3. Impacts of Leakages: Magnitudes and Efficiency Costs

Corruption is widely understood as “the misuse of public office for private gain.” For our purposes, we use the word corruption as “incidents where a bureaucrat (or an elected official) breaks a rule for private gain.” (Banerjee et al. 2012,b). This broader definition would include the most obvious type of corruption—a bureaucrat taking a bribe in order to bend or break a rule—but also encompasses more nuanced forms of bureaucratic corruption, including nepotism to favor a family member rather than issue a competitive bid. We use the word “leakage” to include not only this definition of corruption, but also other acts that are sometimes not seen as corruption but nevertheless lead to a loss of public funds or create inefficiencies in the delivery of public goods and services. Examples include unauthorized absenteeism while still collecting a paycheck, needless delays in providing services, and lack of effort towards final outcomes.

From an economic perspective, there are two basic issues we would like to address about the impacts of leakages: magnitude and efficiency costs. The first, which we examine in Section 3.1, is simply put: how large are leakages? Although anecdotal evidence suggests that leakages are rampant in the developing world and more prevalent in developing countries than in rich ones, there are remarkably few reliable estimates of the actual magnitude of leakages and corruption, and the credible estimates we review in Section 3.1.7 reveal a surprisingly high level of heterogeneity.

However, just knowing the magnitude does not tell us much about how serious the problem is from an economic perspective. After all, it is at least theoretically possible that corruption could just represent a transfer from one party (say, the government) to another party (say, bureaucrats), with little efficiency cost. In fact, if bureaucrats’ official salaries were less than their market wage in expectation of the corrupt rents they would obtain—and there is evidence that this is indeed exactly what happens—there could be no net costs of corruption at all. In practice, however, the evidence we review in Section 3.2 suggests that the efficiency costs of corruption can be quite severe, as corruption may raise the marginal tax rate of firms, decrease business activity, raise the marginal costs of public funds, make certain government projects economically unviable, and undo the government’s ability to correct externalities, leading to inefficient outcomes.

3.1. How large are leakages, really?

3.1.1. Perceptions

Until very recently, most estimates of corruption were based on surveys of perception. These perception surveys have the advantage of good coverage—it is much easier to ask someone’s perceptions of corruption than to actually measure corruption directly. As such, they still form the basis of most cross-country corruption indices, such as Transparency International’s Annual Corruption Perception Index (CPI) and the World Bank’s Control of Corruption Index—although the latter incorporates very different
aspects of corruption, ranging from the frequency with which firms make “additional payments to get things done,” to the effects of corruption on the business environment, and finally to measuring “grand corruption” in the political arena, or the tendency for people to obtain positions of power based on patronage rather than level of ability. Perception-based measures were also used in some of the first empirical work in economics on corruption, such as Mauro’s (1995) well known study of the relationship between corruption and growth, discussed in more detail below.

The challenge with perception-based measures is that they may not measure corruption accurately. Olken (2009) examines the reliability of corruption perceptions in a micro-environment: villagers’ perceptions of the level of corruption in a local road building project. Olken asked villagers to assess the likelihood of corruption in the road project on a scale from 1 to 5. At the same time, he developed a much more detailed measure of the amount of corruption that was actually present in the road project by comparing the amount the village government spent on the road to the amount independent engineers estimated the road would actually cost to build (based on the amount of materials used, the local prevailing prices for materials, and so on). While villagers’ perceptions do reflect actual corruption in the road project, the magnitude is quite weak: increasing the actual missing expenditures in the road project by 10 percent increases the probability a villager reports any corruption in the road project by just 0.8 percent.

Moreover, villagers’ perceptions appear to be biased in two ways. First, villagers are much better at detecting marked up prices (i.e., overcharging for cement) than inflated quantities (i.e., billing for 1000 m³ of rocks but only delivering 800 m³)—and given this, it is not surprising that most of the corruption occurs by inflating quantities. This may account for the relatively low correlation between perceptions and actual corruption, since people must make an inference about the aspects of corruption they cannot perceive—which end up being where the bulk of corruption is usually hidden. Second, Olken shows that individual characteristics, such as one’s education, have much more predictive power than actual corruption itself. If a perception survey has different compositions of people evaluating different projects (or countries), this could create systematic biases in the use of perception.

