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Summary

A large literature suggests that countries with better governance have higher growth rates. We explore whether this is also true at the sub-national level in Indonesia. We exploit a new dataset of firm perceptions of the quality of economic governance in 243 districts across Indonesia to estimate the impact of nine different dimensions of governance on district growth. Surprisingly, we find relatively little evidence of a robust relationship between the quality of governance and economic performance. However, we do find support for the idea that structural variables, such as economic size, natural resource endowments and population, have a direct influence on the quality of local governance as well as on economic growth. This suggests that efforts to improve local governance should pay greater attention to understanding how such structural characteristics shape the local political economy and how this in turn influences economic performance.

Keywords: economic growth; Indonesia; decentralisation; investment climate; governance; private sector.

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Acronyms

APINDO	Asosiasi Pengusaha Indonesia
AR1	Auto Regressive model
BKPM	Badan Pengawasan Pasar Modal (National Investment Coordinating Board)
BPS	Badan Pusat Statistik (Indonesian central statistical agency)
CSIS	Center for Strategic and International Studies
DAU	Dana Alokasi Umum (General Allocation Fund)
DPRD	Dewan Perwakilan Rakyat Daerah (People's Representative Council)
EGI	Economic Governance Index
GMM	Generalised Method of Moments
GDP	Gross Domestic Product
GRDP	Gross Regional Domestic Product
KADIN	National Chamber of Commerce
KPPOD	Komite Pemantauaan Pelaksanaan Otonomi Daerah (Regional Autonomy Watch)
KLU	Kühne Logistics University
KPU	Komisi Pemilihan Umum (General Election Commission)
LEGS	Local Economic Governance Survey
NGO	Non-Governmental Organisation
SIKD	Sistem Informasi Keuangan Daerah (Ministry of Finance)
TAF	The Asia Foundation
TDP	Indonesian Registration Certificate
USAID	United States Agency for International Development
VCCI	Vietnam Chamber of Commerce and Industry
VNCI	Vietnam Competitive Initiative

1 Introduction

The last two decades have witnessed a rapid expansion of the literature on the relationship between institutions, governance and economic performance. Starting with the seminal work of North (1981, 1989, 1990) there has been an appreciation of the importance of institutions – particularly those associated with the enforcement of contracts and the protection of property rights – in creating the incentives that give rise to economic growth (see Helpman 2008 for several recent studies).

The fundamental dilemma facing all of these studies is the difficulty of showing a causal relationship between institutions and economic performance. After all it is perfectly possible that economic growth provides the resources for and generates popular demand for better quality institutions. Considerable ingenuity has been expended to attempt to show a causal link running from institutions to economic performance. Most famously, Acemoglu *et al.* (2001) use settler mortality as an instrument for colonial institutions in an attempt to establish this causal link. They argue that whether settlers in early colonies set up high quality institutions or not was influenced by the prevailing disease environment. In places with high mortality, settlers did not, or could not, install good institutions, whereas in places where the environment was more benign, they did. Acemoglu *et al.* argue that, since early settler mortality is not plausibly related to long-run economic performance except through the influence that it had on institutional development, it can provide a mechanism of identifying the causal relationship between institutions and economic performance.

However, the view of a strong causal link between institutions and economic performance is not universally accepted. For example, Glaeser *et al.* (2004) argue that some measures of institutions currently in use reflect outcomes (such as respect for property rights) rather structural institutional constraints (such as constitutions or electoral systems). They find little relationship between measures of these deeper structural constraints and economic performance, but a potentially strong role for initial human capital. They argue that the available evidence supports the idea that good policies give rise to growth which then results in institutional improvements.

Moreover, there is dispute over which factors are most important in shaping institutions. Sokoloff and Engerman (2000) suggest that it is initial endowments, rather than the effect of disease patterns on colonial settlement, that determined the nature of the institutions constructed in different countries. They show how extractive institutions controlled by elites could perpetuate inequality which in turn slows economic performance and reinforces the institutional status quo.

Recent work by Kauffman and Kraay (2010) reinforces the idea that the relationship between governance and growth may be bi-directional. They find a strong positive causal relationship running from governance to growth, competing against a negative feedback relationship from income to governance. They argue that this can lead to low income governance traps, in which poor governance causes weak economic performance which in turn reinforces poor governance.

One of the weaknesses of most studies in this area is that they have focused on cross-country data. Whilst this provides a large sample of countries and a relatively long time span, such studies are open to the criticism that there are important unobserved factors (e.g. culture) which may have an important influence upon economic performance and which are also correlated with governance, creating the possibility of biased estimates of the relationship between governance and growth.

To combat these issues of causality, a more recent group of scholars have begun to look at variation in governance across sub-national units within countries, and have exploited natural experiments in the creation of institutions or policy to better identify the causal path between governance and economic performance. Because their data is higher quality and their measurement more exacting, these scholars have been better able to test the micro-logics that inform the theories linking governance and growth. As a result, key have advances have been made in testing the relationship between property rights and entrepreneurial activity (Galiani and Scargrodsky 2006; Di Tella 2007; Fields 2007; Banerjee and Iyer 2005; Malesky and Taussig 2009). Other scholars have devised clever subnational analyses of the impact of corruption on economic behavior (Fisman 2001; Golden and Picci 2003; Di Tella and Schargrodsky 2003; Olken 2007), the importance of state-business relations (Cali 2009) as well as the predictability of corruption (Malesky and Samphantharak 2008).

Sub-national studies have the strong advantage that the overarching political and legal framework and, to some extent, aspects of culture and language are considerably more similar within the boundaries of a single country than they are across all countries in the world (although we recognise that some countries have enormous diversities of ethnicity, culture and language within their borders).

Moreover, sub-national analysis of this kind is becoming increasingly relevant for policy as many countries move towards greater political, fiscal and administrative decentralisation. Indeed central governments and donor agencies often have an explicit objective of improving governance at the sub-national level on the grounds that this will improve local economic growth. This assumes that the causal relationship runs from governance to growth. If in fact, the relationship ran in the other direction, then efforts to improve local institutions would have little impact on economic performance. Thus getting a better empirically grounded understanding of the relationship between sub-national governance and local economic growth has significant policy implications.

This paper examines the relationship between sub-national governance and local economic growth in Indonesia. Indonesia is an interesting country to study because it underwent a ‘big bang’ decentralisation in 2001, and administrative, fiscal and political control over many policies has been devolved to (now) 33 provinces and around 500 district/city level governments. Thirty-six per cent of government expenditure is now conducted by regional (provincial and district) governments, with very large increases in district government budgets in the past few years (World Bank 2007). Each province and district now has its own parliament (DPRD) with representatives elected by the general population, as well as the direct election of the district heads. Provincial governments coordinate and perform strategic functions that affect more than one district government. District governments are responsible for most service delivery, local road building and much regulation of the local economy.

However, the economic performance of Indonesia’s districts since decentralisation in 2001 has varied dramatically. Some districts have seen steady economic progress, strong investment and job creation. But many others have lagged behind, failing to share in overall economic growth. Moreover, there is evidence that the policies pursued by sub-national authorities have had an important bearing on the quality of the local investment climate (Lewis 2003). Pepinsky and Wihardja (2009) also suggest that divergent economic performance across districts is driven by heterogeneity in endowments, factor immobility, and institutional quality. The importance of institutional quality at the district level is also emphasised by the central Government of Indonesia, as well as by the donor community. However, up until now, measuring whether this is true and, if so, how important local economic governance is for local economic performance, has been impossible because of the lack of suitable data at the sub-national level.

In 2008, the Asia Foundation, in conjunction with a national Indonesian NGO, Regional Autonomy Watch (KPPOD), launched a new dataset which measures the quality of local economic governance in 243 districts across the country.[1] The data is based on a statistically representative random sample of over 12,000 firms and 729 business associations throughout these districts. We use this data to test empirically the hypothesis that better local governance in Indonesia positively affects local economic performance.

In doing so, we face several challenges. First, meaningful data on economic performance at the district level in Indonesia is only available for a relatively short period of time, and the survey measuring the quality of governance at the district level so far exists for only one year, 2007.[2] Second, establishing causality in the Indonesian context will be difficult for many of the same reasons that have plagued the attempt to establish causality in the cross-country literature: our measures for governance are later than the period for which we have data on economic performance; and plausible instruments which affect only the quality of district governance but not economic performance other than through this channel, are hard to find. Nonetheless, we believe that our data allow us to tell a plausible and empirically grounded story about the relationship between sub-national governance and economic growth in Indonesia, and one which has potentially important policy implications.

Our paper proceeds as follows. The next section provides a brief review of the literature on this topic. We then describe the data that we use, both for measuring local economic performance as well as the quality of local economic governance. The following section describes the simple correlations between measures of growth and various measures of governance. This is followed by simple 'Barro style' growth regressions (Barro 1991) incorporating different aspects of governance as potential explanatory variables. We also test the robustness of our results by using measures of governance from a different survey; and explore potential biases due to the expectations of the respondents. We attempt to address the problem of reverse causality, both by constructing an instrument for governance, and by exploiting the fact that we have both firm and district level data. In addition, we examine whether there is a relationship between sub-national governance and long-run growth using the level of GDP per capita as a proxy for long-run growth. Our final set of results, turns our question on its head and asks about the structural determinants of governance quality. A final section summarises our results and outlines the implications of the results for policy.

2 Literature review

Avinash Dixit (2001) has defined the concept of economic governance as follows:

> Economic governance consists of the processes that support economic activity and economic transactions by protecting property rights, enforcing contracts, and taking collective action to provide appropriate physical and organisational infrastructure. These processes are carried out within institutions, formal and informal. The field of economic governance studies and compares the performance of different institutions under different conditions, the evolution of these institutions, and the transitions from one set of institutions to another.
> (Dixit 2001: 1)

[1] This data set is one of a series of dataset measuring economic governance in Vietnam, Bangladesh, Sri Lanka, Cambodia and the Philippines, supported by the Asia Foundation. See VCCI-VNCI (2007) for the Vietnam work. Further details can be found on www.asiafoundation.org.

[2] A short panel of this survey exists for the districts in one province – Aceh. A survey currently underway will provide panel data for a few additional provinces.

Dixit's definition encompasses an extremely wide spectrum of interactions between market actors and government institutions. Scholarship in political science and economics has explored these interactions from varying perspectives. Some research projects assume a high correlation between different features of governance and therefore define the concept broadly to encompass all such interactions under a single heading (Acemoglu, Johnson, and Robinson 2001; Knack and Keefer 1995). Other scholars have narrowed the lens somewhat, disentangling governance into separate concepts, such as corruption (Wei 2000), transparency (Kaufman *et al.* 2003), regulation (Djankov 2002), and public goods provision (Kaufman *et al.* 2003), that each themselves still contain a number of different policy levers and types of interactions. Other scholars have taken a micro perspective where individual policies such as business registration procedures have been isolated and explored separately from other modes of governance in society. Despite the varying research approaches and perspectives on which factors of governance to include, until recently the literature had appeared to reach a broad consensus – the quality of economic governance is among the most critical factors in determining economic outcomes (Reynolds 1983).

Since North (1981), an extensive literature has stressed two particular types of institutions as central to growth: contracting institutions and property rights institutions. North defines these, in order, as institutions that: (a) provide the legal framework for facilitating private contracts that facilitate economic transactions; and (b) protect individuals from expropriation of property rights by the state. In other words, contracting institutions protect entrepreneurs from each other, while private property institutions protect them from government.

Coase (1937) and Williamson (1975, 1985) wrote seminal pieces on the importance of contract enforcement for economic development. This has since been tested more extensively by operationalising contracting institutions as the cost of contract enforcement and the overall level of confidence of citizens in legal institutions (Grossman and Hart 1986; Hart and Moore 1990; Hart 1995). North and Weingast (1989) and Grief (2006) have written prominent economic histories that link the development of contracting institutions to the well-documented developmental success stories of England during the industrial revolution, the Magrahbi traders, and the Italian city-states. Using variance in institutions across provinces in Mexico, Laeven and Woodruff (2007) find a significant relationship between better contracting institutions and higher levels of growth in firm size. Finally, in a paper that closely relates to our own work, Ardagna and Lusardi (2008) show that better contract enforcement institutions increase the share of entrepreneurs that identify themselves as growth-oriented.

