Working Paper in Economics and Business Volume III No.1/2013

Varieties of Governance of Public Goods Delivery in Indonesia: The Case of Roads after Decentralization and Local Democratization

> Ari Kuncoro Vid Adrison Ifa Isfandiarni

January 2013

Institute of Economic and Social Research Faculty of Economics, University of Indonesia

Working Paper in Economics and Business Chief Editor: Suahasil Nazara Editors: Djoni Hartono, Beta Y. Gitaharie, Femmy Roeslan, Riatu M. Qibthiyyah Setting: Rus'an Nasrudin

Copyright ©2013, Department of Economics Department of Economics Building 2nd Floor Depok West Java, Indonesia 16424 Telp. 021-78886252 Email: rusan.nasrudin@gmail.com Web: http://econ.fe.ui.ac.id/workingpage

Co	ontents	3
Li	st of Tables	4
Li	st of Figures	5
1	Introduction	1
2	Country and Sector Context	2
3	Conceptual Framework and Literature Review	3
4	Methodology	5
	4.1 Field Interview	5
	4.2 Theoretical Model	6
	4.3 Empirical Strategy	8
5	Data	10
6	Results	11
	6.1 Field Interview in 50 sampled Districts	11
	6.2 Econometric Results	14
7	Referrences	23

List of Tables

1 Pre to Post Local Democratization (2003-2006): Paved Road Regressions	15
2 Pre to Post Local Democratization (2003-2006): Passable Road Regressions	17
A2.1 Data Sources for the Main Variables	27
A2.2 List of Instruments	27
A2.3 Classification Districts Based on Road Quality and Governance Compared to Prior	
2005	28
A2.4 Descriptive Statistic for the Main Variables	29
A2.5 Pre to Post Local Democratization (2003-2006): Passable Road and Bribes	30
A2.6 Pre to Post Local Democratization (2003-2006): Paved Roads and Bribes	31
A2.7 Voters Preference: Probability of incumbent to win reelection	32
A2.8 Before and After Decentralization (1999-2003): Paved Roads	33
A2.9 Before and After Pre-Democratization (1999-2003): Passable Roads	34
A2.10 Determinants of Bribes (2003-2006)	35
A2.11 Tax Ratio: Before and After Decentralization (1999-2003)	36

List of Figures

1	Figure 1	7
2	Figure 2	7
3	Figure 3	7
4	Figure 4	8
5	Figure 5	8
6	Graph 1	12
7	Graph 2	13
8	Graph A4.1	37
9	Graph A4.2	37

Varieties of Governance of Public Goods Delivery in Indonesia: The Case of Roads after Decentralization and Local Democratization^{\Leftrightarrow}

Ari Kuncoro^a, Vid Adrison^b, Ifa Isfandiarni^c

^aInstitute of Economic and Social Research University of Indonesia ^bInstitute of Economic and Social Research University of Indonesia ^cInstitute of Economic and Social Research University of Indonesia

Abstract

For Indonesia the fall of Suharto in 1998 brought dramatic changes in the political landscape. It signified the beginning of transformation from an authoritarian regime towards a more democratic society where the distribution power is more devolved. In this respect Indonesia follow what is called a big-bang approach in the transition. First in the agenda of socio-economic reform is decentralization which changes the relationship between the center and local governments. Next in the countrys reform was democratization at the local government level. In this paper we examine how decentralization and democratization affect governance at the local government level. Our particular interest is to assess the impact of decentralization and local democratization on the quality of road. We find that although the temptation to produce lower quality roads is high the combination of democratization, free media, an ad-hoc anti-corruption agency and well educated bureaucrats keep the quality of roads reasonably good while the corruption is held in check.

JEL Classifications:D73, H73, O17

Keywords: Governance, Decentralization, Democratization, Infrastructure Provision

1. Introduction

For Indonesia the fall of Suharto in 1998 brought dramatic changes in the political landscape. It signified the beginning of transformation from an authoritarian regime towards a more democratic society where the distribution power is more devolved. In this respect Indonesia follow what is called a big-bang approach in the transition. First in the agenda of socio-economic reform is decentralization which changes the relationship between the center and local governments (Ranis [1994])¹. Next in the countrys reform was democratization at the local government level. Starting in 2004, a district head has been elected directly by the people through a general election. Potentially this would give a district head more freedom from the local assembly².

The broad definition of governance encom-

^{*}This research is apart of Global Research Project (GRP), generous funding from Global Development Network (GDN) is greatly acknowledged.

Email address: arik@cbn.net.id (Ari Kuncoro)

¹This reform was also prompted by the demand from regional governments, particularly those of resourcerich regions; to have more authorities in managing their own affairs now resurfaces. Responding to this the legislative passed the decentralization law in 1999, which was subsequently enacted in 2001.

 $^{^{2}}$ Before 2001, a district head (regency or municipality) was a part of the central government hierarchy (bureaucracy).But the regional decentralization law in 2001

passes state and political institutions, their checks and balances, the rule of law and the delivery system for the provision of public services. Effective governance includes various components such as accountability, transparency and effective bureaucracy, electoral competition and political checks and balances. The combination of these elements and the mechanism implemented vary across countries and across regions within a country. This would make the case of studying inter-district varieties of governance in public service delivery with a focus on roads in Indonesia is particularly interesting. Most recent initiatives of decentralization in Indonesia can be seen from the perspective of bringing policy makers and road providers closer to citizen, while local democratization afterward is aimed to strengthen the basic component of accountability.

2. Country and Sector Context

From the start the decentralization reform in Indonesia have been hampered by two major constraints that could render the process ineffective. First, after years of the politicization by the Suharto regime, the civil performance is plagued by poor morale and low performance. At the local government level, the corruption of the central government grants had been tolerated as a way to compensate for low incomes. This problem was exacerbated by the lower capacity of the local bureaucracy.

The implementation of democracy at the local government level is not without problem. One urgent issue in the new democratic Indonesia is political party funding. Much of the parties money is thought to come from corrupt government officials. Corrupt money also oils other parts of the political machinery. There are middlemen (calo) who use their money to influence members of parliament making decisions about filling an important public office, a budget allocation, a fast-track draft of a law, and so on. So in practice, local democratization may not reduce corruption. At the local level, in this new political setting, corruption also takes in a different form. Any elected district heads would be potentially the prisoner of the respective local legislative will, since by law he or she will be subjected to censor and impeachment by it. To get his or her program passed by the local legislative, individually or as a group, the local legislative members must be courted - a polite word for bribed. The bribes could range from money appropriated for traveling abroad to awarding lucrative public works to certain firms that have colluded with local legislative members.

For political candidates the entry into politic requires a huge sum of money which comes neither from the state nor parties. To be able to qualify into an election of a public office for example district head or *bupati*, a candidate must be endorsed by a political party or a coalition of parties, and it does not come cheap. If a candidate happens to be an incumbent then he or she can use the budget appropriation or more precisely misappropriation to secure money for political campaign. Like in the above case one way is to sell concession on public work like road construction or road maintenance to the highest bidder who in turn is required to pay kickback. For a new entrant the situation is not much different. He or she can ask special interests like construction and business associations to sponsor the candidacy in exchange for future concession in public work projects.

In this scheme, the quality of work would depend on how much left in the hand of providers after paying some kickback as well as their interest to obtain profits. The amount of kickback as percentage of the project value in turn will depend on the candidate preference for

abolished the hierarchy between the center, provinces and districts. Instead, district heads will be elected by local (district) parliaments (legislative). While provincial governors will continue to represent the center in each respective region, district head (regent or mayor) will no longer act as representative of the center and will be accountable only to local legislative.

personal versus public gains weighed against the prospect of punishment from voters in the next election. In the Indonesian context, lacking strong consumer groups voting is perhaps the only possible tool for citizen to punish elected politicians for bad public service delivery (Henderson and Kuncoro [2011]). This punishment mechanism requires the presence of reasonably good information provided by free news media.

The purpose of this study is to examine how decentralization and democratization affect governance at the local government level. Our particular interest is to assess the impact of decentralization and local democratization on the quality of road. For this, our approach is to combine a field work of interviewing real players in the real world with economic and econometric modeling. The field work is designed as a fact findings mission. To gain a better insight of the problems, the primary data gathered in the field work are used for the conceptual modeling of the relationship between decentralization, local democratization and local governance. The study found that despite the initial worrisome of the deterioration of road quality, the combination of free media, an ad-hoc anti-corruption agency and well educated and better trained bureaucrats keep the quality of roads reasonably good in the atmosphere of decentralization and democratization while the corruption is held in check.

3. Conceptual Framework and Literature Review

The situation mentioned above is modeled as a principal-agent relationship where the voters are principal who demand good quality of infrastructure specifically roads with newly acquired power to vote out incompetent and/or corrupt district heads. The district heads and their associated bureaucracies are agents who are much freer now from the center domination after decentralization, whose task is to deliver infrastructure with good quality but at the same time under the current law they cannot build or maintain roads by themselves and also under democratization they need money to finance political activities including reelection campaign. In the middle are construction firms which bid to get contracts to build road satisfying a certain standard of quality. These firms may subject to extortion from district heads bureaucracy. Altogether, this approach is therefore akin to the long-route accountability.

From the theoretical standpoint, how decentralization affects governance is ambiguous. The first view suggests that decentralization leads to greater fragmentation of government decision making power. The breakdown of coordination among bureaucrats may lead to excess rent extraction and poor public service delivery (Shleifer and Vishny [1993]). In line with this argument, in the case of corruption, Treisman (2000) found that federalist country have higher rate of corruption due to the problem of overgrazing among different levels of government entities over the same targets. Furthermore, Prudhome (1995) and Tanzi (1996) argued that the low capacity of local bureaucrats in delivering public goods and services may prevent the realization of benefits from decentralization. The opposite view on the other hand suggests that decentralization is expected to have moderating impact on corruption and would bring better quality of public service, by increasing the role of the local government and accentuating the forces of inter-jurisdictional and political competition (Tiebout [1956], Huther and Shah [1998]), Fisman and Gatti [2002]).

The theoretical work of Persson and Tabellini (2000) provides an insight into how political accountability may affect bureaucrats performances. With democratization, a government agent is responsible for a certain task that is specific to the respective jurisdiction, thus, logically a more direct accountability should improve the agents performance, and hence a better public service delivery is expected. The opposite view of this matter, on the other hand, argues that decentralization would also create multiple tiers of governments. Potentially it could have the opposing effect to weaken accountability, since voters would have more troubles differentiating, those who were successful, from those who were not (Fisman and Gatti [2002]).

In the case of rent-seeking activities although the regime shift to local democratization is expected to reduce corruption by increasing the role of the local government and strengthening the forces of inter-jurisdictional and political competition, it is also recognized that democracy may have limited impact on corruption (Rasmusen and Ramseyer [1994]) and the transition process is difficult given the role of history, culture and expectations (Tirole [1996], and Andvig and Moene [1990]). One particular worrisome situation is the increase of political transaction cost for lobbying which divert budget money from its productive use (North [1990]).

The existing literature on the impact of decentralization/democratization in the developing countries focuses mostly on its impact on infrastructure or capital spending pattern (Faguet, 2004; Estache and Sinha, 1995; Vergne 2009), while few other studies focus on the impact of decentralization on the efficiency of public infrastructure provision (Chavis, 2010), availability and quality of public infrastructure (Chowdhury et al, 2009). Burgess et. al (2012) examined the role of local political cycle in Indonesia in affecting deforestation. Local politicians who have to finance political activities may not enforce forest policy as they are benefiting from illegal logging.

Faguet (2004) investigates the effect of decentralization on the responsiveness of public investment in Bolivia. There are two main questions of his research; (1) whether or not the pattern of public sector investments have changed since the implementation of decentralization in 1994, and (2) if so, do indicators of need determine the change? In order to answer the research questions, public investments in 10 sectors were analyzed for 1987-1996 period. He found that after decentralization, public investments increased in five sectors, namely education, water and sanitation, water management, agriculture and urban. And these changes are strongly associated with local needs. However, investment pattern did not change for industry and tourism, energy and communication and transport. Another important finding of his research is that the poorest localities put higher priorities on human capital investment and basic social service (water) rather than other sectors, such as agriculture and transportation/communication.

