$  (i.e.,  $H_{f_0} < 0, H_s < 0, G_{f_0} > 0, G_s < 0$ ); again, this means that the own price effect is negative on  $H$ , but the resulting substitution may be in favor of  $G$ .
- An increase in the nationally-provided private good  $H^S$  will reduce the locally-provided private good  $H$ ; in other words, national provision displaces local provision of the private good.

- An increase in the first-period income or second-period income will increase  $G$  or and  $H$  (i.e.,  $G_{I_t} > 0, H_{I_t} > 0$ ); this means that the income effect on the first-period public provision is positive, and that the motivation for higher public provision is greater when the rents from the second period also increases due to an increase in fiscal resources.
- Finally, an increase in the legal or institutional minimum  $G^0$  will increase  $G$  and reduce  $H$ ; since a higher  $G$  likewise implies a lower residual budget, the incumbent may decide to reduce  $H$ .

#### 4. DATA AND EMPIRICAL MODEL

##### 4.1 Empirical model

Linearizing Equations (6') and (6'') and adding stochastic error terms, the amount of publicly-financed private good ( $H$ ) and public good ( $G$ ) can be represented, respectively, as:

$$H_{ij} = \beta_0 + \beta_1 D_{ij} + \beta_2 H^0_{ij} + \beta_3 P_{ij} + \beta_4 F_{ij} + \beta_5 H^S_{ij} + \beta_6 I_{ij} + \beta_7 T_{ij} + e_{ij},$$

$$G_{ij} = \alpha_0 + \alpha_1 D_{ij} + \alpha_2 H^0_{ij} + \alpha_3 P_{ij} + \alpha_4 F_{ij} + \alpha_5 H^S_{ij} + \alpha_6 I_{ij} + \alpha_7 T_{ij} + v_{ij},$$

where  $H$  is the proportion of the poor population that is covered by the SP in the  $i$ th LGU on the  $j$ th election year and  $G$  is the total amount of LGU expenditures (in real terms) net of expenditures on  $H$  and rents. The discount factor,  $D$ , is assumed to be captured by political variables including a dummy variable for local chief executives who have reached term limits on the  $j$ th year and an indicator variable for the incumbent belonging to a political dynasty. The variable  $H^0$  measures the extent of yardstick competition in the provision of PhilHealth sponsorships among LGUs within the same province. The vector  $P$  contains proxies for the price of the public good while the vector  $F$  contains variables that determine the effective price of SP

coverage including the premium rate charged by PhilHealth to the LGU (net of the national government premium share) and the number of years that the LGU had been sponsoring indigent families in PhilHealth. The vector  $\mathbf{H}^S$  contains the level of private goods provided without cost to the LGU by the national government or other sponsors, including the total number of families enrolled in the SP by the national government in 2004 and 2007 and those enrolled by other sponsors such as members of Congress. The income variable  $\mathbf{I}$  is defined as the total real income of the LGU divided by population. The vector  $\mathbf{T}$  contains year dummy variables, to account for the panel nature of the data.

The error terms  $e$  and  $v$  represent the unobservable factors which may influence the provision of  $\mathbf{H}$  and  $\mathbf{G}$ , respectively. With the assumption that  $e$  and  $v$  are normally distributed,  $cov(\mathbf{H}, v)=0$  and  $cov(\mathbf{G}, e)=0$ , and that  $\mathbf{G}$  and  $\mathbf{H}$  have the same set of regressors, we then estimate the basic  $\mathbf{H}$  and  $\mathbf{G}$  equations separately using panel data estimation methods.

We have no direct measures of  $G^o$ , which arguably, has values that is distinct to each LGUs. While there is no specific law on the minimum amount of public goods to be provided by an LGU, in practice, there is an implied minimum, such as the salary of the permanent government workers, which if violated by LGUs could be interpreted as gross dereliction of duty and possibly result in removal from office. Recognizing that the effective  $G^o$  varies across LGUs, we control for its effects by estimating the  $\mathbf{H}$  and  $\mathbf{G}$  equations using fixed and random effects models, with LGUs as the cross-sectional units.

## 4.2 Variables

All variable definitions are summarized in Table 1. The dependent variable  $\mathbf{H}$  was calculated by dividing the number of sponsored families by the poor population, which is estimated by multiplying population by the estimated poverty incidence. We use ratios rather

than level measures for  $H$  because what matters to an incumbent seeking re-election is not the number of individuals benefitting from  $H$  in absolute terms but rather relative to the targeted poor population. While by definition  $H$  should fall in the 0-1 range, we observe  $H$  values that exceed 1.<sup>3</sup> Where the  $H$  values exceed 1, it indicates that the LGU enrolled “political indigents” or the near poor families under the PhilHealth SP, presumably, to take advantage of lower premium rates and subsidies from the national government or to achieve a better performance than the neighboring LGUs.

