

Very Preliminary, not for circulation

Decentralization and Corruption in the Philippines

Omar Azfar and Tugrul Gurgur^{*}

^{*} omar@iris.econ.umd.edu; tgurgur@worldbank.org

I. Introduction

When Corazon Aquino toppled the infamously corrupt regime of Ferdinand Marcos in the democratic revolution of 1986, she promised to follow the democratization with a far-reaching devolution of political and administrative authority to the local level. The revolutionary government made good on its promise and the Local Governments Act of 1991 devolved both political authority and administrative control of many health services and other subjects to the provincial and municipal level. In this paper we examine the causes and consequences of corruption at the local level in the Philippines with a focus on health services.

The devolution of authority in the Philippines was serious¹. The Local Government Code enacted in 1991 and implemented in 1992-3 significantly increased the responsibilities and resources of sub-national governments: 77 provinces, 72 cities, 1526 municipalities and over 40,000 barangays². To defray the cost of devolved expenditures, Section 284 of the Local Government Code provided for 40 percent of central government revenues collected three years before to be transferred back to sub-national governments as internal revenue allotments (IRAs)³. Provinces and cities received 23 percent each of the total transfer, municipalities 24 percent and barangays 20 percent. Provinces also received limited new taxing authority over local natural resource exploitation, agriculture, and other business activities. In addition, the Local Government Code mandated the creation of local democracies at each level, with regular elections being held for both executives and legislative bodies. The combination of the devolution of real expenditure authority, substantial transfers to local governments so they can implement many of their mandates, and the creation of a vibrant local democracy makes it fair to call the decentralization in the Philippines in the early 1990's a serious devolution.

The Philippines continues to be a highly corrupt country ranked 69 out of 90 nations by Transparency International. The President has recently been impeached on a corruption count and removed from office in a case that involves local level corruption

¹ The next few paragraphs borrow heavily from Matheson and Azfar 1999. See Meagher 2000 for a detailed institutional analysis of decentralization in the Philippines.

² These numbers change as new units are created or old ones combined (Miller 1997)

with kickbacks passed up to the Presidency. Much of the corruption in the Philippines does appear to be at the local level, of the 336 impending corruption cases, 49% are against municipal mayors- the level of government which is our focus in this study (Batalla 2000). Many observers have stated that corruption is the root cause of continued poverty in the Philippines. All this makes our study of local level corruption in the Philippines highly relevant in a country specific context.

In addition studies such as this one might have global relevance in terms of the increasingly important question of the determinants of local government performance and the effect of corruption on health service delivery. However, we acknowledge the difficulty of generalizing from one possibly unrepresentative country, and would prefer to replicate this study in other countries with a large number of local governments before making global prescriptions.

It is important to point out one related question that our study does not answer: the impact of decentralization on corruption. The decentralization in the Philippines did coincide with an improvement in corruption assessments by the International Country Risk Guide produced by Political Services International (Figure 1), but this could be due to any number of reasons (there was also a change of government around this time), and its difficult to say anything more. There is reportedly more corruption at the national level according to our respondents –the most reliable respondents for this comparison may be private school principals (Table 1)- but this could easily be due to there being more opportunities for corruption at the national level which controls more than 80% of Philippine finances. As we can see in Figure 2, the extent of authority in different branches of government does correspond with levels of corruption, though the extremely small sample size does not allow any authoritative statements. We examine this issue below in some detail using variation across municipalities.

This paper is structured as follows. We begin by describing the data. In particular we examine in detail the quality of the data on corruption and are reassured by a number of correlations across samples. The corruption perceptions of households, municipal administrators and municipal health officers are all correlated with each other and the

³ The large discrepancy between the 40% revenue allotments and the 12.6% of devolved expenditures can be explained in part by the three-year lag and unbalanced budgets.

corruption perceptions of households are highly correlated with the corruption perceptions of other households in their municipality.

Emboldened by these findings, we begin to examine first the causes and then the consequences of corruption. We find strong evidence that voting in local elections is related to lower corruption and weaker evidence that reading national newspapers is related to less corruption. However reading local newspapers has an apparently perverse effect on corruption.

We also some find evidence for the hypothesis that increases in discretion enjoyed by local governments lead to increases in local level corruption (Myrdal 1968, Klitgaard 1988). More extensive decentralization, which would increase discretion at the local level while decreasing it at the national level, may merely shift opportunities for corruption and corruption itself from the central to the local government. Taking the example of the scandal that led to the removal of president Estrada, had the local government not required the assent of someone at the center to indulge in the alleged improprieties it seems likely that money would still have changed hands and the gambling allowed, but the money wouldn't have been shared with the center.

We next turn to the consequences of corruption. Here we use several different outcome measures from different sources. We use answers to a test of knowledge question we administered to officials; households reports of waiting time and their satisfaction with government health services; and increases in immunizations and decreases in infectious diseases. In each case we find the expected negative, and often significant, effect of corruption on performance. We also find a number of interesting interrelationships between performance variables like the importance of knowledge of immunizations for other reductions in measles and other infectious diseases. Our results for education are slightly weaker. We do find a significant negative effect on household assessments of satisfaction with schools but only an insignificant effect on test cores. It is possible however that this last insignificant result is caused by the large number of missing observations for test scores.

In summary, we find that political disciplines on local governments, especially voting in local elections, has a negative effect on corruption and that adjustability might increase corruption. In terms of the consequences of corruption we find that municipal level corruption has a consistently negative and often significant negative impact on the

delivery of primary health services in the Philippines. We briefly analyze the impact of corruption on educational delivery and find some weak evidence that corruption does adversely affect education.

We describe the data in section 2. We analyze the causes of corruption in section 3 and turn to consequences in section 4. A conclusion follows.

II. Data Description.

Our data is based on eight surveys undertaken in 80 Philippine municipalities in the Spring of 2000. We surveyed 1100 households, 80 municipal administrators, health officials and education officials, 19 provincial administrators, health officials and education officials, 160 government health facility workers and 160 school principals – some private (49) and some public (111)-. The sample of households represents 19 provinces, 80 municipalities within them, and 301 barangays within those 80 municipalities. Households can be matched to either schools or health facilities at the barangay level.

We begin by discussing our central variable of interest –corruption. We define corruption as the abuse of office for personal gain. We prefer this definition to the conventional “abuse of public office for private gain” because that definition unhelpfully assumes away the possibility of corruption in the private sector⁴. Both our intuitions, and those of private school principals we interviewed in the Philippines, suggest that (say) a teacher taking a bribe to give a better grade, is corrupt in either the public or private sector- and we follow that intuition here. However, except for the public private school comparison, most of what we do in this paper is the analysis of public sector practices and performance, and for most of our practical purposes the two definitions are identical.

Corruption manifests itself in several ways: through bribery, the sale of jobs, shirking, and the theft of funds and supplies. We asked questions about all these improprieties in the surveys of government officials. Results are presented in Table 1. There are reports of all kinds of corruption in each kind of government office –with the sole exception of the theft of supplies in the municipal education (DECS) office. Most

kinds of corruption are more prevalent in the municipal administrators office than in other offices, perhaps due to the administrator's office exerting more authority and thus having more opportunity to extract rents (see Figure 2, more on this subject below). Nineteen percent of municipal administrators stated that there were cases of bribery in their office in the last year and a full 32% that there were instances of the theft of funds. By contrast only 2.4% of municipal health officers (MHO's) reported incidents of bribery in their office; however 16.5% did report the theft of funds.

In terms of the public private comparison for schools there seems to be evidence of a small amount of corruption in both private and public schools with, if anything, more corruption in the private sector. It is difficult to say anything concrete with such sparse evidence but perhaps we can suggest that private and public sector practices be examined in some detail before privatization is proposed as a remedy for corruption.

We next created an index of corruption from its various components. This index is correlated at 0.5 or above with most of its components for both the municipal administrator and the municipal health officer. Of course we would expect it to be correlated with its components simply by construction, but only at about $1/7 \sim 0.14$, as it has 7 components, not at 0.5 or above. These high correlations reflect positive correlations among the components of the index- which we do not list to conserve space. These correlations are the first sign that our index is measuring some coherent underlying variable.

We had also asked a general question on "how common is corruption in the municipal government" and if our index was a good measure of corruption we would expect it to be correlated with the answer to this question. In fact the indices are highly correlated with the answers to this general question at 0.32 (p-value=0.00) for administrators and 0.42 (p-value =0.00) for health officials.

While reassuring, correlations within surveys are not in themselves clear evidence of measuring some genuine underlying reality. Answers to different questions by the same person may suffer from individual specific bias, which would create a correlation between answers to different questions. If the different measures of corruption really measured corruption in the municipal government, we would expect the answers to be

⁴ Klitgaard's earlier book "Controlling corruption" (1988) used the definition "abuse of public office for private gain" and popularized that definition. His new book "Corrupt cities" (2000) uses the definition used here.

correlated across surveys. We would, in particular, expect the municipal administrators responses to be correlated with that of municipal health officers, as they are both responsible to the municipal government. The DECS officer is essentially a central government appointee so there is no presumptive reason to expect a correlation with corruption in the DECS office. We would also expect each public officials corruption perception to be correlated with household corruption perceptions. Indeed we find all these correlations: the administrator and health officers corruption indices are correlated with each other and with household corruption ratings. Because the municipal administrators' and municipal health officers' corruption perceptions are both likely to be noisy perceptions of one person, we constructed a "public officials corruption index" combining the answers of municipal administrators and municipal health officers. The resulting index is correlated at 0.28 (p-value=0.01) with household corruption perceptions.

How good is our measure of household corruption perceptions? One way to examine this is to regress the corruption perceptions of each household on the corruption perception of all other households in the municipality. This regression quoted below shows an impressive correspondence between household corruption perceptions and those of others (HH_i) in the municipality (t-stats below coefficients).

$$\text{Corruption}_{HH_i} = 4.71 + 0.971 \text{Corruption}_{HH_i} + 0.066 \text{Corruption}_{PO} \quad R^2=0.26$$

(2.79) (18.45) (0.89) N=1064

This highly significant coefficient, which is indistinguishable from 1, shows a strong correlation between the perceptions of different households in the municipality. It is, however, important to point out that a high coefficient could be generated by some shared bias among households. However the high correlation among households is an important piece of suggestive evidence about the quality of the corruption data, and taken together with correlations across surveys does suggest that our measures of corruption do measure some underlying reality.

