

Corruption

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1 Introduction

Outside of a few developed countries, governmental corruption is often seen as the norm. Yet, despite various attempts to measure the costs of corruption, until recently, there was little quantitative evidence about its extent and consequences. However, even the anecdotal evidence was thought to be sufficiently compelling that anti-corruption policies are a core component of many development strategies; since 1996, the World Bank alone has supported over 600 anti-corruption programs. This reflects a shared conviction that effective governance relies on "clean" governments. Thus, it is impossible to understand government policy without understanding corruption.

Research on corruption faces two important obstacles—one theoretical and one empirical. The theoretical challenge comes from asking whether governmental corruption is an independent concept to begin with, or is it simply a variety of the corruption (or moral hazard more generally) that we see in all firms? In other words, is there something unique to corruption in the government *per se* that does not fit within the standard understanding of how individuals behave in organizational settings and if so, in what ways would that move us away from the basic agency models of the firm.

Empirically, measuring corruption is much more challenging than measuring other types of government outcomes. Corruption, by its very nature, is illicit and secretive. How does one study something that is defined in part by the fact that individuals go to great lengths to hide it? How does one accurately measure the extent of corruption when attempts at measurement may cause the actors involved to either reduce their illicit behaviors during the periods of measurement, or find new ways to obscure their behaviors? If we cannot accurately measure corruption, our ability to conduct empirical tests is severely impaired.

In recent years, research on corruption has grown, in part due to the innovations that have allowed us to overcome these two obstacles. The key theoretical innovation has been a shift in focus, away from trying to understand just the incentives faced by bureaucrats, towards studying the overall setting in which the bureaucrat operates. In other words, in addition to trying to understand what

the optimal incentive scheme should be, there is a move towards understanding the reasons that create the incentive problem in the first place. In this "tasks" approach (as against the "incentives" approach) the focus is on understanding why the bureaucrat has the particular task that he has as well as how to get him to perform that task better.

An example will help illustrate this point. Consider a policeman whose job is to hand out speeding tickets. We might be concerned that he asks for bribes instead of actually handing out the tickets. This could have social consequences if the bribes are smaller than the official fines and affect the incentives to speed. The incentive problem here is how to prevent this and agency theory might suggest how to structure the punishments and rewards to police officers. But we could also ask why the initial fine was put in place to begin with. Why is the bureaucrat handing out tickets to be paid to the government? Why not set the initial rule so that the ticketer keeps the fines? After all, one might think that the incentive effects on the drivers would be the same in either case and now we would not have to worry about bribe-taking. Another option would be to give up on trying to regulate speeding and rely entirely on torts to provide incentives; i.e. to rely on the fact that individuals fear will litigation, and therefore drive responsibly. In other words, one option here is to fight bribe-taking, another is to change the nature of the task. What is the trade-off between these? When is changing the task not desirable, even if it means more bribe-taking or some other distortion?

This focus on tasks has a number of important implications. First, it allows us to begin to answer the question, posed above, about what is distinct about corruption in government. Corruption in the private sector, we will argue, primarily arises out of a conflict over the division of the surplus generated by the agent's action between the principal and the agent: If the principal were prepared to give up enough of the surplus to the agent, the problem of the agent taking unauthorized actions would not arise. This is because both the principal and the agent both only care about how much money they make (to a first approximation) and therefore maximizing the joint pie would be optimal if enough of it went to the agent. Corruption in government, on the other hand, arises out of the fact that the government operates in situations where it does *not* want the price mechanism to operate (and joint revenue to be maximized) and therefore design the bureaucrat's task accordingly, potentially despite the fact that this may lead bribe-taking or other distortions. Thus, side payments (bribes) are problematic for governments in a way that they would not be for firms, because this reintroduces the price mechanism.

Second, and somewhat related, corruption in government is often associated not just with bribe-taking but also with other forms of dysfunctionality in the allocation process. Since the bureaucrats are involved in tasks which involve not relying too much on market forces, there is tendency to rely on non-price allocative mechanisms (which we will call red-tape) which can cause additional forms of inefficiency.

Finally, the emphasis on tasks highlights another form of inefficiency which is not easily captured by looking simply at the bureaucrat's incentive problem.

For example, certain otherwise desirable tasks may not be (or should not be) assigned to bureaucrats because they cause too much corruption.

The advances in empirical research are all associated with improving our ability to measure corruption. This in turn opens the door to being able to better test the implications of the theoretical models. Prior to these improvements, researchers relied on information gleaned from case studies. This approach, however, raises questions of external validity. One of the earliest innovations was the development of perception based measures of corruption, which has led to the advent of large cross-country corruption data sets. While this has led to macro-insights, micro-level work and testing theories of corruption have really been spurred by several innovations, which we describe below. Our newfound ability to more systematically measure corruption has led to several studies that have both examined the implications of the traditional incentive approach to corruption, but have also begun to look at the observable consequences of the task approach discussed in this paper.

This chapter highlights the theoretical and empirical innovations and the doors they open for future research. As a result, it will be more forward looking than backward looking and less a comprehensive review of corruption research than as a guide to where corruption research appears to be headed.¹ It will provide a theoretical framework for understanding the relation between tasks and corruption, overview the empirical tools now available for empirically analyzing corruption, and lay out the theoretical and empirical open questions that appear both interesting and feasible.

2 Defining Corruption

In order to study corruption, we must first define it. The literature offers many different definitions. We focus on the most general one. Specifically, we define corruption as an incident where a bureaucrat (or an elected official) breaks a rule for private gain. This definition would include the most obvious type of corruption—a bureaucrat taking an overt monetary bribe in order to bend a rule, thereby providing a service to someone that he was not supposed to. However, it would also encompass more nuanced forms of bureaucratic corruption. For example, it would include nepotism, such as if a bureaucrat provided a government contract to a firm owned by his or her nephew rather than to a firm that ought to win a competitive, open procurement process. This definition would also include the bureaucrat who “steals time”: he or she may, for example, not show up to work, but still collect his or her paycheck.²

Under this definition, the *rules* define what is corrupt or not. As a result, the same act can be classified as corruption in one setting, but not in another one.

¹There are many excellent papers that we have left out because of space constraints and no doubts that get left out because of oversight or ignorance. Our apologies to the authors.

²Quite often, we see the same forms of corruption in the nonprofit sector, where a social good is being provided, and the private and social value may not necessarily coincide. The models presented in this paper would naturally extend to the non-profit sector.

For example, in many countries—the United States, India, etc—a citizen can obtain passport services more quickly if they pay a fee. While this act would not be considered corruption there, it would be in other countries where there is no such provision in the law. Moreover, many important political economy issues may not necessarily be considered corruption under this definition. For example, a government official providing patronage to supporters may have important ethical and allocative implications, but would not necessarily be corruption if no formal rule is technically broken.³

While the definition of corruption used in this paper is similar to those used by others in the literature, there are important distinctions. For example, our definition is quite similar to the definition discussed by Svensson (2005)—“the misuse of public office for private gain” —and also to Shleifer and Vishny (2001), who define corruption “as the sale by government officials of government property for personal gain.” All three definitions imply that the official gains personally from their particular position. Moreover, as Shleifer and Vishny (2001) define property quite loosely as including both physical assets (e.g. “land”) and assets that have an option value (e.g. “a business license”), their definition encompasses many of the same acts of corruption discussed in this paper and in Svensson (2005). However, there are slight differences in what qualifies as corruption across the definitions. For example, suppose we assume that a government official has the final say over whom to allocate a government contract to. They may choose to sell it to their nephew, and gain great personal happiness from doing so. Thus, this may be considered corruption under Svensson (2005) and Shleifer and Vishny (2001). However, if the official has the final say, and has not broken any official rules, this would not be considered corruption under our definition, despite being morally questionable.

We have chosen to use this definition for a combination of pragmatic and conceptual reasons. Pragmatically, the emphasis on breaking formal rules (as opposed to moral or ethical ones) sidesteps the need to make subjective ethical judgments and thereby avoids the need to have a deeper discussion of cultural differences.⁴ The emphasis on all kinds of gain rather than just money, sidesteps a measurement problem: bribes by their very nature are hard to measure, whereas rule breaking is easier to measure. Conceptually, these distinctions are also in line with the framework we describe below where there will be little reason to differentiate between monetary and non-monetary gains: the potential of bureaucrats to bend rules is the key constraint on optimal allocations.