[Insert Table 1 here.]

The other dependent variable  $G$  is represented by two alternative measures. We computed the first measure by subtracting the estimated amount paid for  $H$  from the total reported annual expenditures of LGUs, both terms expressed in 2001 prices, and then dividing the result by the total population. However, this first measure ignores rents because rents are not directly observed. We therefore propose an alternative measure of  $G$  by further subtracting a proxy measure of rents from the total resources available to the LGUs net of  $H$ . We use as our proxy for rents the expenditures on general public services<sup>4</sup> (i.e., overhead expenses by the local government). The idea is that mayor’s rents are more likely generated from a general expense item because of its opaque purpose, compared to an expense item that has a specific purpose. We thus provide two sets of  $G$  estimates, corresponding to the first definition where rents are ignored (*other expenditures1*) and to the other definition where rents are proxied for by spending on general public services (*other expenditures2*).

Arguably, a mayor’s discount factor changes with amount of time remaining in office. As the term limits approaches, the incumbent mayor’s discount factor approaches zero. A strict implementation of our theoretical model would require our dummy variable *last term* to have

non-positive coefficients in both  $H$  and  $G$  equations if future utility is completely discounted by a politician whose career ends with finality.

In Philippine setting, however, we propose a slightly different treatment of *last term* in the empirical model. Although mayors are allowed to serve a maximum of three consecutive terms each lasting three years, they are by law, not permanently prohibited from running for the same office. A common practice is that after nine continuous years in office, a mayor takes a break of one term and then seeks re-election for the same position. Thus, a mayor on his or her last term behaves like a neophyte, having the incentive to increase  $H$  in order to secure a comeback after a one-term hiatus. The variable *last term*, in this context, can be expected also to have a non-negative coefficient.

Another important consideration is that in the Philippines, there are no strict rules on political dynasties and we note the possibility that incumbents on their last term but who belong to dynasties could behave differently. In particular, a political dynasty member on his or her last term can be better assured of a comeback after a break of one term, and may thus not need to increase  $H$ . To control for this possible joint effect, we interacted *last term* with *dynasty*, a dummy variable for an incumbent mayor who is related by blood or affinity to the previous mayor or to an incumbent governor or congressman.<sup>5</sup> We expect this interaction term to have a non-positive coefficient. We argue that this interaction term can be considered as the appropriate proxy for the vector  $D$  in the empirical model, in the Philippine setting.

In this analysis, the other independent variable of interest is  $H^p$ , a measure of yardstick competition, defined for each LGU to be the average enrolment rate in the PhilHealth SP for all other cities and municipalities in the same province. Arguably, the yardstick effect can work through a demand-side channel where households demand SP coverage from their incumbent

leaders because the same is provided in neighboring LGUs. Alternatively, on the supply-side, the yardstick can be internalized by the incumbent LCE after obtaining information on what other politicians do to court votes. Whether the yardstick effect works through demand or supply-side channels, the variable *yardstick* is expected to have a positive effect on  $H$  (and non-positive effect on  $G$ ).

In the absence of direct measures for the price of public goods, we use the indicator variable *urban* as a proxy measure. The provision of public goods is expected to be more expensive in urban areas not only because of higher input costs also because it takes additional resources (e.g., information campaigns, public appearances) to make spending creditable to the local incumbent. These are necessary given that the relationship between the local chief executive and voter is more impersonal in the cities. When the price of  $G$  rises, we expect  $G$  to decrease but, possibly, for the incumbent to increase  $H$  as well so as to achieve the same level of probability of re-election, given a binding budget constraint.

As discussed in Section 2, the published annual premium rate per indigent household is shared by the LGU and national government. Thus, *premium* is calculated based on PhilHealth published rules on cost sharing which specifies varying rates across LGU income classes that increase through years of participation. The nonlinearities in the premium rates are captured by *years of SP participation* as well as the interaction term *premium\_ years of SP participation*. For the  $H$  equation, the net effect of *premium* on SP, being a price effect, is expected to be negative. On the other hand, increases in *premium* are expected to have a positive effect on  $G$ , again because of the substitutability of  $G$  and  $H$ .