While these statistical tests do suggest that the information we get from our respondents does capture some underlying reality, they do not provide any reassurance on the absence of respondent bias. In the same jurisdiction different respondents may give different assessments of the level of corruption because they like to complain (the "gripe"

factor), because they are frank (the “straight-talking” factor), because they have different definitions of corruption (following Bill Clinton we could dub this the “what is” factor), or because they are less likely to have heard of, or remember, corruption (following Ronald Reagan we could dub this the “recall” factor). All these differences would show up in respondents’ assessments of both local and national corruption. We should therefore be able to use assessments of national corruption –which is the same for everyone in our sample, and differences in it must, almost by definition, reflect some kind of perception bias- to clean our measures of local corruption of respondent bias. Different responses on other forms of social pathologies like social differences, within the same locality, may also capture “gripping” and “straight-talking” bias. Other factors like education and access to media may also influence perceptions of corruption.

To clean the assessments of local level corruption of respondent bias we ran a regression (Table 3) of assessments of local corruption on municipality dummies, assessments of national corruption and social differences; education, income and urban residence; and media access and use. Perceptions of national corruption were a highly significant predictor of perceptions of local corruption. The coefficient of 0.15 means that perception bias could account for 15% of the differences in the assessments of corruption. Assessments of social differences was also positively and significantly related to perceptions of local corruption, perhaps also capturing some “gripe” bias. Finally education was also a highly significant predictor of assessments of corruption, suggesting the existence of a “what is” bias–educated households may define corruption more broadly- or a “recall” effect. We then constructed our measure of household corruption assessments by taking the municipality means of the residuals of this regression. We repeated similar exercises to clean the perceptions of municipal health officers and municipal administrators using the regressions in Table 5. We found similar but weaker –perhaps because of the much smaller sample sizes- evidence of a perception bias among public officials.

We also constructed measures of other aspects of public sector performance and meritocracy, adjustability, accountability and capacity and discuss these below⁵:

⁵ An earlier draft of this paper contains tables that describe these variables in considerable detail. These tables, which were deleted from this draft to conserve space, are available from the authors upon request.

Our meritocracy variable was based on a number of subjective questions asked of the municipal health officer and the municipal administrator. As with corruption, there are presumptive reasons to suspect answers to subjective questions about meritocracy in hiring and promotions from senior officers who, after all, make these decisions. Indeed the base values on some responses seem improbably high –96-97 percent of promotion decisions are allegedly made on the basis of merit and quality of service. We also had no real way of checking the authenticity of the responses other than to note the positive but insignificant correlation (0.12 p-value=0.30) between the administrator and the health officer responses. For this reason, and because of an overlap with corruption, we tend to avoid using meritocracy in the following analysis but do use it as a robustness check for several regressions. Future replications of this study should survey at least two officers – one senior and one junior- in each office to generate more reliable data on sensitive management questions like meritocracy in hiring and promotions. This would also permit important tests to be carried out on the reliability of the data.

The next variable we examine is adjustability. Questions about adjustability are central to the study of local governments and to both positive descriptions and normative prescriptions about the extent of decentralization. The adjustability index is based on answers to questions about hiring, firing and resource allocation. The indices are again between 0 and 100. The mean values of 62 and 63 for the municipal health officer and the municipal administrator indicate they have significant but not complete control over hiring, firing and resource allocation. The indices are also highly correlated with the components (more than we would expect simply by construction) suggesting they are measuring some coherent concept. The correlation of 0.17 between the municipal administrator and the municipal health officer is also reassuring. However the most important reason for our willingness to believe in these numbers- and to a lesser extent those on capacity- is there is no compelling presumptive reason to disbelieve them. Public officials with real authority are likely to be proud of it, those without it likely to complain. In each case we would expect responses to match reality –admittedly imperfectly-.

The next variable of interest is accountability. This too has several dimensions: we use the frequency of audits and evaluations and the existence and enforcement of written targets to measure accountability. The frequency of internal audits is very high and the

frequency of external audits and evaluations is also quite high for both health and administrators' officers. Written targets exist in all municipalities and are reportedly enforced in 89% of them. The mean value of the accountability index is therefore quite high. The index is also highly correlated with its components suggesting it does capture some underlying reality. While we do have some concerns about the quality of the accountability data as public officials may not want to be frank about answers, our concerns are tempered by the objective phrasing of the questions. Respondents might feel less comfortable about explicit lies to a question like "Were you audited in the last year?" than they would to subjective questions like "How accountable is the municipal government?" or "How often does the best qualified person get the job?". (In other contexts, we do find that objective questions are less subject to bias: The subjective question about satisfaction with government health services seems to have a significant "gripe" bias but the more precise question on waiting time doesn't.)

We next turn to capacity. Capacity constraints are often cited as a key constraint to decentralization. However they do not appear to be too severe at the municipal or provincial level in the Philippines. We measured capacity as a combination of training, education and institutional resources and measured capacity at 67 out a possible 100 for the municipal administrators office and 77/100 for the health office. The high numbers on education reflect the fact that 77% of administration and health officers had completed college. This index too is highly correlated with its components but we would expect it to be correlated at about 0.33 simply by construction as it has only 3 components. There is no perceptible correlation between capacity at the administration and health office.

III. The Causes of Corruption

We now begin our examination of the causes of corruption. We examine the effects of basic demographic factors such as education, income and urban residence; federalist disciplines such as voting, media exposure and mobility; the level of discretion enjoyed by municipal administrators and health officers, and management practices in their offices.

We use three measures of corruption as our dependant variable. Household responses on corruption cleaned of perception bias using equation 3.1. Public officials

perceptions of corruption using answers to specific questions about different corrupt practices in the health and administration office, cleaned of perception bias using equations 5.1 and 5.2, and then combined into one index. We present results using each index because it is simplest to interpret the impact of an independent variable on a dependant variable when the two variables are based on the answers of different respondents. However, if both indexes are noisy measures of corruption, we could create a more precise measure of corruption by merging the two indices. This does raise concerns about respondent bias, as the dependant variable would then share a source with all independent variables, but because we have taken care to clean the data of perception biases we think these results are of some worth.

The regressions in Table 6 use municipal level data on the 80 municipalities we sampled. The first two equations 6.1 and 6.2 use household corruption perceptions as the measure of corruption. The first equation is a weighted least squares estimation with the weights equal to the number of observations in the municipality. This number doesn't vary much across municipalities making this equation quite similar to OLS. We quote robust standard errors. OLS is easy to interpret but is probably not the appropriate estimation method because of possible province level effects. The second equation 6.2 is a random effects estimation that explicitly takes these into account.

One well known hypothesis about corruption is that when public officials enjoy more discretion, they have greater opportunities to demand bribes, and may become more corrupt as a consequence. This idea dates back at least to Myrdal's excellent chapter on corruption and was formalized by Klitgaard's famous formula

$$\text{Corruption} = \text{Discretion} - \text{Accountability} + \text{Monopoly}$$

We begin with the first variable- discretion. Discretion is measured by adjustability as reported by public officials and therefore is best analyzed using the household level data as the dependant variable. We do find a positive effect of adjustability on corruption but it is only significant at 20%. The coefficient of 0.18 means that a one standard deviation increase in adjustability leads to an increase in corruption of 0.18, or 1/6th of a standard deviation. While the coefficient is not significant at conventional levels in this equation it does become significant when the combined corruption index is used and

survives a number of robustness checks described below. As the scatter plot at the bottom right hand corner of Figure 3 shows there is no one observation that is driving this relationship between adjustability and corruption, and removal of the one influential observation on the far left would make the relationship much stronger. Bureaucratic accountability as proxied by the public officials responses on audits and evaluations has no perceptible effect on corruption but political accountability –see below- seems important.

Of the federalist disciplines, four -voting in national and local elections, and reading local and national newspapers – represent accountability and mobility should proxy for monopoly. Voting in local elections has a clear negative impact on corruption, reading national newspapers has a less robust impact on corruption. Reading local newspapers appears to increase corruption! While we could tell a plausible story to explain this –reports on corruption raise local newspaper sales- we acknowledge this is *ad hoc* and unsatisfying. These federalist variables are constructed using the household data, and their effect is best analyzed using the public official data, which we do next.

Equations 6.3 and 6.4 use public officials’ reports on corruption as the dependant variable. The significance of most variables falls perhaps due to more noise in the dependant variable –the R^2 drops from 0.36 to 0.26-. Voting in local elections is only significant at 20%. Reading national newspapers also appears to reduce corruption, the coefficient is significant at 10% using weighted least squares and remains significant at 20% if random effects is used. The effect of reading local newspapers becomes insignificant but remains of the wrong sign. The effect of adjustability becomes imperceptible, but this may be due to some residual “gripe” factor biasing the coefficient downwards –public officials who like to complain would complain about both corruption and about their lack of authority-.

One possible reason for weak and insignificant results in equations 6.1-6.4 is measurement error in the dependant variable. Do our results become stronger if we use the “best” measure of corruption we can construct with our data? To do this we create a corruption index combining household and public official responses. The fit of regressions 6.5 is in fact better than equations 6.1 and 6.3 and fit of the random effects equation 6.6 is better than 6.2 and 6.4.

Voting in local elections is highly significant ($t=2.72$, $p\text{-value}=0.008$) in the weighted least squares equation, and remains significant at 5% in the random effects specification. This could be an interesting piece of evidence on the relationship between democratization and corruption. Reading national newspapers is significant at 5% in WLS but only at 20% if random effects are used. Adjustability is now significant at 10% in weighted least squares but only at 20% if random effects are used. Thus all the results do seem a little stronger if the “best” measure of corruption is used.