A study by Estache and Sinha (1995) analyzes the infrastructure spending in both developed and developing countries, using panel data set from 1970 to 1992. The study departs from the fact that many countries have decentralized the provision of public infrastructure to sub-national governments. The effect on infrastructure spending is ambiguous. It will increase if the sub-national government put infrastructure in a higher priority than the central government, or if it is less efficient at delivering services, or if they give up the benefits economic scale to gain more autonomy. On the other hand, the spending will decrease if the local government put infrastructure in a lower priority, or if they are more cost effective. Their study finds that degree of decentralization measured by the ratio of sub national expenditure to total expenditure, and the ratio of own source revenue to total revenue does affect the level of infrastructure spending. They found that the elasticity of total expenditure with respect to both measures of decentralization is approximately 0.3 for developing countries, and 0.2 for industrialized country. However, the elasticity of sub national spending on infrastructure is much higher in developing countries than industrialized countries (1.1-1.4

as opposed to 0.7-0.9).

Vergne (2009) tries to relate the composition of expenditure with election in 42 developing countries. His study departs from Rogoff (1990) theoretical model which predicts that incumbents have the incentives to spend more towards more visible (current) expenditure rather, away from capital expenditure. In his empirical strategy, expenditure is classified into three categories; (1) current expenditure, (2) capital expenditure, and (3) infrastructure expenditure. The study finds that election does change the composition of expenditure, where current expenditure increases, capital expenditure and infrastructure expenditure decreases. In one specification, this study also takes into account the decentralization, measured by the share of sub national expenditure in total government expenditure. Although the result indicates that the distortion is smaller with decentralization, the effect is statistically insignificant.

A recent study conducted by Chavis (2010) analyzes the effect of decentralization on the efficiency of public good provision at the village level in Indonesia. The study investigates the impact of local competition for block grant under Kecamatan (Subdistrict) Development Program (KDP). The efficiency public good provision is measured using two approaches; cost of road construction per square meter, and the amount of missing materials. The finding suggests that competition and local participation increases efficiency of public good provision. A 10% increase in competition leads to a 1.8% reduction in per unit cost of road. The study also finds that efficiency is increased where local participation is high.

Another study on Indonesian case is conducted by Chowdhury et al (2009), which examines the impact of decentralization on the quality of three types of public infrastructure; village road, availability of primary and junior high school, and availability of basic health facility. They use three waves of village potential survey (PODES) of 1996, 2000, and 2006 to construct changes in quality pre and post decentralization. The change in public infrastructure quality between 1996 and 2000 refers to pre-decentralization era, while the change in public infrastructure quality between 2000 and 2006 reflects after decentralization is introduced. Estimation is performed using ordered probit. Their finding shows a significant dependency of road, public schools and healthcare facilities on local income and resources, in both the pre and post decentralization periods. Their results imply that poor villages are less likely to see improvement in the quality of public infrastructure or provision of new public infrastructure. Comparing the parameter estimates between pre- and post- decentralization, they conclude that the dependency of local public infrastructure on the local income and resources declined substantially³.

Our study differs from Chowdhury et al (2009) and Chavis (2010) in the sense that we consider the new political reality faced by district government after decentralization and democratization. While their studies are purely empirical, we conceptually model the decision that must be made by a district head with respect to road construction taking into account all political as well as economic constraints. Our study takes into account the election cycle in a district which influences district head decision on roads provision. In that sense our study is parallel to Burgess et.al (2012) who examine the impact of local political cycle on deforestation in Indonesia.

4. Methodology

4.1. Field Interview

The primary interest to conduct a field interview is to examine the anatomy of the road construction and maintenance business at the

 $^{^3\}mathrm{Note}$ that they do not perform statistical tests on the difference of the parameter between pre- and post-decentralization.

district level. The main goal is to collect information on construction and maintenance budgets per kilometer and their execution especially time for project negotiation, construction time and the tolerance for construction time extension, actual road construction and maintenance costs.

The structured questionnaire was fielded to respondents in the road construction business. If possible the questionnaire was seeking information as far back as 1999 to allow for capturing the impact of decentralization in 2001 and local democratization in 2004. The respondents were a representative construction firms or its association, a representative of transportation firms and local public work offices from 50 districts in Java. For the construction business we found in the field that the association basically serves as a cartel. They decide the order of queuing in receiving local government contract among a small circle of firms. In turn they may sub-contract smaller portion of work to firms outside the circle. It is also planned to ask question about the percentage of kickback from the association. Since some questions like bribe or kickback may involve sensitive matter, interviews were conducted as a conversation between friends.

The field survey was completed in 120 days (around 4 months). We employed our extensive network with local universities throughout Java. They have been involved in LPEM survey since 2001. LPEM led the field survey, assisted by local university, thus, the team consisted of people from both LPEM and local universities. On average, the interview with respondents took 3 days and some were arranged simultaneously in survey areas due to time constraints. Also, the local team was responsible to collect secondary data at district level.

The choice of geographical coverage - focusing on the main island of Java, is based on three considerations. First, location decisions for the Indonesian businesses are focused on Java which holds about 80% of economic activities in Indonesia. Second, the distance between localities in Java is not too far, which permits to examine whether districts learning from each other with respect to governance (Manski [1993]). Third, all districts in Java can be accessible by land transportation.

4.2. Theoretical Model

The following conceptual model is based on stylized facts we gathered in the fieldwork. The results of field interview will be presented later. The impact of decentralizationdemocratization is ambiguous. One undisputed commonality obtained from the field work is that after decentralization a district holds monopoly of the issuance of contracts in public work projects. There may be several viable construction firms in a district but not many. In order to be eligible for bidding process they must join association or cartel approved by a district government which requires them to pay entrant or membership fee or simply bribes. The winner of the bidding process is usually the most dominant firm in the cartel while others will serve as sub-contractors⁴. If the strength of each firm in the cartel is about the same then the winner of the project will be rotated among the most powerful firms while losers of both powerful and less powerful firms may act as sub-contractors.

Based on this, we model the above situation as interaction between two agents. Construction firms are the bribe suppliers or kickbacks which need government contracts to survive. Meanwhile, district heads after democratization have to show to the people that they can provide good quality roads otherwise they will be reelected. So district heads to be credible must possess some sort of monitoring system to ensure the provision of reasonably good roads.

⁴In many instances the so-called dominant firm is a pure-rent seeker without production capacity. The firm only sells concessions to tru construction compabt for fees. The fees are then used to finance political activities.



b

At the same time they are also extract money from budget in the form of inflated budget items, as well as soliciting bribes from firms in order to finance their political activities. The detailed theoretical model is presented in the annex A1.

@*

Fraction of defrauded budget

Figure 1 through Figure 3 illustrates the working of the model. In the case 1 district heads apparatus control the road quality strictly or z=1. This case is depicted in Figure 1. The transition from the indirect election of a district head to a direct election by the people has resulted in a more complex democratic process at the local which would require more funding requirement for political activities or an increase in \mathbf{m} .

From point A, democratization has resulted in the increase of money needed for campaign, while at the same time it results in the increase of perceived minimum quality of roads to win the election from \mathbf{h}^* to \mathbf{h} as well as the need to reduce budget corruption from θ^* to θ' (point B). The overall result is to lower the utility from *bureaucrats* to *bureaucrats*. The point B is the first best situation where there is no bribe.

The second case in **Figure 2** is similar but the quality control is relaxed allowing the firm









to cheat on road quality (0;z;1). In order to recoup some profit losses, the firm now moves southwestward from point C0 to C. The quality of roads \mathbf{h} will be lower than \mathbf{h} but still higher than the pre-democratization level \mathbf{h}^* . The firm profit is now higher than π '.

In **Figure 3** quality control is completely relaxed or z=0. The firm will move from C^0 to C passing the point A. The quality of roads is lower than the pre-democratization era. The firm profit is the highest in this case. In this situation there will be an inverse relationship between the road quality **h** and bribe **b**.

To summarize the relationship implied by Figure 1 through 3, the first order condition from the district head optimization which results in a reaction function for him is graphed in the **h** and θ space as bureaucrats given other tings constant, while firm is derived from the firm optimization. In the vertical axis is the quality of road **h**. In the horizontal axis is the Figure 4: Figure 4



Figure 5: Figure 5



fraction of the full value of project defrauded by the local bureaucrats or θ . Figure 4 is the counterpart of Figure 1 where a new form of democratization has full impact on road quality. The increase of bribes has no impact on road quality since the quality is strictly monitored or z=1. In Figure 5 the quality control is not as strict as before so the construction firm is able to compensate some of profit loss due to higher bribes or $0_{i}z_{i}1$. Since bribes **b** is determined recursively after a district head chooses an optimal level of budget corruption θ what the firm can do facing increasing bribes is o lower road quality from **h** to **h**. The distance between \mathbf{h} and \mathbf{h} represents the amount of cheating. Comparing to the starting point A, the overall effect is however still positive. In the final case z=0 which means there is no quality control so the increase in bribes will prompt the firm to lower road quality enormously such that the cheating effect totally dominate the positive effect of democratization. The road quality is worse than before democratization.

4.3. Empirical Strategy

Since we have well-behaved functions the first-order condition from the the district head and the firm optimization can be solved for the semi reduced form of \mathbf{h} and θ .

$$h = h(\theta, A_{-1}, m, q, H) \tag{1}$$

$$\theta = \theta(h, A_{-1}, m, q, H) \tag{2}$$

From the firm optimization the road quality produced by firm is given by

$$h = h(b(\theta), \theta, c_i.H, z) \tag{3}$$

While given θ , bribes that must be paid by firms is

$$b = b[(\theta(h, A_{-1}m, q, H)]$$
(4)

Substituting (4) into (3) we get the semireduced form

$$h = h(\theta, A_{-1}m, q, c, .H, z) \tag{5}$$

The past accumulated asset A-1 is unobserved so it is assumed that which it influenced by GDP per capita which also serve as the base from which the corrupt officials can extract rents. The full value of projects **H** is assumed to depend on the fiscal situation in the respective district which is represented by local tax ratio to district GDP.

The money for political campaign **m** is unobservable what we know is that since 2004 in which the direct election by the people was launched the money needed by a candidate for political campaign have increased significantly so we will use a time dummy separating years after 2004 from before it. Beside this to control for political factors we include local political competition, the extent of political parties presence (the number of sub-district political parties headquarters). The probability of getting caught by the anti corruption agency (KPK) is measured by the proportion of households exposed to the media in this case having TV sets. The variable \mathbf{z} represents probability that a cheating firm can be caught by the district heads bureaucracy. To capture this we use the percentage of district apparatus with college degree. We assume that cheating in road quality is difficult to detect since it involves many technical matters. So a district staffed with better educated bureaucrats may be able to detect cheating better than others⁵.

We cannot observe directly the fraction of defrauded money out of the total budget θ . However we know the number of cases of both executive and legislative member under investigation by local attorney general offices due to budget corruption. So instead θ will be represented by this variable. One caveat is that this variable may reflect more zeal of the anti corruption office instead of more corruption so one has to be careful when interpreting the results.

The cost of constructing roads will vary from one district to another depending on topographic, geographic and economic conditions. To represent the inter-district variability of construction costs we use the district GDP deflator. In addition we also control for district physical characteristics which capture geographic, topographic and climate condition of a district like flat or hilly area, coastal or not, earthquake area, flooding areas which eventually determines the true cost of road maintenance.