3 Measuring corruption

With this definition in mind, how do we actually measure corruption? It is obviously impossible to make progress without robust measures of corruption – theories cannot be tested, magnitudes cannot be quantified, anti-corruption

³To see a deeper discussion of political corruption, see Pande (2007).

⁴There will still be, of course, discussions of culture in explaining corruption, but simply not in defining it.

policies cannot be assessed. However, measuring corruption is challenging, and even today, there are relatively few studies that are able to credibly describe the extent of the problem. As Bardhan (1997) notes in his review of corruption, “our approach in this paper is primarily analytical and speculative, given the inherent difficulties of collecting (and hence nonexistence) of good empirical data on the subject of corruption.”

The measurement challenges are driven by several problems. First, the very fact that the corruption is illegal makes people reluctant to talk about it: They are both ashamed and afraid that it will get them into trouble. Second, the existing literature—because of the theory it draws on and how it defines corruption—takes a *transactional* view of corruption. Measurement means finding out who bribed who. This is inherently harder to quantify. Third, the traditional narrow focus on monetary transactions also makes it more difficult.⁵ When a government official benefits by stealing “time”—he or she decides not show up for work—random spot-checks can be very revealing (see Chaudhuri et al. (2006) for an example). Finally, measurement systems will evoke responses which make the measurement system less reliable. If the government has a monitoring system in place, corruption will adjust to it and find ways around it and as a result these measurement systems will under-measure corruption.

Despite these difficulties, there were many early attempts at measuring corruption, relying on rich qualitative data, sometimes backed up by numbers. These studies guided our early beliefs about the channels of corruption and the possible methods to eliminate it. Wade (1984) in particular provides a detailed description of how irrigation engineers reap revenue from the distribution of water and contracts in a village in South India. The most fascinating aspect of this study was the documentation of a fairly formal system in which the engineers redistributed revenue to superior officers and politicians. In order to obtain transfers to lucrative posts, the junior officers paid bribes based on expectations about the amount of bribe money that can be collected from the post. Thus, the value of the bribe payment in the transfer process was higher for jobs that had greater bribe extraction possibilities. In essence, the ability to take bribes in a job makes bureaucrats bribe to get it. This highly detailed study gives a glimpse into the pervasiveness of corruption in this area and the mechanics of how it operates. It also illustrates how corruption is interconnected throughout the entire organization and raises the possibility that rather than trying to stamp out one aspect of corruption, it may be necessary to invoke coordinated policies to stamp it out throughout the system. However, like all case studies the study raises questions of generalizability. Is there as much corruption in other contexts? Under what set of circumstances do these systems come into being?

Other studies have focused on anti-corruption policies. For example, Klitgaard (1988) provides several case studies of successful elimination of corruption, such as in the Hong Kong Police Force, Singapore Excise Department, and the

⁵There are exceptions. For example, Tran (2008) gathers a comprehensive set of internal bribery records from a firm in Asia to document the cost of bribe payments over time.

Bureau of Internal Revenue of the Philippines. In all these cases, the levers used are intuitive from an agency theory perspective—more intense or better monitoring, replacing individual actors, etc. They also all seem to involve a person at the top of each institution who was eager to implement these changes. On the one hand, they represent a vindication of an agency theory of corruption. On the other, they raise the more fundamental question: if these levers for eliminating corruption is within the choice set of governments, why are they not implemented? More broadly, while motivating one to have hope that corruption can be fought, they leave lingering questions about why conditions were ripe for these policies here, but not elsewhere. Is what we observe due to particular institutional factors in these settings, or due to more generalizable features of how governments function? What particular combinations of institutions, policies, or conditions would lead to similar steps being taken elsewhere? Should we expect the same consequences of similar anti-corruption policies in different settings?

To solve these inherent problems of case studies, the next set of attempts to measure corruption attempted to provide consistent measures of corruption across countries. However given the difficulty of inducing people to talk about corruption, these measures focus on collecting perceptions of corruption, rather than actual bribes paid or theft of resources. This perceptions based approach has been carried out at quite a large scale, generating interesting cross-country and cross-time data sets. The Economist Intelligence Unit created one of the first of such datasets.⁶ The data collection effort consisted of factor assessment reports that were filled in by their network of correspondents and analysts which are then aggregated into risk factors for about 70 countries. This report included, for example, a question where the respondents report "the degree to which business transactions (in that country) involve corruption or questionable payments" on a scale of one to ten, where a high value implies good institutions. Other cross-country measures on subjective perceptions of corruption followed, including the Control of Corruption measures in the World Bank Governance Indicators (a description of the measures can be found in Kaufmann, Kraay and Mastruzzi (2004)), and measures by Transparency International.⁷ Each of these indicators uses a different methodology with its own advantages and disadvantages, which we do not go into here due to space constraints.⁸ The real advantage of such data is their breadth, which allows one to run large correlational studies. Mauro (1995) is an often-cited example of this kind of study. He uses the Economist Intelligent measures in a cross-country growth regression equation to study the relationship between economic growth, corruption, and red tape.

⁶These are also called the Business International Indicators.

⁷Paper that use perception based measures of corruption in cross-country regressions include Mauro (1995), Knack and Keefer (1995), LaPorta et al. (1999), Treisman (2000), Adsera, Boix and Payne (2003), Fisman and Gotti (2002), Fredriksson and Svensson (2003), Rauch and Evans (2000), and Persson, Tabellini, and Trebbi (2003).

⁸Svensson (2005) provides a thorough description of the differences between the most common cross-country indicators of corruption.

While these perception-based measures of corruption provided evidence on which countries tend to report more or less corruption, many have pointed out their limitations. First, as Rose-Ackerman (1999) points out, it is unclear what the corruption indices actually mean, and what a particular rank implies about the type and level of corruption in a country. For example, in the Transparency International Corruption Perceptions Index for 2008, Brazil, Burkina Faso, Morocco, Saudi Arabia and Thailand all have the same index value. However, the value does not tell us what the form of corruption in these countries entails, and whether the types of corruption that we see in these very different countries have different efficiency implications. By not providing this information, these corruption indices actually tell us little about what types of governance interventions are needed. Second, perceptions may tell us little about the actual reality of situations since they are influenced by the way we see everything else: Perhaps when the economy is good, we perceive less corruption because we are more satisfied with the government. Olken (2008), for example, compares the perception of corruption in a roads project with actual missing expenditures. He finds that while there is real information in perceptions, reported corruption is not particularly responsive to actual corruption. For example, “increasing the missing expenditures measure by 10 percent is associated with just a 0.8 percent increase in the probability a villager believes that there is any corruption in the project.” He also finds that the bias in perceptions is correlated with demographic characteristics, implying that perceptions of a non-random sample of the population may not adequately reflect real corruption levels. This is particularly problematic as many perception measures are not necessarily based on random samples; for example, the measures from the Economist Intelligence Unit is based on the perceptions of foreign businessmen, who may have different perceptions of corruption than domestic businessmen, or the average citizen. Finally, and perhaps probably most importantly for our purposes, these data are most useful for cross-country or cross-geography analysis. They are less useful for testing micro-theories of corruption.

More recently, newer methods for measuring corruption have arisen that solve the small sample problem and move to more concrete measures of corruption. The first set of methods focus on refining survey and data collection techniques to improve the ability to assemble data on self-reported bribes/service delivery quality. This method tends to move away from the larger bribes that individuals or businesses may fear reporting, and instead focus on user-reported petty bribes that the individual may be more likely to report since the bribe values may be relatively low, and bribes may be commonplace in these settings. For example, Svensson (2003) provides analysis from a dataset that provides information on bribes paid by firms in Uganda. To encourage truth-telling in the survey, the survey was conducted by a trusted employers’ association, and also asked carefully worded, hypothetical questions to measure of corruption.⁹ Hunt

⁹For example, “Many business people have told us that firms are often required to make informal payments to public officials to deal with customs, taxes, licenses, regulations, and services, etc. Can you estimate what a firm in your line of business and similar size and characteristics typically pays each year?”