There is one negative result worth talking about. We could find no evidence of the impact of “monopoly” on corruption. The potential mobility of households as measured by a response to the question “Would you move if the quality of government health services was poor?” has no perceptible effect in any of the six regressions 6.1-6.6.

We next perform a series of robustness checks on our results in Table 7. OLS and WLS both might give undue weight to outliers if error terms are not normally distributed. We therefore estimated a robust regression (7.1), which is more appropriate for many other distributions of the error terms. Two variables of interest, voting in local elections, and adjustability at the local level actually rise –a little- in significance, reading national newspapers drops slightly.

Next we added capacity and meritocracy to the equation (regressions 7.2 and 7.3). We hadn’t done this in the core specification because the variables may be endogenous. In fact capacity is significant but we don’t want to interpret the coefficient or significance level literally because of endogeneity concerns. Meritocracy is not significant. Adding these variables to the equation reduces only slightly the significance levels on our variables of interest. When we drop the two variables that never have a t-statistic above 1 (migration and accountability), most of the significance levels on the variables of interest actually rise.

Finally, we were concerned that some particularly optimistic reports on the absence of corruption in certain municipalities may be driving our results. We therefore “truncated” or “flattened” the corruption variable by using a non-linear transformation

$$\text{Corruption}(\text{truncated}) = \max(-10, \text{Corruption})$$

When we use this variable as the dependant variable, the results change only imperceptibly. Voting in local elections remains significant at 1%, and reading national newspapers and adjustability remain significant at 10%.

In summary we found intuitive and robust results linking low levels of corruption to voting in local elections and reading national newspapers. These results were consistently significant for voting in local elections and often marginally significant for reading national newspapers. For another variable of interest, the level of discretion or adjustability enjoyed by local officials, we found the theoretically predicted positive relationship between adjustability and corruption. Reading local newspapers however had a counterintuitive positive effect on corruption perceptions. Finally, monopoly as measured by the potential mobility of households had no perceptible effect on corruption.

IV. The Consequences of Corruption

We now turn to the effect of corruption on health and education services. We use several different measures of health services provided by local governments: knowledge of required immunizations; household responses on satisfaction and waiting time; and answers to questions on increases in immunizations and decreases in infectious diseases asked of public officials. We find an often significant negative impact of corruption on these three different measures of health outcomes. Last we examine the effect of corruption on education outcomes. We use two different measures of outcomes test scores and household's subjective ratings of primary education. We find a negative effect of corruption on education in each case and the effect is significant for the subjective rating.

IV.1. Corruption and health knowledge

First we use an objective, if imperfect, measure of health performance: knowledge of required immunizations. This is based on responses to test of knowledge question we administered to health officers as a part of our survey. Immunizations for measles, BCG (typhoid), DPT (diphtheria) and OPV (polio) are required for infants in the Philippines. Our variable is the number of these diseases mentioned by the health officer interviewed at the health facility. We did not subtract points for mentioning other vaccinations –a number included Hepatitis in their responses.

In Table 8 we estimate the determinants of correct responses to the knowledge question. This equation is estimated at the barangay level. Because the measure is more

objective than other measures we use, we examine the effects of both household and public officials perceptions of corruption on the knowledge variable. The effect of household corruption perceptions is significant in weighted least squares (regression 8.1) but only marginally significant if the random effects estimator is used (regression 8.2). The effect of public officials perceptions of corruption are clearer and highly significant (at 1%) in both the WLS and the random effects estimation. Unsurprisingly if we use the combined index on corruption, the effect remains highly significant at 1%. The coefficient of -0.23 means that a one standard deviation increase in corruption reduces knowledge of required immunizations by 5.5 or $1/4^{\text{th}}$ of a standard deviation.

Income was also significant in the regression were income, with more correct responses in municipalities with richer households. Delays in salary payments at the municipal –but not the facility- level also seemed to adversely affect knowledge, perhaps due to the drain of the most qualified personnel.

IV.2 Corruption, waiting time and household satisfaction ratings

Next we asked the users of government services –households-, about both their satisfaction with government services and a somewhat more precise question on waiting time. Reassuringly the answers to these questions are negatively correlated with each other and we also use an index composed of both questions. We created these indices on satisfaction and waiting time after filtering out the propensity to complain using equations 4.1 and 4.2. Perceptions of national corruption, which are meant to capture the “gripe” bias are only significant for the satisfaction question. This suggests that it might be better to ask precise rather than subjective questions to minimize respondent bias. Of course precise questions may capture less relevant information, so it may be best to ask both precise and general questions, which is what we do. The best measure may well be based on both measures and we construct a third measure based on both satisfaction and waiting time. If the measure were better we would expect the equation predicting it to have a better fit, indeed the fit of the equation for the composite index is better than for either component (0.32 rather than 0.22 or 0.29).

We present the results on the determinants of performance measures based on household responses in Table 9. These equations are estimated at the barangay level. This is the best way to estimate the equation because households were asked to rate the

quality of health services in their barangay health facility. Out of a potential 160 barangays in which we surveyed health facilities, we lost 27 due to missing values on some variable, which left us with 133 observations with which to estimate this equation.

We find that corruption has a negative but insignificant –it is only significant at 20% in regressions 9.1, 9.3 and 9.4- effect on both satisfaction and waiting time. Corruption does however have a marginally significant effect on the composite index based on both satisfaction and waiting time in both the weighted least squares and the random effects equation. Another variable which appears to matter is the supply of medicines which suggest unsurprisingly that decisions at the municipal level or higher are relevant to the quality of services that health facilities can provide. The number of personnel however has a negative and significant effect perhaps reflecting nepotism and over-employment in the government. Alternatively, more personnel could proxy for greater demand for health services in densely populated areas, which may lead to poorer service.

We conducted a series of robustness tests on our findings which are presented in some detail in an earlier draft⁶. The significance of our findings largely remains unchanged- in fact the results become clearer if we use a robust regression. In summary we can say that corruption has a marginally significant and robust effect on the quality of health services as perceived by households.

IV.3 Corruption, immunization rates and disease incidence.

Finally we turn to what may in principle be the best measures of health services – increases in immunization rates and decreases in infectious diseases. However, our data are unfortunately not “hard data” but rather based on the reports of health officers scaled between 1 (fell a lot) and 5 (increased a lot).

We estimated equations of both changes in immunization rates and disease incidence for measles, diphtheria, tuberculosis and hepatitis. The equations on diphtheria, tuberculosis and hepatitis had a poor fit and the F test of joint significance of all regressors was insignificant. This is conceivably due to poor data on the dependant variable, though other explanations are possible. Corruption had the expected sign in most of these regressions but like other variables was insignificant. As with other

⁶ These findings are available from the authors upon request.

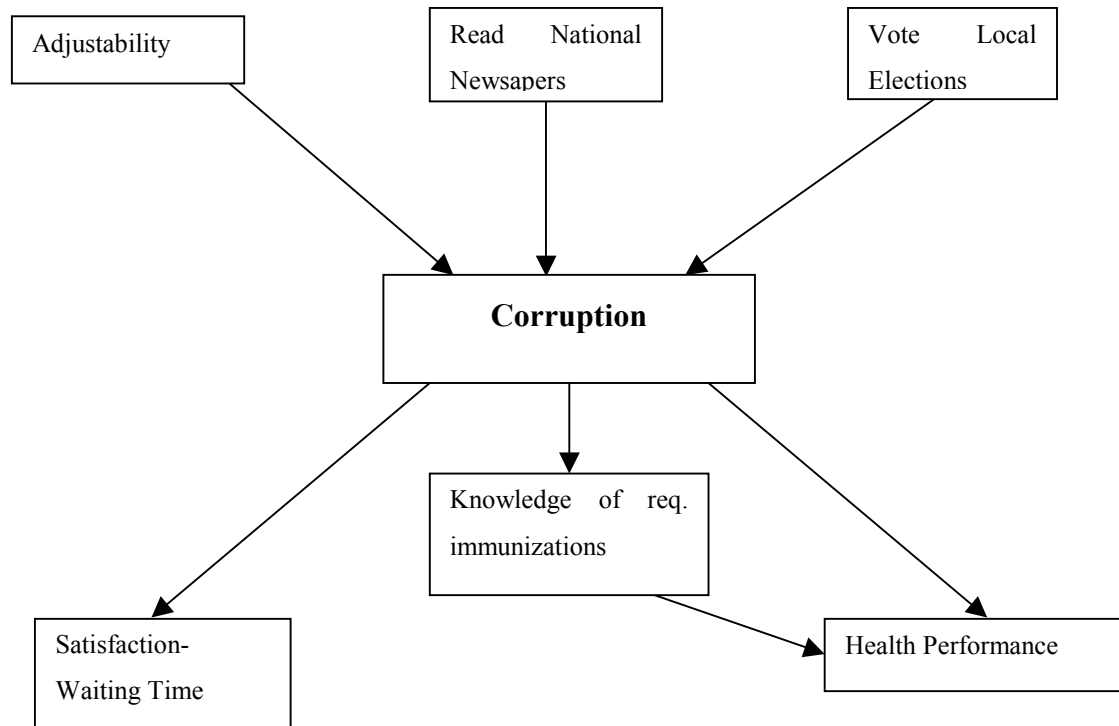
variables we have used in this paper, we would expect an index made from several noisy variables to perform better than each component. We therefore create a composite index of health performance and use that in the regressions.

We use three variables in this set of regressions presented in Table 10. Increases in immunizations, decreases in measles and a composite index composed of increases in immunizations, and decreases in measles, hepatitis, tuberculosis and diphtheria. This regression is run at the municipality level- we lose two observations from a potential 80 due to some missing variables. In each regression we use household's corruption perceptions following our preference for using dependant and independent variables from different sources to minimize perception bias. Corruption has a marginally significant effect retarding increases in immunization but this effect is only significant at 20% in the random effects specification. The effect of corruption on decreases in measles is significant at 10% in both the WLS and the random effects regression but corruption is only significant at 20% in the regression using the composite index.