In addition to the premium subsidies received by LGUs from the national government, private corporations, and members of Congress, LGUs get additional “subsidies” because these

sponsors may unilaterally enrol indigent families and fully pay for their premiums. To the extent that these other sponsors target the same base of indigent families, we can expect other sponsorships to “crowd out” the LGU's own SP enrolments. The variable *SP coverage by national government* and *other sponsors* is thus expected to have negative coefficients in the **H** equation (and positive coefficients for the **G** equation). As mentioned in Section 2, the years 2004 and 2007 were important election years. In 2004, for the first time under the 1987 Constitution, an incumbent president sought a new term. In 2007, the opposition dominated the national elections. Not surprisingly, national government’s enrolments in SP in 2004 and 2007 were substantial. The variables *SP coverage by national government\_2004* and *SP coverage by national government\_2007* reflect SP initiatives of the national government that had no cost implications for the LGUs.

Richer LGUs, in theory and practice, should have a greater demand for health insurance and public goods implying an expected positive sign for the coefficient of *real income per capita* in both **H** and **G** equations. That health insurance is a normal good, at least for households, is well documented (Levy and DeLeire, 2003; Thomas, 1995; Bundorf and Pauly, 2006). We assume that LGUs will behave in a similar manner with respect to demand for health insurance. On the other hand, LGU expenditures on public goods have been found, in many countries, to be positively correlated with income measures (Bird and Vaillancourt, 1998). *Real income per capita* was computed by dividing local government revenues by the population and then the deflating the resulting amount by the 2001 consumer price index.<sup>6</sup>

### 4.3 Specification tests

We used the Hausman test to determine whether the fixed-effect or the random-effect specification is appropriate for the *H* and *G* equations.

Furthermore, we conducted sub-sample regressions on *H* to further identify the yardstick effects and test the price effects of premium rates on SP enrolments. For the first sub-sample run, we included only new participants in the SP (i.e., with only one year of SP participation). Such LGUs are arguably more sensitive to price changes and less sensitive to yardstick competition.. The second sub-sample included the rest of the LGUs, i.e., those having participated in SP for at least two years. For these LGUs, we hypothesize that yardstick effects begin to matter and may even dominate the price effects.

### 4.4 Data

To estimate the model, we used panel data from 1,514 municipalities and cities nationwide, representing 93 percent of all LGUs<sup>6</sup> in the country and for the election years 2001, 2004 and 2007.

We assembled our data set using secondary data obtained primarily from the PhilHealth, National Statistical and Coordination Board (NSCB), Commission on Audit (COA), and Commission on Elections.

Data on the number of families sponsored by the LGUs and under national government programs were obtained from PhilHealth reports published in various years. Length of participation in the SP program was obtained from the same reports. Premium rates for PhilHealth sponsored families were estimated using various PhilHealth circulars on the calculation of premium contributions.

Population data for various census years were from the NSCB. Poverty indicators for municipalities and cities were obtained from the NSCB's small-sample estimates of poverty incidence using data from the Family Income and Expenditure Survey (FIES), a nationwide survey conducted periodically by the NSCB. Urban classifications were also obtained from the FIES data set.

The LGU revenue and expenditure data as well as LGU income classifications were extracted from COA reports for various years. Political variables including indicators of political dynasties were created from data obtained from the Commission on Elections.

#### 4.5 Descriptive statistics

Table 2 shows the descriptive statistics for the full regression sample of 4,433 observations, roughly 1,434 LGUs for each of the three election years included in the analysis. On the average, each LGU has about 1,318 eligible families and enrolled about 43 percent of these in PhilHealth's SP. On the average, the LGUs' other expenditures on public goods were 8.98 pesos including rents and 4.27 pesos excluding rents. About a quarter of all incumbent mayors in the sample were on their third consecutive term (or last term). Of these graduating mayors, about 5 percent belonged to political dynasties. The yardstick for SP enrolment was 43 percent on the average.

A huge majority of LGUs (92 percent) are located in rural areas. The average premium rate faced by LGUs for each sponsored family is 389 pesos (about 9 USD), or about one-third of full rates. Each LGU has also participated in the program for about 2.6 years. Congressmen and the private sector enrolled an average of 144 families while the national government sponsored about 988 and 86 families in 2004 and 2007, respectively. Finally, the average real LGU income per capita was 11.47 pesos.

[Insert Table 2 here.]

Table 3, Table 4 and Table 5 show the summary statistics of the sets regression variables for the sub-samples of LGUs with less than two years, just one year, and more than a year of participation in SP, respectively.

[Insert Table 3, Table 4 and Table 5 here.]

## 5. ANALYSIS OF RESULTS

### 5.1 LGU SP coverage rate

Table 6 reports the panel data estimates for the  $H$  equation (LGU SP coverage rate) using the full sample and the sub-sample of LGUs with longer than a year of SP participation and the ordinary least squares estimates for the LGUs that had less than two years or just one year of SP participation. For the panel data estimates, the Hausman test indicates that the correct specification is fixed effects.