Other authors have explored the importance of property rights for long-term economic growth (Jones 1981; De Long and Shleifer 1993; Olson 2000). In the political economic literature, Weingast (1995, 1993) famously emphasised the importance of the design of political institutions, so that citizens could feel they had a credible commitment that their property would not seized by state authorities. Credible commitments theory sprang from a concept known as time inconsistent policy in positive political economy. Time inconsistent policies are those in which policymakers have an incentive to renege on their announced policies after economic actors (domestic and foreign investors) have already modified their behavior to conform to those policies. These entrepreneurs will refuse to be tricked again and consequently will not respond to policy announcements, but will calculate their actions based on an expectation that the politicians will deviate from policy choices in the future. Sub-optimal growth will inevitably result from such an arrangement, so theorists hypothesised that a credible commitment to policy reform was required to bind policymakers to reform. Such a commitment would need to ensure that the costs of deviating from announced policy were prohibitively high. In short, to achieve economic reform policymakers must bind themselves to a set of rules, which limit their discretionary powers to intervene in the economy.[3]

[3] Elster (1993, 1997 and 1998); Elster *et al.* (2000); Weingast (1995, 1993a and 1993b).

In keeping with this line of argument, De Soto (1989, 2000) argued that informal enterprises tend to be informal only because they are starved of critical business resources, especially the related resources of property rights and credit. In particular, he predicted that, through the provision of land titles, entrepreneurs in the informal sector could be transformed into an important new source of economic growth in the developing world.

A further set of governance institutions that has emerged in recent years is the web of regulations that impact upon entrepreneurship. Djankov *et al*. (2002) identified strong correlation between the costs and time of starting a business and size of the informal economy. Subsequent micro-level studies have shown that registrations of new companies and of new corporate entities are higher when entry and other more general regulatory obstacles to business are lower (Desai *et al.* 2003; Klapper *et al.* 2007; Demirguc-Kunt *et al.* 2006). This is especially true in industries with higher non-regulatory obstacles to entry – for example, more expensive equipment or other required inputs (Fisman and Sarria-Allende 2004) – and where technology or global demand shifts have occurred (Ciccone and Papaioannou 2007). Ardagna and Lusardi (2008) also find that higher entry costs lower the share of entrepreneurs with a growth-orientation. Because these regulations are imposed by the state authorities, however, and are often abused to create rents, scholars have tended to treat these as a subset of property rights institutions or the 'grabbing hand' of the state.

Unfortunately, most empirical work has failed to disentangle the broad spectrum of highly correlated business environment factors. These complicating factors include not only key institutions such as property rights, transaction costs, and regulation that are the focus of our study, but also socio-economic characteristics like income level, financial development, and entrepreneurial culture. As a result of these difficulties, the most influential studies on the interaction of institutions and economic activity have been natural experiments exploiting exogenous shocks to institutions. An example is the emerging stream of evidence supportive of De Soto's hypothesis on the micro-logic for how property rights influence individual-level behavior. Taking advantage of variation in land title distribution in Argentina, Galiani and Scargrodsky (2006) demonstrate how a sudden improvement in property rights led households to investment more in home improvements and personal economic development, such as investing in their children's education. Similar natural experiment approaches have been used to show that a one-time increase in property rights can bolster belief in the power and fairness of the market (Di Tella *et al.* 2007) and substantially increase the number of hours dedicated to productive work (Field 2007). Banerjee and Iyer (2005) found that these effects last across generations, based on regional differences in the property rights regime of colonial India.

Recent microeconomic work on how aspects of the regulatory environment can affect local performance includes two inter-related papers, Kaplan *et al.* (2007) and Bruhn (2008), which both consider the impact of a change in entry costs on investment decisions. Both take advantage of a reform programme in Mexico that, beginning in 2002, staged its simplification of entry regulations across localities. While staging of implementation in particular localities was plainly not fully random, the authors argue convincingly that the programme offers a unique opportunity to separate the effects of entry-specific barriers from institutional factors influencing subsequent business operations.

The evidence that emerges from the two studies, however, is mixed. The authors use different data sources, cover different municipalities and time periods, and come to contradictory conclusions. Kaplan *et al.* (2007) use registration data from the Mexican Social Security Institute covering more localities and a longer time period and identify an only temporary boost in new company registrations, which they argue is best understood as a one-time movement of firms from the informal to the formal economy. Bruhn (2008), in turn, uses household survey data covering a more homogenous set of municipalities to show that

informal business owners were not more likely to formalise after implementation of the reforms. The paper, however, does not address why the increase in new company registrations would only be temporary. Bruhn's findings, in particular, and the mixed findings of the two papers, in general, are consistent with an argument that the immediate costs of formalisation are only one of the property rights institutions an entrepreneur considers when deciding whether or not to formalise.

Perhaps the most comprehensive effort to date to take on the challenge of empirically disentangling how different types of institutions affect economic activity in different ways is the work of Acemoglu and Johnson (2005). The authors conclude that property rights institutions have a significant effect on long-term country-level growth, but contracting institutions do not. Their explanation is that it is much more possible and efficient for private parties to negotiate with each other to reach second-best means for policing their transactions, e.g. reputation-based transactions, than it is for private parties to work out individual solutions with state officials. This is consistent with research on the effectiveness of informal mechanisms such as reputation in policing transactions in the developing world (McMillan and Woodruff 1999; Banerjee and Duflo 2000; McMillan and Woodruff 2002).

A further stream of literature looks not at how institutions have affected growth, but how decentralisation has influenced economic performance. Pepinsky and Wijardja (2009) raise a fascinating puzzle regarding decentralisation in Indonesia. Using a clever application of Abadie's synthetic case approach, they estimate that decentralisation played no role in boosting economic growth in Indonesia since the policy was implemented in 2000. A country of the same size, socio-economic composition, and cultural make-up of Indonesia that did not decentralise would have grown just as fast in the wake of the 1997 Asian Financial Crisis.

Among the explanations they provide to explain this finding is what they term is the third pathology of Indonesian economic development – endogenous institutional quality. In short, decentralisation had a differential effect across Indonesian districts, the primary unit to which new powers were ascribed in the 2001 Constitutional Reforms. Districts that had auspicious conditions for economic development, such as high rates of human capital and political awareness, were better able to develop governance institutions that promoted growth in the post-decentralisation period. Those districts cursed with poor structural conditions for growth and pre-cursors for local accountability were more likely to have their institutions captured by local elites, who exploited their newfound power for private gain rather than promoting general welfare-enhancing growth (Pepinsky and Wijardja, 2009). In short, in this second group decentralisation created a group of *raja kecil* (little kings) who are unaccountable to their citizens (Hofman and Kaiser 2006) and without a strong central government to rein-in their confiscatory impulses (Pepinsky 2008). Because some districts grow faster after decentralisation while others actually experience worsening economic conditions, and there is little factor mobility between localities, the ultimate result of decentralisation for Indonesia as a whole is a wash.

Due to a lack data availability for governance measures and district-level GDP, Pepinsky and Wijardja are unable to test their theory of endogenous institutional selection systematically, relying on a qualitative discussion of five districts where they attempt to establish a link between structural conditions, such as human capital and initial political awareness, and the degree of post-decentralization elite capture. In this paper, we take advantage of the new dataset on economic governance provided by KPPOD (Komite Pemantauan dan Pelaksanaan Otonomi Daerah, Regional Autonomy Watch), to test whether structural conditions are associated with institutional quality and good governance; and, secondly, whether economic governance at the district-level is actually associated with economic growth.

3 Data

Our data comes from two major sources: official survey data from the Indonesian central statistical agency (BPS); and the Asia Foundation/KPPOD survey of the quality of economic governance mentioned above. Our main measure of economic performance is district GDP (both including and excluding oil and gas). To calculate per capita growth we have used the Gross Regional Domestic Product (GRDP) and the population data from the BPS.[4]

It is important to recognise that there are some significant weaknesses in the district level GRDP data produced by BPS. Indonesia has around 500 districts and so calculating accurate estimates of GDP at this disaggregated level presents a considerable logistical challenge. Although all districts are supposed to follow the same procedures, there is inevitably considerable variation in the capacity of local statistical offices across the country. Moreover, some components of GDP are much better measured than others, due to the accuracy of their underlying sources. For example, agricultural GDP is probably measured reasonably accurately because it is based on estimates of cropping areas and yield undertaken three times a year by the Ministry of Agriculture.[5] Similarly the output of manufacturing industries with more than 100 employees is measured annually through the Industry Survey, and that for electricity, gas and water from their respective public utilities. On the other hand, estimates for construction, trade hotels and restaurants, transport and services are all likely to be subject to considerable measurement error.

Whilst measurement error in our dependent variable should not bias our results, by adding noise it may make it more difficult to discern statistically significant determinants of district growth. We therefore check our results for robustness using two alternative measures of district level economic performance: first we use the most accurately measured component of GDP – manufacturing output;[6] secondly, we use data from the annual national household survey to calculate mean per capita consumption expenditure at the district level. To account for the fact that prices are not the same throughout the country, we deflate per capita consumption in each district by the consumer price index of the nearest city for which this data is available.[7]

For our explanatory variables, we draw on data compiled from numerous other surveys conducted by BPS. For example, the BPS conducts the National Socio-Economic Survey (Susenas) every year, which provides comprehensive socioeconomic indicators at the district level. Every three years, the BPS also conducts the Village Potential Census (Podes). This covers all villages in Indonesia, collecting data on basic infrastructure and socioeconomic conditions. We have also drawn budget data from the Regional Finance Information System (SIKD-Ministry of Finance), investment data from the National Investment Coordinating Board (BKPM), and electoral data from the Ministry of Home Affairs, the General Election Commission (KPU) and The Asia Foundation (TAF).

One of the main challenges in constructing the database is in dealing with splitting districts. Enthusiasm for decentralisation at the local level (coupled with strong fiscal incentives) has resulted in many districts splitting to form new, smaller districts. Over the years observed, the number of district governments in Indonesia grew by more than 50 per cent. In 1999, the

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4 There are in fact three different sources of population data: interpolations from the Population Census; Susenas data; and the population measures used by the Ministry of Finance to calculate fiscal transfers. We use the first of these because they are the official figures published by the BPS.

5 Although see (Rosner and McCulloch 2008) for a critique of the method of calculation used.

6 We also attempted to use data on outstanding loans at the district level from Bank Indonesia but found that this data has no correlation with GDP growth data.

7 BPS publishs consumer price indices for 43 cities throughout the country.

BPS recorded 299 districts in Indonesia. Within two years the number had increased rapidly such that the number of district governments receiving the General Allocation Fund (DAU) from the central government in 2001 was 336.[8] In 2005, Indonesia had 32 provinces and 434 districts that received DAU.[9] In order to avoid spurious changes in per capita growth rates resulting from the splitting of districts, we collapsed the post-decentralisation data to provide data for exactly the same set of 292 pre-decentralisation districts throughout.

Our main interest is in identifying the impact of local economic governance on economic performance. For this we draw on the Local Economic Governance Survey (LEGS) implemented by the Asia Foundation and KPPOD in 2007. Around 50 firms were sampled randomly from each of the 243 districts in 15 of the country's 33 provinces, a total sample of 12,187 firms. Within each district, the survey was stratified by size (10–19 employees; 20–99; 100+)[10] and by three aggregate sectors – production, trade, and services.[11] The survey is representative of all non-primary private sector firms with 10 employees or more.[12] Each sampled firm was asked a series of questions about nine different aspects of local governance: access to land and security of tenure; market entry and business licensing; local government-business interaction; business development programmes; the capacity and integrity of the Mayor/Regent; local taxes, user charges and other transaction costs; local infrastructure; and security and conflict resolution. The responses of the 50 firms in each district to the questions in each of these nine areas were used to construct a set of sub-indices reflecting the quality of governance in each area. For example, the Land sub-index was constructed from responses to questions about the time to obtain a land certificate, the ease of getting access to land, the frequency of land evictions and of land conflict and the overall perception regarding whether there are significant land problems in the district.[13] In our analysis we also aggregate the sub-indices into a single Economic Governance Index (EGI) for the district.[14]

One advantage of these measures of local economic governance, is that they are under the direct control of the local government. Often surveys of the sub-national investment climate aim to rank the attractiveness of locations for investment (e.g. GTZ 2008) and therefore include variables relating to the endowments of the district, such as its natural resources and proximity to major markets. However, these are not characteristics which a district government can influence and therefore not good measures of the quality of local economic governance. The LEGS, by contrast, focuses on attempting to measure the quality of governance rather than endowments.