Corruption also appears to have an effect on health outcomes through knowledge of required immunizations by health officials. We earlier found that both household and public official perceptions of corruption had a negative effect on knowledge; here we find that knowledge does improve outcomes. Knowledge is insignificant in the regression of increases in immunizations but it is highly significant in the regressions of decreases in measles (at 5%) and the regression of the composite health index (at 1%). In summary we find robust and sometimes significant evidence of a direct impact of corruption on health outcomes like increases in immunization and decreases in measles. For decreases in measles we find strong evidence of an indirect effect of corruption on improvements in outcomes through better knowledge among health center staff of required immunizations. Figure A below shows the direct and indirect impact of corruption on health outcomes.

We might also be interested in whether federalist disciplines on local government lead to an improvement in the quality of service through mechanisms other than the level of corruption. We find no evidence of such an effect. Voting in local elections, reading local newspapers and listening to the radio have no perceptible effect on measures of health performance. Reading national newspapers has a perverse negative effect.

Figure A. The Causes and Consequences of Corruption in the Philippines



IV.4 Corruption and education outcomes

We next analyze the effect of corruption and other factors on education delivery. We use two measures of education outcomes, the first is the average pupil score on the national elementary attainment test (NEAT) and the other is a subjective rating by households of their satisfaction with the quality of education. The measure of corruption used here is from the responses of the municipal education (DECS) officer.

The media index – a combination of the frequency of using media and using media as the primary source of information on politics- appears to have a positive impact on NEAT scores. However, there are serious concerns about causality –people might read newspapers more often in area with better education- and the result should not be taken literally.

Social differences –an index composed of the answers to questions about whether differences in ethnicity, religion, landholdings etc. divide people- has a negative impact on NEAT scores. Corruption has a barely perceptible impact on NEAT scores.

For the subjective measure of satisfaction with education, however, corruption has a clear negative impact on satisfaction with schools. A one standard deviation increase in corruption in the DECS office reduces satisfaction by almost 1/3 of a standard deviation – a significant effect-. Taken together the results from the two sets of regressions using different independent variables with one significant and one insignificant negative impact on corruption suggest that corruption does in fact undermine education delivery in the Philippines.

V. Summary

In this paper we used data from 80 municipalities in the Philippines to assess the causes and consequences of corruption in local governments. Our findings were that voting in local elections and reading national newspapers appeared to act as effective corruption reducing disciplines on local governments. Reading local newspapers appeared to have the paradoxical effect of increasing corruption. Adjustability or discretion at the local level appeared to be related to more corruption as theory predicts, but the effect was barely perceptible.

Our results on the consequences of corruption showed clearly that corruption undermines the delivery of health services in the Philippines. We used four different measures of the quality of health services knowledge of required immunizations, households assessments of the quality of health services, improvements in immunization rates, and reductions in specific diseases. In each case we found corruption had the expected negative effect on the quality of health services, and the effect was often significant.

Our results on education were similar but slightly weaker. We used two measures for the quality of education: test scores and household assessments of the quality of education. Corruption appeared to have a clear negative impact on household assessments of quality, but we had a large number of missing observations for test scores,

and perhaps as a consequence the effect of corruption on test scores, while negative was not significant.

Taken together our results do suggest that corruption undermines the delivery of health and education. This complements cross-country findings on the subject, and adds to the expanding list of ways corruption undermines welfare.

Bibliography

Batalla, Eric, The Social Cancer: Corruption as a Way of Life, Philippine Daily Inquirer, August 27, 2000.

Department of Interior, Philippines, *Local Government Code of 1991*, Republic Act No. 7160, Department of Interior and Local Government, Manila, 1991.

Klitgaard, Robert, *Controlling corruption*, University of California Press 1988.

Klitgaard, Robert, Ronald MacLean-Abaroa, and H. Lindsey Parris *Corrupt Cities: A Practical Guide to Cure and Prevention*, ICS Presss 2000.

Knack, Stephen and Omar Azfar, Are Larger Countries Really More Corrupt? World Bank, PRWP No. 2470.

Manasan, Rosario, "Local Government Financing of Social Service Sectors in a Decentralized Regime: Special Focus on Provincial Governments in 1993 and 1994", Discussion Paper 97-04, Philippine Institute for Development Studies, Manila 1997.

Miller, Tom, "Fiscal Federalism in Theory and Practice: The Case of the Philippines", Economist Working Paper Series, USAID, 1997.

Oates, Wallace, *Fiscal Federalism*, London, Harcourt, Brace, Jovanovich, 1972.

Transparency International, 2000. Corruption Perceptions Index, <http://www.transparency.de/documents/cpi/2000/cpi2000.html>

Tresiman, Daniel, The Causes of Corruption, Journal of Public Economics, June 2000.

Table 1: Corruption Table

	All Officials	Mun. Health	Mun. Adm.	Mun. DECS	Public Schools	Private Schools
Mean Statistics						
Proportion of People Who Get Paid but Don't Show Up		2.56	6.33	0.00	-	-
Paid to Obtain Jobs		2.95	3.80	5.00	8.87	3.40
Theft of Funds Happened in the last year		16.45	31.65	1.25	1.83	4.08
Theft of Supplies Happened in the last year		16.23	15.38	0.00	1.83	6.12
Bribery Happened in the last year		2.53	18.99	1.25	0.92	4.08
Frequency of Theft of Funds		3.80	9.09	14.67	1.53	1.36
Frequency of Seeking Informal Payments		4.49	10.68	12.00	0.92	2.04
Corruption in the National Government		74.00	69.23	62.77	66.35	80.85
Corruption in the Provincial Government		59.43	43.86	37.96	50.65	69.57
Corruption in the Municipal Government		43.42	29.32	24.79	36.86	62.32
Corruption in the Baranguay Government		38.96	28.85	22.22	24.76	48.89
Corruption Index		6.95	13.88	4.64	2.65	3.51
Correlation between Corruption Index and Other Corruption Measures						
Proportion of People Who Get Paid but Don't Show Up		0.44*	0.46*	-	-	-
Paid to Obtain Jobs		0.43*	0.15	0.54*	0.61*	0.29*
Theft of Funds Happened in the last year		0.61*	0.85*	0.25*	0.59*	0.89*
Theft of Supplies Happened in the last year		0.64*	0.83*	.	0.39*	0.88*
Bribery Happened in the last year		0.56*	0.86*	0.34*	0.51*	0.89*
Frequency of Theft of Funds		0.55*	0.58*	0.87*	0.32*	0.25
Frequency of Seeking Informal Payments		0.53*	0.55*	0.81*	0.40*	0.18
Corruption in the National Government		0.22	0.11	0.14	0.00	0.09
Corruption in the Provincial Government		0.21	0.24*	0.18	0.20*	0.09
Corruption in the Municipal Government		0.42*	0.32*	0.36*	0.07	0.11
Corruption in the Baranguay Government		0.40*	0.26*	0.41*	0.13	0.10
Correlation between Corruption Indices						
Mun. Health		1.00	0.17	-0.00	0.06	-0.12
Mun. Adm.		0.17	1.00	0.07	-0.17	0.10
Mun. DECS		-0.00	0.07	1.00	0.01	0.23*
Public Schools		-0.12	0.10	0.01	1.00	0.29
Private Schools		0.06	-0.17	0.23*	0.29	1.00
Corruption Perception of Households		0.13	0.21	0.28*	-0.05	-0.19
Residual of Corruption Perception of Households		0.17	0.18	0.24*	0.01	0.15

Summary Means Table 2

Municipal Level Data

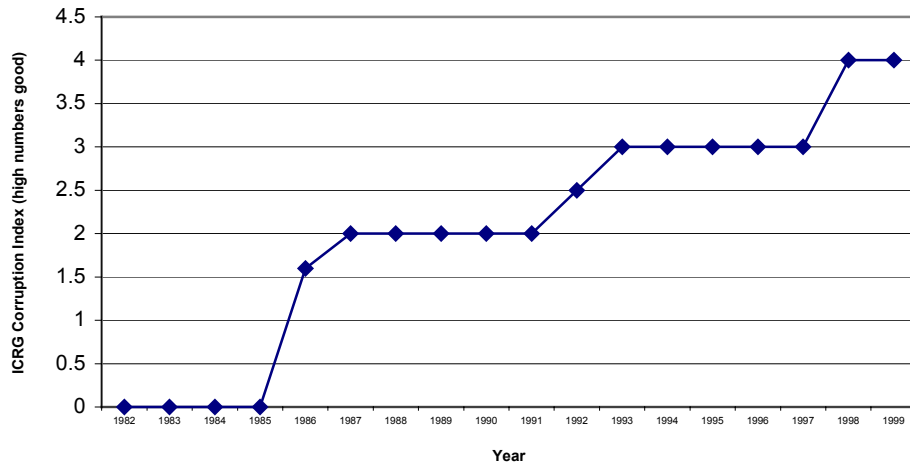
Variable	Obs	Mean	Std. Dev.	Min	Max
Corruption Household	81	0.8600	18.068	-42.47	43.23
Corruption Public Officials	81	-0.5672	10.494	-14.48	32.01
Corruption Combined	80	0.5737	23.360	-49.32	56.07
Read Local newspapers	81	17.740	18.553	0	80.71
Read National Newspapers	81	26.874	24.107	0	80
Vote in Local Elections	81	79.431	15.039	35.71	100
Vote in national Elections	81	85.467	11.689	50	100
Log Income (expenditure)	81	6.3222	0.4756	4.82	7.267
Education	81	46.181	8.5508	20	68.18
Urban	81	0.8117	0.3199	0	1
Social Differences	81	53.784	25.778	0	96.42
Migrate if health care poor	81	18.284	15.746	0	60.71
Adjustability	81	62.93	16.705	13.33	100
Accountability	81	74.843	14.430	25	100
Anti-corruption attitudes	81	0.7400	0.3047	0	1
Delay in payments	81	6.790	13.117	0	66.66