(2007) utilizes the International Crime Victims Surveys and Peruvian Household surveys, both of which contain information on bribes to public officials if the individual has been the victim of a crime.¹⁰ Other studies collect “prices” paid for services that should be free. For example, Banerjee, et al (2004) collects fees paid at government health centers in India (that should be mostly free), while Antonossava, et al (2008) collected data on prices paid and quantities received from the public distribution system in India and compare them to the official prices for these commodities. The main benefit of these methods is a move to measures that have actual meanings. For example, using the measure in Banerjee, et al (2004), we can estimate the bribe amounts paid at the health centers, and use this information to understand how the bribes affect the allocations of services. We can also use it as an outcome measure to study the effectiveness of anti-corruption policies in government health centers. However, these types of measures are limited if we believe that individuals are under-reporting bribes, and particularly if we believe that this under-reporting is biased by corruption levels in themselves. Moreover, most of the time, these measures are often limited to petty corruption since it is difficult to ask individuals about the larger bribes that they may have paid.

The second method is the use of physical audits of how people perform their duties. For example, Chaudhury et. al. (2006) performed an ambitious multi-country study of teacher and health worker absence, where they performed spot checks to determine whether bureaucrats were showing up for work.¹¹ Similarly, Bertrand, et al (2006) followed individuals through the process of obtaining a driving license in India, and recorded all extra-level payments made and the rules that were broken in exchange for these extra-legal payments. Barron and Olken (2007) designed a study in which surveyors accompanied truck drivers on 304 trips along their regular routes in two Indonesian provinces. The surveyors observed the illegal payments the truck drivers made to the traffic police, military officers, and attendants at weigh stations.

One of the key challenges to the audit studies is whether the observed outcomes actually reflect corruption rather than some less intentional form of bureaucratic ineffectiveness, since often there is no smoking gun (bribe overtly paid, job left entirely unattended, etc). For example, Bertrand et al (2006) find that there is a misallocation of licenses—people who cannot drive are able to get them. Could this be due to an “overloaded” bureaucrat who does not have time to screen license candidates or due to an “incompetent” bureaucrat who cannot distinguish between a good and bad driver? To understand this question, they collect detailed quantitative and qualitative data on how the bureaucrats behave through the licensing process. For example, they document extreme behaviors (e.g. simply never administering a driving test) which would be hard to label “incompetence.” Similarly, Duflo, Hanna, and Ryan (2008) measure teacher absenteeism in rural India using audit methods. Does the fact

¹⁰Mocan (2008) also use the ICVS to determine what characteristics were associated with greater corruption.

¹¹Other papers that do this include Duflo, Hanna, and Ryan (2008), who measure teacher absence, and Banerjee et al (2007), who measure absenteeism amongst medical providers.

that teachers often does not come to school imply that they are consciously breaking the rules for private gain? Or, are lives of the teachers so difficult that they just cannot make it to school often enough, despite trying as hard as they can. Their research design provides information that allows them answer these questions. Specifically, they evaluate a program that monitors the teachers and provides incentives to the teachers based on teacher attendance. They find that teachers are very responsive to the incentives. The very fact that the teachers respond to the incentives so strongly implies that the teachers were previously ignoring the rules, and were not just incapable of attending.

We refer to the third technique as cross-checking. The idea behind it is to compare official records of some outcome with an independently collected measure of that same outcome. One example of cross-checking is to compare how much money was released to the bureaucrat with how much those who he was supposed to give the money to report having received. For example, Reinikka and Svensson (2005) compare data from records on central government disbursements and a public expenditure tracking survey to measure dissipation in a school capitation grant in Uganda, finding that the average school received only about 20 percent of central government spending on the program. Fisman and Wei (2004) compare Hong Kong's reported exports to China at the product level with China's reported imports from Hong Kong to understand the extent of tax evasion. Another way to conduct a cross check would be to collect records from the bureaucrat documenting how the government resources were spent in achieving a task, and then to compare with an objective measure of how much it should have cost to conduct that same task. The difference between the two measures is, then, the estimate how much was "stolen." Olken (2007) uses this method. He calculates corruption in the context of road projects, by comparing the actual expenditures reported with an independent measure of what it should have cost to build a road of that particular quality. To obtain the independent measure, he sampled each road to determine the materials and labor used, and then multiplied these by local prices. In the end, he finds that, on average, about 24 percent of expenditures across the project villages were missing.¹²

As with any other method, this method has both strengths and limitations. Its innovation lies in the fact that it creatively allows the measurement of dissipated government resources without asking the actors involved if they have paid or received an actual bribe, reducing the chance of under or mis-reporting. Thus, it often allows us to move past petty corruption and perhaps look at larger scale corruption. However, it is difficult to understand whether the dissipated resources are actually corruption, or simply mis-measurement in the indicators or even just a sign of bureaucrat incompetence. For example, in Olken (2007), it remains possible (though unlikely) that road quality is mis-measured, or that the bureaucrats are not good at building roads? It is possible (though again unlikely) that the missing resources reflect the bureaucrats trying to reallocate

¹²Other examples of cross-checking in the developing world include Hsieh and Moretti (2006) to estimate bribes in Iraq's Food for Oil Program. Olken (2006) and Antonossava et. al. (2008) measure theft in food distribution programs using the same methods, while Di Tella and Schargrodsky (2003) use it to measure corruption in hospital procurements.

funds to better uses: For example, in Renikka-Svensson (2005), it is possible that the resources that should have gone to the schools capitation program were actually spent on services that the community deemed more important, and did not end up in the pockets of government officials. Would this have necessarily been bad?

One way to get around these concerns is to look for correlations (motivated by theory) between the extent of dissipation and some other variable. For example, to show that the differences in reported shipments is corruption, and not just mis-measurement in the shipments, Fisman and Wei (2004) document that the differences are “negatively correlated with tax rates on closely related products, suggesting that evasion takes place partly through mis-classification of imports from higher-taxed categories to lower-taxed ones, in addition to under-reporting the value of imports.”¹³

In addition to these methods that have been recently used in the literature, there are several innovative methods that are being explored in current studies. While the work is not yet published, methods such as these will surely contribute to our tools available. For example, Banerjee and Pande (2007) attempt to use second-hand data on which politicians have gotten rich since they entered politics to identify those who have profited from corruption.¹⁴ They find that this measure correlates strongly with other more direct (perceptual) measures of corruption (such as the answer to the question “do you think the politician used his office for private gain”). Banerjee, Olken and Pande (2008) are collecting data on public procurement records, and using information on number of qualified and unqualified bidders, characteristics of the winning bid, and the final price of contracts to understand whether officials are bending procurement rules.

These innovations in measuring corruption allow us to use quasi-experimental and experimental methods to understand the causes and consequences of corruption. This increases the need to have effective frameworks for analyzing corruption, and for generating testable hypotheses. As noted earlier, the current framework suggests hypotheses based on agency problems. Specifically, how can we ensure that a bureaucrat fulfills a particular rule through the use of greater monitoring and incentives? In the next section, we propose a broader mechanism-design framework for understanding the role of corruption in bureaucracies. We, then, discuss papers that test the agency model, and a newer

¹³Duggan and Levitt (2002) provide an interesting example of cross-checking in sumo wrestling. They basically show that a wrestler has a higher probability of winning than expected when the match is key to his rank. To distinguish match throwing from effort, they use theory as a guide: the effect goes away when there is greater media scrutiny, suggesting that it is not effort. Moreover, the next time the same two wrestlers meet, the opponent is more likely to win, suggesting that throwing future matches is a form of the bribe paid for winning a key match. Similarly Antanassova et. al (2008) cross-check receipt of a BPL card (which in India identifies someone to be poor and allows them access to a set of redistributive programs) against actual income levels. They correlate the error rate with features such as caste of the recipient, their place in certain social networks etc., and argue that the correlations are what a simple theory of corruption would predict.

¹⁴Di Tella and Weinschelbaum (2007) provide a theoretical framework for thinking about unexplained wealth as an indicator for corruption.

generation of papers that are beginning to test the broader framework we propose.