Using the full sample, the full sample regressions suggest the presence of the effects both term limits and yardstick competition. Mayors belonging to political dynasties and on their last term reduce  $H$ . They appear to discount future utility from  $H$  presumably because their membership in a political dynasty which could assure re-election causes a disincentive to spend on vote-getting SP membership. On the other hand, mayors on their last term, but who do not belong to any political dynasty, do not discount future utility from  $H$  – a result which is consistent with the notion that term limits are considered temporary breaks so that the incumbent has the need to continuously court votes. Our results thus suggest that while term limits, at least in the Philippine context, are good for the provision of  $H$ , political dynasties are not. Put

differently, membership in political dynasties to an incumbent is an alternative to providing insurance coverage for securing votes.

[Insert Table 6 here.]

The full sample regressions show large yardstick effects. LGUs respond to competition in the provision of  $H$  – greater SP in the rest of one’s province has a positive, significant, and large effect on own SP enrolment. Specifically, a point increase in the average SP coverage rate for all other LGUs in the province induces an almost equal increase (0.85) in the LGU's own coverage rate. The effect is slightly higher for LGUs with just one year of SP participation (1.01).

$H$  is higher in urban areas, presumably because  $G$  is relatively more expensive than  $H$  in these places. The relative cheapness of  $H$  could also be due to the LGUs' better information and reduced transaction costs resulting from the proximity to PhilHealth service offices in urban areas.

Although *premium* has a positive and significant coefficient, the marginal effect of *premium* is negative given the number of years of SP participation. The net marginal effect of *premium*, by considering both *premium* and its interaction with *years of SP participation*, is close to zero suggesting that for LGUs, as a whole, the demand for  $H$  appears unresponsive to price. We gain further insights on this with the sub-sample regression results, which indicate that new SP participants (with less than two years) are price-sensitive but older SP participants (with more than a year of SP participation) are not. It thus appears that while the decision to participate in the SP for the first time is a price decision, it ceases to be such with longer participation in the program. Presumably, factors other than price become more influential in deciding on  $H$ .

The own SP enrolment of the national government and other payers appear to "crowd out"  $H$ . With a relatively fixed number of indigent households, increased SP enrolment by other

fundings tends to reduce own enrolment by LGUs. This finding is consistent with the hypothesis that since LGUs and other funders target the same population group and LGUs can gain political credit for national government sponsorships (presumably because, unlike the President, the mayor is usually present each time national government sponsorships are awarded to the local population), an increased number of external SP sponsorships could result in fewer ones by the LGUs themselves.

As expected, *real income per capita* has a positive effect on *H*. Richer LGUs have indeed higher SP enrolments.

## 5.2 LGU's other expenditures per capita

Table 7 reports the regression results for the *G* equation, using the two measures of expenditures on public goods. As in the *H* equation, the Hausman test supports a fixed effects specification for both measures of expenditures on public goods.

Both measures of other local government expenditures appear insensitive to our proxy for the discount factor. The mayors in their last terms or those that belong to dynasties do not appear to spend more or less on *G* than other mayors. As expected, the average SP coverage in the neighboring LGUs have no statistically significant effects on the local provision of public good, as measured by *other expenditures1*. However, the same variable now has negative and significant effects on the provision of public goods net of rents, as measured by *other expenditures2*. This indicates that resources are diverted from local public goods towards health insurance coverage as the incumbent "competes" with its peers in this aspect and secures her rents first.

The results for either measures of other local government expenditures indicate that there are no own-price effects (proxied by *urban*). However, we find some evidence of negative cross-

price effects, since the estimated coefficients of *premium\_years of SP participation* are negative and statistically significant from zero.

As hypothesized, income effects are positive under the alternative definitions of *G*, which means that public good provision and rents both rise with fiscal revenues.

[Insert Table 7 here.]

## 6. CONCLUSION

In sum, we find evidence that incumbent local chief executives in the Philippines respond to both electoral incentives and fiscal factors in their decisions (or at least, in directing their local governments) to provide public services and extend health insurance coverage to their constituents, particularly the poor. Interestingly, term limits (in the absence of a political dynasty) have positive effects on extending health insurance coverage to the poor, but no effect on the provision of other public services. Also, yardstick competition induces higher SP coverage rate and lower spending on other public services. As it were, the out-going incumbent by issuing PhilHealth ID cards to the SP-covered families is either dispensing favors in preparation her re-election bid after the mandatory three-year hiatus or reacting to pressure from her peers or to the local population. Both types of public expenditures, however, increase with fiscal revenues.