Barangay Level Data

Variable	Obs	Mean	Std. Dev.	Min	Max
Sat. with govt health services	294	-1.0565	19.153	-83.80	29.71
Urban	159	0.40566	0.4909	0	1
Education	301	47.348	14.661	12.727	86.36
Log Income (Exp)	301	6.3584	0.6247	4.3407	8.0001
Allocation of Health Crit.	159	1.5031	0.9670	0	3
Supply of Medicines	157	67.675	19.183	16.666	100
Log Employment CL	158	1.3820	0.3973	0.8361	3.0109
Adjustability CL	158	7.3839	19.412	0	100
Accountability CL	158	78.71	19.618	0	100
Social Pressure against corrupt	301	64.93	36.493	0	100
Corruption Household	282	0.7312	17.934	-42.47	43.239
Corruption Public Official	301	-0.5892	10.483	-14.48	32.011
Corruption Combined	281	-0.0367	23.219	-49.32	56.073
Know required immunizations	296	67.70	21.122	25	100
Delayed payments CL	149	11.49	24.742	0	100

Figure 1

Philippines



Source: International Country Risk Guide 2000

Figure 2

Adjustability and Corruption Across Agencies (without schools)

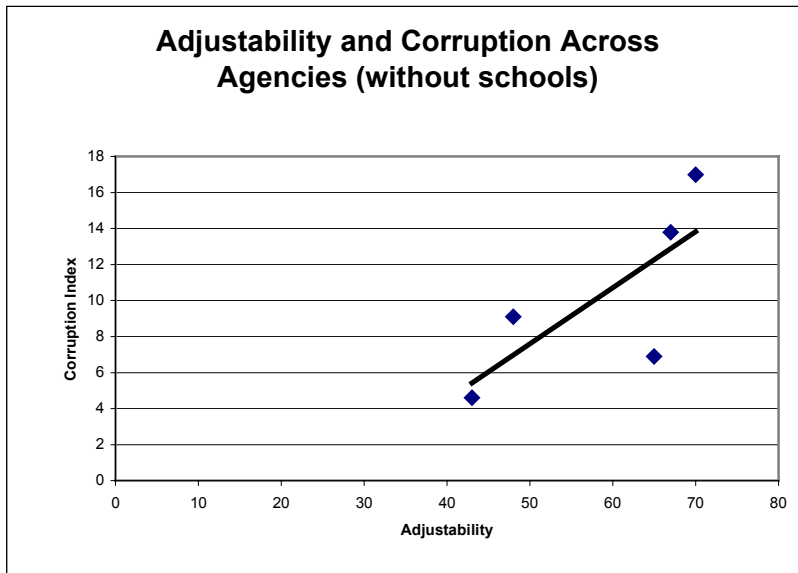


Table 3: Cleaning Corruption Perception of Households

	Fixed Effect (Group: Municipality)
	3.1
Read Local Newspaper	-0.03 (-0.78)
Read national Newspaper	-0.01 (-0.33)
Listen Radio	0.03 (0.94)
Watch TV	0.1 (0.25)
Follow Local Events	-0.02 (-0.77)
Follow National Events	0.03 (0.98)
Know Mayor/Vice Mayor/Vice President	-0.01 (-0.31)
Vote based on Ethnicity	0.05 (1.94)*
Perception of National Corruption	0.15 (7.31)***
Perception of Social Differences	0.06 (2.00)**
Social Initiative	-0.01 (-0.24)
Culture Against Corruption	0.02 (0.90)
Urban	-2.02 (-0.82)
Education	0.16 (3.28)***
Log(income per capita)	0.73 (0.60)
Home Ownership	0.15 (0.06)
Female	-3.67 (-1.28)
Age	-0.05 (-0.59)
Constant	9.29 (1.01)
N	809
F(18,710)	5.93***
R2 within	0.13
R2 between	0.10
R2 overall	0.12

t stats below coefficients

Table 4: Cleaning Satisfaction with Government Clinic and Waiting Time Perceptions of Households

	Satisfaction	Waiting Time
	4.1	4.2
	Fixed Effect (Group:Barangay)	Fixed Effect (Group:Barangay)
Education	-0.01 (-0.21)	0.01 (0.75)
Log(income per capita)	0.01 (0.01)	-0.19 (-0.82)
Home Ownership	7.32 (2.99)***	-1.03 (-2.42)**
Perception of National Corruption	-0.06 (-2.69)***	0.00 (0.59)
Age	-0.07 (-0.76)	-0.00 (-0.21)
Female	0.29 (0.09)	-0.68 (-1.27)
Constant	78.94 (8.30)***	37.12 (22.33)***
N	932	926
F(6,632)	2.83***	1.67
R2 within	0.03	0.02
R2 between	0.00	0.01
R2 overall	0.01	0.01

t stats below coefficients

Table 5: Cleaning Corruption Perception of Municipal Health Officials

	Health officers	Administrators
	5.1	5.2
	OLS	OLS
Education	0.15 (1.14)	0.08 (2.13)**
Log(income per capita)	1.72 (0.87)	3.01 (1.16)
Home Ownership	0.04 (2.56)	-0.03 (-0.36)
Perception of National Corruption	0.06 (1.56)	0.07 (1.06)
Age	-0.16 (-1.52)	-0.11 (-0.53)
Female	-0.85 (-0.34)	-3.42 (-0.56)
Constant	-20.12 (-1.41)	-16.38 (-0.77)
N	75	77
F(7,67)	1.85*	3.96***
Adj R2	0.13	0.04

t stats below coefficients

Table 6. The Causes of Corruption

Corruption measure	Corruption Household		Corruption Public Officials		Corruption Merged	
	WLS Robust Std Err	Random Effects Province	WLS Robust Std Err	Random Effects Province	WLS Robust Std Err	Random Effects Province
	6.1	6.2	6.3	6.4	6.5	6.6
Read Local Newspaper	0.207** 2.229	0.185 1.586	0.062 1.025	0.084 1.149	0.292** 2.214	0.284* 1.864
Read National Newspaper	-0.207** -1.929	-0.142 -1.188	-0.125* -1.819	-0.116 -1.577	-0.345** -2.473	-0.245 -1.517
Vote in Local Election	-0.482*** -2.703	-0.428** -2.172	-0.191 -1.547	-0.173 -1.420	-0.629*** -2.717	-0.533** -2.135
Vote in National Election	0.322 1.397	0.270 1.086	0.037 0.254	-0.001 -0.006	0.328 1.107	0.205 0.656
Migrate if Health Services Poor	-0.086 -0.742	-0.035 -0.268	0.011 0.143	0.036 0.450	-0.057 -0.394	0.035 0.212
Log PC Expenditure	5.26 0.990	7.44 1.209	-0.903 -0.322	-2.18 -0.589	4.00 0.591	4.63 0.578
Education	0.114 0.477	0.012 0.044	0.381** 2.318	0.397** 2.244	0.541* 1.726	0.390 1.038
Urban	-14.4** -2.387	-14.5** -2.312	-1.06 -0.281	-0.075 -1.356	-15.1** -2.044	-14.8* -1.876
Social Differences	0.173* 1.954	0.151 1.217	-0.070 -1.371	-0.082 -1.458	0.109 0.989	0.166 1.000
Adjustability	0.184 1.491	0.187 1.527	0.056 0.871	0.049 0.676	0.269* 1.773	0.238 1.540
Accountability	0.039 0.320	0.049 0.370	0.052 0.670	0.070 0.857	0.082 0.460	0.127 0.744
Anti-corruption attitudes	2.355 0.412	2.598 0.398	-0.083* -1.685	-0.075 -1.356	3.153 0.402	1.88 0.744
Delayed payments	-0.185 -1.084	-0.194 -1.280	0.064 0.101	0.036 0.393	-0.129 -0.521	-0.154 -0.810
R sq within		0.15		0.22		0.20
R sq between		0.56		0.34		0.55
R sq	0.36	0.34	0.26	0.25	0.38	0.35
N	80	80	80	80	80	80

t stats below coefficients

Table 7. The Causes of Corruption Robustness Check

Corruption measure	Corruption Merged					
		Capacity Added		Migration and Accountability Dropped		Corruption Left truncated
Estimation method	Robust Regression	WLS Robust Std Err	Random Effects Province	WLS Robust Std Err	Random Effects Province	Robust Regression
	7.1	7.2	7.3	7.4	7.5	7.6
Read Local Newspaper	0.247* 1.892	0.260** 2.005	0.264* 1.752	0.260** 2.075	0.261* 1.745	0.247* 1.911
Read National Newspaper	-0.225* -1.801	-0.291** -2.201	-0.168 -1.094	-0.338** -2.528	-0.244* -1.645	-0.25* -1.819
Vote in Local Election	-0.725*** -3.078	-0.664*** -2.931	-0.648*** -2.637	-0.639*** -2.912	-0.583** -2.437	-0.725*** -3.109
Vote in National Election	0.381 1.258	0.328 1.093	0.242 0.794	-0.316 1.158	0.225 0.741	0.381 1.271
Migrate if Health Services Poor	-0.025 -0.158	-0.073 -0.522	0.024 0.150			
Log PC Expenditure	2.57 0.378	5.00 0.708	5.82 0.757	4.64 0.727	4.50 0.615	2.58 0.383
Education	0.519 1.607	0.529* 1.685	0.422 1.159	0.490 1.548	0.401 1.135	0.519 1.623
Urban	-21.3*** -2.803	-16.10** -2.163	-16.15** -2.075	-15.1** -2.229	-15.1 -1.983	-21.3*** -2.833
Social Differences	0.237** 2.342	0.092 0.754	0.093 0.800	0.110 1.009	0.108 0.952	0.237** 2.366
Adjustability	0.267* 1.806	0.248 1.600	0.229 1.535	0.263* 1.891	0.239* 1.680	0.267* 1.824
Accountability	-0.042 -0.263	0.164 0.874	0.207 1.223			-0.042 -0.266
Anti-corruption attitudes	-0.417 -0.053	1.269 0.231	-1.106 -0.136	-1.01 -0.872	-0.100 -0.903	-0.414 -0.053
Delayed payments	-0.292 -1.591	-0.059 -0.231	-0.079 -0.423	-0.126 -0.514	-0.171 -0.921	-0.292 -1.607
Capacity		-0.392** -2.078	-0.431** -2.176			
Meritocracy		0.085 0.494	0.213 1.299			
R sq within			0.29		0.18	
R sq between			0.48		0.60	
R sq		0.41	0.38	0.39	0.36	
N	80	80	80	80	80	80