These types of biases could create problems in macro-level perception indices as well. For example, after the fall of Soeharto in 1998, many commentators perceived that corruption in Indonesia became worse. For example, Kuncoro (2006) argued that decentralization in the post-Soeharto era replaced “centralized corruption—one-stop shopping […] with a more fragmented bribe collection system.” Many players at both the local and the national level started demanding bribes, and their failure to coordinate their bribe-taking behavior resulted in a higher total level of bribes. The worsening of perceptions of corruption was captured by the Transparency International Index—measured on a scale from 0 (highly corrupt) to 10 (highly clean)—which fell from a value of 2.0 in 1998 to 1.7 in 1999, and stayed at the same level in 2000. This may well have been the case, but another explanation is that the fall of Soeharto’s dictatorship resulted in a free press. Unlike the press under the Soeharto regime, which was tightly restricted, the free press was newly able to report on allegations of corruption, which it did. It is therefore possible that perceptions of corruption rose even though actual corruption fell. For these types of reasons, economists have been moving to more direct measures of corruption whenever possible. Developing more direct measures of corruption not subject to these types of biases that are applicable across countries and contexts remains an important topic for future research.
3.1.2. **Estimating Bribes: Survey Evidence**

Perhaps the most direct way of measuring bribery is through the use of surveys of bribe-payers. In most contexts, there is relatively little stigma associated with paying bribes, and so in many cases bribery can be measured using surveys of firms or households. One notable example of this is Svensson (2003), who surveyed firms in Uganda and examined how much they paid in bribes. On average, firms in the survey report bribe payments of about 88 USD per worker, or about 8 percent of their total costs.

Since this type of survey-based measure of bribes is the most easily replicable, it is one of the only areas where consistent measurement is now being carried out across countries and over time. One key dataset is the International Crime Victim Surveys (ICVS) from 49 countries, in which individuals are asked whether any government official in that country has asked them or expected them to pay a bribe for his services during the previous year. Using this data, Mocan (2008) finds that income and education of the individual have positive impacts on the likelihood of being asked for a bribe in developing nations. The impact of these variables is not statistically significant for developed nations. Hunt (2004) uses the 1999 and 2000 data on bribes paid by individuals to public officials in 34 countries from the same source to examine the implications of trust networks. In her framework, a bond of trust may permit an implicit quid pro quo to substitute for a bribe, and this should reduce corruption. The results show that residents of small towns, long-term residents of an area, and residents of regions where a large share of the population is their own age are less likely to bribe. She interprets these results as being consistent with the idea that individuals who can easily form bonds of trust or are likely to be members of trust networks bribe less. The World Bank Enterprise Surveys (WBES)\(^1\) have asked comparable questions about firms’ informal gifts or payments in obtaining water, electricity, telephone connection, operating and import licenses, or obtaining construction-related contracts, meeting with tax officials, securing government contracts, and more generally “getting things done.” This data is available in the main Enterprise Survey as well as in various types of surveys conducted under the umbrella of WBES such as the Indicator Survey and Informal Survey, and covers most low- and middle-income economies. As this type of data becomes more available we will be able to produce more reliable estimates of bribery over time and across countries.

3.1.3. **Estimates from Direct Observation**

The best way to measure corruption is often to observe it directly. Needless to say, this is difficult, since corrupt officials rarely will let corrupt behavior be observed. Nevertheless, there are several notable examples of direct observation of corrupt activity. Perhaps the most famous example is the case of Montesinos in Peru, documented by McMillan and Zoido (2004). Montesinos, who was secret-police chief under President Alberto Fujimori in Peru, bribed judges, politicians and the news media to support the Fujimori regime. Remarkably, he kept detailed records, with signed contracts from those he bribed.

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\(^1\) See [https://www.enterprisesurveys.org](https://www.enterprisesurveys.org) for exact details on the number of countries and years available for each type of survey.
and videotapes of them accepting the bribes. After the fall of the Fujimori regime the contracts and videotapes became public, and McMillan and Zoido use them to estimate the cost of bribing various types of government officials. On average, they show that politicians received bribes ranging from 3,000 - 50,000 USD per month, depending on whether the politician was in the opposition party (higher) or Fujimori’s party (lower), with judges receiving bribes of the same order of magnitude. The bribes to control the media were orders of magnitude larger—as much as USD 1.5 million per month for one television station’s support.

Olken and Barron (2009) provide direct data on actual bribes in a more prosaic setting: the bribes truck drivers pay to police on their routes to and from the Indonesian province of Aceh. Over a nine month period, enumerators accompanied truck drivers on their regular routes, dressed as truck drivers’ assistants, and simply noted the amounts that truck drivers paid each time they were stopped at a police checkpoint or weigh station. On over 300 trips, they observed more than 6,000 illegal payments. Usually the amount of each payment was small—averaging USD0.50 to USD1, sometimes in cash and sometimes in kind (such as a pack or two of cigarettes). In total, the illegal payments represented 13 percent of the marginal cost of the trip. By comparison, the salary of the truck driver was only 10 percent of the marginal cost of the trip.