4 A formal framework for understanding corruption

The challenge of modeling corruption comes from the very definition of corruption. Corruption, as we say above, is when the bureaucrat (or elected official) breaks a rule for private gain. This immediately raise some questions. Why have rules in place which are going to be violated? Why not change the rules so that there is no incentive to violate them? This leads to an ancillary question: under what conditions can you change the rules costlessly and get rid of corruption without affecting anything else that you care about? When is that not possible and why?

Answers to these questions are important both from the positive and the normative points of view. They help us separate between the cases when corruption is the result of systemic constraints that we understand well and cannot solve through better incentive design and the cases where our framework provides no reason why corruption could not, through judicious choice of incentives, be eradicated. Of course the fact that we are in the latter case does not have to mean that there is always something we can do to fix things: there may be other constraints, coming from the structure of political economy or just some agency problem that we have not captured, that may make it impossible to get rid of corruption. But the categorization forces us to look for a different kind of answer, and possibly to suggest a way to improve things.

A related methodological advantage of the framework we propose below is that it helps us to structure the empirical research. By focusing our attention on the nature of the underlying task, it makes clear that the variation in corruption across the world or even across different departments of the same government, may be driven by the underlying tasks being performed. It may not be a fixed organizational (or national) characteristic. To put it differently, our framework generates testable implications which relate the extent of corruption to aspects of the underlying task being performed and to characteristics of the relevant social welfare function. It also helps us in interpreting the observed correlations between corruption and other forms of governmental failure. For example, the positive correlation between length of bureaucratic processes and bribe-taking in cross-country data has been interpreted by La Porta et al (1999) as evidence that the processes have been introduced with malafide intentions and could be removed at no social cost. Our framework allows us to ask when this is indeed the case, and when this interpretation may be invalid.

That said, it is worth emphasizing that while we call the analysis below a framework and show that it encompasses many of the models of bureaucratic misbehavior in the literature, we make no claims of generality for it. We make a large number of modeling choices that are pointed out along the way. These

are made mostly in the interests of simplicity and clarity, but we recognize that many of them can also have substantive implications.

4.1 Ingredients of our framework

4.1.1 The Bureaucrat's Job

At the heart of our framework is the bureaucrat who may be tempted to be corrupt. We start with the bureaucrat's job description: he in charge of a simple resource allocation problem described below.

The resource allocation problem is very simple: Assume that there is a set of slots of size 1 (a continuum) that need to be allocated to a population of size $N > 1$. There are two types of agents: type H and type L numbering, N_H and N_L respectively. The social benefit of giving a slot to H is H and the private benefit is h . The corresponding numbers for L are L and l . We assume that $H > L$ and that types are private information. The ability to pay for a slot for a type H is $y_H \leq h$ and the corresponding ability for a type L is $y_L \leq l$. Finally both types have the option of walking away and not taking the slot. We will return to this assumption in the last sub-section of this section.

While simple, the problem goes beyond the standard resource allocation problem under asymmetric information (i.e. what auction theory typically studies) in two important ways. First, we do not assume that the private benefit to the person who gets the slot is necessarily the social benefit. Such a divergence is characteristic of many situations where the government is involved. For example, society wants to give licenses to good drivers ($H > 0$) and not to bad ones ($L < 0$) but private benefits of getting a license are probably positive for both types. Or suppose the slot is not going to jail. H types are innocent. L types are not. $H > 0$ is the social benefit of not sending an innocent to jail. $L < 0$ is the social benefit of sending a criminal person to jail. But the private benefits are positive for both types: $h \leq l$ but $h, l > 0$. Second, we allow the potential beneficiaries to have an ability to pay that is less than their private benefits (or willingness to pay) ($l > y_L$ or $h > y_H$). This is conventionally treated as being equivalent to the beneficiary being credit constrained, but it is worth emphasizing that covers a range of situations (including the credit-constraint case). For example, consider the person who wants to take his child to the hospital to be treated but his permanent income would not cover the cost. He would however be willing to pay his entire income (less survival needs, say) to save his child's life and in addition would be willing to stand in line for four hours a day every morning. In this case his total willingness to pay (in money and time) is clearly greater than his ability to pay. Clearly if he could freely buy and sell labor, this case would reduce to the standard credit constraint case, but given the many institutional features that govern labor markets, this would be an extreme assumption.¹⁵

¹⁵Another example that exploits a different rigidity in labor markets is the following: there is a woman who is not allowed by her family to work is willing to walk three miles every day to make sure that her child gets an education. Her ability to pay (assume that the rest of the

4.1.2 The bureaucrat's instruments

We will focus on direct mechanisms, which are ones where the bureaucrat simply announces (and sticks to) an allocation rule which he specifies as a function of the beneficiary's announced type, the probability that she will get the slot, the price she will have to pay and the amount of "testing" that she would have to go through (and possibly, pass).

Testing consists of a technology for detecting types directly. If used on someone of type L for a period of time t , the probability that he will fail the test is $\phi_L(t)$. The corresponding probability for a type H is $\phi_H(t)$. Both are increasing in t but $\frac{\phi_L(t)}{\phi_H(t)} > 1$ and strictly increasing in t . The cost of testing for t hours is νt . The cost of being tested for t hours is δt .

The mechanism then takes the following shape: the bureaucrat announces two vectors (p_H, t_H, π_H) and (p_L, t_L, π_L) and then the two types self-select. We will restrict ourselves to winner-pay mechanisms here (mechanisms where you don't pay when you don't get a lot) but the results for the more general case where you may have to pay a non-refundable "entry fee" to even enter the bidding are similar (see Banerjee (1997)). We recognize that the actual mechanism used will often be very different from the direct mechanism: we discuss some of the issues this raises in the concluding sub-section

4.1.3 The bureaucrat's incentives

We assume that the bureaucrat is the agent of what we call the government but others have called the constitution-maker, a principal whose preferences is to maximize the social welfare generated by the allocation of the slots. This is partly an artifact of the way we model things. What is key is that the bureaucrat has a boss whose objectives are different from his and who is in a position to punish him. Otherwise he would never have to break any rules since he, in effect, makes his own rules. The assumption that his boss cares about social welfare is convenient but not necessary. Much of what we have to say would go through if the principal cares less about the bureaucrat's welfare and more about that of the other beneficiaries than the bureaucrat, which may be true even if think of the principal as the standard issue, partly venal, politician. After all, the politician cares about staying in power and making the bureaucrat happy may not be the best way to get there. Of course, it could be that the bureaucrat is the one who cares the beneficiaries and is trying to protect them from his boss. This is an interesting and not necessarily unimportant possibility that we do not investigate here. More generally, a set up like ours deliberately rules out the more interesting strategic possibilities that arise in models of political economy, in order to focus on the implementation issues that arise even without them.¹⁶

family does not care about education) is clearly less than her willingness to pay.

¹⁶There is some tension between the assumption of distribution neutrality and the assumption that some beneficiaries do not have enough money to register their willingness to pay: why not simply give them more money (raise their y_H and y_L)? Implicit behind this assumption is a view that public money is scarce. Moreover it may be hard to give away money, because even those who do not need the slots may start asking for them, if the government is

The bureaucrat’s role in our framework is to allocate the slots, which is something that the government cares about but does not directly control. The government sets the rules under which the bureaucrat is supposed to make the allocation. In particular, the government defines a set \mathbf{T} which defines the levels of testing that can be given to H types and L types, a set \mathbf{P} which defines the set of prices they can be required to pay if they get the slot, and a range Θ of the share of slots that the H types can get.

To make these rules bind, we need to assume that the bureaucrat has a cost γ of straying from these rules. To generate corruption we need to assume that the cost γ varies across bureaucrats (with a distribution function $G(\gamma)$) and is unobserved by the government—without this assumption the rules will never be broken in equilibrium (since in this framework, there is no point to having rules that everyone breaks—we will return to this point in the concluding sub-section).

A corruptible bureaucrat is one for which γ is finite.¹⁷

This setting naturally gives rise to the following concepts:

- Corruption is when the bureaucrat breaks the rules
- Bribe-taking is when the bureaucrat breaks rules for money.
- Red-tape is socially unnecessary testing.
- Allocative inefficiency is when the wrong people get the slots.