Thus, from the point of view of achieving universal health insurance coverage, our results indicate that the objectives of the local politicians under decentralization are not necessarily opposed to those of health sector. In fact, our results suggest that local chief executives will want to extend health insurance coverage not only to poor but perhaps also to the others just above the poverty threshold. Given that these so-called near poor are just as

vulnerable as the poor to illness and other shocks and to the extent that their specific circumstances are better observed by local authorities, then the devolution of some social health insurance functions to local governments could work, counter to the critiques against health decentralization (e.g., Akin, Hutchinson and Strumpf, 2005; Homedes and Ugalde, 2005). The key insight here is that the decentralization of this particular function works because health insurance is largely redistributive and essentially a private good, which serves the incumbent's objective of getting re-elected. Further, our results suggest that premium subsidies could be offered only to new or prospective participants who are price-sensitive and then yardstick competition instead should be promoted among long-time participants in the SP.

However, local governments seem to substitute the expansion in insurance coverage for lower spending on other public services. This substitution however has to be tempered to the extent that other local public services - including local public works, social services, and economic services - are important as well. Notwithstanding the trade off, these types of local spending also seem more susceptible to rent-seeking. Incumbents who face term limits tend to spend less on them. On this score, our results support previous studies about local authorities being less than perfect political agents.

## ENDNOTES

<sup>1</sup> The percentage shares are based on the assumption that each member represents one family.

The figure for 2010 suggests that some SP members do not have dependents (i.e., single-member households) or there could be multiple family members who are enrolled as primary members under SP.

<sup>2</sup>  $G^0$  could be legally or institutionally determined. This assumption is similar to that made in some of the incumbency models discussed in Persson and Tabellini (2002). This assumption applies in the Philippines where a local government must account for at least the fiscal transfers it gets from the national government every year. Fiscal outlays are audited by the Commission on Audit.

<sup>3</sup> In the 3-year pooled sample, there are 554 LGUs with SP coverage rates greater than 1. The average coverage rates for these LGUs are about 2.135.

<sup>4</sup> According to a manual of Bureau of Local Government Finance, general public services "cover expenditures for services that are indispensable to the existence of an organized state. This includes executive and legislative services; overall financial and fiscal services; the civil service; planning; conduct of foreign affairs; general research; public order and safety; and centralized services."

<sup>5</sup> A similar definition of political clan is used in Solon, Fabella and Capuno (2009) and Rivera (1999).

<sup>6</sup> As measured here, *real income per capita* in a period is also a good proxy for the next period's revenues since most LGUs are heavily dependent on central fiscal transfers, which is based on the preset formula and distributed periodically and automatically to LGUs (Guevara, 2000).

<sup>7</sup> Our samples exclude the local governments in the Autonomous Region of Muslim Mindanao.