Sequeira and Djankov (2010) use a similar methodology in Mozambique and South Africa, shadowing clearing agents who process customs for cargo as it passes through the ports. They find that, on average, bribes represent 14 percent of the total shipping costs for a standard container passing through the port of Maputo, Mozambique, and 4 percent of total shipping costs for a standard container passing through Durban, South Africa.

### 3.1.4. Estimating Graft: Estimation by Subtraction

The most common method for estimating graft is what we term estimation by subtraction. In this method, one obtains two measures of the same quantity, one measure before corruption takes place and one measure after corruption takes place. The estimate of corruption is the difference between the two measures.

One of the first estimates using this technique is the pioneering study by Reinikka and Svennson (2004). In their paper, they use what they term a Public Expenditure Tracking Survey (PETS) to track educational funds in Uganda. Specifically, they compare the amount of a special education block grant sent down from the central government and compare it to the amount of the block grant received by schools. They estimate a leakage rate of 87 percent. Once the results were publicized, a subsequent study found that the leakage rate fell to less than 20 percent. An important question in such an approach is the quality of recordkeeping: if schools have poor records, some of the money might not show up on the books even though it may have been received. Studying the importance of recordkeeping quality in PETS
is an important issue for the replicability of this technique. Subsequent to this work, similar PETS studies have been carried out, largely by the World Bank, in a variety of contexts.\(^2\)

Another recent study in Indonesia estimates the extent of missing funds in an anti-poverty program called *Inpres Desa Tertinggal* (IDT, Presidential aid for poor villages). Suryadarma and Yamauchi (2013) compare the amount of disbursed funds in a given district and year to the amount actually received by households of IDT villages in these districts to find that only 69 percent of disbursed funds on average reach the intended beneficiaries. They also find that districts which had a high initial human capital index and a greater number of female village heads received a greater proportion of the disbursed funds and targeted these funds more accurately to the poorest 20 percent of households in the villages. Therefore, their evidence suggests that local characteristics can influence the level of leakage that occurs.

Using a similar approach, Fisman and Wei (2004) measured tax evasion by comparing Hong Kong’s reported exports and China’s reported imports of the same products. The strategy allowed them to differentiate three different aspects of tax evasion: underreporting of unit value, underreporting of taxable quantities, and mislabeling of higher-taxed products as lower-taxed products. These calculations are then used to estimate the effect of tax rates in tax evasion. They found that higher-taxed products were associated with a forty percent higher median evasion rate.

Olken (2007) implements a related exercise in the case of rural road projects. Instead of using an expenditure tracking survey to estimate the amount received, he compares the official amount spent on the road to an independent engineering estimate of what the road actually cost to build, where engineers dug core samples of the roads to estimate materials quantities, did price surveys to estimate local prices, and interviewed villagers to estimate actual wages paid. Importantly, since some amount of materials naturally disappears during construction, Olken built several small “test roads” where he knew there was no corruption so that he could calibrate the metric so it would show zero corruption when, in fact,

\(^2\) Public Employment Tracking Surveys have also been carried out in Albania, Cambodia, Chad, Macedonia, Papua New Guinea, Peru, Rwanda, Senegal, Sierra Leone, Tanzania, Ghana, and Honduras, as well as in Bangladesh, Madagascar, Mozambique, Nigeria and Zambia, where they focused on evaluating the quality of service delivery (dfid.co.uk). While we do not summarize all PETS surveys here, it is useful to examine several more in detail. Two PETS in Tanzania (1999 and 2001) tracked pro-poor expenditures in health and education at all levels. The 1999 PETS was carried out in forty-five primary schools and thirty-six health facilities, and indicated the diversion of a large portion of funds (about 57 percent in education and 41 percent in health care) disbursed by the center for non-wage education and health expenditures to other non-education sectors and also for personal gain. The 2001 PETS was implemented in 20 primary schools and 20 clinics and found substantial delays in disbursement of funds at all levels of the government. Delays were more pronounced in case of non-wage expenditures and in rural areas. Relative to Uganda, the impact on transparency mechanisms in the central government of the two surveys was not as significant. A third PETS in Tanzania focusing on disbursement of government funds for primary education in 2004 revealed an unnecessarily complex system of transferring funds, lack of information about entitlements at the headmaster and school committee levels. The 2000 Ghana PETS also focused on health and education was based on interviews with 40 district education officers and 40 district health officers, and a facility-level survey of a total of 119 primary schools, 79 junior secondary schools and 173 primary health clinics. The results showed that only 20 percent of non-wage public health expenditure and 50 percent of non-wage education expenditure reached the frontline facilities. The Honduras PETS (2000) was intended to diagnose and quantify ghost workers, absenteeism and job migration and the reasons that contributed to such phenomena in the health and education sectors. The survey found that 2.4 percent of the health and 3 percent of the education payroll were ghost workers. Absenteeism was particularly high for health workers: only 73 percent were present at work during the survey. The impacts of the PETS within the government are not really known and are an important direction for future work.