4.1.4 A useful typology

Before jumping into the analysis of this model, it is helpful to underline some of the different possibilities that can arise in our framework. The following typology will prove to be particularly handy—the labels of the cases should be self-explanatory, but, in any case, more explanation will emerge as we analyse each case.¹⁸

cases	$y_H > y_L$	$y_H \leq y_L$
$h > l$	I: Aligned	III: Partial Misalignment
$h \leq l$	II: Partial Misalignment	IV: Misaligned

The fact that we have only four cases is of course an artifact of the assumption

offering cash to all those who apply. But if public money is scarce and giving away money is hard, how can we not care about the distribution of surplus between the bureaucrat and his clients. Assuming that the government puts more weight on the welfare of the beneficiaries than on the welfare of its own bureaucrats would probably make more analytical sense, at the cost of complicating the analysis.

¹⁷This formulation is quite specific in that the cost of violating the rules is independent of the extent of violation.

¹⁸The fact that we have only four cases is of course an artifact of the assumption that all H types are identical in their willingness and ability to pay and likewise for L types. However the basic distinction were trying to make here is between the case where H types are willing and/or able to pay more and the case where they may not be (captured by $h \leq l$ and $y_H \leq y_L$). The situation where a large fraction of L types are willing and/or able to pay more than a large fraction of H types is qualitatively very similar to the case where all L types are able/willing to pay more than all H types.

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4.2 Examples of case I

The pure market case $H = h = y_H, L = l = y_L$, is a part of this case, but it is broader than that: Some of the other cases that fall into this category include:

1. Choosing efficient contractors for road construction: Type H are the more efficient contractors. For the same contract, they make more money: $h > l$. Since they are the one's who will get paid, the price they pay to get the contract is just a discount on how much they will eventually get paid rather than out of pocket expense. It is plausible therefore that $y_H = h$ and $y_L = l$.
2. Allocating licenses to import to those who will make the socially optimal use of them: In an otherwise undistorted economy, the private benefits should be the same as the social benefits, like in the road construction case, but in this case there may be credit constraints because you pay first and profits from them later. However it is plausible that the type H 's should be able to raise more money than the type L 's. $y_H < h = H > L = l > y_L$ and $y_L < y_H$.

4.2.1 Examples of case II

This seems to us to be the least likely of the four cases: one possible example is a merit goods like subsidized condoms against HIV infection: H are high risk-types. They like taking risks: Hence $h < l$. But may well be richer (say because they can afford to buy sex): $y_H > y_L$

4.2.2 Examples of case III

1. How to allocate hospital beds? The H types are the one's who really need them (say, rather than those who just need cosmetic surgery). The social valuation probably should be the private valuation in this case: $H = h > L = l > 0$. However there is no reason to assume that the H types can afford to pay more. We capture this by assuming: $y_H = y_L = y$.
2. How to allocate subsidized food grains targeted towards the poor. Presumably the H types are the poor who benefit more from subsidized food grains and the social benefit is plausibly just the private benefit:

$H = h > L = l > 0$. However the poor may not be able pay as much for the grains as the non-poor: $y_H < y_L$.

4.2.3 Examples of case IV

1. Law enforcement: This is the example we already mentioned where the slot is not going to jail: $H > 0 > L, y_H = y_L = y, h = l > 0$
2. Driving Licenses: This is another example that came up before. The one difference from the previous example, may be that bad drivers probably value the license more since they are more likely to be picked up by the police: $H > 0 > L, y_H = y_L = y, h < l$.

4.2.4 Analysis of case I

If $H > L > 0$, it is always possible to set $p_H = y_L + \varepsilon, p_L = y_L$ and allocate a slot for every H type—the rest are allocated to the L types by lottery. The incentive constraints for self-selection are satisfied since the L types cannot pay more than y_L and as long as ε is small enough the H types will want to bid $p_L + \varepsilon$ to get an increased chance of getting the slot.

What would a corruptible bureaucrat want to do to maximize the value of the revenues that he can collect from allocating the slots? One option is to set $p_L = y_L$. Set p_H such that the type H does not want to claim to be a type L , i.e.

$$(h - p_H) \leq (h - y_L) \frac{1 - N_H}{N_L}$$

In this case it is optimal to set

$$p_H = \min\{y_H, (h - y_L) \frac{N - 1}{N_L} + y_L\}$$

Offer the goods with probability 1 to the type H s, and with probability $\frac{1 - N_H}{N_L}$ to the type L s. This option generates the optimal social allocation and involves no red-tape. Therefore if this is what the bureaucratic wanted to choose, the government could just allow him to maximize profits—i.e. just "sell" him the right to allocate the slots and impose no constraints on him.

The problem is that in this case p_H might very well be lower than y_H : the bureaucrat is not extracting all the rents from the type H 's. One alternative is to set

$$p_L = p_H = y_H > (h - y_L) \frac{N - 1}{N_L} + y_L$$

and not sell to the L s at all. This is the monopoly option and generates an inefficient outcome.

However there is a third option that is relevant as long as ν , the cost of testing to the bureaucrat, is small enough. In this option anyone who claims to

be a type L gets tested for a duration t_L but no one gets rejected even if they fail. Then type H 's IC constraint becomes

$$(h - p_H) = (h - y_L) \frac{1 - N_H}{N_L} - \delta t_L.$$

Clearly p_H goes up when t_L goes up, which is what makes this an attractive option as long as ν is small. To limit the number of possibilities, assume that $\nu = 0$.

Of course by doing this the L type is being made worse off. So t_L must satisfy IR_L

$$(l - y_L) \frac{1 - N_H}{N_L} - \delta t_L \geq 0$$

As long as IR_L is not binding, raising t_L always pays off in terms of allowing p_H to be raised. Once it binds, it is possible to continue to increase t_L by reducing p_L below y_L , but this will never pay off since reducing p_L also forces the bureaucrat to reduce p_H .

The first point to be noted about this third possibility is that comes with red-tape. The testing is unnecessary since there is a mechanism that always delivers the optimal allocation without testing. This red-tape is faced by L types, i.e those who have a low probability of getting the good and is in order to create some artificial scarcity and extract more rents for the bureaucrat (along the lines suggested by Shleifer-Vishny (1994)).

The second point is that red-tape only emerges when $y_L < l$ and from the IR_L above it is clear that t_L is increasing in $l - y_L$. This makes clear why people do not have to go through red-tape when they try to buy most marketed goods (which are goods for which $l = y_L$). Governments are associated with red-tape, in this view, because governments often supply goods that markets do not supply or supply inefficiently

Another point that emerges from looking at IR_L for this case is that the extent of red-tape is decreasing in the scarcity of the good. Scarce goods can be efficiently allocated without much red-tape because the H types are already grateful for getting them and are willing to pay a high price for them. Red tape comes about as an antidote to abundance.

A fourth point is that the outcome with red-tape always welfare dominates the monopoly outcome: all the slots are being used here and while the L types do suffer some socially unnecessary testing, they are better off than they would be if they never got a slot. On the other hand, the first outcome, which is the outcome without red-tape, always welfare dominates the outcome with red-tape. The problem is that from the point of how much money the bureaucrat is making, it is the other way around: The red-tape outcome generates more revenue compared to the efficient no red-tape outcome but not necessarily the monopoly outcome.

The rationale for why the government may make rules that then create corruption and specifically bribe-taking follows from the previous observation: In this case an attempt to penalize money-making by the bureaucrats (say by

imposing a cap on the price of the slots at $p_H + \varepsilon$) will always (weakly) improve welfare, at the cost of generating bribe-taking (because of partial compliance), either by improving resource allocation (in the monopoly case) or by reducing red-tape (in the red-tape case). The one exception is the situation mentioned above, where $y_L = l$ (so that there is no red-tape) and the bureaucrat prefers the efficient outcome to the monopoly outcome.

Under this theory of corruption, the predicted correlation between red-tape and bribe-taking is likely to be positive (which is consistent, as mentioned above, with what La Porta et al. find in the data). Except in the one case mentioned in the last paragraph, the government will always prefer to cap the price, though the exact level of the cap might vary. As the incentive to be corrupt goes up—it is easy to see that the incentive is increasing in $y_H - y_L$, $l - y_L$, the abundance of the slots and the enforcement of the anti-corruption policy—the extent of bribe-taking and red-tape will go up, and even though the government may raise the price cap in order to reduce violations, the net effect on the extent of bribe-taking and red-tape should still go in the same direction.