t stats below coefficients

Figure 3

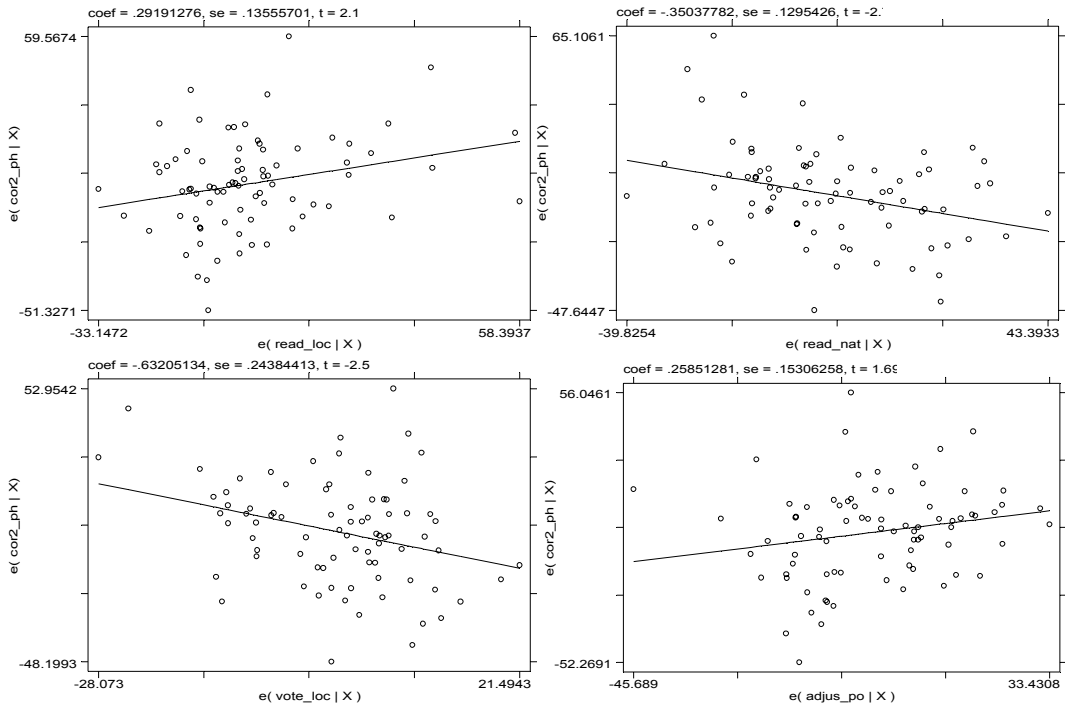
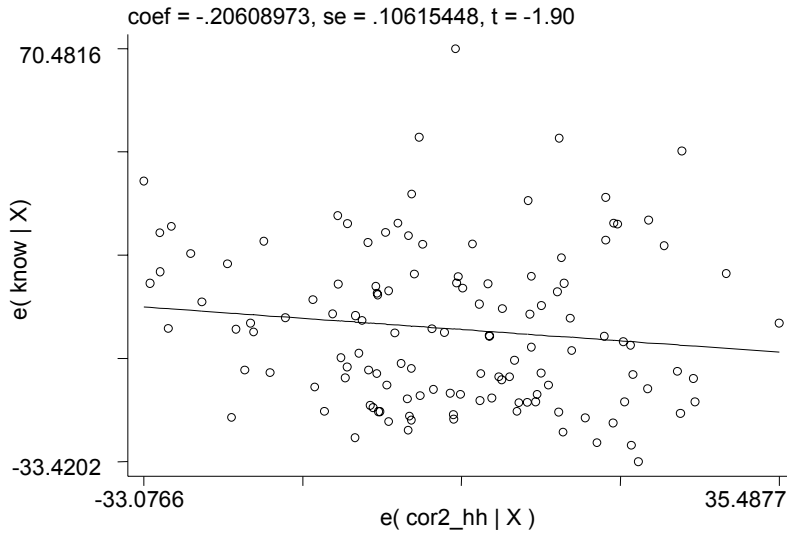


Table 8. The Philippines: Explaining Public Officials' Knowledge of Immunizations at Government Clinics

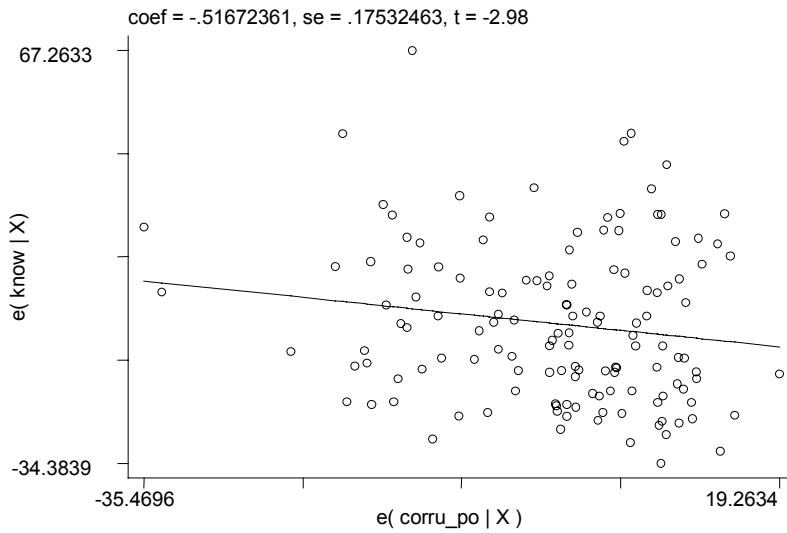
The model also include the following variables: urban dummy, education of households, social pressure against corruption. The coefficients are insignificant and not reported. Coefficients for regression for each independent variable; t-statistics in parentheses. *** significant at 1%, ** significant at 5%, * significant at 10% . Household survey (HH), municipal health officials survey (PO), health clinic survey (CL).

	WLS (w=no.of obs in mun.)	Random Effects (Group: Province)	WLS (w=no.of obs in mun.)	Random Effects (Group: Province)	WLS (w=no.of obs in mun.)	Random Effects (Group: Province)
	8.1	8.2	8.3	8.4	8.5	8.6
Read Local Newspaper	-0.03 (-0.33)	-0.05 (-0.55)	-0.03 (-0.42)	-0.04 (-0.44)	-0.02 (-0.14)	-0.03 (-0.29)
Read National Newspaper	-0.19*** (-2.59)	-0.16* (-1.89)	-0.18*** (-2.67)	-0.16*** (-2.07)	-0.18*** (-2.50)	-0.19*** (-2.64)
Vote in Local Election	0.17* (1.89)	0.15* (1.67)	0.16* (1.71)	0.15 (1.61)	0.17* (1.91)	0.16* (1.74)
Vote in National Election	-0.07 (-0.49)	0.00 (0.12)	-0.08 (-0.78)	-0.01 (-0.14)	-0.06 (-0.57)	-0.02 (-0.35)
Migrate if Health Services Poor	0.02 (0.63)	0.04 (0.95)	0.01 (0.42)	0.02 (0.60)	0.01 (0.63)	0.02 (0.71)
Log(income per capita) (HH)	2.53 (1.49)	4.56* (1.95)	3.32* (1.85)	5.47** (2.04)	5.17** (2.11)	4.01** (1.95)
Allocation of Funds by the National Govt. Based on Health Related Crit. (PO)	0.44 (0.23)	-1.01 (-0.52)	0.01 (0.01)	-0.58 (-0.58)	0.12 (0.08)	-1.01 (-0.48)
Supply of Medicine (CL)	0.26*** (2.78)	0.24** (2.48)	0.23*** (2.57)	0.19** (2.19)	0.22*** (2.87)	0.20** (2.58)
Log of number of personnel at clinic (CL)	-1.66 (-1.08)	-1.23 (-0.22)	-2.04 (-1.01)	-1.58 (-0.51)	-2.12 (-1.18)	-1.42 (-0.25)
Corruption at the Municipal Level (HH)	-0.20** (-2.55)	-0.21* (-1.92)				
Corruption at the Municipal Level (PO)			-0.50*** (-2.98)	-0.52*** (-3.08)		
Corruption at the Municipal Level (PO+HH)					-0.21*** (-3.11)	-0.23*** (-2.67)
Delay in Salary Payments (PO)	-0.35*** (-3.60)	-0.30** (-2.42)	-0.29*** (-2.66)	-0.22* (-1.68)	-0.32*** (-3.78)	-0.27* (-1.89)
Delay in Salary Payments (CL)	0.14 (1.57)	0.09 (1.12)	0.09 (1.12)	0.05 (1.07)	0.11 (1.31)	0.08 (1.29)
N	127	127	135	135	127	127
F(10,116)	4.99***		5.94***		6.83***	
Chi Square (10)		24.47**		29.43***		25.65***
R2 within		0.16		0.24		0.28
R2 between		0.25		0.13		0.25
R2 overall	0.25	0.19	0.25	0.21	0.27	0.27

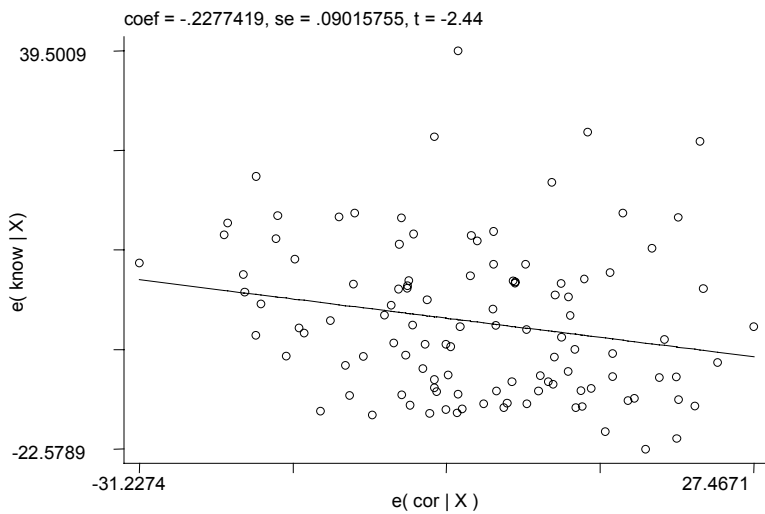
Figure 4



Corruption at the
Municipal Level (Public
Officials' Perception)