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8 The number of districts is not consistent across sources of data. For example, BPS's Susenas and Podes surveys do not always have the same number of districts even when they are conducted in the same years. This is because of different sampling frame used at different times of the year. In addition the *de jure* and *de facto* status of a new district is recorded differently by different institutions. To be consistent, we have used the definition of the Ministry of Finance – an autonomous province/district is the one that receives DAU in the beginning of fiscal year.

9 Since 2001, the number of districts in Indonesia (excluding six non-autonomous district level governments in Jakarta) is: 2001 = 336, 2002 = 348, 2003 = 370, 2004 = 410, 2005-07 = 434, 2008 = 459.

10 The sample frame was the Economic Sensus 2006 list of firms with some omissions. The sample was roughly 'probability proportional to size' where the size was the number of firms in the population within each size, sector strata. A minimum of 5 per cent of firms sampled were large, and a minimum of 45 per cent of firms were medium to ensure adequate representation of the larger size classes – see KPPOD (2008) for full details of the sampling methodology.

11 Production includes the BPS KLU classifications for mining, manufacturing, electricity gas and water, and construction; Trade includes the KLU classification for trade; Services includes all remaining KLU classifications – see KPPOD (2008).

12 Firms whose principal activity was farming, forestry or fishing were excluded because including them would have made the sampling frame far too large and because the nature of the governance issues faced in these primary sectors may be rather different than those faced in all other sectors. Government owned firms were also excluded since their perspective of local governance is likely to be very different from that of the private sector, as were public educational and health services and other government institutions.

13 See KPPOD (2008) for a detailed description of the construct of the sub-indices.

14 In the analysis presented here the EGI is a simple sum of the nine sub-indices. This differs from the EGI calculated by KPPOD (2008) since they include a measure of the quality of local legislation based on expert assessment and use weights of the relative importance of different sub-indices.

The data gathered includes both numerical and perception data. There is a significant literature about the potential biases that can result from the use of perception data (see Kahneman and Krueger 2006 for a review). However, we believe that both forms of data are useful. In particular, perception data can be invaluable for assessing issues for which few easily available quantitative measures exist (e.g. the capacity and integrity of the district head). Because the survey collects the perception of firms actually experiencing the governance of the local administration we believe it is likely to be more accurate than surveys based only upon local expert opinion. Moreover, where both numerical and perception data are available on an issue, they are generally consistent. For example, districts in which the electricity is cut off more often, tend to report worse perceptions about the quality of electricity infrastructure.

In addition to the firm survey, the LEGS interviewed officials from three business associations in each district, including local chapters of the national chamber of commerce (KADIN) and the employers association (APINDO), as well as the association associated with the sector with the largest share in the local economy. Overall 729 business associations were interviewed. This provided additional information about the ways in which local governments consult businesses and how often they do so, as well as the assessment of business associations of the quality of these processes. It also includes information about the frequency and quality of business development programmes run by the local government.

Finally, the LEGS also collected secondary data on local taxes and user charges, and reviewed 932 local regulations and mayoral decrees relating to licensing, traffic of goods and services and labor issues. Legal experts in KPPOD then scored these regulations according to their compliance with national law, the consistency between the stated objectives and the measures introduced, and whether they violated any fundamental principles such as the free movement of goods within Indonesia.

4 Results

4.1 Correlations between governance and growth

Before undertaking more sophisticated analysis of the relationship between governance and district growth performance it is useful to look at simple correlations and associations between governance and growth in our data. Table 4.1 therefore presents the simple pairwise correlations matrix between the governance sub-indices and district growth from 2001–2007.

Three striking features emerge from Table 4.1. First, there are substantial correlations between various different governance sub-indices. For example, districts which tend to score highly on access to information, also tend to score higher on all other sub-indices except two: business development programmes, where they tend to score lower; and the integrity of the district head, where the correlation is not statistically different from zero. A similar story appears for all the other sub-indices with almost all sub-indices being positively correlated with most of the other sub-indices, but, usually, negatively with the business development programmes sub-index.

We would expect significant small positive correlations between these sub-indices since the concepts of governance inevitably overlap to some extent. However, the large correlations between, for example, transaction costs, security, licensing and all the other sub-indices does suggest that it may be possible to summarise these governance concepts with fewer variables. Moreover, the fact that one sub-index – business development services – is

negatively correlated four other sub-indices is peculiar. It is not clear why business development services should score better in districts where access to information, infrastructure, land, and security is worse.

The second striking feature from Table 4.1 is that only one of the nine sub-indices (infrastructure) has a significant correlation with district growth from 2001–2007.[15] This does not suggest, *prima facia*, evidence for a strong link from the quality of governance to growth.

Third, the relationship between these governance sub-indices and the growth of real per capita expenditure at the district level is different from the relationship with GDP growth. Indeed there is no statistically significant correlation between the growth in per capita expenditure and per capita GDP growth, and three sub-indices (Land, Security, and Transaction Costs) are negatively associated with the growth in real per capita expenditure.

The lack of clear positive association between governance sub-indices and economic performance is surprising. However, there are a number of factors which might be obscuring such a link. First, each sub-index is composed of several underlying variables. It could be that some variables are positively correlated with growth but others are negatively correlated resulting in no association for the sub-index as a whole. To address this we explore the correlations between the variables making up each of the sub-indices and growth.

Table 4.2 shows the correlations between each of the variables making up each sub-index and real per capita GDP growth, both with and without oil. Several of the underlying variables which go into the sub-indices are correlated with growth. For example, most of the infrastructure variables are correlated with growth. At the same time there is surprisingly little correlation with some aspects of governance and growth – for example, none of the business development programme variables are correlated with growth and most variables for most indices do not have a statistically significant correlation with growth. At the same time, with the exception of business development programmes, all sub-indices have at least one variable which is strongly correlated with growth. For example, the overall nature of the interaction between local government and businesses is strongly correlated with growth; so is the (lack of) land conflict, as well as the overall perception of constraints in licensing, and security issues. Districts in which fewer firms have to make security payments to the police also grow faster. But not all correlations are in the direction we might expect. In particular, districts in which firms tend to report that the district leader is involved in corrupt activities also tend to grow faster. This may reflect a reverse causality i.e. districts which grow fast have more opportunities for corruption.

The differences between the correlations with GDP growth and non-oil GDP growth are also revealing. The ownership of a generator and the frequency of black outs are strongly correlated with GDP growth including oil – but not when oil is omitted. Similarly the corruption of the district head, land conflicts, licensing, the nature of the interaction between business and the local government and security payments to the police all lose their association with growth when oil is excluded. This would appear to support the idea that concentrated natural resource endowments (in this case oil) create opportunities for significant growth, but also for large rents. The quality of governance may therefore matter much more in such contexts than in places where such rents are less important.

[15] This result also holds if one calculates growth between 2001–2005, excludes oil from GDP, or calculates GDP per worker rather than per capita.

Table 4.1 Correlation matrix of district growth and governance sub-indices

Sub-Index	Access to information	Infra-structure	Integrity	Interaction	Land	Licensing	Security	Business Develop-ment Progra-mmes	Trans-action Costs	GDP growth real pc 2001–2007	non-oil GDP growth real pc 2001–2007
Access to information	1.00										
Infrastructure	0.25*	1.00									
Integrity	0.06	0.22*	1.00								
Interaction	0.15*	0.06	0.76*	1.00							
Land	0.11	0.25*	0.21*	0.10	1.00						
Licensing	0.34*	0.33*	0.52*	0.54*	0.18*	1.00					
Security	0.38*	0.31*	0.42*	0.42*	0.49*	0.46*	1.00				
Business Development Programmes	-0.11*	-0.13*	0.09	0.18*	-0.37*	0.13*	-0.20*	1.00			
Transaction Costs	0.29*	0.35*	0.32*	0.24*	0.47*	0.29*	0.57*	-0.21*	1.00		
GDP growth real pc 2001–2007	0.01	0.28*	-0.02	-0.04	0.04	0.03	0.09	-0.05	0.07	1.00	
non-oil GDP growth real pc 2001–2007	0.01	0.15*	0.04	0.01	0.01	0.05	0.05	0.00	0.07	0.85*	1.00
Growth in real per capita expenditure 2001–2007	-0.10	0.01	0.05	0.00	-0.12*	0.00	-0.13*	0.07	-0.17*	-0.09	-0.03

Source: Authors' own

Table 4.2 Correlations between real per capita growth and components of governance

	GDP growth real pc 2001–2007	non-oil GDP growth real pc 2001–2007	Growth in per cap consumption expenditure 2001–2007
Access to Information			
Ever tried to access government information	-0.1201*	-0.0717	-0.0147
Overall impact of Access to Information on firm activities	0.1022	0.068	-0.0857
Business Development Programmes			
Average share of firms saying 6 programmes exist	-0.0487	0.0151	0.0257
Average share of firms participating in 6 programmes	0.0045	0.0147	0.0515
Average satisfaction with the programmes	0.0051	-0.0069	0.0471
Overall impact of Business Development Programmes on firm activities	-0.077	-0.026	0.0554
Infrastructure			
Evaluation of quality of roads, lights, water, electricity, and telephone	0.2553*	0.1512*	0.0123
Average log time taken to fix each type of infrastructure	0.1036	0.0556	0.0845
Average of ownership of genset and frequency of black outs	0.2656*	0.0825	-0.0175
Overall impact of Infrastructure on firm activities	0.2069*	0.1524*	-0.0156
– of which			
Evaluation of quality of roads	0.0784	0.0712	0.0129
Evaluation of quality of street lighting	0.2255*	0.1574*	0.0566
Evaluation of quality of local water supply	0.2195*	0.0888	-0.0021
Evaluation of quality of electricity	0.2122*	0.0422	-0.0256
Evaluation of quality of telephone	0.1886*	0.2087*	0.0045
Log time to fix roads	0.0526	0.0078	0.0006
Log time to fix street lighting	0.0464	0.0447	0.0365
Log time to fix local water supply	0.1304*	0.0746	0.1234*
Log time to fix electricity	0.1424*	0.0744	0.0128
Log time to fix telephone	0.0316	0.016	0.1448*
Ownership of a generator	0.3143*	0.0772	-0.0628
Frequency of blackouts	0.1299*	0.0676	0.0477
Integrity			
District head's understanding of business issues	-0.0401	0.0052	0.086
Local officials appointed based on relevant skills	0.0156	0.0122	0.0381
District head takes strong action against corruption	0.0155	0.0626	0.1177*
District head (doesn't) take corrupt actions themselves	-0.1370*	-0.0401	-0.0043
District head is a strong leader	-0.0188	0.0745	0.0001
Overall impact of the Capacity and Integrity of the district head on firm activities	0.0843	0.0639	-0.0531
Interaction between local government and businesses			
Existence of a communication forum	-0.0655	-0.0367	0.08
Composite of: does the leader try to solve business problems; do the solutions meet your expectations; do the officials follow up	-0.0236	0.0127	0.0317
Composite of: do the local bureaucrats: undertstand businesses needs; discuss policies; discuss problems; don't set up competing SOEs; provide support facilities for business	-0.0564	0.0014	0.0874
Is the local government biased to investment or rent seeking	-0.0873	-0.1112	0.0075
Does the local government treat all businesses equally without discrimination	-0.0007	0.0501	-0.0775
Actions of the local government do not increase business costs	-0.0405	0.0227	-0.0478