It is however possible to get the correlation to go the other way. An increase in $y_H - y_L$ keeping $l - y_L$ fixed will eventually cause the corrupt bureaucrats to switch from the red-tape outcome to the monopoly outcome and we will see an increase in bribe-taking and a fall in red-tape. If the primary source of variation is in y_H then this would predict a negative correlation.

One would also expect to see a negative correlation if in addition to capping the price, the government puts pressure on the bureaucrat to improve the allocation and this moves the bureaucrat away from the monopoly outcome (which has higher bribes) to an outcome with red-tape.

Along the same lines it is worth pointing out that in this case it could be counterproductive for the government to try to make a rule that tries to limit red-tape if it simply moves the bureaucrat towards the monopoly outcome.

Finally, if we were prepared to go outside the world of our model and assume that the government does not set the cap strategically but rather its just there or it is therefore for other unmodeled reasons, then it could be that the cap is actually below y_L . Take the extreme case where it is supposed to be free (the cap is zero). In this case the government would actually want the bureaucrat to test those who apply for the slots (since the price mechanism will not do any screening). Here a bureaucrat who is corrupt might actually do some good: all he needs to do is to raise the price for the H types to $y_H + \varepsilon$ and scrap the red-tape and social welfare would unambiguously go up. In such cases bribe-taking would be an antidote to red-tape and they would move in opposite directions. This is the old idea that corruption greases the wheels and increases efficiency (Huntington (1968)), but note that it can only happen when the government is not using its choice of rules to maximize welfare.

Now consider the alternate scenario within Case 1, where $L < 0$. This case is simple if the government can reduce the number of slots to N_H . Then the government can just let the bureaucrat set the monopoly price.

If the number of slots cannot be controlled (say the bureaucrat can create extra import licenses up to a point), then the government will want to make

it a rule that the minimum price for these slots has to be y_L . Corruption here will take the form of the bureaucrats selling off the surplus slots for a price below the minimum price. If this is too big a problem the government may also set a testing requirement. Everyone would have to be tested for t^* units of time before they get a slot: As long as $\delta t^* > l$, the L types will not want a slot. However it is not in the bureaucrats interest to test people since this eats into their willingness to pay. Therefore we would expect a negative correlation between bribe-taking and testing (which we should interpret as red-tape since it is possible to achieve the optimal allocation without testing).

4.2.5 Analysis of case II

The basic incentives in this case are very similar to case I. The one difference is that the H types want the good less now relative to the L types, and this makes it harder to extract the rents from the H types will continuing to serve the L types: Hence there is more of a tendency to move towards what we called the monopoly solution in the previous sub-section, where the L types are not served at all and there is no red-tape.

4.2.6 Analysis of case III

Assume that $h > l$, $y_H = y_L = y$ which are the assumptions under which this case is analyzed in Banerjee (1997). Also to limit the number of cases, let $y_H = y_L = y < l$.

In this case a government that is interested in maximizing social welfare would set up a “price” mechanism: $p_H = y$, and p_L^* such that:

$$l - y = \frac{(1 - N_H)}{N_L} (l - p_L^*)$$

and gives it to self-professed h types at price y and to self-professed l type at price p_L^* .¹⁹ There is no testing needed.

What would a corruptible bureaucrat do? If there is no check on prices or on allocative efficiency, he will raise the price for everyone to y and hold a lottery. There would be no red-tape. The government may want to fight this by capping the price that can be charged the L type at p_L^* , while leaving the bureaucrats free to set p_H . Now the bureaucrats who violate the rule will still allocate and random (and charge $p_L = p_H = y$) but those whose cost of being corrupt is higher will allocate optimally.

The government may in addition want to control allocative efficiency directly. If the government also puts a penalty on misallocated slots, the corrupt bureaucrats will still raise the price to y and then test the self-professed H types to generate sorting. Assuming (for convenience) that no one ever fails the test (so that it is totally useless as a test) the amount of testing will be given by

$$l - y - \delta t_H = \frac{1 - N_H}{N_L} (l - y)$$

¹⁹This only works if y is high enough. Otherwise p_L might have to be negative.

which is the condition that gets the L types to reveal that they are L types. The red-tape here is on the H types—those who will get it with a higher probability of getting the slots also jump through more hoops. This is in contrast with Case 1 where the red-tape is on type L .

We will therefore see both bribe-taking and red-tape, but the L types will pay bribes and the H types will suffer red-tape. What happens in this setting when y goes up? Note that the p_L^* is defined by

$$l - y = \frac{(1 - N_H)}{N_L}(l - p_L^*)$$

It is easily checked that the gap between y and p_L narrowed by the rise in y . The temptation to take bribes goes down when y goes up. Similarly from the definition of t_H it is evident that t_H goes down when y goes up. In other words when y is what varies red-tape and bribe-taking move together. Moreover the bureaucracies that serve the more financially constrained (low y) will be the ones where we will see most of both.

The same positive correlation would also be observed when the source of variation is the extent of corruptibility in the bureaucracy. When the slots become more scarce, it is easily checked from the equations defining p_L^* and t_H that both red-tape and bribe-taking will go up. So once again they move together, but the underlying causal channel is exactly the opposite of what we saw in case 1 (there scarcity helped, here it hurts).

A final observation: Suppose the government cannot control allocative efficiency. Then, as we saw, allocations may be very inefficient, but there will be no red-tape. Red-tape emerges here as a symptom of the government's success in fighting allocative inefficiency. While red-tape is undesirable all else being the same, its absence might reflect a more serious government failure. On the other hand, if the government can control allocative efficiency, then controlling red-tape may be extremely beneficial.

4.2.7 Analysis of case IV

Let us first restrict our attention to the even more specific situation where $N_H > 1$, $y_L = l > h = y_H$. The goods are scarce, but the private valuation of the high types is lower than that of low types—as in, for example, Laffont-Tirole (1993). The analysis in this section draws upon Guriev (2004).

The price mechanism will not give us allocative efficiency in this case. The optimal mechanism involves setting the lowest value of t_H such that

$$\begin{aligned} h - \delta t_H - p &\geq 0 \\ (1 - \phi_L(t_H))(l - p) - \delta t_H &= 0 \end{aligned}$$

for some value of p . Clearly it must also be the case that $p < h$.

In this case a corrupt bureaucrat will try to raise the price and give it to the l types to both types). They will not want to test since testing is a waste.

The government will cap the price to improve allocative efficiency. As a result there will be bribe-taking and there will continue to be inefficiently low levels of testing.

Corruption will be negatively correlated with red tape, if what varies is the corruptibility of the bureaucratic class. Testing and allocative efficiency will be positively correlated. On the other hand if the extent of misalignment, $l - h$, is what varies then, corruption, red-tape and misallocation may go together.

The case where the slots are more abundant ($N_H < 1$) or even ($N < 1$ but $L < 0$) is not very different. The rules will involve some testing and setting price lower than h . Corrupt bureaucrats will try to maximize profits: the problem they face is exactly like the one in case I (all that is different is the social ranking of the two types). As in that case, the less desirable (now H) types may only get the slot with a probability less than 1, and they may actually best tested to discourage the L types from pretending to be H types.

4.3 Summary and Implications

The first purpose of setting up and analyzing this framework was to illustrate a style of thinking about corruption that treats the rules as an endogenous outcomes, rather than as outside the scope of study. This allows us to ask whether the rules we observe make sense and help us understand where we would need to act in order to reduce the distortions caused by corruption.

Second, it makes clear that the problems caused by corruption can be very different in different contexts. For example in case I, the government is trying to fix the problem that price is too high and correspondingly demand is too low, while in case IV it is fixing the problem that the demand is coming from the wrong people. The differences between these situations is important both from the point of view of positive economics – we would expect to see very different patterns of bribe-taking, red-tape and misallocation in each of these cases – as well as from the point of view of policy, since we would want to base our anti-corruption efforts based on who is expected to pay the bribes and bear the red-tape. For example, in case I the people who are being deprived of the good are the L types, which is not very costly for society because they are the ones who value the good less (this is even more true because this case only arises when there are relatively few L types).