The empirical counterpart of (5) is given by

$$h = \alpha_0 + \alpha_1 \theta + \alpha_2 D2004 +$$
(6)
$$\alpha_3 \theta. D2004 + \Delta.G +$$
$$\Gamma Y + \Phi.P + u$$

In (6) θ is defrauded money from local budget, D2004 is the time dummy, **G** is a vector of district physical characteristics containing dummy variables whether a district is in flat or hilly area, coastal or not, which determines the true cost of road maintenance. The variable θ will be interacted with the time dummy to examine the effect of the regime change in the election system on **h**. In the meantime vector Y captures socio-economic condition of district like GDP per capita, ratio of local tax to GDP to represent the district fiscal capacity and local price or cost of living. The vector P captures all political variables like local political competition measured by the Herfindahl index of the parties share of local votes, the proportion of households with TV and the share of households subscribing newspapers representing the probability being caught by the anti corruption agency.

By construction, θ represented by the number of cases of suspected budget corruption, is endogenous so one has to implement instrumental variable method (IV). For this a set of geographic variables mentioned above like coastal or not, hilly or not, flooding area or not and so on can potentially be used as instruments. In addition a set of socio-demographic variables like religious affiliation represented by the number of Islamic schools, fraction of government employment in the local population and the fraction of population with high school education or more will be used as instruments⁶.

According to the theoretical model, the coefficient α_1 is expected to be negative. A new form of democratization will make a district head to pay more attention to the quality of public goods as this is one the prerequisite to be reelected. In the process in the face of increasing need for political campaign, he has to balance this with the desire to accumulate wealth. The first best situation is when there is no bribe. In this case both α_1 and α_3 will be strongly negative while α_2 is significantly positive and large. If both coefficients α_1 and α_3 are positive or negative but insignificant then the differential effect of the budget corruption

⁵According the procurement regulation it is impossible for bureaucrats to do their own design. Designing is the responsibility of construction firms. Certainly bureaucrats can set up local standard of quality based on the guidance (minimum standard) from the national public work ministry.

⁶The exaustive list can be seen in Table 2.

before and after democratization in reducing road quality is at best very little⁷.

The coefficient of GDP per capita is expected to be positive indicating that richer districts would have more potential to afford better road quality. The same thing also applies to district tax ratio which captures the fiscal situation. The higher is the tax ratio the more likely they can afford to build good quality roads.

Probability to win the relection

Another interesting issue to examine is the election itself. The probability of an incumbent to win election (λ) is in the form of Probit equation given by

$$\lambda = \lambda(h, \theta, m, G, Y, P) \tag{7}$$

The sign of the coefficient of \mathbf{h} in (18) cannot be determined in apriori. One one hand the district head needs to extract money rent to finance his campaign which lower his reputation as well as may result in a lower quality of roads. On the other hand he needs to show his competence to the voters by providing good quality of roads people But this would require him to extract less from the budget which under the absence of private contribution from elsewhere may result in less money for relection campaign. if he does too much then he may not be releccted since there will be public disgruntlement on his performance.

For the budget corruption θ we use the number of budget corruption cases involving both the excutive and legislative branches in a district. If θ and **h** have the opposite signs then there is a trade off between those two district head must lower budget corruption to build good quality roads. If θ and **h** are both positive then the district head bureaucracy may give consession (or subsidy) from corupted budget to the firm in the form of lower bribes in order to encourage a firm to build good quality road.

Like before we cannot observe the political funding for this as in the previous exercise we use the year 2009 (the most recent election) dummy to signify the difference between before and after the introduction of the new lection law allowing the district head and the members of local legislative to be ellected directly by direct people vote. The positive sign suggests that incumbents are more likely to be elected after 2004 than before.

The empirical version of (7) is given by

$$\lambda = \beta_0 + \beta_1 h + \beta_2 \theta +$$

$$\beta_3 D 2004 + \Delta G + \Gamma Y +$$

$$PhiP + u$$
(8)

5. Data

To estimate the model empirically we use a data set from the Statistical Bureau (BPS) called PODES or village potential. We are looking specifically for information related to road quality. There are two pieces of information regarding the road quality that can be aggregated from the village to the district level from PODES: fraction of passable roads and fraction of paved roads at the district level. We argue that this information is credible since it is created from the responses of village head concerning the roads passing through the village.

Fraction of paved roads in a district may also represent quantity rather than quality since it contains a political element. Roads have been used to demonstrate competency by local political candidates since the Suharto era. Simply because it is free and the benefits can be felt by all, unlike services like hospital, school which are not free. Before the election to attract voters a district head may intensify the road paving but the quality can only be observed later on. If it turns out that the roads

⁷It is also possible that α_1 and α_3 are strongly positive. This case is probable but unlikely since after the democratization the bureaucrats would increase their budget corruption θ and use some of the money to subsidize the construction firm to produce road with better quality than before the regime change.

are impassable within 6 months later then construction firms may cheat on quality assuming that the traffic volume is unchanged. This suits our model that allows firms to cheat on quality. So fraction of paved and passable roads in a district will be our two main outcomes to represent quality.

There are three election cycles in the period of analysis in 1999, 2004 and 2009. In the 1999 election, a district head was chosen by a local legislative, while starting in 2004 he or she will be chosen directly by the people. Our research aim is to assess how these two different schemes of democracy affect the quality of public goods in this case roads. We assume 3 to 4 years lag for all covariates allowing some adjustment to take place (see Table A2.1 in Appendix). For instruments we use variables farther back in time (see Table A2.2 in Appendix).

The PODES data sets in our possession are for 1986, 1990, 1996, 2000, 2003 and 2006. The road quality in 2003 and 2006 will be our main outcomes overtime. We have measurement at the sub-district level so for those two election cycles altogether there are 2052 observation. Some of other covariates like the fraction of hilly and flooding areas are also measured at the sub-district level. Other covariates like the number of budget corruption cases, the fraction of bureaucrat with college degrees, the number of households with TV, the fraction of population exposed to newspaper, the tax ratio, GDP per capita, GDP deflator are calculated at the district level. Table A2.1 summarizes our data sources.

6. Results

6.1. Field Interview in 50 sampled Districts Governance/Institution

Most of districts (23 out of 50) show a reduction in bribe in 2011 compared to the value in 2005. However, the role of local parliaments is increasing not only in budgeting process but also in planning and disbursement priority. The latter is supposed to be the local government authority. As consequence, many roads built or preserved are not based on the priority but on the constituency areas of local parliament members. This is in line with the general trend in manufacturing sector (Graph 1).

In general the strategy to join the project awarding circle is for several contractors to establish a cartel to win the bidding process. In this scheme each cartel member will have to pay some amount to local government. As a cartel, construction firms could negotiate the amount of bribe with the local government officials. This mechanism also allows other members to carry out the project as sub-contractors even though only one firm is selected as a winner.

For districts experiencing an increase (19 out of 50) in bribes the winner of the bidding process is usually preselected. Various practices to extort money such as making payment to the local government as an information fee or booking fees, or to the local party as a membership fee, are at play. By paying the information fee, the construction firms will get the first information earlier so they will have enough time to prepare good bidding documents then be selected as a winner. Similar to the information fee, booking fee is paid by the construction firms to obtain a guarantee for upcoming projects. This is usually paid in the early fiscal year. Unlike the two previous fees, the construction firms who pay the membership fee will be included in a bidding arrangement. This mechanism is quite sophisticated as it needs a good cooperation among local parties, business associations and local government officials. The transaction will then appear as a normal procurement process although the winner has actually been pre-selected.

Regarding to the practice to bribe local parliament members, each contractor usually pays some money as a percentage i.e. 5% to 10% of total contract to the campaign team of incumbent in the local election. Besides making



Figure 6: Graph 1

Sources: Annual Manufacturing Surveys

payment to their political campaign teams, the contractors could also pay directly to the local parliament members if the project areas happen to locate where their voters live.

In some districts where the clan of district head is dominant in both executive and legislative agencies, the bidder of construction projects is usually the one who has special connection with the clan of incumbent and or with the local party. Interest groups such as business associations are also part of their clique. In this typical district, the bribe tends to decrease, the quality of road remains unchanged or improved, but all construction projects are controlled by their clique.

Most of construction firms prefer to prefinance their project due to the complexity of administration process and higher unofficial payment. The more frequent the contractor requests the payment, the more documents should be prepared and the higher unofficial payments are paid to the local government. They usually borrow from local banks or joint financing with other firms for about 3-6 months, depending on the length of the project.

The impact of new regulation on procurement process implemented in January 2011 is unclear some respondents reveal positive impacts, others not. The frequent complaints from construction firms on new procurement system are (i) expensive, (ii) more complicated procedure, and (iii) unreliable internet connection. Meanwhile, the positive impacts on new procurement regulation are (i) less documents required, (ii) less face to face meeting, and (iii) open to any firms. Despite those positive impacts, this new e-procurement system still can be hacked by the internal procurement official. For instance, announcing an invitation to bid where the winner has actually already been decided in advance. In this scheme district officials try to split up the projects into the smaller ones so the grantee can be chosen without having to go to the official bidding process since by law small projects can be carried out based on direct appointment by local government.

During the project implementation, collusion between construction firms and road supervisor from both local government and consultant still exists in some districts, particularly at the project hand over stage. For example, monthly certificate and assessment report could be manipulated by the consultant supervisors and or by the officials in order to speed up the disbursement process. Physical inspection is not carried out randomly; instead, this is carried out only at a certain part of road to avoid detection of cheating. This would make road durability shorter than it should be. *Road Quality*

According to the respondents, in general, most of districts have better road quality in 2009 compared to the condition in 2005 (**Graph 2**).⁸ It is interesting to observe that the percentage of good roads actually higher in the era of direct election after 2004 compared to those in 2001. This is in line with the travel time which is faster in some districts due to new or good road quality, but slower in most of city areas due to the congestion. All municipalities or cities in the sample have similar road condition due to their small areas and flat contour. In addition, cities (municipalities) roads have been built since hundred years ago and traffic passing through cities is well regulated due to their relatively small areas of coverage.

 $^{^{8}}$ We do not have road data in 2010 and 2011



Source: Field Interview in 50 Districts

Unlike cities, districts (kabupaten) characteristics vary from one to another which affects their road quality. For instance, the existence of industry and natural resources such as mining, forestry, and plantation requires inter-city transportation which pass district roads Also, natural condition i.e. topography (mountain or flat), heavy rainfall, river mouth, etc. could affect the road quality in general.

One new development in this matter is that the new law on traffic has been stipulated in 2010 and effectively implemented in January 2011. This law says that only the police could inspect and fined the vehicles violating the law. Unfortunately, not all police are trained or equipped with adequate tools to do some measurements and assessment. So many heavy vehicles with high tonnage continue to pass district roads which are not designed to withstand heavy loads. Consequently roads in districts deteriorate quicker than their supposed standard specification.

The percentage of heavily damaged roads is slightly higher in 2009 compared to 2001 (**Graph 2**). For this bad road category, the travel time increases by two folds or triple, while the vehicle maintenance cost also rises by almost a double, and the time to replace slow moving part is getting shorter. This typical bad road will last only for 3 to 4 months. Road durability with a proper maintenance period is about one to two years for the hot-mix type, and less than six month for the asphalt type. In general local governments have allocated road maintenance in their annual budgets.⁹

Relationship between Road Quality and Governance

In this study, road quality is measured based on the interview with local transportation associations regarding the travel time, perception over the road quality, and time to replace the slow moving parts. Meanwhile, the governance is assessed by asking construction firms question on unofficial payment (bribe) paid to a respective local government and or to local parliament, time spent to receive the first payment; and perception over the procedure to obtain contract, procurement and payment. All questions are asked by comparing the current condition to the prior 2005 conditions. The results are summarized in **Table A2.3**.

From **Table A2.3**, almost half of district in the sample have better road quality compared to the 2005 condition. About one third of total districts with better quality road are facing an increase in bribe and very few are dealing with unchanged bribe. It seems that the local government together with the local parliament, in one hand, increase local budgets to finance road maintenance to provide higher quality of road but on the other hand extorting higher bribes from the construction firms. Detailed discussion can be seen in **Box2 Annex 6**.