Actions of local government do not increase business uncertainty	-0.0556	0.013	0.0065
Overall impact of issues associated with Interaction on firm activities	0.1237*	0.1042	-0.0899
Land			
Weeks to get a land certificate	-0.0261	-0.0238	0.0032
Ease of getting land	-0.0796	-0.0076	-0.0334
Infrequency of eviction in this area	0.0474	-0.0603	-0.2074*
Infrequency of land conflict	0.1274*	0.0548	-0.0401
Overall constraint of land issues and legal uncertainty on firm activities	0.0939	0.101	-0.0701
Licensing			
Percentage of firms that have a TDP	-0.1958*	-0.1152*	0.1205*
Average of: ease of getting a TDP and mean days to get a TDP	0.094	0.0578	-0.0187
Average of: cost of TDP and whether cost bothers them	0.048	-0.0278	-0.1332*
Combined score of three measures of efficiency of licensing	0.039	0.0513	-0.0188
Percentage of firms that say there is a complaint mechanism	0.0179	0.0925	0.079
Overall constraint of licensing on firm activities	0.1556*	0.1078	-0.111
– of which			
ease of getting TDP	0.0773	0.0356	-0.0133
mean days to get TDP	0.0798	0.0644	-0.0185
cost of TDP	0.1221*	-0.0507	-0.1530*
whether cost bothers them	-0.0059	-0.0169	-0.0929
business licensing is carried out in an efficient manner	0.0344	0.0355	0.03
business licensing is free of illegal collections	0.0513	0.0603	-0.0357
business licensing is free of collusion with officials	0.0243	0.0464	-0.0359
Security			
Existence of theft in the neighbourhood	0.0991	0.0137	-0.1732*
Composite opinion of how police handle cases	-0.0286	-0.0221	-0.0251
Quality of the police in dealing with worker demonstrations	-0.0181	0.0051	-0.0543
Overall constraint of security on firm activities	0.1609*	0.1244*	-0.0859
Transaction Costs			
How much does paying user charges bother the firm	-0.0277	0.0117	-0.0612
Existence of user charges on the distribution of goods	0.0818	0.1487*	-0.0273
Composite of: existence of voluntary donations and how much they bother you	-0.0819	-0.0755	-0.1509*
Security payments to the police	0.1139*	0.01	-0.2280*
Overall constraint of Transaction Costs on firm activities	0.1046	0.0851	-0.1166*

Notes: Note – all variables are normalised to a 0–100 scale and, where necessary, reversed so that higher scores are good. For brevity some variable names keep the negative description, but the results reported are for the reversed variable, for example the 'mean days to get a TDP' variable is in fact reversed so that districts with lower mean days score higher. We would therefore expect, apriori, all correlations to be positive.

Source: Authors' own

Another potential reason for the lack of correlation between several aspects of governance and GDP growth, is that we use GDP. GDP in some districts can be highly concentrated among a relatively small number of firms. But the quality of local economic governance may affect all firms, including the large majority of small firms that contribute relatively little to GDP. Table 4.2 therefore also presents the correlations with per capita expenditure which is a more accurate measure of the wellbeing of the average household than GDP per capita. Once again, the correlations between the growth in real per capita consumption expenditure and governance variables differ markedly from the correlations with GDP growth. For

example, growth in per capita expenditure is positively associated with the district leading taking strong steps to tackle corruption, but this is not associated with GDP growth. Moreover, we also find some surprising negative correlations. Growth in per capita expenditure tends to be higher in districts more prone to land evictions; where getting a license (TDP) is more costly; and where theft and extractions are higher. These all suggest that the relationship between governance and growth may be more complex than often assumed.

4.2 Regression analysis

The initial correlations presented above reinforce the importance of controlling for other factors which are likely to influence growth. We therefore estimate a simple Barro style growth model (Barro 1991; Barro and Sala-i-Martin 1995) of growth as a function of factor endowments. Specifically we estimate

$$g_i = \beta_0 + \beta_1 y_{i0} + \beta_2 .K_i + \beta_3 .L_i + \beta_4 .G_i + \varepsilon_i \qquad (1)$$

where g_i is the growth of per capita GDP of district i between 2001–2008; β_0 is a constant, y_{i0} is the per capita GDP of district i in 2001, K_i is a proxy for the capital stock of district i, L_i is the human capital of district i, G_i is a vector of variables representing the quality of governance of the district, ε_i is a i.i.d. error term.[16]

Neoclassical growth theory suggests that poorer regions should converge towards their long-run steady state growth, implying that β_1 should be negative. Similarly theory would suggest that β_2 and β_3 should be positive. Our aim is to examine the vector β_4 to see whether certain aspects of governance have promoted growth over and above the level which might be expected by endowments alone.[17]

We use the share of the population with junior school education as a proxy for human capital. Good measures of physical capital are difficult to obtain at the district level. However, we do have data on the share of households with telephone connections, which we use as an indication of the development of physical capital. To account for the potentially very different growth performance of districts with and without mineral resources, we also include the share of mining in district GDP as a regressor. Finally, since the geography of the different major island groups in Indonesia may have an important influence on growth, we include a set of dummies for the five main island groups.[18] Table 4.3 shows the results from estimating equation (1).

The first column of Table 4.3 shows a result typical of such growth regressions: population size and schooling are positively associated with growth, as is capital, although the coefficient is not statistically significant. A higher share of mining in GDP significantly reduces overall growth, reflecting the slower growth of mineral GDP relative to non-mineral GDP over this period. Conditional on these control variables, growth is faster in districts with initially lower per capita GDP.

Column 2 of Table 4.3 includes all of our governance sub-indices. Consistent with our correlation results, we find none of the coefficients on the sub-indices statistically different from zero, with the exception of infrastructure. The infrastructure sub-index is positively

[16] In addition we include dummies for different island groups, and the share of mining in GDP as a measure of resource dependence.

[17] Earlier work on district level growth in Indonesia (McCulloch and Bambang 2008) examined the impact of a wide range of other potential determinants of growth e.g. remoteness, topography, sectoral distribution, ethno-linguistic fragmentation, and found surprising few strong correlates of growth.

[18] Table Appendix A1 shows the descriptive statistics for our explanatory variables.

associated with growth. To account for potential multi-collinearity between the sub-indices reducing the significance of individual indices, we also entered each of the sub-indices into the equation separately – again the only sub-index which was statistically significant was the infrastructure sub-index.[19]

Our results therefore suggest that the initial finding of little correlation between governance and district growth was not driven by a failure to account for other structural determinants of growth. It is possible that this surprising result is driven by our relatively noisy growth variable. To check this possibility we explored three alternative measures of growth. First we considered the growth in real non-oil GDP per capita (column 3). Our results were virtually unchanged, except that, unsurprisingly, the share of mining in GDP no longer has an influence on growth rates. When all the governance sub-indices are included (column 4), only infrastructure is statistically different from zero (although the sub-indices on integrity and interaction between local government and business are significant at the 10 per cent level when entered individually).

Another possibility is that the leap from governance to GDP growth (with or without oil) may simply be too far. Moreover, the quality of calculation of different elements of GDP varies, with some elements calculated based on annual surveys and censuses, whilst other components are approximated from historical and provincial or national data. This approximation process could add significant noise to the GDP figures. To account for this, we re-estimated our regression using manufacturing GDP as the dependent variable. Manufacturing GDP is regarded by the central statistical bureau as the most accurate component of GDP since it is calculated based on an annual census of industries; it is also the element of GDP most directly linked to local economic governance. Column 5 and 6 show the regressions using manufacturing GDP.

Few of the structural variables for human or physical capital that are associated with overall growth appear to influence the growth in manufacturing GDP, although there is still some weak evidence for conditional convergence. However, when governance variables are added we see a major change. Infrastructure again has a positive and significant influence on manufacturing growth, as does the nature of the interaction between the local government and firms. However, there is also a significant *negative* impact of governance associated with the presence and quality of local business development programmes, as well as the integrity of the district leader. Holding other things equal, districts with more and better business development programmes had slower growth in manufacturing GDP; and districts where the local leader and their administration was regarded as more corrupt, grew faster. The former could be explained through a programme placement effect – it may be that business development programmes are put in districts where industry is struggling. However, the positive influence of corruption is a puzzle, to which we return later.

Finally, as a cross-check of our results using GDP based dependent variables, we looked at the growth in mean real per capita expenditure at the district level, taken from the annual household survey (*Susenas*). Of course, the growth in per capita expenditure is even further removed from local economic governance than GDP growth, since it requires that the growth that occurs trickles down to the population in that district in the form of higher expenditure. However, it could be that better governed districts are more effective at ensuring that local growth reaches the population. Column 7 shows the familiar story with human and physical capital contributing to growth, and conditional convergence once these variables are taken into account. When governance variables are added (column 8), infrastructure remains positive, but now integrity enters positively, whilst districts that experience more crime appear to grow faster.

[19] Results available on request.

Table 4.3 Regressions of growth on governance variables

Dependent variable:	GDP growth per capita 2001–2007		Non-oil GDP growth per capita 2001–2007		Manufac GDP growth per capita 2001–2007		Expenditure growth per capita 2001–2007	
non-oil GDP growth real pc 2001–2007	1	2	3	4	5	6	7	8
Initial income[+]	-0.010***	-0.008560***	-0.009***	-0.008308***	-0.001479	-0.003321**	-0.028911***	-0.034274***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.002]	[0.002]	[0.008]	[0.009]
Log population 2001	0.006***	0.005477***	0.007***	0.005213***	0.006322*	0.002420	0.002934	0.000445
	[0.002]	[0.002]	[0.002]	[0.002]	[0.003]	[0.004]	[0.002]	[0.002]
Share of population with junior schooling (2001)	0.073*	0.081420*	0.070*	0.074618*	-0.010349	0.033562	0.096565**	0.055993
	[0.041]	[0.043]	[0.040]	[0.041]	[0.071]	[0.076]	[0.040]	[0.041]
Telephone access per household (2000)	0.027	0.017606	0.040**	0.030589	-0.008420	-0.035346	0.096243***	0.087491***
	[0.020]	[0.021]	[0.019]	[0.020]	[0.027]	[0.038]	[0.025]	[0.031]
Share of mining in GDP (2001)	-0.031**	-0.028633*	0.000	0.006824	-0.004268	-0.003159	0.008143	0.006714
	[0.014]	[0.015]	[0.010]	[0.009]	[0.018]	[0.018]	[0.008]	[0.008]
Access to information		-0.000098		-0.000093		-0.000129		-0.000146
		[0.000]		[0.000]		[0.000]		[0.000]
Business Development Programmes		-0.000030		-0.000042		-0.000437***		0.000097
		[0.000]		[0.000]		[0.000]		[0.000]
Infrastructure		0.000537***		0.000506**		0.000536**		0.000333
		[0.000]		[0.000]		[0.000]		[0.000]
Integrity		-0.000035		-0.000048		-0.000594**		0.000429**
		[0.000]		[0.000]		[0.000]		[0.000]
Interaction		0.000108		0.000202		0.000685**		-0.000290
		[0.000]		[0.000]		[0.000]		[0.000]
Land		-0.000189		-0.000145		-0.000174		0.000051
		[0.000]		[0.000]		[0.000]		[0.000]
Licensing		-0.000218		-0.000178		-0.000257		0.000027
		[0.000]		[0.000]		[0.000]		[0.000]
Security		0.000248		0.000127		-0.000068		-0.000333**
		[0.000]		[0.000]		[0.000]		[0.000]
Transaction Costs		-0.000027		-0.000013		-0.000217		-0.000197

		[0.000]		[0.000]		[0.000]		[0.000]
Constant	0.084*	0.055569	0.070	0.053422	0.001029	0.128039**	0.320244***	0.422937***
	[0.048]	[0.061]	[0.046]	[0.055]	[0.034]	[0.061]	[0.096]	[0.120]
Observations	275	184	275	184	275	184	275	184
R-squared	0.18	0.30	0.12	0.25	0.04	0.14	0.11	0.23

Robust standard errors in brackets

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

+: Initial Income is per capita GDP in 2001 for the GDP regression; per capita non-oil GDP in 2001 for the non-oil GDP regression; per capita manufacturing GDP in 2001 for the manufacturing regression; and per capita expenditure in 2001 for the expenditure regression.

Source: Authors' own

The results from Table 4.3 show a somewhat confusing picture about the influence of local governance on growth. The only governance sub-index consistently associated with growth is infrastructure governance. For the most generic measures of GDP growth, no other measures of governance have a significant effect. Conversely, several other aspects of governance appear to matter for manufacturing growth, whilst the integrity of the district leader seems to have a conflicting effect, with higher corruption boosting manufacturing growth, but greater integrity more effective at ensuring that growth is distributed to the average person in the district.