Another purpose of this exercise was to make a substantive point: One common theme that runs through the various cases is that corruption is much more of a problem when the underlying allocation problem involves goods where either there is a mismatch between the private and social preferences or goods where there is a mismatch between the ability to pay and the willingness to pay. One reason, therefore, why there is more corruption associated with governments is that governments tend to step in precisely when there is this kind of mismatch and therefore markets do not function very well.

To underscore why corruption in government tends to be more serious than corruption in the private sector, it is worth comparing corruption in government and corruption in the private sector within the world of our model. The private

sector operates in the sub-case of our case I – which we call the pure market case – where we should expect $H = h = y_H, L = l = y_L$. In this case the only possible distortion comes from the fact that the bureaucrat wants to make more money by selling only to H type. Clearly a private firm, which presumably wants to make money, would also go to this outcome if it had direct control. If there is corruption in this case, it must arise from the firm being unwilling to share its profits with its bureaucrat: essentially the one case where this may happen is when the profit maximizing solution is to set $p_L = p_H = l = L$ and to sell to everyone. However if (say) the firm decrees the entire revenue from this should go to it, the bureaucrat might prefer to ration the good (at least to some fraction of the population) and demand a bribe of $H - L$, in addition to the price.²⁰ Notice however that as long as the firm was willing to give its bureaucrat a high enough share of the revenues, this would not happen: At the heart of the problem is the fact that the firm is unwilling to "sell" the firm to the bureaucrat, probably because the bureaucrat is unable or unwilling to pay a high enough price for it (credit constraints or lack of risk capital).

Contrast this with the case where it is the government that is the principal. The problem here is that the government does not want profit maximization and therefore does not want to "sell" the job to the bureaucrat, who would actually be happy to be allowed to maximize profits. This significantly alters the nature of corruption and the social costs associated with it.

The obvious corollary to this claim is that the government needs to be realistic about the market failures it can fix, given the limitations in its monitoring capacity. For a formal development of this point see Acemoglu and Verdier (2000).

A third point that the framework brings out is that bribery and red-tape, while undesirable in themselves, may be the result of trying to fix some other, more serious problem. The fact that there is no bribery cannot be interpreted as evidence that all is well.

Fourth, it suggests that under many circumstances red-tape and bribe-taking may be the result of a partially successful attempt to combat corruption. Bureaucrats who are free to charge as much money as they want and keep it, obviously will not want to ask for bribes and may not also have the incentive to create red-tape, since red-tape is a cost for their clients and eats into the surplus they can extract. One way to end bribe-taking and red-tape therefore is to lift all rules on the bureaucrat. The trade off is that it might lead to a massive misallocation. Therefore the absence of bribe-taking or red-tape is not a guarantee that corruption has not had any deleterious consequences. Indeed the problems created by corruption may be so bad that the government actually ends up giving up on regulating (which eliminates bribe-taking and red-tape), even when regulation is highly needed.²¹

²⁰Of course, if the firm knew exactly how many clients were there, it would notice that it is getting less money than it expected, but our model is easily extended to the case where the firm does not exactly know the size of the population of applicants but its agent does.

²¹It is alleged that in Mexico the requirement of driving tests to get a licence was eliminated not because everyone could drive safely, but because of the amount of corruption it was

Finally, the results from our framework make it clear that it is only under quite specific conditions that we can interpret the correlations between bribery, red-tape, etc. as evidence for a particular theory of corruption. Alternative theories of corruption, represented by the different cases that we identified, can all generate the same kinds of correlations between observables.

5 Empirical Work Revisited: Testing theories of corruption

5.1 The effect of incentives

Much of the current empirical work on corruption only tests the piece of the theory that emphasizes the effects of incentives on the probability that a bureaucrat breaks a rule. They start from some source of variation in the level of monitoring of the bureaucrat and/or his rewards for being rule-abiding, and look at the effect on the chance that a rule is broken. For example, Fisman and Miguel (2007), find that an increase in punishments for parking violations in New York City reduced the violations amongst the set of diplomats that were most likely to violate the rules. Using experimental techniques, Olken (2007) finds that the theft in road projects is greatly reduced by raising the probability of being caught. Duflo, Hanna and Ryan (2008) and Banerjee et al. (2007) find that strengthening incentives reduces absenteeism. Using a natural experiment in Buenos Aires hospitals, Di Tella and Schargrodsky (2001) find effects of both more stringent monitoring and higher wages on procurement prices.

Several more recent papers in this space have also tried to go a step further and understand whether or not a reduction in corruption due to monitoring and incentives improve the final allocation of services. In the case of the Di Tella and Schargrodsky (2003), less bribe-taking means better procurement prices, which is the outcome of interest. Olken (2007) looks at the effect of auditing not only on theft, but also on the quality of the roads that were built. Duflo, Hanna and Ryan (2008) study whether incentives can create distortions due to multi-tasking. In other words, they are concerned that in order to complete the task as specified by the incentives, the agent reduces their effort along other dimensions. Specifically, they ask whether providing incentives for teachers to attend school will cause the teachers to compensate by teaching less. To answer this question, they measure not only teacher attendance as the final outcome, but also the learning levels of the children and find that the multi-tasking problem is certainly not large enough to outweigh the benefits of better incentives.

generating.

5.2 Beyond shirking and bribery: how bureaucrats distort resource allocation

Bertrand et al.(2007) take a further step towards our framework by treating the bureaucrat's problem as a problem of allocating resources and therefore allowing for the fact that there is no one to one correspondence between less bribe-taking and a better social outcome. The basic idea of the paper is to experimentally vary the underlying types a bureaucrat faces and use the bureaucrat's responses to infer the allocative mechanism used the beuraucrat.

Specifically they compare three randomly chosen groups of license candidates. The first group was told to obtain a license as usual, the second group was given a large incentive to obtain the license in the minimum legal time allowed (30 days) and a third group was offered free driving lessons. Within our model the second group represents a situation where h and l have both gone up by the same amount and the third group a situation when the fraction of h types, $\frac{N_H}{N}$, goes up.

The driving license case, as noted above, corresponds to our case IV. To reduce the number of possible cases, assume that $y_H = h < l = y_L$ (which, as always, is to be interpreted as the case where a substantial fraction of L types are willing and able to pay more than a large fraction of H types). Moreover also assume $N < 1$ but $L < 0$. Finally assume that the bureaucrats know that there is a change in the environment but the government's rules do not change (perhaps because the government is unaware of the change in the environment, which is plausible).²²

It is easy to check that in case IV an equal increase in h and l without any change in the rules, will have a number of different effects. L types will now want to apply even if they are assigned to a bureaucrat who is being "honest" i.e. whose cost of breaking the rules are too high compared to the benefit to him from breaking the rules. Therefore, the fraction of those who apply to an honest bureaucrat and end up getting a licence should go down. However just because many more L types apply, many more will (just by chance) end up passing and the average quality of those who get a licence would go down. However the gains from being corrupt would also be higher and this will reduce the fraction of bureaucrats who choose to be honest.

The "corrupt" bureaucrats, i.e. the ones who will opt to break the rules, of whom there are now more, will raise the price. The fraction of L types getting through, conditional on being allocated to a corrupt bureaucrat, should not change but since there are now more corrupt bureaucrats, the average quality of driving among those who get a licence should go down. Moreover because there are now more corrupt bureaucrats the average amount of testing should

²²The bureaucrat does not have to know that there is an experiment going on. All that we require is that the applicants have the opportunity to signal to the bureaucrat that there is a change in the environment, by showing a greater willingness to pay bribes or by offering higher bribes than he would have expected. Our assumption that the bureaucrat makes a take it or leave it offer, makes it harder for him to learn about the change in the environment, but in the real world there is probably some back and forth that facilitates information exchange.

also go down.

By contrast, an increase in the fraction of H types in the population (the second treatment) should improve the fraction of drivers who get a licence when they get allocated to an honest bureaucrat as well as the average quality of licenced drivers. Those who get allocated to a corrupt person, should get more or less the same treatment, with the licences going to the highest bidders and perhaps some red-tape on those who want to pay less (H types) to discourage those who are willing to pay more from claiming otherwise.