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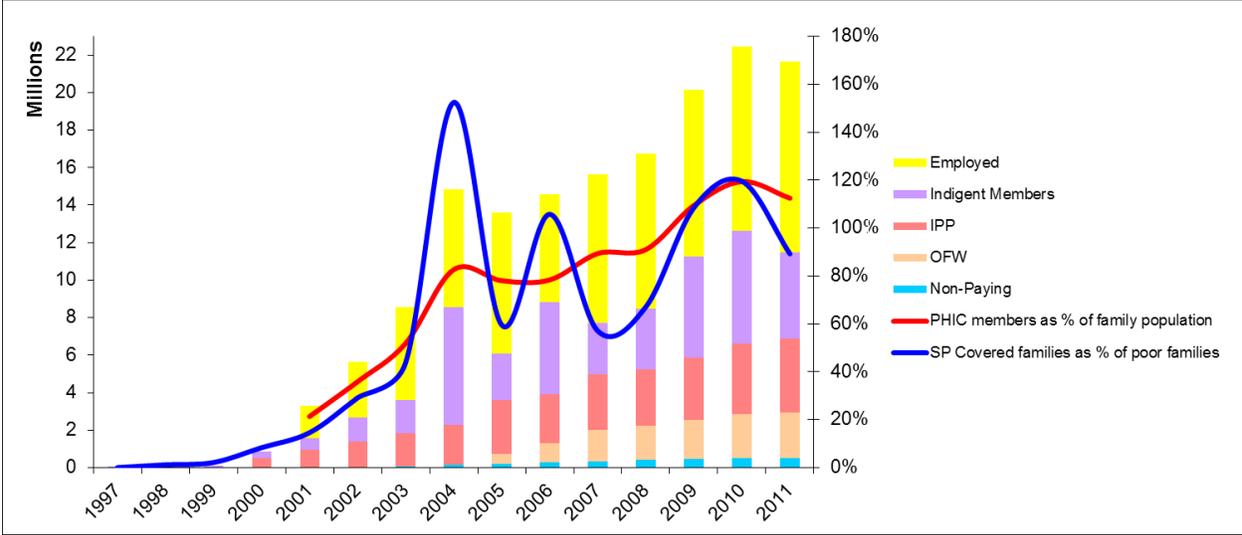
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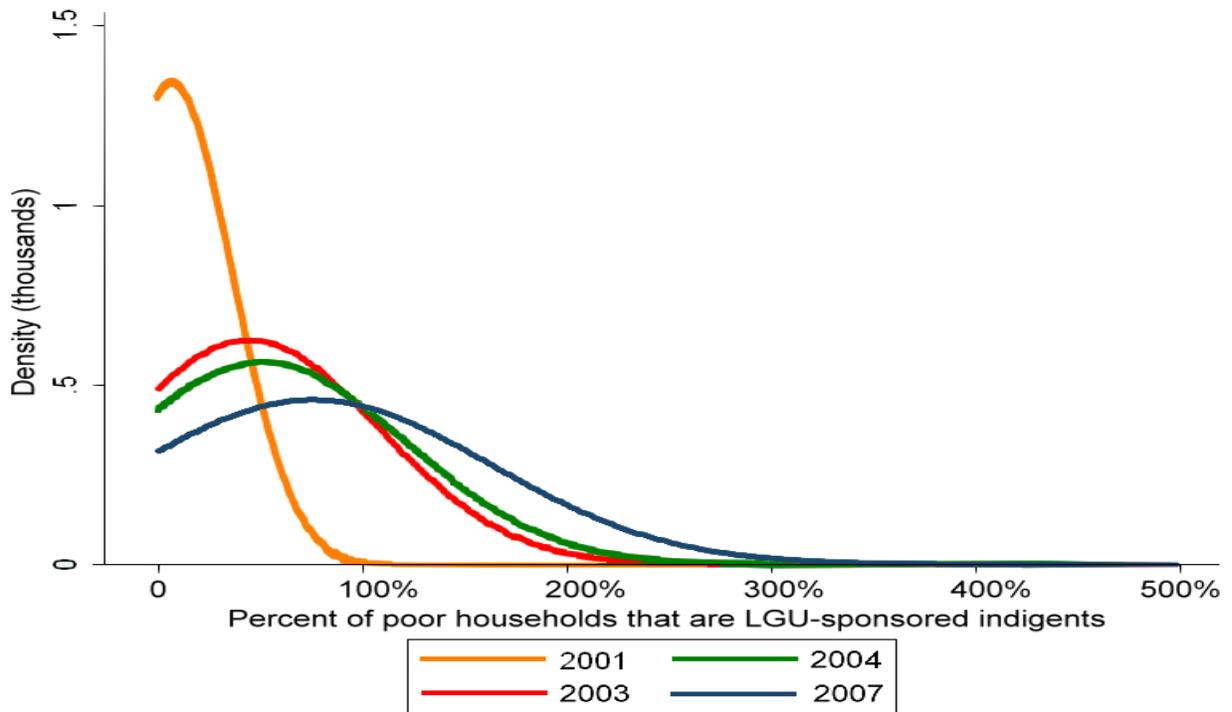
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**Figure 1. Number of NHIP beneficiaries, 1997-2011**



Source of raw data: Philippine Health Insurance Corporation.

**Figure 2. Distribution of local governments by proportion of poor households enrolled in the NHIP, 2001-2007**



Sources of raw data: Philippine Health Insurance Data, National Statistics Office, and National Statistical Coordination Board.

**Table 1. Variable definitions**

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Variable	Variable Definition / remarks
LGU-sponsored coverage rate	Ratio of SP members enrolled by the LGU to number of poor families
Other expenditures1	Total expenditures of the local government net of SP premium payments, per capita (in 2001 prices)
Other expenditures2	Total expenditures of the local government net of SP premium payments and expenditures on general public services, per capita (in 2001 prices)
Last term	=1 if incumbent mayor is on his/her third consecutive term in office
Dynasty	= 1 if incumbent mayor is related by blood or marriage to a previous or current mayor, governor or member of Congress, in the same province
Last term_dynasty	Interaction of Last term and Dynasty
Yardstick	Ave SP coverage rate for all other local governments in the provinces.
Urban	=1 if urban, 0 otherwise
Premium	Premium share of the LGU per indigent (2001 and 2004 based on old premium schedule, 2007 based on new premium schedule)
Years of SP participation	Cumulative number of years with positive SP enrolment
SP coverage by national government in 2007	Number of SP members enrolled by the national government in 2007
SP coverage by national government in 2004	Number of SP members enrolled by the national government in 2004
SP coverage by other sponsors	Number of indigents enrolled by legislative or private sponsors
Real income per capita	Total local government revenues per capita (in 2001 prices)
Year 2004	=1 if year is 2004, 0 otherwise
Year 2007	=1 if year 2007, 0 otherwise