To try and understand the influence of individual aspects of governance on these different kinds of growth, we broke down the sub-indices into their constituent variables and included them individually into the regression. Since there are several variables included in each sub-index, it is not possible to include all the variables from every sub-index into a single regression. We therefore estimated each regression with the variables from one sub-index at a time. For brevity, we report the results only for the regressions involving the infrastructure variables, and the integrity variables.

4.3 Regressions with individual variables

4.3.1 Infrastructure variables

Table 4.4 shows the results from regressing our four different measures of growth on our control variables and the individual infrastructure governance variables. For GDP growth including oil and gas, the perceptions of firms about the quality of roads, lights, water, and electricity do not have a statistically significant effect. However, when oil and gas are excluded, firm perceptions about the quality of roads, and telephone connections do have a positive impact upon growth, whilst, surprisingly, districts in which firms had a more negative perception of the quality of electricity tended to grow faster.

However, perceptions about the quality of infrastructure are highly endogenous to growth itself. We therefore include a set of more concrete variables about the quality of infrastructure services. These suggest that, other things equal, districts in which problems with water were fixed faster, tended to have higher GDP growth rates. Moreover, districts which experienced fewer electricity black outs also grew faster. Finally, firms were asked how important a constraint they felt infrastructure was. Where firms indicated that infrastructure was an important constraint, growth was slower.

It is useful to get an indication of the size of these effects. These results suggest that if a district's overall score infrastructure was to improve from the mean to the top quartile, it would gain around 0.3 per cent per capita GDP growth each year. A further 0.35per cent in growth might be gained by lifting a district from the bottom quartile of electricity black outs to the median performance.

However, almost none of these results carry over to our other two measures of growth – manufacturing growth and growth in per capita expenditure. Indeed, the time taken to fix electricity problems appears to be positively associated with these measures of growth – that is, districts in which such problems took longer to be resolved grew faster. This is peculiar – but is due to high growth rates in a small number of districts with significant electricity supply constraints. It remains the case that more frequent blackouts slowed growth.

Table 4.4 Regressions with infrastructure variables

	GDP growth incl oil	GDP growth non–oil	Manufacturing GDP growth	Expenditure growth
Control variables				
Initial income 2001*	-0.010094***	-0.008732***	-0.002879	-0.034508***
	[0.003]	[0.003]	[0.002]	[0.011]
Log population 2001	0.006162***	0.006100***	0.005584	0.002239
	[0.002]	[0.001]	[0.004]	[0.002]
Share of population with junior schooling (2001)	0.068201*	0.062403*	0.030682	0.099320**
	[0.038]	[0.036]	[0.071]	[0.047]
Telephone access per household (2000)	0.004591	0.012994	-0.044244	0.073543**
	[0.023]	[0.022]	[0.036]	[0.034]
Share of mining in GDP (2001)	-0.031349**	0.003999	-0.021662	0.005308
	[0.015]	[0.009]	[0.017]	[0.008]
Infrastructure variables				
Quality of roads	0.000142	0.000287**	0.000104	0.000013
	[0.000]	[0.000]	[0.000]	[0.000]
Quality of street lighting	0.000122	-0.000012	0.000031	0.000279*
	[0.000]	[0.000]	[0.000]	[0.000]
Quality of local water supply	-0.000131	-0.000163*	-0.000186	-0.000184
	[0.000]	[0.000]	[0.000]	[0.000]
Quality of electricity	-0.000223	-0.000395**	0.000136	0.000202
	[0.000]	[0.000]	[0.000]	[0.000]
Quality of telephone	0.000230*	0.000352***	-0.000074	-0.000223
	[0.000]	[0.000]	[0.000]	[0.000]
Log time to fix roads+	0.000106	0.000043	-0.000022	0.000118
	[0.000]	[0.000]	[0.000]	[0.000]
Log time to fix street lighting+	-0.000244	-0.000124	0.000007	-0.000208
	[0.000]	[0.000]	[0.000]	[0.000]
Log time to fix local water supply+	0.000322**	0.000268**	0.000151	0.000231
	[0.000]	[0.000]	[0.000]	[0.000]
Log time to fix electricity+	-0.000109	-0.000059	-0.000555***	-0.000454**
	[0.000]	[0.000]	[0.000]	[0.000]
Log time to fix telephone+	-0.000171	-0.000193*	0.000239	0.000265
	[0.000]	[0.000]	[0.000]	[0.000]
Ownership of a generator+	-0.000028	0.000016	-0.000097	-0.000101
	[0.000]	[0.000]	[0.000]	[0.000]
Frequency of blackouts+	0.000233*	0.000268**	0.000402**	0.000253*
	[0.000]	[0.000]	[0.000]	[0.000]
Overall infrastructure constraint	0.000163**	0.000173***	0.000012	-0.000111
	[0.000]	[0.000]	[0.000]	[0.000]
Constant	0.072957	0.048976	0.034380	0.391874***
	[0.053]	[0.048]	[0.041]	[0.136]
Observations	184	184	184	184
R-squared	0.34	0.33	0.11	0.22

Robust standard errors in brackets

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

* Initial Income is per capita GDP in 2001 for the GDP regression; per capita non-oil GDP in 2001 for the non-oil GDP regression; per capita manufacturing GDP in 2001 for the manufacturing regression; and per capita expenditure in 2001 for the expenditure regression.

+ this variable has been reversed so that a higher value indicates a better performance.

Source: Authors' own

4.3.2 Integrity variables

The integrity and competence of local officials is measured through six variables relating to the perception of local firms regarding:

- the district leader's understanding of business issues
- the appointment of officials with relevant skills
- whether the leader takes strong action against corruption
- whether the leader is corrupt themselves
- whether the leader is a strong leader and
- an overall assessment of how much issues associated with integrity and competence of local officials influence business performance.

Table 4.5 shows the results of including all these variables individually in our growth regressions.

Remarkably, none of these variables have any statistically significant association with GDP growth over the period, whether or not oil is included. However, the same is not true when looking at manufacturing growth and the growth of per capita expenditure. For both of these measures of growth, we observe seemingly contradictory effects of integrity. First, there is a positive association between a local leader taking strong action against corruption and district manufacturing growth. However, at the same time we see a negative association between firm perception of the integrity of the leader and local manufacturing growth (i.e. districts in which firms perceive the leader to be more corrupt, grew faster). For growth in per capita expenditure we also see a negative association with firm's perception of the strength of the leader, with stronger leaders associated with lower growth. As a result, districts where a higher proportion of firms reported that issues of integrity and competence were a significant constraint, had faster growth in per capita expenditure than those where these constraints were felt to be less important.

The size of these effects is not large, but they are not trivial either. Improving a district's score on the corruption of its leader from the median of 42.9 to the upper quartile of 49.1 would, according to Table 4.5, be associated with growth in per capita expenditure being 0.15 per cent *lower*. But achieving the same improvement in firm perceptions that leaders take strong action against corruption would improve growth by 0.38 per cent.

One plausible interpretation of these results is that the behaviour and competence of district officials has relatively little influence over GDP growth in their district, which comprises a very large number of activities, most of which are out of their immediate control. However, they do have some influence over specific manufacturing plants and over the distribution of the gains from growth in their district. Moreover, it may be that strong actions by the district leader to prevent generalised corruption, improve the business climate in a way that supports growth. At the same time, many firms may believe that growth generates rents and that these are inevitably captured, in part, by the local leader, suggesting that the negative coefficient on the integrity of the leader is endogenously determined. Whether these conjectures are correct or not, there is no escaping the fact that the data do not support a simple strong positive association between the integrity and competence of local officials (however desirable this may be for a range of reasons) and district level growth.

Table 4.5 Regressions with integrity variables

	GDP growth incl oil	GDP growth non-oil	Manufacturing GDP growth	Expenditure growth
Control variables				
Initial income*	-0.009102***	-0.008575***	-0.001896	-0.028899***
	[0.003]	[0.003]	[0.002]	[0.009]
Log population 2001	0.006007***	0.006007***	0.000935	0.002143
	[0.002]	[0.002]	[0.003]	[0.002]
Share of population with junior schooling (2001)	0.077655*	0.069613*	0.027293	0.108032**
	[0.041]	[0.040]	[0.072]	[0.042]
Telephone access per household (2000)	0.029333	0.040855**	-0.030720	0.085326***
	[0.021]	[0.020]	[0.035]	[0.028]
Share of mining in GDP (2001)	-0.031445**	0.004841	-0.005257	0.010641
	[0.014]	[0.008]	[0.016]	[0.007]
Integrity variables				
Leader's understanding of business issues	0.000075	0.000089	-0.000175	0.000157
	[0.000]	[0.000]	[0.000]	[0.000]
Appt of skilled officials	-0.000107	-0.000134	0.000044	-0.000068
	[0.000]	[0.000]	[0.000]	[0.000]
Strong action against corruption	0.000243	0.000226	0.000307*	0.000418**
	[0.000]	[0.000]	[0.000]	[0.000]
Leader is corrupt+	-0.000025	0.000045	-0.000368***	-0.000237**
	[0.000]	[0.000]	[0.000]	[0.000]
Strong leader	-0.000077	-0.000067	-0.000185	-0.000183*
	[0.000]	[0.000]	[0.000]	[0.000]
Overall influence of integrity	0.000060	0.000048	0.000041	-0.000200*
	[0.000]	[0.000]	[0.000]	[0.000]
Constant	0.068219	0.058618	0.092318**	0.337563***
	[0.051]	[0.048]	[0.042]	[0.111]
Observations	186	186	186	186
R-squared	0.26	0.21	0.11	0.21

Robust standard errors in brackets

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

* Initial Income is per capita GDP in 2001 for the GDP regression; per capita non-oil GDP in 2001 for the non-oil GDP regression; per capita manufacturing GDP in 2001 for the manufacturing regression; and per capita expenditure in 2001 for the expenditure regression.

+ this variable has been reversed so that a higher value indicates a better performance.

Source: Authors' own

4.4 Alternative measures of governance

Another reaction to the above results might be to doubt the quality of the Local Economic Governance Survey data. Fortunately, we are in a position to check this because a separate survey was carried out for the Investment Coordination Board (BKPM) by a different survey organisation. This survey looked explicitly at the quality of local licensing, one of the district government's principle tools for influencing the local investment climate and an important component of local economic governance. It covered 291 districts, of which 168 were also covered by the EGI survey. Many of the questions in the BKPM survey are similar to those asked in the licensing section of the LEGS. We therefore constructed a licensing sub-index from the BKPM survey using the questions which most closely resembled those used to

construct the licensing sub-index in the Economic Governance Index (EGI). If this sub-index was found to be closely associated with growth, whilst the EGI was not, then this would be evidence that (at least) one of the indices was unreliable.[20]

Table 4.6 shows the coefficients on the LEGS and the BKPM licensing sub-indices from a regression of each dependent variable on all the control variables and all the sub-indices. The columns indicate whether the LEGS or the BKPM licensing sub-index was used.[21]

The results for the GDP growth and non-oil GDP growth regressions show that licensing continues to have no statistically significant impact on growth using the BKPM measure in place of the EGI measure. The same is true for the regressions of per capita expenditure. However, the manufacturing growth regression shows a substantial change, with licensing using the BKPM measure becoming statistically significant and positive. This is an interesting result. First, it provides us with some confidence in the EGI data. Had there been a strong relationship between the BKPM measure of licensing and GDP growth, this would have suggested that our EGI measures might be flawed – but we see no such relationship. However, the existence of a strong positive association between the BKPM licensing measure and manufacturing growth also makes sense, since this survey focuses on firms that have licenses. These are firms for whom licensing is more likely to matter. If manufacturing growth at the district level is driven by larger and more successful firms, who are also more likely to have a license and therefore be in the BKPM survey, then it is not surprising that we see a strong positive association using the BKPM measure. The EGI measure may miss this because its sample includes firms for whom licensing is less relevant.