Corruption at the
Municipal Level
(Households' Perception)



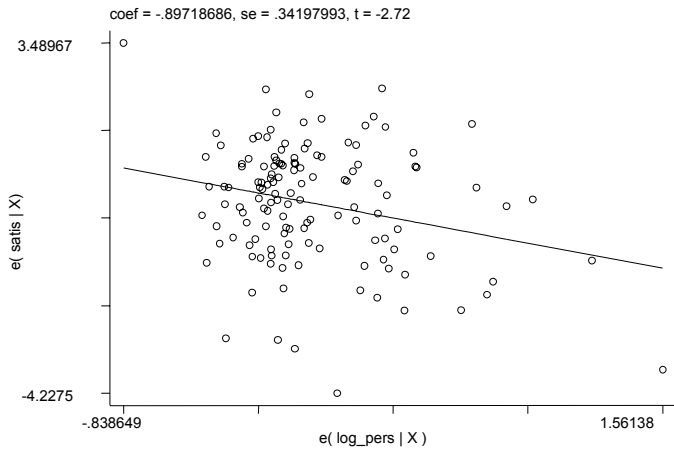
Corruption at the
Municipal Level (Average
of Public Officials' and
Households' Perception)

Table 9. The Philippines: Explaining Waiting Time at and Satisfaction with Government Health Clinics

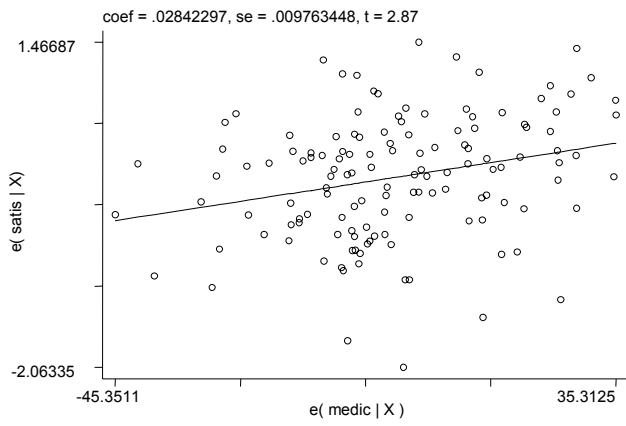
The model also include the following variables: urban dummy, education of households, income of households, delay in salary payments of public officials. The coefficients are insignificant and not reported. Coefficients for regression for each independent variable; t-statistics in parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%. Household survey (HH), municipal health officials survey (PO), health clinic survey (CL).

	Satisfaction with Government Health Clinic		Waiting Time		Satisfaction+Waiting Time	
	WLS (w=no.of obs in mun.)	Random Effects (Group: Province)	WLS (w=no.of obs in mun.)	Random Effects (Group: Province)	WLS (w=no.of obs in mun.)	Random Effects (Group: Province)
	9.1	9.2	9.3	9.4	9.5	9.6
Read Local Newspaper	0.08 (0.95)	0.12 (1.40)	-0.04 (-2.18)**	-0.03 (-2.08)**	0.09* (1.78)	0.10 (1.40)
Read National Newspaper	-0.03 (-0.39)	-0.04 (-0.52)	-0.01 (-0.12)	0.00 (0.04)	-0.02 (-0.48)	-0.04 (-0.52)
Vote in Local Election	-0.09 (-0.78)	-0.09 (-0.93)	0.01 (0.34)	0.01 (0.52)	-0.04 (-0.47)	-0.08 (-0.56)
Vote in National Election	0.02 (0.12)	0.02 (0.12)	-0.02 (-0.82)	-0.03 (-1.15)	0.00 (0.05)	0.01 (0.09)
Migrate if Health Services Poor	-0.03 (-0.96)	-0.04 (-0.89)	0.00 (0.74)	0.00 (0.54)	-0.02 (-0.78)	-0.06 (-0.98)
Supply of Medicine (CL)	0.19** (2.35)	0.20** (2.15)	-0.04*** (-3.04)	-0.04** (-2.18)	0.03*** (2.78)	0.03*** (2.89)
Log of Number of Personnel at the Clinic (CL)	-6.39* (-1.91)	-6.41 (-1.47)	2.39* (1.88)	2.12*** (2.63)	-1.85** (-2.68)	-0.90*** (-2.78)
Knows the Required Immunizations (CL)	0.02 (0.26)	0.02 (0.21)	0.03** (2.08)	0.03* (1.74)	-0.01 (-0.85)	-0.00 (-0.52)
Allocation of Funds by the National Govt. Based on Health Related Criteria (PO)	-0.90 (-0.57)	-1.02 (-0.58)	0.27 (0.72)	0.20 (0.58)	-0.11 (-0.75)	-0.08 (-0.69)
Freedom to Adjust (PO)	0.12 (1.31)	0.07 (0.69)	0.01 (0.29)	0.01 (0.72)	0.01 (0.89)	0.01 (0.54)
Freedom to Adjust (CL)	0.03 (0.64)	0.02 (0.30)	0.01 (0.77)	0.02 (1.25)	-0.01 (-0.74)	-0.01 (-0.98)
Accountability (PO)	-0.02 (-0.15)	0.04 (0.30)	0.05** (1.99)	0.05* (1.85)	-0.01 (-1.22)	-0.01 (-1.25)
Accountability (CL)	0.11 (0.97)	0.14 (1.55)	-0.00 (-0.32)	-0.01 (-0.49)	0.01 (1.35)	0.01 (1.52)
Social Pressure against Corruption (PO)	0.10** (2.42)	0.12** (2.37)	-0.00 (-0.31)	-0.00 (-0.24)	0.02* (1.95)	0.01* (1.80)
Corruption at the Municipal Level (PO)	-0.28* (-1.66)	-0.25 (-1.46)	0.03 (1.05)	0.03 (1.09)	-0.02** (-1.95)	-0.02* (-1.88)
N	133	133	133	133	133	133
F((15,117)	2.08***		1.84**		2.87***	
Chi Square (15)		28.0*		40.63***		49.12***
R2 within		0.15		0.21		0.26
R2 between		0.38		0.43		0.50
R2 overall	0.22	0.20	0.29	0.27	0.32	0.34

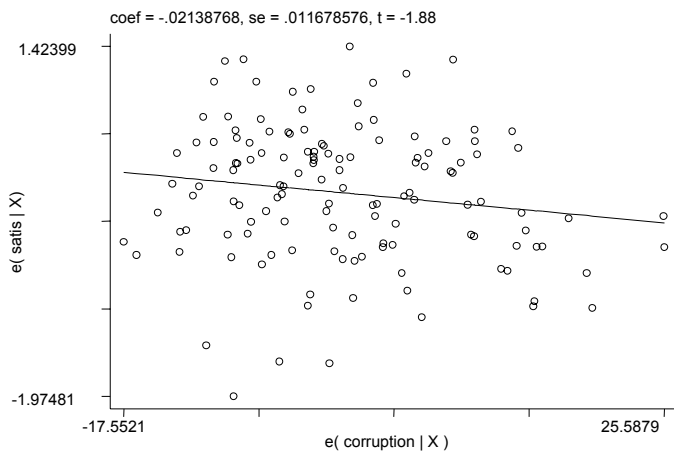
Figure 5



Log(personnel)



Availability of Medicine



Corruption at the
Municipal Level

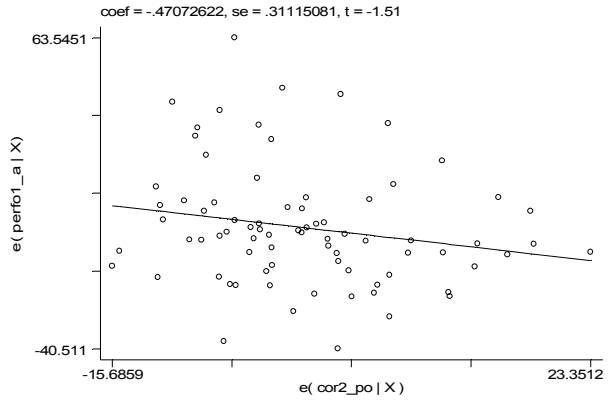
Table 10: Explaining Change in Occurrence of Diseases