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**Table 2. Summary Statistics, full sample**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
LGU-sponsored coverage rate	4431	0.43	0.89	0	19.03
Other expenditures 1 (real per capita)	4431	8.98	8.41	0.65	308.00
Other expenditures 2 (real per capita)	4431	4.27	4.68	0	184.03
Last term	4431	0.24	0.43	0	1
Dynasty	4431	0.24	0.43	0	1
Last term_dynasty	4431	0.05	0.21	0	1
Urban	4431	0.08	0.27	0	1
Premium	4431	389.11	218.44	118.80	600.00
Years of SP participation	4431	2.64	2.45	0	10
Premium_years of SP participation	4431	1323.25	1455.91	0	6000.00
SP coverage by national government in 2007	4431	86.36	812.20	0	31666.00
SP coverage by national government in 2004	4431	989.13	2628.15	0	59506.00
SP coverage by other sponsors	4431	144.28	513.47	0	13499.00
Real income per capita	4431	9.78	9.47	1.60	387.22
Yardstick	4431	0.43	0.58	0	3.87
Year 2004	4431	0.34	0.47	0	1
Year 2007	4431	0.32	0.47	0	1

**Table 3. Summary Statistics, sub-sample for LGUs with less than two years of SP participation**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std.Dev.</b>	<b>Min</b>	<b>Max</b>
LGU-sponsored coverage rate	1795	0.04	0.21	0	3.66
Last term	1795	0.18	0.38	0	1
Dynasty	1795	0.24	0.43	0	1
Last term_dynasty	1795	0.03	0.18	0	1
Yardstick	1795	0.10	0.15	0	1.76
Urban	1795	0.06	0.24	0	1
Premium	1795	271.19	222.28	118.80	600.00
SP coverage by national government in 2007	1795	6.68	139.24	0	4939.00
SP coverage by national government in 2004	1795	519.21	2129.61	0	59506.00
SP coverage by other sponsors	1795	40.63	233.80	0	4436.00
Real income per capita	1795	7.99	6.13	1.60	82.61
Year 2004	1795	0.16	0.36	0	1
Year 2007	1795	0.06	0.24	0	1

**Table 4. Summary statistics, sub-sample of LGUs with just one year of SP participation**

Variable	Obs.	Mean	Std. dev.	Min.	Max.
LGU-sponsored coverage rate	253	0.28	0.49	0	3.66
Last term	253	0.19	0.39	0	1
Dynasty	253	0.25	0.43	0	1
Last term_dynasty	253	0.04	0.19	0	1
Yardstick	253	0.18	0.24	0	1.76
Urban	253	0.09	0.29	0	1
Premium	253	311.43	234.46	118.80	600.00
SP coverage by national government in 2007	253	25.47	201.11	0	2163.00
SP coverage by national government in 2004	253	344.49	1278.49	0	10402.00
SP coverage by other sponsors	253	52.25	280.62	0	2836.00
Real income per capita	253	8.69	5.35	3.09	35.79
Year 2004	253	0.13	0.34	0	1
Year 2007	253	0.17	0.38	0	1

**Table 5. Summary statistics, sub-sample of LGUs with more than a year of SP participation**

Variable	Obs.	Mean	Std. dev.	Min.	Max.
LGU-sponsored coverage rate	2636	0.70	1.06	0	19.03
Last term	2636	0.28	0.45	0	1
Dynasty	2636	0.24	0.43	0	1
Last term_dynasty	2636	0.06	0.23	0	1
Yardstick	2636	0.65	0.65	0	3.87
Urban	2636	0.09	0.28	0	1
Premium	2636	469.41	175.10	118.80	600.00
Years of SP participation	2636	4.34	1.69	2.00	10.00
Premium_years of SP participation	2636	2194.43	1294.65	237.60	6000.00
SP coverage by national government in 2007	2636	140.62	1043.35	0	31666.00
SP coverage by national government in 2004	2636	1309.12	2876.08	0	58246.00
SP coverage by other sponsors	2636	214.86	627.48	0	13499.00
Real income per capita	2636	11.00	11.02	2.02	387.22
Year 2004	2636	0.46	0.50	0	1
Year 2007	2636	0.50	0.50	0	1