In most districts with better or unchanged road quality and a decrease in bribe is often perceived by the media as a success story of the anti corruption agency (KPK) in combating corruption (one example is Kabupaten Sidoarjo in East Java in **Box 1 Annex 6**). In reality it could be very different story. The respective construction firms do not reduce the quality of road because there is a lower bribe paid to



⁹However, in some areas, some concrete roads are built and preserved by the private sector budget which is usually manufacturing companies located in industrial areas.

the local government or to the local parliament. Moreover, those typical districts may have high own sources of revenue from local taxes and levies so the government officials or parliament members have no temptation to request higher bribe as those have already received higher income due to higher own source revenue. The implementation new procurement system (eprocurement) as well as the domination clan or cliques of district head and construction firms could also contribute to this good road qualitylow bribe situation.

For districts with bad road quality and a decreasing or unchanged bribe, construction firms appear to pay lower or same amount of bribe but due to complicated local regulation to prevent corruption and cheating very few firms are willing to take risk to carry out the construction projects so the district roads may fall into disrepair (a good example is Kabupaten Temanggung in **Box 3 Annex 5**).

The worst situation occurred when districts have bad road quality and while the bribe is increasing. It seems that demand for bribe has forced firms to sacrifice road quality just to maintain some decent profits (one example is Kabupaten Cirebon in West Java in **Box 4 Annex5**).

The results of the above field interview suggest that the impact of decentralizationdemocratization on road quality is at best ambiguous for some it leads to the better while for others it goes the other way. This observation is incorporated into the reformulated theoretical model.

6.2. Econometric Results

Local Democratization

Graph A4.1 shows the general picture of our two main outcomes paved and passable roads. Overall it is suggested that the quality in terms of paved roads increases significantly after the introduction of the direct election in 2004 This is accompanied by the decline of variability of the percentage of paved roads across districts (Graph A4.2). All districts tried to increase the percentage of paved roads with those that lagged behind attempted to catch up with those already ahead. There is a slight decrease of the average of passable roads across subdistrict, but the most obvious case is the jump of standard of deviation from passable roads. So the quality in term of whether the roads are passable for year around show more variations in 2006 with some districts continue to lag behind. This graph provides useful information on the whole situation but it is hard to draw any meaningful conclusion about the firm cheating. This has to wait for the econometric analysis.

Table A2.4 in the annex gives the descriptive statistic of all variables used as the dependent variables and the main covariates. These variables vary significantly from one district to another. For example for the tax ratio it varies enormously from around 0.5 percent to 70 percent of district GDP. Some districts have low exposure to TV program while others almost all households have TV sets. There are also significant topographic and geographic variations there are flat areas with no hills and while others are very mountainous. Some areas virtually have no paved roads, while it is possible that in the rainy season only about 20 percent of the total areas are passable to 4 wheels vehicle.

The estimation results for two outcomes for roads fraction of paved and passable are presented in Table 1 and Table 2. We use two estimation methods. First is a plain OLS with robust standard error labeled as model I (column 1 and 3). To account for the endogeneity of the number of corruption cases θ we employ the IV-GMM (instrumental variable general method of moment) method. The list of potential instruments can be seen in **Table A2.2**. In the paved road regressions (**Table 1**), the impact of changing the election system from an indirect one through local legislative in electing a district head to a direct system election is to increase the fraction of paved road. The coefficient of time dummy is positive and strongly

Fraction Paved Road	OLS		IV-GMM	
	Ι	II	Ι	II
Number of budget Corruption cases	-0.129	-0.002	-0.057	0.158
	[-1.90]*	[-0.24]	[-0.28]	$[2.08]^{**}$
Dummy 2006	0.166	0.195	0.149	0.626
	$[8.26]^{***}$	[7.51]***	$[7.44]^{***}$	$[2.84]^{**}$
Dummy 2006 X $\#$ of budget Corruption cases		-0.021		-0.357
		$[-1.65]^*$		$[-2.15]^{**}$
Fraction of households with TV	0.074	0.076	-0.018	0.014
	$[1.76]^*$	$[1.80]^*$	[-0.42]	[0.27]
Log GDP per capita	0.053	0.051	0.085	0.06
	$[3.86]^{***}$	$[3.73]^{***}$	$[6.56]^{***}$	$[3.12]^{***}$
Tax ratio	0.561	0.525	0.787	0.196
	$[2.24]^{**}$	$[2.09]^{**}$	$[3.14]^{**}$	[0.45]
District price indicator (GDP deflator)	-0.244	-0.024	-0.031	-0.02
	$[-2.75]^{**}$	$[-2.75]^{**}$	[-2.89]**	[-1.48]
Fraction of hilly areas in a district	-0.198	-0.198	-0.216	-0.212
	[-7.59]***	[-7.60]***	[-7.99]***	$[-6.91]^{***}$
Fraction of areas prone to flooding	-0.292	-0.285	-0.307	-0.199
	$[-5.66]^{***}$	$[-5.57]^{***}$	$[-5.91]^{***}$	[-2.80]**
Herfindahl Index of political parties	-0.024	-0.031	-0.027	-0.161
	[-0.43]	[-0.52]	[-0.44]	$[-1.77]^*$
Fraction of population subscribing newspaper	0.316	0.323	0.314	0.426
	$[7.20]^{***}$	$[7.24]^{***}$	$[6.97]^{***}$	$[5.47]^{***}$
Number of Observation	2052	2052	2052	2052
F-value	52.74^{**}	48.52^{**}		
Wald-chisq			620.05^{**}	424.52**
P-value			0.88	0.09

Table 1: Pre to Post Local Democratization (2003-2006): Paved Road Regressions

1. Figures in parentheses are t-ratio

2. *** Significant at 1% level

3.** Significant at 5% level

4. * Significant at 10% level

5. Instruments are number of voters in the previous election, percentage of government employees in 1990s, average distance to district capital from a village, percentage of population with high school education in 1990s, bribe in manufacturing sector 3 years back and fraction of population subscribing newspaper.

significant in all model specifications and estimation methods.

We manage to get a negative relationship between the fraction of areas with paved roads and budget corruption. The less is the corruption the higher is the road quality. However what is more important is the differential effects on paved roads after the introduction of direct election. For this purpose we introduce an interactive term between time dummy and the number of corruption cases (model II) in both OLS and IV-GMM estimation methods. The theoretical framework predicts that this new form of democracy would increase the road quality due to lower budget corruption. The interactive term is negative and significant giving support to this prediction. The coefficient of interactive term is more negative and statistically stronger if we take into account the endogeneity of budget corruption.

The highest is the fraction of households with TV the better is the road quality. So the public exposure will force the district to build better roads which is only possible if he reduces corruption. This variable however does not survive the application of IV-GMM procedure. To begin with, its effect has never been very strong in the OLS works (significant at the 10 percent level, so it is not too surprising that the effects will disappear if the endogeneity is taken care of.

Richer areas appear to have greater ability to build better quality roads. The coefficient of logarithm of GDP per capita is positive and strongly significant in all specifications. Higher GDP per capita serves as a base for local tax collection. Though not always the case, districts with higher GDP per capita would have more potential to have higher tax ratio. Poorer districts in the meantime would have to rely more on the central government transfer. The coefficient of district tax ratio is positive and significant at the 5 percent level stressing the importance of government resources from taxation. It appears that the construction of paved road is also sensitive to local cost. The higher the price deflator the lower is the fraction of areas with paved roads. In 3 out of 4 specifications, the coefficient is negative and significant at the 5 percent level. Related to cost as well as to the level of technical difficulties is the contour of the areas. Hilly regions are less likely to have paved roads since it will cost more. The coefficient of the fraction of mountainous areas in a district is strongly significant at the 1 percent level for all specifications. Moving to the next covariate, areas frequently visited by flooding also tend to have lower fraction of paved roads.

The local politic appears to have little influence on the decision to build or to improve road. The local politics is represented by Herfindahl index calculated from the share of votes of all parties. The variable is significant only in IV-GMM with an interactive term the variable so the results have to be interpreted with a caution. The coefficient is negative and significant at the 10 percent level. The more concentrated are the votes in few political parties the less likely the areas to be paved. So local political competition has positive effect on road quality and may work to the advantage of local people.

Finally the fraction of local population exposed to newspaper or subscribing newspaper serves as an early warning to a district head for any public discontent especially with respect to roads. The coefficient is positive and significant at the 1 percent level. The existence of free media has positive impact on the quality of roads.

Table 2 presents the results of the passable road regressions. The regressions are intended to detect the cheating of road quality mostly on the part of construction firms.

The fraction of areas of paved roads in a district passable by 4 wheelers year around is created from the eye witness account of village heads for district roads passing through their

Fraction Paved Road	OLS		IV-GMM	
	Ι	II	Ι	II
Number of budget Corruption cases	-0.004	0.001	-0.003	-0.02
	[-1.56]	[-0.73]	[-1.45]	[-1.60]
Dummy 2006	-0.011	-0.004	-0.011	-0.042
	[-2.85]***	[-1.08]	[-2.98]***	[-1.97]**
Dummy 2006 X $\#$ of budget Corruption cases		-0.004		0.026
		[-1.08]		[1.54]
Fraction of households with TV	0.002	0.003	-0.01	-0.01
	[0.25]	[0.32]	[-1.20]	[-0.89]
Log GDP per capita	0.0002	-0.00001	0.001	0.003
	[0.05]	[0.00]	[0.32]	[0.84]
Tax ratio	0.16	0.154	0.13	0.15
	$[3.54]^{***}$	$[3.37]^{***}$	$[3.30]^{***}$	$[3.41]^{***}$
District price indicator (GDP deflator)	0.003	0.003	0.001	0.005
	[1.20]	[1.21]	[0.48]	[1.60]
Fraction of hilly areas in a district	-0.011	-0.012	-0.011	-0.014
	[-1.83]*	$[-1.85]^*$	$[-1.97]^{**}$	[-2.47]**
Fraction of areas prone to flooding	-0.032	-0.03	-0.034	-0.036
	[-2.34]**	$[-2.26]^{**}$	$[-2.96]^{***}$	[-2.64]***
Herfindahl Index of political parties	-0.002	-0.003	0.001	-0.01
	[-0.19]	[-0.25]	[0.13]	[-0.93]
Fraction of bureaucrats with college degree	0.04	0.04	0.038	0.022
	$[4.79]^{***}$	$[4.57]^{***}$	$[3.18]^{***}$	$[1.85]^*$
Number of Observation	2052	2052	2052	2052
F-value	6.72^{**}	6.18^{**}		
Wald-chisq			66.88^{***}	50.97^{**}
P-value			0.21	0.32

Table 2: Pre to Post Local Democratization (2003-2006): Passable Road Regressions

1. Figures in parentheses are t-ratio

2. *** Significant at 1% level

 $3.^{**}$ Significant at 5% level

4. * Significant at 10% level

5. Instruments are number of voters in the previous election, percentage of government employees in 1990s, average distance to district capital from a village, percentage of population with high school education in 1990s, bribe in manufacturing sector 3 years back and fraction of population subscribing newspaper.

villages. This variable is somewhat more reliable than the data produced by district offices which may strategize to exaggerate or to discount the cases depending on their motives, in order to attract funding from the central government.

Statistically the results for the passable roads are weaker than the paved road case. None of the number of budget corruption cases is significant. Meanwhile all 4 coefficients of time dummy are negative and three of them are significant at the 5 percent level. So there is some indication that there the durability of roads are declining significantly at least in some areas, the situation which is not clearly indicated in the summary statistic (**Table A2.4**). Finally local politics have nothing to do with road durability.

The fraction of household with TV is not significant indicating that the problem of quality cheating is hard to detect by the general public or the press which do not have technical competency to do the job. From physical appearance roads may look fine but they may be washed away in the rainy season or at least would be marked by big potholes.