corruption was zero. Using this approach, Olken estimated that “missing expenditures”—the difference between what the village claimed the road cost and what the engineers estimated it actually cost—averaged about 24 percent of the total cost of the road.

Another way of implementing this technique is to compare administrative data to a generally administered household survey. Olken (2006) uses this approach to estimate theft of rice from a program that distributed subsidized rice in Indonesia. Using this approach, he estimates that, on average, at least 18 percent of the rice cannot be accounted for, with greater amounts in ethnically heterogeneous and sparsely populated areas.

Employing a similar approach, Duflo et al. (2013) carry out a field experiment involving industrial plants in Gujarat, India in order to measure the extent of underreporting of pollution by third party auditors. In their control group, plants continue to follow the status quo of hiring and paying their own auditors whereas in the treatment group plants are assigned auditors who are paid a fixed wage from a central pool and are subject to random performance checks. By comparing pollution levels reported by third party auditors to those reported by an independent technical agency, the authors find that 29 percent of audit reports from the control group falsely state that a plant’s pollution level is just below the regulatory standard. Therefore, in the status quo, auditors maximize on their business incentive to underreport pollution in order to continue receiving the auditing contract and payment from the industrial plant.

An important component of corruption that is often hard to measure is personal, non-wage asset accumulation by politicians while in office, which is exactly what Fisman et al. (2012,c) set out to measure in their innovative study in India. Since November 2003, all political candidates in a number of Indian states have been required to report the value and composition of their assets when standing for office. Taking advantage of this policy, Fisman et al gathered data on the assets of all winners and runner ups in an election in a given year who stood for office again in the following election. Therefore, they were able to compare the growth in assets between the two elections of those who were in office to those who served as a good counterfactual – the runner ups that almost made it to public office. They find that annual asset growth of the election winners is between 3 to 6 percent higher, on average, than the runner ups. However, they find evidence that the results are largely driven by those who hold high positions in the government, with the asset growth of Parliamentarians in the Council of Ministers being 13 to 29 percent greater than that of runner ups. Furthermore, the effect was minimal for first time politicians compared to an estimated incumbent premium of 12.6 percent in asset growth, suggesting that career politicians have low earning potentials in their outside options. When examining corruption through price manipulations, one can compare an official price to the market price and use the difference as a measure of price manipulation. Hsieh and Moretti (2006) do this for a very famous case: corruption under the Iraqi Oil-For-Food program administered by the United Nations. Specifically, they compare the price received by Iraq for its oil to the going price for comparable oil on the world spot market and use a model of the market for oil trading to infer what share of that under-pricing was likely received by Saddam Hussein’s regime. While the total amount of corruption they estimate is enormous—approximately USD 1.3 billion—it amounts to only about 2 percent of the total volume of oil sold.

Of course, not all price markups are corruption—they could simply reflect incompetence in obtaining good prices for the government, or a lack of incentives in the government sector to obtain the best prices.
In the Italian case, Bandiera et al. (2009) compare corruption with incompetence by examining the decision to switch to procurement through a centralized price agency rather than procuring by oneself. If price markups were due to corruption, those agencies paying the highest prices (the most corrupt) would be less likely to switch to the centralized procurement regime; if they are due to incompetence (“passive waste” in their terminology), those paying the high prices would be more likely to adopt centralized procurement. On average they estimate that 83 percent of the above-average prices in the Italian data they examine are due to “passive waste,” and only 17 percent due to corruption. Of course, it is possible that in many other countries, the share due to corruption is much higher.