4.5 Expectation bias

Another possible explanation for the lack of a strong association between our measures of governance and economic growth relates to expectations. It could be that, in fact, there is a strong association between the two, but that respondents in places that are growing have higher expectations of economic governance than those in places which are not. The KPPOD survey relies heavily on perception data from firms. If these firms are more likely to report that some aspect of governance is poor when the overall economy is growing than firms in other districts faced with a similar quality of governance, but where the overall economy is not growing so quickly, then we will fail to find any relationship between economic governance and growth.

Fortunately, the KPPOD survey is not only a survey of perceptions. It mixes questions about firms perceptions, with more concrete questions such as the time taken to obtain licenses and the number of times electricity is cut off. We would expect these more factual questions to be less influenced by expectations of progress. If expectation bias is causing our lack of association, then we would expect to see concrete governance variables having a robust association with growth, whilst perception variables of the same concepts do not. To evaluate this we therefore looked at the simple correlations between our various different measures of growth and concrete and perception measures in three areas: infrastructure, licensing, and land. Table 4.7 shows the results.

[20] The BKPM sub-index is correlated with the EGI licensing sub-index. However, the correlation is quite weak (0.23) and some of the individual variables in the two sub-indices are not correlated at all. To some extent this reflects the fact that the questions asked are different in the two surveys –where the questions are closer, the correlation is higher. The differences also reflect the fact that the samples are different: the EGI is a stratified random sample of firms in the district; the BKPM survey is only administered to firms that say that they possess one of the three key licenses.

[21] To ensure that the results were not driven by differences in the sample of districts between the two surveys we used the set of districts common to both surveys in the regressions.

Table 4.6 Comparing LEGS and BKPM licensing sub-indices

	GDP growth incl oil	GDP growth incl oil	GDP growth non-oil	GDP growth non-oil	Manufacturing GDP growth	Manufacturing GDP growth	Expenditure growth	Expenditure growth
	LEGS	**BKPM**	**LEGS**	**BKPM**	**LEGS**	**BKPM**	**LEGS**	**BKPM**
Licensing sub-index	-0.000369	-0.000051	-0.000295	-0.000034	-0.000202	0.000452**	-0.000078	-0.00004
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	153	153	153	153	153	153	153	153
R-squared	0.4	0.39	0.35	0.34	0.22	0.24	0.24	0.24

Robust standard errors in brackets

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

Note: Regressors are the same as in previous tables except for the licensing sub-index.

Source: Authors' own

Table 4.7 Comparing concrete and perceptions based measures

	Measure of growth (per capita)			
	GDP	non-oil GDP	Manufacturing	Expenditure
Infrastructure				
Perception of quality of electricity	0.2255*	0.1574*	-0.0958	0.0566
No. of blackouts	0.1299	0.0676	-0.0708	0.0477
Time to fix electricity problems	0.0464	0.0447	-0.1043	0.0365
Licensing				
Perceived ease of getting a license (TDP)	0.0773	0.0356	-0.0421	-0.0133
Time to get a license (reversed)	0.0798	0.0644	0.0003	-0.0185
Land				
Perception of ease of getting land certificate	-0.0796	-0.0076	-0.0407	-0.0334
Time to get land certificate (reversed)	-0.0261	-0.0238	0.0721	0.0032

Source: Authors' own

Table 4.7 shows that for most concrete and perception-based variables there is no statistically significant correlation with growth. Moreover, in the case where there is, it is the perception variable for the quality of electricity that is strongly correlated with GDP growth, whilst neither of the two concrete measures (number of blackouts and time to fix problems) were significantly correlated with growth. This is the opposite of the result that we would expect were our results to be arising from perception bias.

4.6 Reverse causality

In a recent paper using cross-country data, Kaufmann and Kraay (2010) argued that there is a positive causal effect of governance on growth, but that this is partially masked by a counteracting negative reverse causal effect running from growth to governance. This might be the case if, for example, better governance improved growth, but growth then led to greater opportunities for corruption and rent-seeking.

The traditional approach to tackling problems of reverse causality is to find instrumental variables which only affect growth through their influence on governance. Finding such variables is typically rather difficult, since, most variables that are likely to have a significant impact upon governance will also have some independent impact upon growth.

One interesting place to look is the detailed BPS collection of data on natural disasters in Indonesia. Sadly, natural disasters are common in Indonesia and take many different forms including floods, droughts, mudslides, earthquakes, and tsunamis. Most of these types of disasters are (mercifully) not widespread across the country and therefore do not provide sufficient spatial variation in the dataset, but two types of disaster are particularly common: floods and mudslides. Both of these are negatively correlated with several measures of governance, but uncorrelated with GDP growth. More importantly, there is a plausible rationale for their use as instruments. Mudslides and floods destroy infrastructure, including government infrastructure. It is therefore quite plausible that governance would be worse in districts that have more frequent floods and mudslides due to the constant disruption of disasters slowing down the process of institution building. Of course, such disasters would also wipe away economic infrastructure and therefore affect the GDP of the district. But the effect of the disaster on GDP is primarily through its impact on infrastructure, and not through some other channel. Moreover, this does not necessarily imply that districts with more frequent disasters have slower growth rates, over the entire time period. Hence, it is plausible that these disasters may only affect growth rates through the influence that they have on the quality of local governance.

Given our relative paucity of instruments, it is not possible for us to draw on the full complement of governance variables used above. We therefore construct an overall Economic Governance Index (EGI) as a measure of the overall quality of governance in the district.[22] The results are shown in Table 4.8.

Table 4.8 column 1 shows that the overall EGI does have a statistically significant and positive impact upon GDP growth, even in the OLS regression. However, the effect is rather small – a district moving from the bottom to the top quartile of the EGI would see its growth rate rise by around 0.4 per cent. When the EGI is instrumented with mudslides[23] (column 2), this effect is greatly strengthened, so that a similar move in governance quality would increase growth by 2.8 percentage points. Columns 3 and 4 show that this result also applies to non-oil GDP growth, with a large increase in size of the EGI coefficient in the instrumented

[22] We construct the EGI by adding up all the nine sub-indices. Note that our EGI therefore differs slightly from that published in KPPOD (2008) since our index is unweighted and contains only those sub-indices derived from the survey data; the KPPOD EGI also contained a sub-index of regulatory quality based on expert assessment of local legislation.

[23] Statistical tests rejected floods as a suitable instrument.

regression. However, the result does not carry through to the growth of manufacturing (columns 5 and 6) or per capita expenditure (columns 7 and 8). In both cases, we find no statistically significant influence of the EGI in either the OLS or 2SLS regressions.

To test whether these results also applied to individual aspects of governance, we undertook the same regressions using the Integrity sub-index as our measure of governance. The results – shown in Table 4.8 – are very similar. In the OLS regressions, Integrity was not significantly related to GDP growth and only very weakly associated with non-oil GDP growth. However, when Integrity was instrumented using mudslides we see a much larger and statistically significant impact in both cases. As before, this result does not apply to manufacturing growth or to the growth in per capita expenditure.

We would not wish to overstate these results; the mudslide variable is a relatively weak instrument, and, although our proposed causal explanation is plausible, it is not beyond challenge.[24] Nonetheless, we believe that our results provide some tentative evidence that the positive relationship between overall governance and economic growth may be being masked by negative feedback in the reverse direction.

4.7 Panel data analysis

In the previous analyses, we employed cross-sectional data. Independent variables were measured in year 2001 with growth calculated as average annual GDP growth between 2001 and 2007. The cross-sectional structure is reasonable, given that we only have one year of governance measures from 2007, but can safely assume that governance captures inherited governance from previous years. Moreover, cross-sectional data has the advantage of averaging over several years of economic growth, which limits the impact of noise caused by idiosyncratic shifts in a particular year. Many of the districts have quite small economies, making it possible that a single new investment project in a given year, or conversely a single closure of a large project, can create wild swings in GDP that complicate panel analysis.

Figure 4.1 documents this problem by showing a scatter plot of economic growth over economic governance, across time. Blue circles represent districts which average reasonable economic growth in a given year, but red diamonds highlight the district-years, where growth exceeded or declined over 15 per cent in a given year. These fluctuations hamper time series estimation.

On the other hand, as our analysis suggests, a cross-sectional structure privileges the structural conditions that a district inherited at the beginning of the reform era, such as initial human capital and infrastructure. What we really care about is the ability of local policymakers to stimulate growth in their economy, given the structural endowments that they inherited. To observe this, more clearly, we also attempted a panel analysis, which studied each of the 243 districts every year between 2001 and 2007. This technique helps us observe whether governance may be associated with growth in the short term.
We begin with straightforward OLS panel model in Table 4.9, but use an AR1 process to address serial correlation. The results are not encouraging for governance. Our aggregate measure of governance is actually negatively associated with changes in per capita GDP over time. This robust negative relationship holds up after controlling for structural conditions (Model 2), adding year and island fixed effects (Model 3), and controlling for natural disasters (Model 4).

[24] We did search for and try alternative instruments. Specifically, we attempted to use whether a district had split or not as an instrument, but this was not suitable because splits are not random and do affect subsequent economic performance (DSF 2007); UNDP/BAPPENAS/DSF 2009). We also obtained mortality data from the early nineteenth century in order to construct an instrument similar to that used by Acemoglu, Johnson and Robinson (2001), but this data was only available for a small number of regions.

Table 4.8 Instrumental variable regressions of growth on governance and integrity

	GDP growth incl oil	GDP growth incl oil	GDP growth non-oil	GDP growth non-oil	Manufacturing GDP growth	Manufacturing GDP growth	Expenditure growth	Expenditure growth
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
EGI	0.000052*	0.000346**	0.000049*	0.000384**	-0.000046	-0.000089	-0.000032	0.000197
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Integrity sub-index	0.000161	0.001105*	0.000181*	0.001178*	-0.000261	-0.000075	0.000103	0.001340
	[0.000]	[0.001]	[0.000]	[0.001]	[0.000]	[0.001]	[0.000]	[0.001]

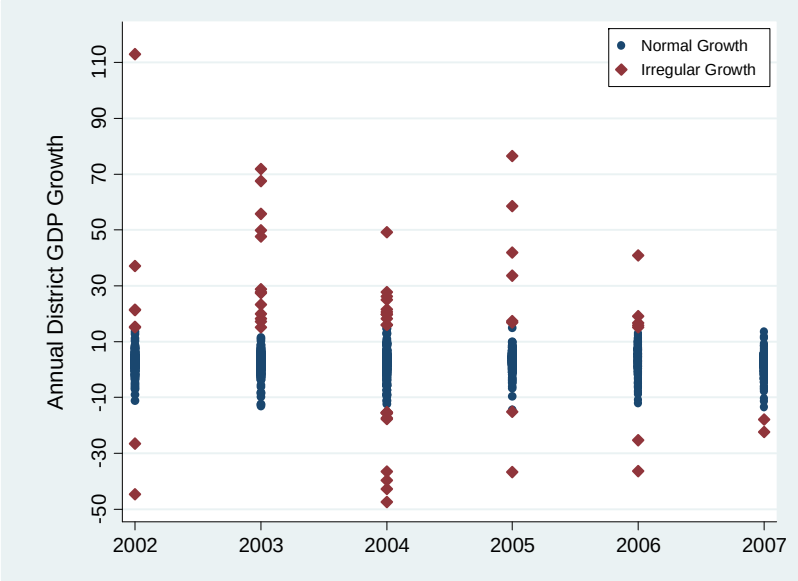
Robust standard errors in brackets

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

Note: Table shows the coefficient on EGI/Integrity sub-index when these are included (separately) in OLS and 2SLS regressions along with the control variables shown in previous tables.

Source: Authors' own

Figure 4.1 Economic growth and economic governance



Source: Authors' own

Estimation of the panel model poses some econometric complications. Almost all of the variables in the previous models are potentially endogenous to economic growth. That is, GDP growth may be responsible for improved education, infrastructure, and governance. Using OLS under these conditions produce biased and inconsistent parameter estimates. Secondly, our measure of governance is time invariant and therefore may be correlated with others explanatory variables. The district-level fixed effects are contained in the error term in equation, which consists of unobserved district-specific effects, v_i, and observation-specific errors, e_{it}.

Thus, in addition to estimating the panel model by OLS, we use the difference GMM (generalised method of moments) estimator suggested by Arellano and Bond (1991). The logic of this estimator is to first difference the variables in the model that vary over time, in order to remove the unit fixed effects, and then to instrument the first-differenced predetermined and endogenous variables on lags of levels variables sufficiently deep to be uncorrelated with the first-differenced term. The panel-level errors are serially uncorrelated, which can be tested by checking that the first -differenced residuals do not exhibit second-order serial correlation.