The detection of cheating may be performed more effectively by competent specialists or technicians or at least by bureaucrats of certain types who can deter cheating before it starts either through better monitoring management or higher technical competency. For this purpose we include the percentage of bureaucrats with college degree as a proxy for those who may do better job in the road quality monitoring. The result shows that districts with better educated bureaucrats are less likely to have problem with road impassability especially during the rainy season. The coefficient of the fraction of local bureaucrats with college degree is positive and strongly significant at the 1 percent level.

Related to the road durability is the ability of districts to do regular maintenance which needs to be financed from tax revenues. There is no difference between rich and poorer districts with respect to whether roads are passable or not but those with higher ratio of local tax to GDP face less problems with road impassability. The coefficient of tax ratio is positive and strongly significant in all specifications. Higher tax ratio could also mean that potentially there would be more resources to a district which imply they could do everything better.

The task of maintaining roads year around appears to be harder in mountainous regions as well in districts vulnerable to frequent flooding. Flooding is the worst enemy to road maintenance. The coefficients of for frequently flooded areas are always negative and significant at the 5 percent level in all specifications.

Comparing results from Table 1 and Table 2, it suggests that an introduction of direct election would make district heads to improve the road quality in terms of the increase of paved road areas but perhaps at the expense of some decline in durability. In the theoretical part we assert that the decline of quality (in terms of durability) may result because construction firms have to pay higher bribes to compensate for the district head loss of corruption incomes from defrauding local budgets. The above results give a hint but not a direct result that this may be the case.

To be able to confirm the results we replace the number of corruption cases with the trend of bribes in a district. The bribe data from the field interview have too many missing values while the timeframe is too short. It may be good enough for analytical narrative but certainly not sufficient for any econometric exercises. To overcome this problem we use the trend of bribes in manufacturing sector in a district. We assume that bribes of all sectors in a district move in a similar fashion since in the end all of those must be paid to the same corrupt district heads bureaucracy in a district.¹⁰ The bribe in the manufacturing sec-

¹⁰In other words the relationship $\theta(b)$ is substituted in to the semi-reduced form in equation (15).

tor in Indonesia can be calculated for every district since we know firms location though the firm identity is censored. The regressions results are presented in **Table A2.5** and **Table A2.6** in Annex 2.

This does not mean there is no cheating by construction firms since on average there is a slight decline in durability. Also the year 2006 dummy is negative and significant which means although there are more paved roads in 2006 as indicated in the paved road regression, the roads are less durable which may indicate lower quality or cheating on the part of construction firm. As the theoretical model indicated and also corroborated by a field interview, this may stem from the increase in bribes which force firms to cheat to preserve profits. It may not happen in general scale rather only in some certain districts whose district heads are really pure rent seeker and hence affects the overall district bureaucracy attitude. For good districts which are the majority in our sample, the temptation to increase bribes and to cheat on quality may be held in check by local free media and monitoring system. So the situation is more in line with Figure 2 where the positive effects from the new election system still persist despite the continuation of some cheating.

In the era of direct election system, district heads need to build better quality roads more to satisfy potential voters while at the same time a more vigorous public scrutiny would force them to lower corruption from local budget. The risk of extorting more bribes from firms is also high. As our field interview indicated, this however will not eliminate bribing altogether since the results suggest the negative relationship between bribes and the road durability still persists. So what has been happening after 2004 all interested parties will just preserve the old bribing system quietly not attracting public attention.

The burden of the new form of election regime may fall on construction firms since district heads bureaucracy has monopoly power to award project grants. At the same time they need to build better quality roads to attract voters as well as to signal their competence. This will cost firms more which would squeeze profits but construction firms may have very little choices except to continue the business as long as the profits are comparable to the opportunity costs elsewhere. To check this we rerun the model in **Table A2.5** and replacing the fraction of passable roads with paved roads. The results are presented in **Table A2.6**.

None of the coefficient of bribe is significant. Bribes have no effect on road quality. Meanwhile, the time dummy is still positive and statistically strong, which means a big positive effect on the number of areas with paved road after the introduction of a direct election system. In model II of OLS version the interactive term between bribes and time dummy is negative and significant suggesting that after 2004 the increase of bribes tend to lower road quality but the effect does not survive when the IV-GMM procedure is applied. So at best our interpretation is that some cheatings have indeed taken place perhaps almost everywhere but not in a sufficient magnitude that would make the positive effect of democratization on road quality disappears altogether.

Probability to win reelection

There is a question whether road quality as the single most important variable in the voters mind is really valid outcome. There may be some other public goods that are equally or more important. To answer this question we estimate empirically the probability to win reelection equation (7). The dependent variable is a dichotomous one having the value of one if the incumbent won the election and zero otherwise.¹¹

In the regression equation beside a measure of road quality we also incorporate other public goods such village markets, village bus termi-

 $^{^{11}\}text{We}$ attempted to instrument both the road quality ${\bf h}$ and defrauded budget Θ but the model does not converge.

nal, village health facility and access to district water company which serves the public either through piped in water, central village water tower or water truck. In another experiment we pair road quality and the number of budget corruption cases to examine which issue is really more important in the election. The results are presented in **Table A2.7** in Annex 2.

None of other public goods is important in the reelection of incumbent. For the voters to have passable roads year around is more important than just having roads paved. The fraction of areas with passable roads is positively significant at the 5 percent level, while it is not significant for paved roads. The probability of an incumbent to be reelected is higher if he or she did a good job in maintaining the road durability in the district and not simply just making new or paving roads. The number of budget corruption cases has never been significant in any of the above specifications.

The time dummy for 2009 is positive and strongly significant suggesting that more incumbent won the reelection in 2009. In 2004 many incumbents were the product of the old indirect election system in which campaigning directly to the voter had never been important. At the time of transition in 2004, they were still grasping on issues that might attract voters. There was also a public sentiment against insider of which outsiders were perceived as being cleaner or less corrupt (Henderson and Kuncoro [2011]). In 2009 however, the incumbents were cleverer having learned their lesson. The use of road quality as a political instrument is not new. To mobilize popular support from rural areas Suharto had used among others road construction as income generating public work as well as to smooth people and goods movement in the countryside (Kuncoro and Resosudarmo [2006]).

Only few of other covariates are significant which may be a sign of good thing for the voters rationality. This suggests that inter district variations in socio-economic, demographic and geographic do not matter very much. Local governments are expected to deliver something real and durable. The above results also suggest that the voters preferences are more or less uniform across districts favoring road quality over other things.

Decentralization Results

Table A2.8 summarizes the econometric results for the paved roads before and after decentralization in 2001 but local democratization has yet to take place in 2004. So decentralization has not yet fully accompanied by full accountability to local people. The difference between model I and model II is the inclusion of fraction of population exposed to newspaper in the later and not in the former. The purpose is to examine whether the existence of local free media in this case newspaper provides a sufficient counterbalance for the potential lack of accountability on the part of local government since local people still could not vote out incompetent or corrupt local government.

Looking at glance the impact of introducing fraction of population exposed to newspaper is to weaken the impact of bribes on fraction of paved roads in a district. One plausible explanation is that in the 2001-2003 periods although the time line for local democratization had not been announced, the logic of decentralization-local democratization sequencing was already a public knowledge so district heads and people might form their expectation and behavior accordingly. In the regression with newspaper variable, the inclusion of newspaper variable (model II) weakens the bribe effects on paved roads. In the regressions without newspaper variable we managed to find a significant negative relationship between fraction of paved roads and bribes. But these effects disappear if newspaper variable is added into the equation. The coefficient of newspaper variable itself is positive and highly significant. In the regression without newspaper variable the TV ownership is not strong enough to weaken bribe effects. It suggests that public exposure to newspaper may provide strong deterrent against corrupt behavior.

The coefficient of yearly dummy for 2003 is significant and negative for regression without newspaper variable suggesting that quantitatively the road situation deteriorated after decentralization went into effect. But controlling for newspaper the negative effects become insignificant basically telling the same story as above. The tax ratio is positive but insignificant which is understandable since almost all aspects of local public finance were still very much controlled by the central government prior to 2001. Other covariates controlling for topographical contour of the areas more or less behave in the same way as in the local democratization regressions. District GDP deflator as a proxy for cost show that local costs, does not impose any constraint on road construction since it is either insignificant or positive but weakly significant.

The same sort of exercises with respect to passable roads is presented in Table A2.9. The coefficients of bribes are negative and significant in 3 out of 4 specifications. The addition of newspaper in the set of covariates does not weaken this relationship. Again it suggests that cheating on the part of construction firm is hard to detect people will only realize about the defect perhaps some months after the roads are in place. The newspaper variable itself is positive and highly significant so more passable roads that are not washed away in the rainy season will be available to the public. The existence of free media in the form of newspaper coverage is essential to keep pressure on district heads to maintain roads in good condition. The TV ownership remains significant and positive at least in 2 specifications. There is no change in fraction of passable road before and after decentralization - year dummy and its interaction with bribes are basically insignificant except in one case where the year dummy is negative and weakly significant.

Turning to other covariates, none of GDP per capita variable is significant which suggests cheating in road quality is nothing to do with rich or poor districts. Richer districts could afford to have better road quality as shown by the paved road regression but this effect disappear in the passable road regressions. All district GDP deflator which is used as a proxy of construction cost have wrong positive sign but this may only reflect that construction costs in richer areas are more expensive. Despite this, all other control variables for construction costs such as fraction of hilly, prone to flooding have the right negative sign an significant at one percent level.

Determinants of Bribes

In **Table A2.10** in Annex 2, we present several results of the first stage regressions of firm bribe and number of budget corruption cases. In each respective dependent variable we incorporate the average bribes/number of budget corruption cases in contiguous districts to examine whether there is a demonstration effect or social learning from adjacent areas.

Between 2003 and 2006, bribes have decreased as shown by the negative and significant coefficient of the year 2006 dummy. In the bribes regressions average distant of villages to district capital approximates the size of a district. The coefficient is positive and significant at 1 percent level. The larges is a district the higher is the bribes which suggest monitoring and enforcement problem. The larger is the size of government employee in the local work force the higher is the bribes reflecting the scale effect of potential extorters. The fraction of manufacturing in district GDP which suggest that the formal sector serves a base for bribe collection. The coefficient of average bribes in contiguous districts is not significant indicating there is no learning effect for corrupt behavior. So it is possible that for a clean district to locate side by side or surrounded by corrupt districts and relatively unaffected.

Unlike in the bribe regressions the year 2006

dummy in the budget corruption regressions is not significant. The average distant to district is positive and highly significant. There is no change between 2003 with respect to the number of corruption cases involving district budget. Coastal districts appear to be less corrupt. In one model, the percentage of coastal villages in a district is negatively significant at the 10 percent level. The Herfindahl index of political parties is negative and significant at the 10 percent level. This could mean that the increase of one or few parties dominance in a district strengthens the ruling parties lobbying power against local attorney general office or local anti corruption agency (KPK) to dismiss budget corruption cases. Again the average number of corruption cases in contiguous districts is not significant so there is no social learning effect.

Determinants of Tax Ratio

In our empirical estimation tax ratio is treated as exogenous. Actually it can be endogenous influenced by political and socio-economic variables. We investigate this matter and the results are presented in Table A2.11 in Annex 2. Between 1999 and 2003 (before and after decentralization) the district level tax ratio in Indonesia has increased as shown by a positive and highly significant the year 2003 dummy. The average distant to district capital is negative and significant reflecting collection and administrative problems as a district becomes larger in geographical size. The percentage of government employee in the work force is positive and significant which show the potential increase of tax collection capacity with the size of government sector. The relationship between district GDP per capita and tax ratio is negative which indicate that richer areas do not pay their dues. The problem of tax evasion is perhaps more rampant in richer areas which is helped by the collusion between tax payers and tax collectors.