3.1.5. Estimating Other Types of Leakage from Surveys

Shirking by government employees can also be considered an important type of leakage. To examine this, Chaudhury et al. (2006) conducted an innovative survey in 6 countries—Bangladesh, Ecuador, India, Indonesia, Peru, and Uganda—to examine the degree to which public sector teachers and health workers were not performing their job. To conduct the survey, surveyors showed up unannounced at government schools and health clinics during hours they were supposed to be open and simply counted attendance rates. Averaging across the countries in their sample, about 19 percent of teachers and 35 percent of health workers were absent. For primary school teachers, this ranged from a low of 11 percent absence in Peru to 27 percent absence in Uganda; for primary health centers, it ranged from 25 percent in Peru to 40 percent absence in India and Indonesia. The authors find lower rates of absence in richer countries and, looking within India, in richer Indian states—OLS regressions of absence on log of per capita GDP in the sample of countries and in Indian states surveyed revealed that a doubling in income is associated with a 5.8 percentage point and 4.8 percentage-point drop in absence rates respectively.

Although many would not consider this a form of corruption, it can be thought of as a type of leakage, as these public servants were not working a substantial fraction of the time for which they were paid. Banerjee et al. (2004) conducted a similar exercise for health workers in the state of Rajasthan and found comparable absence rates of 45 percent for medical personnel in sub-centers and aid posts, and 36 percent in the (larger) primary health centers and community health centers. In a snapshot of teacher absences across Indian states, Kremer et al. (2005) find that 25 percent of teachers were absent from school, and only about half were teaching during unannounced visits to a nationally representative sample of government primary schools in India. Higher absence rates were concentrated in the poorer states.

3.1.6. Estimates from Market Inference

Finally, in some cases one can use the theory of market equilibrium, combined with data on market activity, to estimate the amount of corruption. In a pioneering study, Fisman (2001) applied this approach to estimate the value of political connections to Indonesian president Soeharto. Specifically, he obtained an estimate from a Jakarta consulting firm of how much each publicly traded firm was “connected” to Soeharto, on a scale of 0-4. He then estimated how much each firm’s price moved when Soeharto fell ill to estimate how much the stock market assessed the value of those political connections. If the efficient
markets hypothesis holds, then the change in stock market value surrounding these events captures the value of the political connection to the firm. Since investment bankers in Jakarta estimated that the total market would fall by 20 percent if Soeharto died, he can calibrate these estimates to estimate the total “value” of the connections to Soeharto. On net, for the most connected firms he estimates that about 23 percent of their value was due to Soeharto’s connections.

The Fisman market approach is replicable in any case where one has data on firms’ connections to prominent politicians and when the politician experiences health shocks. For example, Fisman et al. (2012,a) has replicated the same approach for the United States, looking at the value of connections to former U.S. Vice President Dick Cheney, using shocks while he was a candidate and while he was in office. In a marked contrast with the Soeharto paper, he finds zero effect of Cheney’s heart attacks on the value of Cheney-connected stocks.

Faccio (2006) pursues a similar approach using a large sample of countries—she examines political connections to 20,202 publicly traded firms in 47 countries. For each of these firms, she defines the firm as having a political connection if a board member or large shareholder is a politician (e.g., Member of Parliament or minister). She focuses on corporations where a previous board member and large shareholder becomes a politician. She finds that, on average, having a member of your board or large shareholder become a politician is associated with a 2.29 percent increase in the company’s share value. Echoing the contrast between Soeharto in Indonesia and Cheney in the United States, when she splits the sample into countries with below and above average corruption levels (as measured by the World Bank perceptions index), she finds that the impact comes entirely from high corruption countries: in above median corruption countries, having a board member or large shareholder become a politician increases stock market value by 4.32 percent, but in below median corruption countries, having a board member or large shareholder become a politician has no impact on stock value.3

Another approach to measuring corruption uses equilibrium conditions in the labor market. Specifically, one can use the fact that people in the public sector must, on the margin, be indifferent between their public sector job and alternative jobs in the private sector. If, controlling for their job opportunities, pay is lower in the public sector, the result could simply reflect a compensating wage differential. But if pay in the public sector is lower but consumption levels are the same, one could infer that the difference between pay and consumption in the public sector relative to the difference between pay and consumption in the private sector tells us something about how much those in the public sector are likely receiving in the form of bribes. Gorodnichenko and Peter (2007) perform this exercise using a household survey in Ukraine. They find that, controlling for education, hours of work, job security, fringe benefits, job satisfaction, and secondary employment, public sector workers received 24-32 percent less income than their private sector counterparts. Crucially, however, they have the same level of consumption and assets, suggesting that a large part of the gap must be made up in bribes. Aggregating

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3 Not all studies find zero effect of connections in wealthy countries. Faccio (2006), for example, finds that stock price of firms headquartered in the home town of politicians who died suddenly fell on average by 1.7 percent around the death of the politician. Jayachandran (2004), who uses the surprise event of Senator Jeffords leaving the Republican Party and tipping control of the U.S. Senate to the Democrats to show that a firm lost 0.8 percent of market capitalization the week of Jeffords’ switch for every $250,000 it gave to the Republicans in the previous election cycle.
across the economy they estimate that the total amount of the gap (and hence bribery) is between USD 460 million – USD 580 million, or about 1 percent of GDP.