In our setting, the Arellano-Bond model poses two additional complications. First, a large instrument set, i.e., the use of a large number of lags as instruments, may over-fit the predetermined and endogenous variables and consequently bias parameter estimates toward their OLS counterparts. We minimise this concern by using only the first available lag for any variable to be instrumented.

Model 5 of Table 4.9 re-runs the previous OLS specification in the Arellano-Bond Framework, while Models 6–9 repeat the analysis for different operationalisations of the dependent variable, including GDP, Non-Oil GDP, Non-Oil GDP per capita, and personal expenditures. The models demonstrate persuasively that governance is uncorrelated with income growth. Once again, structural factors, particularly secondary school graduates, share of mineral resources, and infrastructure play the most important role. Interestingly, mudslides have a negative effect on economic growth on GDP (Model 6) and Non-Oil GDP (Model 7), but do not show up in the per-capita models. Finally, when we re-ran the Non-Oil GDP and expenditure models again, replacing the final EGI index with each sub-index we still found that governance is not significantly associated with economic growth in any of the specifications.

4.8 Firm level evidence

All of the analysis so far has focused on the district as the unit of analysis. However, the KPPOD data from which we have derived our district governance measures is actually a survey of over 12,000 firms. Moreover, this survey asked detailed questions about the individual characteristics of the manager of the firm and the characteristics of firm itself. We can therefore test the influence of district level local economic governance on the performance of firms, controlling for the influence of individual and firm characteristics. Moreover, this approach suffers less from the endogeneity problems associated with the district level regressions since individual firm performance is not likely to affect the average assessment of local governance by firms in a district, whereas the average quality of local governance should affect individual firms.[25]

[25] It does not, of course, solve the problem entirely, since there could be common omitted factors influencing both district level governance and individual firm performance.

Table 4.9 Panel data estimates of governance growth relationship

Dependent Variable (Model)	**Ordinary Least Squares**				**Arellano-Bond**				
	GDP Capita	**GDP Capita**	**GDP Capita**	**GDP Capita**	**GDP Capita**	**GDP**	**Non-Oil GDP**	**Non-Oil GDP/Cap**	**Expenditures**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
EGI	-0.02298***	-0.01945***	-0.02328***	-0.01266	-0.01537	-0.01323	-0.02366	-0.02335	-0.01006
	(0.009)	(0.004)	(0.004)	(0.023)	(0.021)	(0.029)	(0.030)	(0.023)	(0.010)
Secondary School Graduates		0.96604***	0.47801***	4.04084***	4.36748***	4.03119***	4.26476***	4.75846***	1.79583***
		(0.096)	(0.092)	(0.918)	(0.774)	(1.375)	(1.335)	(0.867)	(0.448)
Telephones		0.00000***	0.00000***	0.00000**	0.00000**	0.00000	0.00000	0.00000**	0.00000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Asphalted Roads (%)		0.00039***	-0.00002	-0.00241*	-0.00137*	-0.00137	-0.00092	-0.00079	-0.00073*
		(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Share of Mineral Resources		2.23285***	1.78670***	1.75259***	1.75497***	1.37667**	-0.01811	0.13305	0.13116
		(0.107)	(0.098)	(0.410)	(0.391)	(0.636)	(0.683)	(0.499)	(0.164)
Population		-0.00000***	-0.00000***	0.00000	0.00000	0.00000***	0.00000***	0.00000	0.00000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Mudslides				0.00228	-0.00073	-0.00289**	-0.00275**	-0.00080	-0.00042
				(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Floods				-0.00177	-0.00078	0.00106	0.00092	-0.00054	-0.00061
				(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Island FE			YES	YES	YES	YES	YES	YES	YES
Year FE			YES	YES	YES	YES	YES	YES	YES
Constant	16.77441***	16.26686***	16.83370***	15.80826***	15.90733***	28.61039***	28.86769***	15.97673***	12.45825***
	(0.503)	(0.237)	(0.204)	(1.398)	(1.288)	(1.769)	(1.739)	(1.385)	(0.631)
Observations	1463	1372	1372	1372	1372	1372	1372	1372	1371
Number of id_m	209	200	200	200	200	200	200	200	200
Chi Squared	7.104	720.1	1728	449.5	539.1	3620	4371	530.6	4671
R2	0.0336	0.544	0.597						
Hansen's J				47.49	56.44	55.65	52.91	46.74	58.81
Population				0.0953	0.247	0.271	0.363	0.605	0.184

Standard errors in parentheses; Fiited with AR1 process to address serial correlation.

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own

Measures of firm revenue or value-added tend to be extremely noisy (de Mel, McKenzie *et al.*. 2008). As a result we use a qualitative variable indicating whether the firm made a profit, broke even, or made a loss in the previous year. We estimate the following equation using an Ordered Probit regression:

$$\Pr_{ij} = \beta_0 + \beta_1.IC_{ij} + \beta_2.FC_{ij} + \beta_3.EGI_j + \varepsilon_{ij} \quad (2)$$

where $\Pr_{ij}$ is the probability of firm *i* in district *j* being in each of the three categories of profit, break even or loss, IC_{ij} are the individual characteristics of the manager of the firm, FC_{ij} are the characteristics of the firm, EGI_j is the economic governance index for district *j,* and ε_{ij} is an error term. The results are shown in Table 4.10.

Table 4.10 Determinants of firm profitability

	1	2	3
VARIABLES	Probability of making a profit		
Female manager	0.001266	-0.000967	-0.001425
	[0.010]	[0.010]	[0.010]
Age of manager	-0.001545***	-0.001485***	-0.001547***
	[0.001]	[0.001]	[0.001]
Experience of manager	0.000093	-0.000065	-0.000153
	[0.001]	[0.001]	[0.001]
Completed primary	0.012851	0.008126	0.006162
	[0.018]	[0.018]	[0.018]
Completed junior secondary	0.035412*	0.027424	0.022013
	[0.019]	[0.019]	[0.019]
Completed senior secondary	0.078881***	0.071584***	0.066772***
	[0.017]	[0.017]	[0.017]
Completed above senior secondary	0.099708***	0.093418***	0.085959***
	[0.017]	[0.017]	[0.018]
Age of enterprise	-0.000782**	-0.000762**	-0.000792**
	[0.000]	[0.000]	[0.000]
Trade sector	0.068336***	0.064693***	0.062372***
	[0.010]	[0.010]	[0.010]
Service sector	0.015478*	0.010609	0.008739
	[0.009]	[0.009]	[0.009]
Number of employees in 2007	0.000081**	0.000081**	0.000082**
	[0.000]	[0.000]	[0.000]
Exporter	0.031305	0.030630	0.036252*
	[0.019]	[0.019]	[0.019]
In a business association	0.013643	0.013219	0.012495
	[0.011]	[0.011]	[0.011]
ln per capita non-oil GDP 2001	-0.007775	-0.008062	-0.007892
	[0.009]	[0.009]	[0.009]
ln population 2001	-0.031224***	-0.024432***	-0.026680***
	[0.006]	[0.006]	[0.007]
Share of pop ever in junior sec school	0.215325	0.281348**	0.273819*
	[0.138]	[0.138]	[0.143]
Telephones per household 2000	-0.098845	-0.093876	-0.202705***
	[0.069]	[0.068]	[0.073]

Share of mining in GDP 2001	0.060423*	0.051507	0.071177**
	[0.032]	[0.032]	[0.033]
Access to information sub-index			-0.001768***
			[0.000]
Infrastructure sub-index			0.000821
			[0.001]
Integrity sub-index			0.000306
			[0.001]
Interaction sub-index			-0.001777**
			[0.001]
Land sub-index			-0.003195***
			[0.001]
Licensing sub-index			0.002233***
			[0.001]
Security sub-index			0.001128**
			[0.001]
Business Dev Progs sub-index			-0.000608
			[0.000]
Transaction Costs sub-index			0.001757***
			[0.000]
Economic Governance Index		0.000107	
		[0.000]	
Observations	9,295	9,189	9,189

Standard errors in brackets

Notes: Coefficients are the marginal effects of the variable on the probability of being profitable in the previous year. Regional dummies were also included.

Source: Authors' own

It is clear from Table 4.10 (Column 1) that individual and firm characteristics have a strong influence on firm profitability. For example, firms with older managers were slightly less likely to be profitable. However, by far the strongest effect is the educational level of the manager. Firms with better educated managers are much more likely to be profitable than those with less well educated managers, even after taking into account the size of the firm. Firm characteristics also have an influence. Firms in the trade and services sector were more profitable over this period than those in manufacturing; similarly younger firms and larger firms were slightly more likely to be profitable, although the effect is small. The effect of being an exporter and being in a business association is much larger and positive, but not statistically significant. Some district level characteristics were also important. Firm in districts with a high share of mining activity were more likely to be profitable, perhaps reflecting spillovers from larger firms in the district. Most significantly, firms in districts with larger populations were less likely to be profitable, consistent with the presence of more intense competition in more populated locations.

Column 2 shows the same regression but adding governance in the form of the EGI. The effect of overall governance, although positive, is both extremely small and not statistically significant. Column 3 breaks down the EGI into its component sub-indices. Here we see some interesting but perplexing results. Firms are more likely to be profitable in districts where access to land and to information is worse and with worse interaction between business and the local government. At the same time firms are more likely to be profitable in districts with better security, lower transaction costs and better licensing procedures. The capacity and integrity of the district leader, infrastructure, and the presence of business development programmes do not have a statistically significant effect.

These results point again to the complex bi-directional causality of governance and economic performance. It seems hardly likely that worse access to land and information boost business profits. Rather it seems more likely that places in which businesses are growing experience competition for land resources and generate a degree of confusion leading to poorer access to information. This suggests that it is not possible to give a definitive answer to the issue of how governance affects economic performance without understanding the broader structural determinants of governance. We turn to this now.

4.9 A political economy approach

The underlying idea of our analysis so far, is that improvements in local economic governance should, in principle, improve economic performance. In other words, we have been thinking of governance as something which is amenable to improvement due to policy action and which would then help to boost local economic growth. However, much of the evidence presented above suggests that many of the structural variables which influence economic growth, also have an impact upon the quality of economic governance, confounding the relationship between the two.

There is a large literature on the political determinants of governance, particularly in a decentralised setting (Bardhan and Mookherjee 2000; Lockwood 2009). Much of this focuses on the political institutions and incentives faced by the relevant actors and how this determines the outcomes observed. However, the incentives faced by political actors are often influenced by the structural economic context in which they operate (e.g. remote or close to major cities, with or without major natural resources etc). Hence it is valuable to turn our question around and ask what the data show about the determinants of governance.

To do this we must specify more clearly what aspects of governance we are referring to. One approach would be to take the sub-indices of the EGI. However, these are constructed explicitly to represent governance processes which are likely to impinge on economic growth which is not our focus here. Rather we are interested in how structural variables may influence broad characteristics of governance. We focus on four key characteristics of local level governance: stability, the extent of rent-seeking, the technical competence of the administration, and transparency and accountability. Our dataset contains several variables which can ask as suitable proxies for each of these core attributes of governance.

Next, we specify the structural characteristics that we might expect, *apriori*, to influence these attributes of governance. Consider natural resources. There is a large literature on the natural resources curse (see for example Ross 1999; Dunning 2008), the idea that the presence of natural resources gives rise to conflict over control of these resources and therefore, paradoxically, slower growth. If this is true at a sub-national level would expect that measures of instability should be correlated with natural resource dependence. Similarly, the desire to control rents from natural resources could weaken incentives for transparency and accountability.

Related to this is the size and perhaps the growth of the district budget. There is a literature suggesting that aid flows act in a similar way to natural resources, providing incentives for local leaders to pay less attention to their electorate and more to the external donor (Moore 2004; Morrison 2009). If this is true at a country level, it could also be true at the district level, particularly since more than 80 per cent of district funding still comes from the centre. However, we would also expect that districts that receive more funds per capita than others should also be more competent than those with less funding.