Policy Implication

Building on the momentum of decentralization

and democratization Indonesia now has undergone another experiment in democracy namely the change of election system from indirect to direct election by the people. For politicians (district heads) and their associated bureaucrats alike the transition is not easy. With a direct election system, politicians have to address the need of voters, while at the same time have to find the way to finance the political machinery. There is a little doubt that the cost of political activities has increased significantly. In the Suharto era this had been run by the centralized political system. With the departure of Suharto the system has become fragmented with no clear hierarchy of power.

One urgent issue in this new form of democracy democratic Indonesia is political party funding. A reform on political activities funding is overdue. Much of the parties money is thought to come from the selling public offices, government project, influencing budget allocation. In this study we focus on the governance aspect of the granting road construction projects to private contractors. In the era of direct election system, district heads will have to build better quality roads more to satisfy potential voters while at the same time a more vigorous public scrutiny would force them to lower corruption from local budget. To compensate the loss of corruption money they may increase bribes from awarding contracts to private contractors. The findings however suggest that there is no apparent dramatic increase with respect to bribes though it is still the way to do business in the road construction business. Voters punishment may not be enough to deter district heads from increasing bribes. Other important factors must also exist. In this case the other factors are the existence of local free media and the ad-hoc anti corruption agency (KPK) which holds corruption in check.

There are two types of corruption in road projects, budget mark-up and collusion between providers and district government. To minimize budget corruption the establishment of procurement standard for road construction that takes into account district heterogeneity is necessary. In the early budgeting process this should be verified by a district audit body which is independent from a district government to prevent budget mark-up. Despite the fact that invitation to bid is an open process, formation of cartel or pre-selection of winner is prevalent almost everywhere. Ad hoc anti corruption agency should also focus on the bidding process not just after the projects are completed in order to prevent collusion as early as possible. Once a project is finished a quality check should be done by an independent third party instead of by local government agency. Standard qualification for bureaucrats for technical department in charge of quality monitoring must be high political appointment of rentseeker agent should be avoided as it would be self-damaging to district government credibility.

Producing high quality roads as demanded by voters are not cheap while most of the contracts are fixed. Taking into account also the bribes that have to be paid to , this would have eaten into firms profit. So the temptation to produce lower quality roads is high. District heads after knowing this would increase quality monitoring since their jobs in the eyes of voters would depend on the road quality. To summarize, the combination of democratization, free media, an ad-hoc anti-corruption agency and well educated bureaucrats holds corruption in check and even may still maintain decent quality of roads.

7. Referrences

- Andvig, J.C. and K.). Moene, (1990) How Corruption May Corrupt, *Journal of Economic and Behavioral Organization*, vol 13, p. 63-76.
- [2] Austen-Smith, D., (1987), 'Interest Groups, Campaign Contributions and Probabilistic Voting', *Public Choice*, vol. 54.
- [3] Baron, D., (1989), 'Service Induced Campaign Contribution and the Electroral equilibrium', *Quarterly Journal of Economics*, vol. 104.

- [4] Burgess, R., M. Hansen, B. Olken, P. Potapov and S. Sieber, (2012), 'The Political Economy of Deforestation in the Tropics', *forthcoming in Quarterly Journal of Economics*.
- [5] Chavis, L. (2010). Decentralizing development: Allocating public goods via competition. *Journal of Development Economics*, 93, 264-274.
- [6] Chowdhury, S., Yamauchi, F., & Dewina, R. (2009, October). Governance Decentralization and Local Infrastructure Provision in Indonesia. *IFPRI Dis*cussion Paper No 00902.
- [7] Engel, E.; R. Fischer and A. Galetovic, (2009), 'On The Efficient Provision of Roads', *GDN Working Paper Series* No. 12.
- [8] Estache, A., & Sinha, S. (1995, May).Does Decentralization Increase Spending on Public Infrastructure? World Bank Policy Research Working Paper No 1457 (1457).
- [9] Faguet, J.-P. (2004). Does decentralization increase government responsivness to local needs? Evidence from Bolivia. *Journal of Public Economics*, 88, 867-893.
- [10] Fisman, R. and R. Gatti, 2002, 'Decentralization and Corruption: Evidence across Countries', *Jour*nal of Public Economics, vol. 83, p. 325-345.
- [11] Henderson, J.V., and Ari Kuncoro, 2004, Corruption in Indonesia, with J.V. Henderson, NBER Working Paper no. w10674, August.
- [12] Henderson, J.V., and Ari Kuncoro, 2011, Corruption and Local Democratization in Indonesia: the Role of Islamic Parties, *Journal of Development Economics*, vol. 94(2), p. 164-180.
- [13] Kaufmann, D., and A. Kraay, 2002, 'Growth without Governance', World Bank Policy Research Working Paper, no. 2928, November.
- [14] Kuncoro, Ari, and Budy Resosudarmo, 2006, Understanding Economic Reform in Indonesia, in J.M. Fanelli and G. McMahon (eds), Understanding Market Reforms; volume 2: Motivation, Implementation and Sustainability, Palgrave Macmillan, December, 2006
- [15] Huther, J. and A. Shah, 1998, 'Applying a Simple Measure of Good Governance to the Debate on Fiscal Decentralization', World Bank Policy Research Working Paper, no. 1894.
- [16] Manski, C.F., 1993, 'Identification of Endogenous Social Effects: The Reflection Problem', *Review of Economic Studies*, vol. 60, p. 531-542.
- [17] North, D., 1990, 'A Transaction Cost Theory of Politics', *Journal of Theoretical politics*, vol. 2., p. 555-67.
- [18] Persson, T., and G. Tabellini, 2000, Constitutional Determinant of Government Spending, mimeo.
- [19] Prudhomme, R., 1995, 'The Danger of Decentralization', *The World Bank Observer*, vol. 10(2).
- [20] Ranis, G., and F. Stewart, 1994, 'Decentralization

in Indonesia', Bulletin of Indonesian Economic Studies, vol. 30(3), p. 41-72.

- [21] Rasmusen, E., and J.M. Ramseyer, 1994, 'Cheap Bribes and the Corruption Ban: A Coordination Game Among Rational Legislators', Public Choice, vol. 78, p. 305-327. Rogoff, K. (1990). Equilibrium Political Budget Cycles. American Economic Review, 80, 21-36.
- [22] Tanzi, V., 1996, Fiscal Federalism and Efficiency: A Review of Some Efficiency and Macroeconomic Aspect, in Bruno M., and B. Pleskovic (eds), Annual World Bank Conference on Development Economics, 1996, World Bank
- [23] Tiebout, C., 1956, 'A Pure Theory of Local Expenditure', *Journal of Political Economy*, vol. 64, p. 416-424.
- [24] Tirole, J., 1996, 'A Theory of Collective Reputation', *Review of Economic Studies*, vol. 63, p. 1-22
- [25] Treisman, D., 2000, 'The Causes of Corruption: A Cross-National Study', Journal of Public Economic, vol. 76, p. 300-457.
- [26] Shleifer, A. and R.W. Vishny, 'Corruption', Quarterly Journal of Economics, vol. 108, p. 599-617.
- [27] Vergne, C. (2009). Democracy, elections and allocation of public expenditures in developing countries. *European Journal of Political Economy*, 25, 63-77.

Annexes A2. Tables District Head

Local bureaucracy is represented by a district head which will be running in the next election. To win next election, he needs campaign funds. The money comes from exploiting his bureaucracy by corrupting the budget for roads and extorting firms applying for government contracts. Let Θ be the fraction taken out by the head out of the total value of the project H. Another source of revenue is from a monopolist firm which will pay a kickback of **b** to be awarded a contract of $(1-\Theta)H$. So the total revenue for the head is

$$R = \Theta H + b \tag{A1.1}$$

The expected utility the district head depends on the probability to win the next election, λ and the expected value asset (E[A] accumulated during his term

$$E(V) = V(h, \lambda, E, (A)) \tag{A1.2}$$

where $V_{h\dot{\iota}}0$, $V_{hh\dot{\iota}}0$, $V_{\pi\dot{\iota}}0$ and $V_{E[A]\dot{\iota}}0$. The appearance of quality of road in the utility function suggests that he will feel satisfaction from doing his duty providing good roads for the local population apart from his corrupt behavior. The indirect effect of road quality will also come from the probability to win the election which will higher for being relatively clean or a low Θ and maintaining high quality of road (**h**),

$$\lambda = \lambda(\theta, h) \tag{A1.3}$$

where $\lambda_{\Theta} = 0, \lambda_{\Theta} = 0, \lambda_{h} = 0$ and $\lambda_{hh} = 0$.

If the head is winning the election he can accumulate assets (\mathbf{A}) further after deducting expenses for campaign (m), so his expected asset accumulation is given by

$$A = A_{-1} + \lambda (1 - q)(\Theta H + b) - m$$
(A1.4)

In (A1.4) A-1 is the previous accumulated asset is zero. Finally, \mathbf{q} is the probability of getting caught by the anti corruption agency (KPK).

<u>Firm</u>

The maximum net value of the project received by a firm is $(1-\Theta)H$. The profit for a construction firm is given by

$$\pi = (1 - \theta)H - c(h, c_1) - b(\Theta))$$
(A1.5)

The construction cost would be more expensive with higher quality of roads so $c_{h,i}0$ and $c_{hhi}0$ and c_i is location cost heterogeneity. We assume that district heads are concerned about their reputation not willing to be perceived as too corrupt but at the same time also do not want to lose their income from corruption. So when the corrupted money from the budget Θ falls they will seek compensation by asking higher bribes from the firm. Likewise when Θ increases they may lower bribes from firm. In other words **b** and Θ are substitutes or $b_{\Theta}i0$. Once a firm gets a contract, roads will be produced according to the production function

$$h = 1 - \pi \tag{A1.6}$$

For simplicity here we assume that both π is uniformly distributed between zero and one. From (A1.5) and (A1.6) it is clear that road quality **h** and profit π will be inversely related.

It is possible for a firm to cheat to get higher profit which implies a lower quality of roads. Suppose h^s is the minimum standard quality must be met by the contractor. If a firm produces road with lower quality than h^s the contract will be cancelled and it will not get profit. Let¹² assume that \mathbf{z} is the probability of getting caught of producing lower quality road. A firm will cheat producing lower road quality h^c if the expected value of doing so is higher than meeting the standard quality

$$pi(h^5) = \ge (1-z)\pi(h^c)$$
 (A1.7)

Based on this the profit function will become

$$\pi = (1 - z)[(1 - \theta)H - c(h, c_1)] - b(\theta))$$
(A1.8)

In (A1.8) bribes **b** must be paid in advance or the amount of kickback paid by a firm to join the bribing system in awarding road projects.

Solution to the Model

A firm is assumed to choose the quality of roads \mathbf{h} to maximize the utility of the net value of the project,

$$V^{F} = V^{F}((1-z)[(1-\theta)H - c(h)] - b(\Theta))$$
(A1.9)

From the point of view of a firm, **b** is exogenously determined since it is affected by Θ chosen by the district head.

Meanwhile the district head is to choose the amount of Θ and the quality of road, **h**, to maximize the utility of net income

$$(Max_{b.h}, V^G = V^G \Lambda(\Theta, h), E[A])$$
(A1.10)

 st

$$E[A] = A_{-1} + \lambda(1-q)\Theta \cdot H + b - m$$
(A1.11)

 $^{^{12}}$ In Henderson and Kuncoro (2004), we allow firms to negotiate the amount of bribes with the bureaucrats. Besides bribes, the time spent on negotiation is also counted as costs.