	Increase in Immunization	Increase in Immunization Random Effect	Decrease in Measles	Decrease in Measles Random Effec	Health Performance	Health Performance Random Effec
	10.1	10.2	10.3	10.4	10.5	10.6
Urban	6.18 (0.65)	6.78 (0.71)	12.76 (1.20)	12.10 (1.08)	8.92 (1.44)	8.61 (1.39)
Education (HH)	0.89 (2.03)**	0.86 (2.10)**	-0.36 (-0.76)	-0.32 (-0.67)	0.44 (1.41)	0.45 (1.70)*
Log(income per capita) (HH)	-9.45 (-1.09)	-9.38 (-0.99)	0.51 (0.01)	-0.15 (-0.01)	-10.88 (-1.85)*	-11.38 (-1.85)*
Vote in Local Elections (HH)	-0.15 (-0.74)	-0.14 (-0.66)	0.28 (1.06)	0.27 (1.08)	0.10 (0.66)	0.09 (0.68)
Read National Newspapers	-0.31 (-1.94)*	0.30 (-1.89)*	-0.35 (-1.77)*	-0.34 (-1.79)*	-0.11 (-1.31)	-0.13 (-1.28)
Read Local Newspapers	0.27 (1.21)	0.28 (1.57)	-0.32 (-1.76)*	-0.33 (-1.56)	0.01 (0.07)	0.01 (0.07)
Listen Radio	-0.06 (-0.62)	-0.06 (-0.59)	0.09 (0.70)	0.09 (0.77)	0.03 (0.46)	0.04 (0.58)
Go to Private Clinics (HH)	-0.07 (-0.48)	-0.08 (-0.60)	0.34 (1.85)*	0.34 (2.07)**	0.06 (0.65)	0.07 (0.72)
Ethnic Polarization (HH)	0.11 (0.93)	0.12 (0.91)	0.43 (2.53)**	0.43 (2.82)***	0.15 (2.12)**	0.15 (1.75)*
Supply of Immunization (CL)	-0.01 (-0.10)	-0.02 (-0.20)	0.06 (0.24)	0.02 (0.17)	-0.01 (-0.10)	-0.02 (-0.24)
Log of Number of Personnel at the Clinic (CL)	12.74 (1.86)*	12.40 (1.50)	8.27 (0.82)	8.48 (0.87)	4.69 (0.88)	4.80 (0.89)
Knows the Required Immunizations (CL)	0.16 (0.95)	0.15 (0.97)	0.42 (2.54)**	0.42 (2.30)**	0.25 (2.76)***	0.26 (2.51)***
Allocation of Funds by the National Govt. Based on Health Related Criteria (PO)	2.80 (0.75)	2.64 (0.66)	-0.27 (-0.06)	-0.51 (-0.11)	4.55 (2.16)**	4.35 (1.67)*
Capacity (PO)	-0.28 (-0.89)	-0.26 (-1.01)	-0.46 (-1.41)	-0.46 (-1.51)	0.03 (0.19)	0.03 (0.18)
Freedom to Adjust (PO)	0.02 (-0.11)	0.03 (0.18)	0.29 (1.21)	0.28 (1.30)	0.19 (1.74)*	0.19 (1.59)
Freedom to Adjust (CL)	-0.22 (-1.86)*	-0.23 (-1.18)	-0.06 (-0.26)	-0.07 (-0.30)	-0.04 (-0.35)	-0.05 (-0.38)
Accountability (PO)	-0.30 (-1.38)	-0.32 (-1.43)	0.03 (0.10)	0.02 (0.07)	-0.04 (-0.20)	-0.05 (-0.33)
Accountability (CL)	0.09 (0.36)	0.10 (0.51)	0.13 (0.54)	0.14 (0.58)	0.12 (1.01)	0.13 (0.96)
Delay in Salary Payments (CL)	-0.25 (-1.80)*	-0.22 (-1.45)	-0.13 (-0.66)	-0.13 (-0.72)	0.04 (0.37)	0.04 (0.38)
Corruption at the Municipal Level (HH)	-0.31 (-1.73)*	-0.30 (-1.59)	-0.40 (-1.90)*	-0.40 (-1.82)*	-0.16 (-1.52)	-0.17 (-1.35)
Theft at Government Clinics (HH)	-0.31 (-1.88)*	-0.32 (-1.32)	0.29 (0.68)	0.28 (1.00)	-0.11 (-0.41)	-0.12 (-0.77)
Constant	60.56 (1.16)	59.30 (0.93)	-6.73 (-0.08)	-1.77 (-0.02)	46.97 (1.23)	50.25 (1.21)
N	78	78	78	78	78	78
F(21,56)	2.36***		3.82***		2.16**	
Chi_Sq(21)		29.83*		41.79***		31.54*
R2 within		0.25		0.33		0.29
R2 between		0.46		0.60		0.51
R2 overall	0.36	0.35	0.43	0.43	0.36	0.36

t stats below coefficients

Figure 6

Immunization



Measles

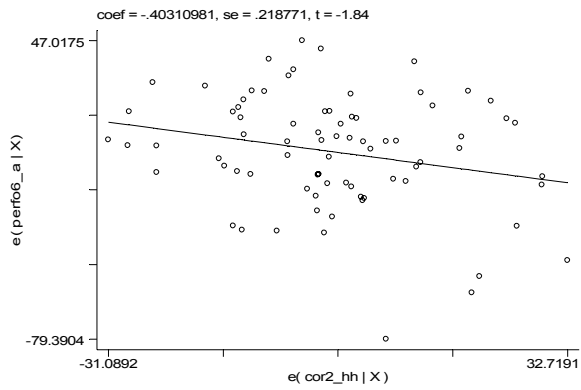
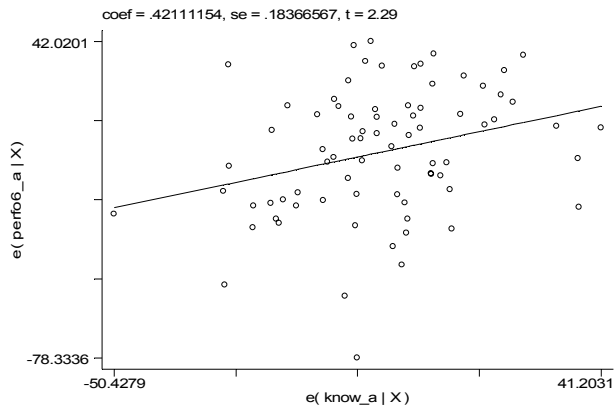
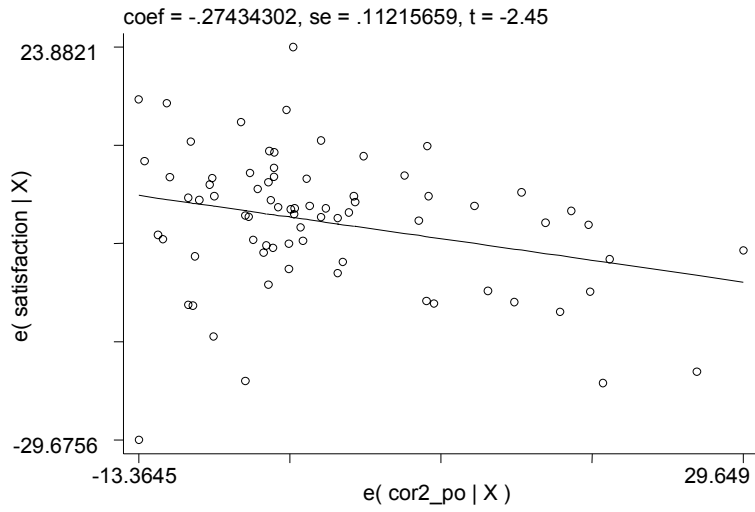
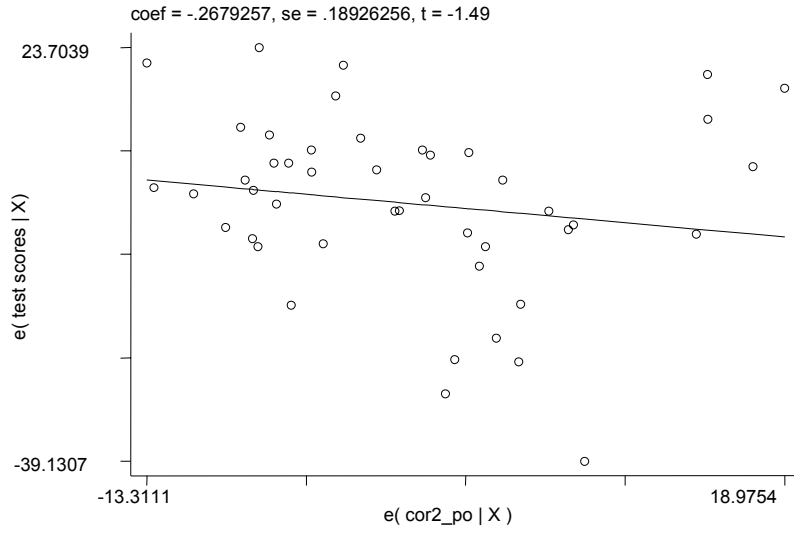


Table 11: Explaining Education Outcomes

	NEAT SCORES			SATISFACTION WITH SCHOOLS		
Beta coefficients are reported	WLS	CLUSTER	RANDOM EFFECT	WLS	CLUSTER	RANDOM EFFECT
	11.1	11.2	11.3	11.4	11.5	11.6
Media Index	0.571*** (2.722)	0.576*** (3.244)	0.575*** (3.095)	-0.031 (-0.318)	0.034 (1.138)	0.034 (0.035)
Voting Index	-0.010 (-0.075)	0.011 (0.017)	-0.011 (-0.193)	0.098 (0.812)	0.102 (0.849)	0.098 (0.894)
Log Income	0.247 (1.502)	0.238 (1.503)	0.244* (1.674)	0.039 (0.323)	0.042 (0.322)	-0.038 (-0.071)
Inequality	0.217 (1.445)	0.214 (1.242)	0.211 (1.329)	-0.204 (-0.990)	-0.204 (-0.622)	-0.212* (-1.850)
Education	-0.079 (-0.450)	-0.077 (-0.716)	0.071 (0.179)	-0.042 (-0.369)	-0.043 (-0.285)	-0.040 (-0.052)
Urban	-0.208 (-0.433)	-0.217 (-0.282)	-0.231 (1.636)	-0.126 (-0.985)	-0.119 (-1.234)	-0.120 (-0.747)
Social Differences	-0.100* (-1.875)	-0.100** (-2.273)	-0.087 (-0.604)	0.035 (0.217)	0.033 (0.632)	0.034 (0.573)
Corruption	-0.097 (-1.429)	-0.088 (1.642)	-0.090 (-1.301)	-0.302** (2.160)	-0.304** (-2.313)	-0.333*** (2.646)
N	44	44	44	70	70	70
F test	6.23**	2.84**		2.40*	1.17	
Chi sq			18.83*			12.90
R2	0.42	0.24	0.41	0.14	0.09	0.13

t stats below coefficients

Figure 7



tugrul gurgur
L:\IrisPhilippines\Paper\Decentralization and corruption in the Philippines July 16.doc
July 25, 2001 6:15 PM