Consider, then, the size of the local economy. One of the surprising stylised facts from our data is that cities have worse overall governance scores than rural districts. However, this is less surprising if we think of the influence that the size of the local economy might have on

rent-seeking. Rent seeking is more lucrative when there is more rent to be sought. Thus cities, and larger local economies, may be more prone to rent-seeking simply because the incentives for such behaviour are much higher in wealthier regions than in poorer ones. If this is the case, the size of the local economy should be an important predictor of scores on rent-seeking. However, we would also expect living in a richer district to have some advantages, particular in the form of more competent local officials and, perhaps, more open and transparent government.

Other structural variables might include population. As with the size of the local economy, higher populations may create more opportunities for rent-seeking. They also make service delivery more complex potentially lowering people's perceptions of the competence of the local government. Finally, we might expect the general level of education of the district to have an influence, both on the competence of the local administration and on the transparency and accountability of its government.

Table 4.11 shows the results of a series of regressions exploring the above hypotheses. Column 1 explores the influence of the size of the economy and its natural resource dependence on stability. In particular, we look at whether the infrequency of land conflict[26] is affected by GDP per capita and a sectoral Gini coefficient which measures the level of concentration of the local economy.[27] The results show precisely the hypothesised relationship – district in which the economy is more concentrated in a small number of sectors report a higher frequency of land conflict.[28] In addition, richer districts report more land conflict. Column 2 extends this idea by adding a dummy variable for whether a district is a city or not, and a dummy for whether the district is on Java. The results suggest that there are two types of land conflict appearing in the data. First, there is land conflict resulting from the pressure of population in cities, indicated by the strong positive coefficient on the city dummy. Second, there is land conflict occurring typically in larger, sparser, natural resource endowed districts off Java, as shown by the large and significant negative coefficient on the Java dummy and the continued significance of the sectoral Gini. Interestingly, the coefficient on per capita income is no longer significant, suggesting that it is the concentration of the economy that matters for land conflict, rather than its size.

In Column 3 we test the idea that budgetary resources from the central government also provide incentives for instability and conflict. We include two variables, the size of the government budget (per capita) and the growth of the per capita budget between 2001 and 2007. Local budgets have grown extremely rapidly since decentralisation, doubling between 2005 and 2007 alone. We find evidence in favour of the idea that this large increase in resources has generated conflict. The coefficient on the growth of the budget is large and statistically significant, whereas that on the size of the budget is small and insignificant. Overall therefore we find strong support in our data for the idea that natural resources and the rapid growth of budgets have led to a measure of instability and poorer governance, particularly in cities and natural resource endowed districts off Java.

We can conduct a similar exercise for measures of rent-seeking. Table 4.12 shows a regression of the extent of illegal payments in the licensing process against a set of structural variable. Our priors were that the size of the economy would increase the extent of rentseeking, as would having a larger (and denser) population. Column 1 shows strong support for our hypothesis. Richer districts do indeed have more illegal payments, as do districts with larger populations and particularly cities. By contrast, the sectoral concentration and budgets do not appear to have a significant influence on this kind of rent-seeking.

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[26] Thus a higher score indicates less frequent conflict.

[27] This is the Gini of the shares of GDP in each sector. Thus if one sector represents all of GDP then the Gini will equal one, whereas if all sectors have an equal share the Gini will be zero.

[28] The same result holds when using the share of mining instead of the sectoral Gini.

Table 4.11 Determinants of land conflict

VARIABLES	(1) land conflict	(2) land conflict	(3) land conflict
Log non-oil per cap GDP 2007	0.0822***	0.0269	0.00826
	[0.0279]	[0.0458]	[0.0483]
Gini sector 2007	0.299*	0.383	0.370
	[0.177]	[0.246]	[0.255]
City		0.138**	0.155***
		[0.0538]	[0.0548]
Java		-0.168***	-0.149***
		[0.0331]	[0.0374]
Government Expenditure per capita 2007			-0.00365
			[0.00781]
Growth in per capita government expenditure 2001-2007			0.825**
			[0.412]
Constant	-1.091***	-0.232	-0.0949
	[0.419]	[0.627]	[0.684]
Observations	211	211	206
R-squared	0.066	0.196	0.199

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own

To explore the determinants of the competence of the local officials we examine the number of days to fix local roads. Our hypothesis would suggest that roads get fixed faster in richer locations, but slower in more populous districts. We would also anticipate that larger budgets would reduce the time needed, and we add a measure of the educational level of the district which we also expect to reduce the time.

Column 2 of Table 4.12 both confirms and refutes some of our priors. Richer districts do indeed fix roads faster, and more populous districts take more time. However, time is also longer in districts with concentrated economies. This may suggest that governments in such districts focus their attention on serving core sectors, to the neglect of more general road maintenance. Worryingly, the per capita budget allocation is unrelated to the time to fix roads, and the growth of budgets is positively associated with repair time i.e. districts which saw larger proportionate increases took longer to fix their roads. This suggests the presence of capacity problems in using additional resources effectively. Finally, better schooling appears to increase, rather than decrease the time to fix the roads. This is interesting because it implies that the capacity constraints may not be related to skills but rather associated with the incentives created by the resource flows.

Looking at the structural determinants of transparency and accountability, we use two measures of openness: a concrete measure, in the form of the existence of a complaint mechanism; and a perception measure – the extent to which firms believe that the district leader solves their problems. Our priors here are that richer and better educated districts will be more open. Column 3 and 4 of Table 4.12 show the results. We do find that richer districts and districts on Java are more likely to have complaint mechanisms. We also find that districts with larger populations are less likely to report the existence of such a mechanism

(probably because spreading information is harder in larger districts). However, there is no association between this form of transparency and better education.

Finally, given the lack of an association between budgets and better service delivery, it might be asked why district leaders exert so much effort into increasing their budget. A partial answer is given in Column 4. This shows that the factor that has the largest influence on the perception that the local leader is solving their problems is the growth of the local budget. Given that local leaders are directly elected, it is therefore not surprising that increasing the size of the local budget is a priority.

Table 4.12 Determinants of rent seeking, competence, and transparency

	(1)	(2)	(3)	(4)
VARIABLES	illegal payments	time to fix roads	complaint mechanism	leader solves problems
Log non-oil per cap GDP 2007	0.0557*	-4.348	0.0856***	1.042
	[0.0333]	[2.699]	[0.0307]	[2.271]
Gini sector 2007	0.144	52.54***	-0.147	-12.81
	[0.188]	[14.76]	[0.168]	[12.42]
City	0.195***	2.467	0.0169	-4.341
	[0.0527]	[4.066]	[0.0462]	[3.421]
Java	-0.0372	-0.897	0.193***	-5.090**
	[0.0391]	[3.006]	[0.0342]	[2.529]
Log population 2007	0.148***	3.542*	-0.0376	-7.176***
	[0.0268]	[2.060]	[0.0234]	[1.733]
Government Expenditure per capita 2007	0.00932	0.0865	0.0104	-0.764
	[0.0110]	[0.842]	[0.00957]	[0.709]
Growth in per capita government expenditure 2001–2007	-0.251	95.91***	0.220	42.59
	[0.422]	[32.79]	[0.373]	[27.58]
Share of population with Junior Secondary schooling 2007		99.98**	-0.833	-50.39
		[49.84]	[0.566]	[41.93]
Constant	-1.531***	15.24	-0.469	143.1***
	[0.514]	[39.91]	[0.453]	[33.58]
Observations	206	206	206	206
R-squared	0.257	0.149	0.207	0.223

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

5 Summary and conclusions

The analysis undertaken above suggests that the relationship between local governance and district growth is somewhat more complex than at first sight. We consistently find, across a range of methodologies and data, that there is little or no statistically significant association between many typical measures of local economic governance and the growth performance of the district. This is something of a surprise, given the strong association typically found in cross-country data between similar measures of national governance and country level growth.

What might be driving this result? The first possibility is the poor quality of the data. District GDP data are extremely noisy; so are our measures of governance due to the relatively small sample of firms in each district. The former makes it less likely for us to find statistically significant associations, whilst the latter biases the size of any association we find towards zero. The fact that we find a positive and both economically and statistically significant association between overall governance and district growth when instrumenting growth with mudslides supports the idea that poor data quality is behind our weak results. However, although there is clearly a need for the collection of better quality data, we do not believe that our results are primarily driven by measurement error. The failure to find any significant association between district level governance and firm performance is likely to be more robust to measurement error and our panel data estimates similarly suggest no association. Something else is going on.

A second possibility is that our results are being masked because some of the structural variables that influence growth, also have an effect on the quality of local governance, but not necessarily in the same direction. The most obvious example is that larger, more populous, urban economies also create a much richer environment for rent-seeking. Similarly natural resources may exacerbate local conflict. Our data show quite a bit of support for the idea that structural characteristics influence the quality of local governance. Thus the inconsistent relationship we find between governance and growth may be because both are being driven in different ways by a set of more fundamental structural variables.

The third possible reason why we find little association between local governance and growth may be because there isn't much of a relationship. It is telling that the strongest connection to emerge from the data is between the quality of infrastructure and growth, and, in particular, the reliability of the electricity supply. However, this is not under the control of the district government (it is primarily the responsibility of the national electricity company, PLN). The same is true of many respects of land management and policing. Those aspects of local economic governance which do clearly lie under district control (e.g. licensing, business programmes, local charges etc) may simply not matter very much to most local businesses.

Our results therefore do suggest some clear implications for policy and action. First, improving the quality of the data at the district level will be essential to monitor progress in an effective way. This is true of both growth and investment data, as well as data on governance. Moreover, given role of structural variables in affecting the nature of local governance, it may not make much sense to compare districts which are completely different from one another on the same governance scale. Rather, this suggests that districts should be compared with those similar to themselves, or, preferably, that panel data should be constructed so that districts can be compared with their own performance over a period of time.

Second, there is a need for both central government and donor institutions to think about the political economy of district governance in a more nuanced way. In particular some donor programmes are premised on the idea that district governance is something which can be

improved with a range of technical interventions. Whilst measures to improve technical capacity at the district level are certainly welcome, it is also important to understand the incentives of the political and private sector actors in the district and how these are shaped by the location and endowments of the district. Having better analysis of these issues might help district strengthening programmes be more successful.

Finally, and perhaps controversially, there may be a need to focus less on the capacity of district governments and more on the capacity of key national agencies (and private sector actors), particularly in the areas of infrastructure, land and credit. It was notable that when firms were asked what their key constraints were, they tended to highlight these areas rather than those amenable to action by local governments. In short, although effective local governments can play an important role, growth also depends on a range of national policies and actors as well.

Appendix

Table A1 Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
GDP growth real pc 2001–2007	341	0.031	0.027	-0.106	0.125
non-oil GDP growth real pc 2001–2007	341	0.033	0.023	-0.104	0.119
Manufacturing GDP growth real pc 2001–2007	342	0.047	0.041	-0.195	0.348
Real pc growth in expenditure 2001–2007	326	0.035	0.021	-0.036	0.109
ln per capita GDP 2001	341	15.4	0.8	14.0	19.4
ln per capita non-oil GDP 2001	341	15.3	0.7	14.0	18.8
ln per capita manufacturing GDP 2001	342	25.8	2.0	19.3	30.9
ln per capita expenditure 2001	327	12.0	0.3	11.3	13.0
ln population 2001	341	12.9	0.9	10.1	15.3
Share of population with junior secondary 2001	327	0.150	0.035	0.031	0.274
Share of households with telephone 2000	311	0.071	0.094	0.002	0.533
Share of mining in GDP 2001	321	0.084	0.192	0.000	0.966
Access to information sub-index	209	46.7	10.7	10.0	71.6
Business development programmes sub-index	211	42.0	12.1	13.8	86.7
Infrastructure sub-index	211	65.4	12.5	23.1	88.9
Integrity sub-index	211	56.7	10.7	25.9	88.6
Interaction between state & private sector sub-index	211	54.8	9.6	25.3	80.0
Land sub-index	211	70.2	10.5	37.3	99.4
Licensing sub-index	211	60.2	8.2	32.5	85.1
Security sub-index	211	59.8	11.7	27.2	96.6
Transaction costs sub-index	211	67.0	12.8	34.2	95.5

Source: Helpman (2008)

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