3.1.7. So How Much Corruption Is There, Really?

Table 1 presents the magnitude of corruption estimated from all of the studies reviewed above, separated into estimates of graft (theft of government funds) and estimates of bribes. The table shows the dramatic range. It also shows that, while a number of credible estimates have emerged, in some sense there is relatively little hard data when compared with other development indicators. For example, virtually all countries of the world have regular measurements of government expenditure, GDP, manufacturing, education, health, and so on, compiled on a regular basis at the provincial level or perhaps at even finer levels of detail. Compared to that benchmark, our knowledge about corruption is still limited to a few cases, with only the absence study of Chaudhury et al. (2006), the political connection study of Faccio (2006), and the World Bank Enterprise surveys and Business Environment surveys creating meaningfully comparable data across countries.

The magnitudes of corruption raise several important questions. First, a striking correlation that comes up in a variety of datasets—from the perception indices to the absence study of Kremer et al (2005) to the Faccio (2006) and Fisman (2001) studies of the value of political connections to the Sequiera and Djankov (2009) comparison between ports in South Africa and Mozambique—is the strong negative relationship between income and corruption: as best we can measure it, richer countries in general appear less corrupt. The causality likely runs in both directions. It is easy to see how low corruption could cause countries to become rich if corruption hinders economic activity (Mauro 1995). However, the relationship in the other direction—that richer countries become less corrupt—is less obvious. On the one hand, certain types of income shocks, such as natural resource shocks, may lead to there being more rents to be expropriated and more corruption. For example, Caselli and Michaels (2009) present the case of oil revenues distributed to municipalities in Brazil, as a result of the large increase in Brazil’s off-shore oil production in Brazil. On the other hand, more complex business relationships may lead to demand for better government, and higher incomes may mean that countries have more resources to invest in cleaning up corruption. Triesman (2000) argues using geographic instruments for per-capita income that, at least in part, exogenously richer countries tend to be less corrupt, but understanding the mechanisms behind this relationship is an important open question.

Second, even among countries at similar income levels, and even within countries, there is still a marked amount of heterogeneity in corruption levels, as shown in Table 1. Understanding in more detail

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4 We include estimates of the value of political connections in the graft category, under the idea that the value of those connections comes from the firm’s ability to appropriate rents from the government due their connections, although one could easily categorize them separately instead.

5 Complementing the results of Caselli and Michaels (2009), Monteiro and Ferraz (2010) find that royalty payments create a large incumbency advantage in the two elections that followed the oil windfall boom that benefited some Brazilian municipalities, but that this effect disappears in the medium-run, while Tabellini et al. (2009) find that larger transfer to municipalities increased political corruption and reduced the quality of candidates for mayor.
why corruption is high in some cases but low in others is an important question, one which will be explored in more detail in the subsequent sections.

Third, one issue with virtually all of the “hard” estimates of corruption discussed here is that they may suffer from selection bias in both directions. To the extent that measures of corruption depend on voluntary disclosure, such as surveys of bribery or disclosing links to politicians sitting on corporate boards, one might expect that corruption would be understated, as places where corruption is most severe might be less likely to disclose it. To the extent that researchers explicitly choose cases to study, corruption may be overstated, as researchers interested in corruption are not going to invest the time and energy necessary to develop a careful metric of corruption if they have a prior belief that they are not going to find much. Developing careful, rigorous metrics of corruption that are not subject to these types of selection bias is an important area for future research.

Finally, although there are some cases where corruption is substantial (e.g. the 87 percent of missing funds in Uganda or the 24 percent of missing construction expenditures in Indonesia), in many cases one is left wondering why corruption is not greater.

Open Research Questions:

- How much corruption would we find if we could construct an unbiased sample?
- Why does corruption appear lower in richer countries?
- What prevents corrupt officials and political leaders from extracting even larger amounts?
- Are some government functions or programs more susceptible to leakages and why?