**Table 6. Regression for LGU-sponsored coverage rate of the poor, by sample**

Independent variables	Full Sample	Sub-sample for newly participating LGUs (years < 2)	Sub-sample for newly participating LGUs (years =1)	Sub-sample for old LGU participants (years >1)
	(Panel estimates)	(OLS estimates)	(OLS estimates)	(Panel estimates)
Last term	0.06612* (0.04)	-0.00071 (0.01)	-0.06434 (0.06)	0.09804* (0.06)
Dynasty	-0.04163 (0.04)	0.00282 (0.01)	-0.02438 (0.06)	-0.15484 (0.11)
Last term_dynasty	-0.07934 (0.05)	-0.00126 (0.02)	0.08767 (0.10)	-0.0807 (0.08)
Yardstick	0.85401*** (0.05)	0.57913*** (0.15)	1.01013*** (0.23)	0.81093*** (0.09)
Urban	0.41762** (0.20)	0.05281 (0.04)	0.29823* (0.17)	0.67376* (0.38)
Premium	0.00057*** (0.00)	-0.00004** (0.00)	-0.00035*** (0.00)	0.00038 (0.00)
Years of SP participation	0.15374*** (0.02)			0.20693* (0.11)
Premium_years of SP participation	-0.00021*** (0.00)			-0.0001 (0.00)
SP coverage by national government in 2007	-0.00003*** (0.00)	0.00007 (0.00)	0.00007 (0.00)	-0.00005*** (0.00)
SP coverage by national government in 2004	-0.00002*** (0.00)	0 (0.00)	-0.00004 (0.00)	-0.00002*** (0.00)
SP coverage by other sponsors	-0.00001 (0.00)	-0.00001 (0.00)	-0.00003 (0.00)	0.00001 (0.00)
Real income per capita	0.01188*** (0.00)	0.00238 (0.00)	0.01914** (0.01)	0.01116*** (0.00)
Year 2004	-0.13541*** (0.03)	-0.07963*** (0.03)	-0.07672 (0.12)	-0.36512** (0.16)
Year 2007	-0.26172*** (0.03)	-0.08291*** (0.02)	-0.27167*** (0.05)	-0.86817*** (0.22)
Constant	-0.27966*** (0.04)	-0.01278 (0.02)	0.09039 (0.10)	-0.21722 (0.24)
Fixed Effects	YES <sup>a</sup>			YES <sup>a</sup>
R-squared	0.404	0.159	0.329	0.196
N	4431	1795	253	2636

Notes: Figures in parentheses are robust standard errors.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

<sup>a</sup> The results of the Hausman test rejects the null hypothesis of a random effects model at  $p < 0.01$ .

**Table 7. Regression for LGU's other expenditures, full sample, panel estimates**

Independent variables	Other expenditures1	Other expenditures2
Last term	-0.05382 (0.07)	0.00808 (0.05)
Dynasty	0.09055 (0.12)	0.10633 (0.10)
Last term_dynasty	-0.13162 (0.14)	-0.1654 (.014)
Yardstick	-0.0623 (0.10)	-0.14796** (0.07)
Urban	0.18608 (0.123)	0.2903 (0.19)
Premium	0.00042 (0.00)	0.00002 (0.00)
Years of SP participation	0.13222** (0.06)	0.0506 (0.05)
Premium_years of SP participation	-0.00032*** (0.00)	-0.00018* (0.00)
SP coverage by national government in 2007	-0.00006 (0.00)	-0.00004 (0.00)
SP coverage by national government in 2004	0.00002 (0.00)	-0.00001 (0.00)
SP coverage by other sponsors	0.00009 (0.00)	0.00011 (0.00)
Real income per capita	0.79631*** (0.01)	0.47344*** (0.01)
Year 2004	-0.35566*** (0.13)	0.02926 (0.10)
Year 2007	-0.04052 (0.18)	-0.04686 (0.14)
Constant	1.2119*** (0.12)	-0.24828** (0.11)
Fixed Effects	YES <sup>a</sup>	YES <sup>a</sup>
<i>R</i> -squared	0.903	0.83
<i>N</i>	4431	4431

Notes: Figures in parentheses are robust standard errors.

\*p<0.10, \*\*p<0.05, \*\*\*, p<0.01.

<sup>a</sup>The results of the Hausman test rejects the null hypotheses of a random effects model at p<0.01.