A2. Tables

Variables	Sources	Period	Level
Fraction of paved roads	PODES	1999, 2003, 2006	Sub-district
Fraction of passable roads	PODES	$1999,2003,\ 2006$	Sub-district
Number of budget corruption cases	Newspaper	$1999,2003,\ 2006$	District
Fraction of households with TV	PODES	1996, 1999, 2003	District
GDP per capita	Regional account	1995, 1999, 2002	District
Tax Ratio	Interior Ministry	1994, 1999, 2002	District
Price (GDP Deflator)	Regional account	1996, 1999, 2002	District
Fraction of hilly areas	PODES	2003, 2006	Sub- district
Fraction of flooded areas	PODES	1999,2003,2006	Sub-district
Political parties Herfindahl Index	Election Body	1999, 2004	District
Population exposed to newspaper	PODES	1996, 1999, 2003	District
Bureaucrats with college degrees	PODES	$1996, 1999,\ 2003$	District

Table A2.1: Data Sources for the Main Variables

Table A2.2: List of Instruments

Variables	Sources	Period	Level
Fraction of eligible voters	PODES	1990,2000, 2003	District
Fraction of government employee	Population Census	1990, 1995	District
Distance to district capital	PODES	2000	District
Distance to sub-district capital	PODES	2000	District
Fraction of high school graduates	Population Census	1990, 1995	District
Bribe in production costs	Manufacturing Survey	1996, 1999, 2002	District
Price (GDP Deflator)	Regional account	1996, 1999, 2002	District
Average altitude	PODES	2000	District
Fraction of coastal villages	PODES	1996, 1999, 2003	Sub-district
Fraction of quake zones	PODES	1999,2003, 2006	District
Number of Islamic schools	PODES	1986,1990, 1996	District
Number of mosques	PODES	1986,1990, 1996	District

Road Quality	Governance (in Terms of Bribe)			
	Decrease (Better)	Unchanged	Increase (Worse)	
Better	 KabKuningan Kota Bandung Kota Sukabumi Kota Surakarta KabWonosobo Kab Gresik Kota Mojokerto KabPacitan KabSidoarjo KabTuban Kota Surabaya Kota Cilegon Kota Tangerang KabTangerang (pretest) 	1. Kab Bogor 2. KabMagetan	 KabMajalengka KabGrobogan Kab Kudus Kota Magelang Kota Semarang Kota Malang KabLebak 	
Unchanged	 Kota Pekalongan Kab Kediri 	 KabBlora Kota Jogjakarta KabPonorogo 	 Kota Cirebon KabTegal KabBangkalan 	
Worse	 KabBekasi KabPekalongan KabPurworejo KabTemanggung KabNgawi KabSampang Kab Malang 	 KabJepara KabKebumen KabPati KabJombang 	 Kab Cirebon KabGarut KabSubang KabSumedang KabTasikmalaya KabPemalang KabKulonprogo KabPamekasan KabTrenggalek 	

Table A2.3: Classification Districts Based on Road Quality and Governance Compared to Prior 2005

Sources: LPEM Field Interview

Table A2.4: Descriptive Statistic for the Main Variables

Variables	Mean	Sd	Min	Max
Fraction of paved roads	0.693	0.288	0.03	1
Fraction of passable roads	0.978	0.074	0.2	1
Number of budget corruption cases	1.229	0.878	0	4
Fraction of households with TV	0.38	0.169	0.111	1
Log GDP per capita	1.432	0.591	0.37	4.469
Tax Ratio	0.046	0.025	0.0045	0.219
Price (GDP Deflator)	3.278	0.801	0.51	5.81
Fraction of hilly areas	0.224	0.275	0	1
Fraction of flooded areas	0.128	0.125	0	0.786
Political parties Herfindahl Index	0.272	0.123	0.036	0.783
Population exposed to newspaper	0.666	0.168	0.208	1
Bureaucrats with college degrees	0.191	0.133	0.036	0.961

Dependent Var.: Fraction Passable Road	OLS		IV-GMM	
Covariates	Ι	II	Ι	II
Bribes	-0.005	-0.003	-0.001	-0.038
	[-1.74]*	[-1.45]	[-0.17]	[-4.04]***
Dummy 2006	-0.014	-0.007	-0.011*	-0.036
	[-3.33]***	[-0.93]	$[-1.67]^*$	$[-2.64]^{**}$
Dummy 2006 X Bribes		-0.015		0.036
		[-0.94]		[1.46]
Fraction of households with TV	-0.003	-0.0002	-0.002	-0.01
	[-0.29]	[-0.02]	[-0.21]	[-1.07]
Log GDP per capita	-0.0002	-0.0001	-0.0004	0.002
	[-0.06]	[=-0.05]	[-0.10]	[0.66]
Tax ratio	0.167	0.168	0.165	0.168
	$[3.71]^{**}$	$[3.73]^{**}$	$[3.57]^{**}$	$[3.67]^{***}$
District price indicator (GDP deflator)	0.002	0.002	0.002	0.002
	[0.92]	[0.89]	[0.88]	[1.04]
Fraction of hilly areas in a district	-0.014	-0.013	-0.013	-0.015
	$[-2.25]^{**}$	$[-2.25]^{**}$	$[-2.04]^{**}$	[-2.34]
Fraction of areas prone to flooding	-0.03	-0.027	-0.03	-0.04
	$[-2.27]^{**}$	[-2.22]**	$[-2.25]^{**}$	$[-3.15]^{***}$
Herfindahl Index of political parties	0.0004	0.005	0.0002	-0.009
	[0.03]	[0.44]	[0.02]	[-0.76]
Fraction of bureaucrats with college degree	0.046	0.045	0.045	0.051
	$[5.00]^{**}$	$[4.96]^{**}$	$[4.93]^{***}$	$[5.23]^{***}$
Number of Observation	2052	2052	2052	2052
F-value	6.57^{**}	6.01^{**}		
Wald-chisq			69.46^{***}	66.16^{***}
P-value			0.65	0.09

Table A2.5: Pre to Post Local Democratization (2003-2006): Passable Road and Bribes

1. Figures in parentheses are t-ratio

2. *** Significant at 1% level

3. ** Significant at 5% level

4. * Significant at 10% level

5. Instruments are number of voters in the previous election, percentage of government employees in 1990s, percentage of households subscribing newspaper, average distance to district capital from a village, percentage of population with high school education in 1990s, distance to the nearest major port, number of mosque 16 years back, number of Islamic school 16 years, back, percentage of village prone to earthquake and average village altitude in a district.

Fraction Paved Road	OLS		IV-C	GMM
	Ι	II	Ι	II
Bribes	-0.006	-0.006	0.028	0.029
	[-0.65]	[-0.63]	$[0.71]^{**}$	[0.72]
Dummy 2006	0.161	0.194	0.18	0.194
	$[7.91]^{***}$	$[8.00]^{***}$	$[6.05]^{***}$	$[2.55]^{**}$
Dummy 2006 X Bribes		-0.023		-0.031
		$[-2.52]^{**}$		[-0.19]
Fraction of households with TV	0.062	0.073	0.07	0.074
	[1.49]	$[1.76]^*$	[1.60]	[1.52]
Log GDP per capita	0.052	0.052	0.047	0.046
	$[3.87]^{***}$	$[3.82]^{***}$	$[3.02]^{***}$	$[2.99]^{***}$
Tax ratio	0.599	0.528	0.582	0.585
	$[2.39]^{**}$	$[2.10]^{**}$	$[2.32]^{**}$	$[2.33]^{**}$
District price indicator (GDP deflator)	-0.027	-0.024	-0.028	-0.028
	$[-3.05]^{***}$	[-2.75]	[-3.14]***	$[-3.15]^{***}$
Fraction of hilly areas in a district	-0.204	-0.199	-0.197	-0.198
	[-7.88]***	$[-7.69]^{***}$	$[-7.31]^{***}$	[-7.32]***
Fraction of areas prone to flooding	-0.287	-0.284	-0.284	-0.277
	[-5.54]	$[-5.55]^{**}$	[-5.47]***	[-4.36]***
Herfindahl Index of political parties	-0.011	-0.03	-0.013	-0.004
	[-0.19]	[-0.51]	[-0.22]	[=0.06]
Fraction of population exposed to newspaper	0.314	0.326	0.303	0.302
	$[7.02]^{***}$	$[7.24]^{**}$	$[6.48]^{***}$	$[6.42]^{***}$
Number of Observation	2052	2052	2052	2052^{-1}
F-value	52.95***	48.78***		
Wald-chisq			550.82^{***}	552.69^{***}
P-value			0.38	0.73 - 0.006

Table A2.6: Pre to Post Local Democratization (2003-2006): Paved Roads and Bribes

Notes: 1. Figures in parentheses are t-ratio

2. *** Significant at 1 % level

3. ** Significant at 5 % leve

4. * Significant at 10 % level

5. Instruments are average distance to district capital from a village, percentage of population with high school education in 1990s, percentage of coastal villages in a district, number of mosque 16 years back, number of Islamic school 16 years back, percentage of villages prone to earthquake, average altitude and percentage of village head with at least high school education.

Kuncoro et al./Varieties of Governance of Public Goods Delivery in Indonesia...

Probability of incumbent to win reelection	Model			
Covariates	I	II	Ι	II
Fraction paved road	0.351		0.27	
Fraction passable road	[1.48]	13 11	[1.17]	12 21
		$[2.86]^{**}$		$[2.58]^{**}$
Number of budget corruption cases			-0.006	0.008
			[-0.13]	[0.20]
Village market	0.0003	-0.0002		
	[0.12]	[-0.10]		
Village bus terminal	-0.02	-0.014		
	[-2.28]**	[-1.78]*		
Village health facility	-0.017	-0.019		
	[-0.49]	[-0.60]		
Access to district water company	-0.004	-0.004		
D 2000	[-2.23]**	$[2.58]^{**}$	0 505	0 500
Dummy 2009	0.63	0.071	0.587	0.589
	$[3.50]^{***}$	$[3.07]^{***}$	$[3.44]^{***}$	$[3.51]^{***}$
Fraction of nousenoids with 1 V	0.734 [0.16]**	0.512	0.245	0.228
	$[2.10]^{++}$	[2.10]	[0.00]	[0.03]
Log GDP per capita	-0.133	-0.089	-0.103	-0.133
Tor notio	[-1.10] 0.0	[-0.90]	$\begin{bmatrix} -1.22 \end{bmatrix}$	[-1.10]
Tax Tatio	-2.2	-1.07	-2.41	-1.94 [1 19]
District price indicator (CDP deflator)	[-1.13]	[-0.94] 0.108	[-1.30]	[-1.12]
District price indicator (GD1 denator)	[1, 22]	$[1 \ 0.103]$	$[1 \ 24]$	0.095 [1 66]*
Fraction of hilly areas in a district	$\begin{bmatrix} 1.22 \end{bmatrix}$ 0.034	0.008	[1.24] _0.1/3	-0.17
Traction of miny areas in a district	[0.12]	[0.03]	[-0.58]	[-0.73]
Fraction of areas prone to flooding	[0.12]	-0.262	-0.237	-0.147
Fraction of areas prone to noouning	[-1.20]	[-1.08]	[-0.76]	[-0.55]
Herfindahl Index of political parties	0.629	0.489	0.419	0.237
	[1.47]	[1.29]	[0.98]	[0.60]
Fraction of population exposed to newspaper	0.263	0.006	0.211	-0.006
	[0.67]	[0.02]	[0.54]	[-0.02]
Number of observation	137	137	137	137
Wald-chisq	54.64***	69.11***	42.69***	45.03***
Pseudo-R-squared	0.352	0.405	0.305	0.349

Table A2.7: Voters Preference: Probability of incumbent to win reelection

Notes:

1. Figures in parentheses are t-ratio

2. *** Significant at 1% level

3. ** Significant at 5% level

4. * Significant at 10% level

5. All coefficients are marginal effects

Dependent Var.: Fraction Paved Road	OLS		IV-GMM	
Covariates	Ι	II	Ι	II
Bribes	-0.042	-0.034	-0.707	-0.208
	[-1.74]*	-1.46]	[-2.04]**	[-0.86]
Dummy 2003	-0.057	-0.0001	-0.316	-0.097
	[-1.69]	[0.00]	[-2.03]**	[-0.65]
Dummy 2003 X Bribes	0.045	0.034	0.567	0.198
	$[1.74]^*$	[1.36]	$[2.12]^{**}$	[0.90]
Fraction of households with TV	0.388	0.282	0.622	0.332
	$[6.26]^{***}$	$[4.45]^{***}$	$[3.73]^{***}$	$[2.88]^{***}$
Log GDP per capita	0.083	0.074	0.091	0.073
	$[5.43]^{***}$	$[4.87]^{***}$	$[4.54]^{***}$	$[4.37]^{***}$
Tax ratio	0.236	0.187	-0.257	0.155
	[0.44]	[0.36]	[-0.35]	[0.24]
District price indicator (GDP deflator)	0.001	0.001	0.002	0.002
	[1.21]	$[1.75]^*$	$[1.73]^*$	$[1.66]^*$
Fraction of hilly areas in a district	-0.164	-0.143	-0.227	-0.152
	$[-5.96]^{***}$	$[-5.28]^{***}$	$[-5.00]^{***}$	[-4.58]***
Fraction of areas prone to flooding	-0.3	-0.287	-0.111	-0.263
	$[-5.07]^{***}$	[-5.08]	[-0.63]	$[-2.01]^{**}$
Fraction of population exposed to newspaper		0.368		0.352
		$[6.30]^{***}$		$[4.82]^{***}$
Number of Observation	1789	1789	1789	1789
F-value	47.53***	54.68^{***}		
Wald-chisq			321.29^{***}	535.1^{***}
P-value			0.13	0.75

Table A2.8: Before and After Decentralization (1999-2003): Paved Roads

1. Figures in parentheses are t-ratio

2. *** Significant at 1% level

3. ** Significant at 5% level

4. * Significant at 10% level

5. Instruments are percentage of coastal villages in a district, number of mosque 16 years back, number of Islamic school 16 years back and percentage of villages in river plain in a district.

Dependent Var.: Fraction Paved Road	OLS		IV-GMM	
	Ι	II	Ι	II
Bribes	-0.009	-0.008	-0.049	-0.087
	[-2.13]**	$[-1.89]^*$	[-0.94]	[-1.97]**
Dummy 2003	-0.0004	0.008	-0.036	-0.002
	[-0.09]	[1.48]	[-1.72]*	[-0.11]
Dummy 2003 X Bribes	0.007	0.005	0.06	0.046
	[1.49]	[1.16]	[1.54]	[1.45]
Fraction of households with TV	0.02	0.005	0.02	0.041
	$[2.10]^{**}$	[0.51]	[0.84]	$[1.74]^*$
Log GDP per capita	0.0003	-0.001	-0.001	0.001
	[0.13]	[-0.42]	[-0.46]	[0.40]
Tax ratio	-0.084	-0.091	-0.052	-0.204
	[-1.18]	[-1.30]	[-0.51]	[-1.83]*
District price indicator (GDP deflator)	0.0002	0.0002	0.0004	0.0003
	$[1.82]^*$	$[2.38]^{**}$	$[2.57]^{***}$	[1.44]
Fraction of hilly areas in a district	-0.018	-0.015	-0.013	-0.024
	[-3.07]***	$[-2.60]^{***}$	[-1.74]*	$[-3.01]^{***}$
Fraction of areas prone to flooding	-0.029	-0.027	-0.035	0.021
	$[-2.94]^{***}$	$[-2.81]^{***}$	[-1.36]	[0.68]
Fraction of population exposed to newspaper		0.052		0.057
		$[4.89]^{***}$		$[3.59]^{***}$
Number of Observation	1789	1789	1789	1789
F-value	5.59^{***}	6.88^{***}		
Wald-chisq			42.80***	39.00^{***}
P-value			0.17	0.18

Table A2.9: Before and After Pre-Democratization (1999-2003): Passable Roads

1. Figures in parentheses are t-ratio

2. *** Significant at 1% level

3. ** Significant at 5% level

4. * Significant at 10% level

5. Instruments are percentage of coastal villages in a district, number of mosque 16 years back, number of Islamic school 16 years back and percentage of villages in river plain in a district.

Dependent Variable: Bribes	Bribes		Number of corruption cases	
Covariates	Ι	II	Ι	II
Dummy 2006	-0.523	-0.494	0.26	0.262
	[-4.09]***	[-2.91]***	[1.43]	[1.37]
Average distance to district capital	0.01	0.01	0.022	0.022
	$[1.99^{**}]$	$[1.92]^*$	$[3.44]^{***}$	$[3.40]^{***}$
Fraction of manufacturing in GDP	0.004	0.004	0.008	0.008
	$[1.72]^*$	$[1.67]^*$	$[2.50]^{**}$	[2.02]
Fraction of hilly areas in a district	-0.004	-0.004	0.005	0.004
	[-1.34]	[-1.33]	[1.08]	[0.89]
Percent of government employee	0.156	0.152	0.123	0.119
	$[1.96]^*$	$[1.86]^*$	[1.31]	[1.27]
Fraction of village on the coast	0.001	0.001	-0.016	-0.015
	[0.10]	[0.15]	$[-1.67]^*$	[-1.54]
Fraction of population exposed to newspaper	0.036	0.039	0.682	0.716
	[0.10]	[0.09]	[1.52]	[1.57]
Log GDP per capita	-0.012	-0.015	0.011	0.01
	[-0.07]	[-0.08]	[0.07]	[0.06]
Herfindahl Index of political parties	0.008	0.019	-0.974	-0.886
	[0.02]	[0.05]	$[-1.93]^*$	[-1.68]*
Bribes in contiguous district		0.095		
		[0.85]		
# of corruption cases in contiguous district				0.154
				[1.17]
Number of Observation	180	174	174	174
F-value	4.01^{***}	4.62^{***}	5.09^{***}	4.62^{***}
R-squared	0.164	0.165	0.138	0.157

Table A2.10: Determinants of Bribes (2003-2006)

1. Figures in parentheses are t-ratio

*** Significant at 1% level
 ** Significant at 5% level

4. * Significant at 10% level

Dependent Variable: Tax Ratio	Model			
Covariates	Ι	II	Ι	II
Dummy 2003	2.64	3.271	2.638	2.674
	$[6.27]^{***}$	$[4.78]^{***}$	$[6.30]^{***}$	$[6.40]^{***}$
Average distance to district capital	-0.072	-0.067	-0.071	-0.084
	$[-3.00]^{***}$	$[-3.59]^{***}$	$[-3.16]^{***}$	$[-3.76]^{***}$
Percent of government employee	0.642	0.672	0.782	0.759
	$[2.08]^{**}$	$[2.95]^{***}$	$[3.60]^{***}$	$[3.55]^{***}$
Fraction of village on the coast	0.007	0.003	0.006	0.006
	[0.21]	[0.09]	[0.19]	[0.19]
Log GDP per capita	-2.369	-2.339	-2.297	-2.232
	[-7.75]***	[-7.68]***	[-8.18]***	[-7.76]***
Herfindahl Index of political parties	1.984	1.748	1.611	1.749
	[1.23]	[1.08]	[1.00]	[1.10]
Percent of high school in population	0.069			
	[0.87]			
Fraction of population exposed to newspaper		2.977		
		[1.58]		
Percentage of village head with high school ed.			1.563	
			[1.07]	
District head has college degree				-0.345
				[-0.93]
Number of Observation	180	180	180	180
F-value	17.57***	19.93***	17.98***	18.49***
R-squared	0.444	0.456	0.445	0.443

Table A2.11: Tax Ratio: Before and After Decentralization (1999-2003)

Figures in parentheses are t-ratio
 *** Significant at 1% level

3. ** Significant at 5% level

4. * Significant at 10% level

A4. Graph



Figure 8: Graph A4.1

Sources: calculated from PODES various years

Figure 9: Graph A4.2



Source: calculated from PODES various years

A5. Interview Results from Selected Districts

Box 1: Kab Sidoarjo-better road quality and lower bribe

This district has better road quality and lower bribe compared to 2005. There are several reasons why Sidoarjo experiencing better road and lower bribe i.e. high economy activities, high local budget, good initiative on maintaining road, and compensation from mud flow disaster (Lapindo).

Sidoarjo is known as one of the main industrial areas in East Java and located next to Surabaya, a capital city of East Java province. As an industrial area, traffic is dominated by the heavy trucks or containers from the factories to other areas to transporting their goods. Besides, Sidoarjo is connecting to the toll road of Tanjung Perak seaport where many heavy vehicles travel the roads. So most of roads built by the local government is made from concrete materials in order to meet the weight of heavy vehicles.

As one of the main industrial area in East Java province, economic activities are growing so as to increase local budget (APBD) as well as its own source revenue from local tax and user charges. The government officials and parliament members have benefited from this as they receive higher income from local budget. For instance, a certain proportion of own source revenue has been allocated for parliament member income. Higher incomes may reduce demand for bribe.

On the other hand, the local government has signed the MOU with the industries located in Sidoarjo. The MOU stated that the industry has to be responsible for road maintenance they used. It means that each industry which damages roads it is frequently used would have to repair them using their own budgets. The task of the government is only to provide standard of road specification The MOU has lessened the government burden in maintaining.

Since May 2006, there was a mud volcano in Sidoarjo created by the blowout of a natural gas well drilled by PT Lapindo Brantas. This mud flow destroyed thousand houses and many people had to be relocated to new settlements. To compensate for the huge loss, the company Lapindo has to rebuild new settlements for those people as well as improved access roads to those locations. As a result this compensation reduces the local budget for build new road and its maintenance.

Due to the combination of high economic activities which bring tax revenues, good initiative to involve industry for road maintenance and compensation of mud flow Sidoarjo would become an example how a district can enjoy better road quality while keeping good governance. Kuncoro et al./Varieties of Governance of Public Goods Delivery in Indonesia...

Box 2: Kab Kudus better road quality but higher bribe

Kab Kudus is a flat area and the soil is relatively unstable. Although Kudus as one of the center of cigarette industries in Java, not many heavy vehicles or trucks pass the district road. So, about 80 percent of road is categorized as good road and its durability is about one year.

Around 20 percent of local budget has been allocated to the parliament members to finance their constituency needs in each respective area. Bribe paid to the local government is increasing from 3 to 5 percent. In addition, the construction firms should allocate some money for administration, insurance, etc about 5 percent each. Thus, in total there is an increasing bribe.

Box 3: Kab Temanggung worse road quality but lower bribe

Kab Temanggung is a highland, surrounded by the mountains so the soil is relatively unstable. As one of the center of tobacco in Java, many heavy vehicles or trucks pass the district road particularly during the harvesting period and worsen the road condition. Only 12 percent of road is categorized as good road.

In order to apply clean government, the district head is imposing various local regulations regarding obtaining projects. As a result, bribe is decreasing from 13% to 8%.

Unfortunately, the complicated regulations create disincentive for the construction firms to obtain the projects, hence, the roads become deteriorating. On bidding projects, usually firm only offers one name but in fact the project is carried out by 2 or 3 construction firms.

Box 4: Kab Cirebon worse road quality and higher bribe

Kab Cirebon is located at North coast of Java Sea and part of main road in Northern Java. Cirebon has seaport mainly for transporting coal from Java to Kalimantan island, so many heavy trucks pass the district road. As a consequence, about 40 percent of road condition is bad; its durability only 3 to 4 months and travel time increases by 3 times due to traffic. Despite the high economic activities, local budget is relatively low which covers only around 60 percent of the fiscal needs.

Regarding to the bribe, the construction firms pay some amount of money in advance to local political parties for the projects awarded. This payment is about 5-10% of total project value and considered as membership fee. It means the firms paid the membership fee will be included in a bidding arrangement but actually the winner has been pre-selected. Moreover, the local budget is allocated based on number of parliament member in each voters area. The more number of parliament members from particular voters area, the higher amount of local budget goes to that area. It means that the project is not based on local governments priority.