The results from the incentive treatment show that individuals who were offered the incentive were 42 percentage points more likely to obtain it in 32 days or less. However, they paid about 50 percent more to obtain this licenses, and they were more likely to break a rule during the process (for example, they were 13 percent more likely to not take a driving test). In the end, these extra payments translated to a greater number of bad drivers on the road: those offered the incentive were 18 percent more likely to obtain a license despite not knowing how to operate a car. These results are entirely consistent with theoretical predictions discussed above, as long as there are enough bureaucrats around who have a relatively low cost of breaking the rules. In particular while the decline in the quality of driving among those who have a license would happen both with honest and corrupt bureaucrats, the reduction in testing can only happen in our model if the bureaucrat is corrupt.

It is worth pointing out that one would not observe the same pattern if the bureaucrats did not know that the distribution of h and l has shifted. In this case if h and l go up by the same amount both types would now want to be tested when they hit an honest bureaucrat. If they end up with a corrupt person, both types will just pay and get the licence without being tested. The average price would not change and the fraction getting tested would go up. However the quality of driving among those who get a licence would go down since the l types who hit the honest bureaucrat now want to be tested. This clearly does not fit the facts about price and testing.²³

The results of the driving lessons treatment, are also broadly consistent with the theory. Those in this group are tested more often and more likely to have got the licence based upon passing the test. This last fact in particular suggests that there are some honest bureaucrats around. They also pay less for the licence,

²³However it also worth remarking that our assumption that bureaucrats are randomly assigned to applicants plays a very important role here. One alternative assumption would be that applicants can either choose to go through the official system knowing that an honest bureaucrat will be assigned to them with some probability but otherwise they end up with a corrupt guy who will always fail you (because in the official channel there are no bribes—the corrupt bureaucrats find it at least weakly optimal to fail everyone who comes through the system). Or you can choose to go through the unofficial channel which guarantees that you pay a bribe and get the licence. In the original equilibrium of this game it is likely that all H types will try the official channel while the L types will go the other way. In this scenario only H types ever take the test and fail

In this case during the experiment H types will shift towards the corrupt route and therefore end up paying more, testing less and an increased probability of getting a licence. However, counterfactually, average licenced driver quality will go up because the fraction of H types who fail goes down.

though much more than they should have legally. This is in fact a prediction of the exactly model we have, but only because we assumed (for convenience) that all H types have a lower willingness to pay than all L types. A more plausible argument is that the H types actually have an incentive to shop around, i.e. go to multiple bureaucrats till they find one who is honest. We do in fact see shopping around in their data and it is therefore a plausible explanation for why the increase in the fraction of H types reduces the average amount paid.

The paper also some evidence that there is a lot of red-tape i.e. pointless testing. They show that of those experiment participants who, at least initially, tried to follow the rules (get tested, not pay bribes, etc.), there is a higher success rate among those individuals found to be unqualified to drive based on the independent test (74 percent compared to 62 percent). In other words, the probability of getting a licence is less than 1 even those who can drive and not higher for them than for those who cannot, suggesting that passing the test is uncorrelated (at best) with driving ability. The testing serves no direct screening purpose.

Both these features—a probability of winning less than 1 and pointless testing—are consistent with case IV, in the scenario where slots are abundant. However to get pointless testing, it is important that $y_H < h$ – otherwise you might as well raise the price all the way up to h . This divergence between the ability to pay and the willingness to pay, seems implausible in this context. The amounts of money involved (around \$25) are not large for the poor in Delhi, which is where the experiment was carried out.

A more plausible story might be that the applicants do not fully understand the rules of the game and therefore think that it is easier to use the official channel than it actually is, while the bureaucrat is not in a position to directly explain to them how things really work, and therefore is using the fruitless testing to signal to them that they need to readjust their expectations. This would be consistent with the fact that no one directly pays a bribe to the bureaucrat: Those who want to go the bribe route go to an agent, who facilitates the transaction. When someone actually approaches a corrupt bureaucrat through the official route, the bureaucrat does not ask for a bribe, and instead goes through the motions of what he is supposed to do, while presumably trying to make sure that the next time they go directly to the agent.

5.3 Changing the rules

To date, much of the empirical literature focuses on how bureaucrats respond to incentives, with the rules being kept fixed. Our theoretical framework, however, also emphasizes the impact of different choices of rules, taking into account the bureaucrat’s response.

One challenge with looking at this issue empirically is essentially methodological: What should we assume about the extent to which these rules are the product of optimization by the government? The government clearly makes many rules to combat malfeasance by government officials, but how well does it understand the consequences of these rules for corruption?

There are two possible approaches to this issue: One is what one might call the political economy approach. This is the position taken in the theory section here: We assume some preferences for the government and figure out how the rules and the nature and extent of corruption should vary as a function of the underlying economic environment if the government was optimizing based on those preferences. We could then look for evidence for the comparative static implications of that model, and jointly test the model and our assumption about what is being optimized.

The alternative is to assume that the forces of political economy, while important, leave a significant amount undetermined and as a result changes in rules can often arise as pure organizational innovations, without changes in the "fundamentals." This approach leads naturally to an experimental approach towards studying the effects of the rules.

Banerjee, Munshi, Mookherjee and Ray (2001) implement a version of the first approach in the context of the governance of localized sugar cooperatives. They assume that the cooperative maximizes a weighted average of the profits of the various principals of these cooperatives – the different types of member-farmers who grow the cane that the cooperative turns into sugar – taking into account the fact that the management of the cooperative wants to siphon off as much of the profits as possible, and generate a set of comparative statics predictions that map the pricing of cane and the productivity of the cooperative onto the underlying mix of farmers in the cooperative. These implications are then tested and seem to be broadly confirmed.

However corruption in these cooperatives is essentially private sector corruption, embodied primarily by the underpricing of cane. We are yet to come across a paper that combines this political economy approach with the more complex manifestations of corruption that we identified above.

More importantly, in many instances our theories of political economy are simply too incomplete to be very useful guides to what rules actually get chosen. The objective of a specific government at a specific point of time is some complex product of its long-term goals and its short-term compulsions and moreover, the way it chooses the rules must take account the compulsions of all future governments. While there is an interesting and growing literature on this subject, it is not clear that it is ready to be taken to the data.

It is also not clear how much governments understand about the consequences of the various policy choices that they are making or about the policy options that they have in hand. A more evolutionary approach to policy change, where changes happen because political actors are trying to solve some "local" problem but the solutions often have unanticipated and often global consequences, may be more descriptively accurate. Certainly it fits better with the kinds of stories that one hears about how change came to China.

An advantage of this second approach is that it permits us to think of policy changes as organizational innovations, and therefore at least initially exogenous in a way that technological innovations are usually thought of as being exogenous (in other words, the assumption is that need to solve problem is a product of various forces of society, but the adoption of a particular solution at a par-

ticular point of time, less so).²⁴ It also makes it clear that governments might choose bad rules (rules that go against its own objectives, because it does not understand the consequences of its choices

A number of recent empirical exercises start from this point of view. For example, Besley, Rao, and Pande (2006) find that, in South India, there exists a relationship between holding village meetings (i.e. more community participation in the process) and better allocations of BPL (Below Poverty Line) cards, that provide privileged access to subsidies and government services. Bjorkman and Svensson (2008) study decentralization in an experimental context. Rather than imposing all centralized rules on health centers, community meetings to decide the most important rules that health centers should be following, and the mechanisms for the community to monitor the health centers. They find incredibly large impacts: infant mortality rates were cut by one-third. However Banerjee et al. (2008) who evaluate a similar decentralization program in India find that it performs no better than the civil service system based system of monitoring teachers.

It is difficult to think about what to make of these vastly different empirical findings given that we do not have a particularly good theory of how decentralization affects corruption and the distortions associated with corruption.²⁵ How does decentralization change the kinds of rules that are optimal and the direction in which they get violated? How does the exact nature of decentralization factor into all this?

As it is, the presumption behind the empirical literature is to decentralization as a shift of control rights into the hands those who have more local information. The basic notion is that the government now has more information and therefore can limit the extent of malfeasance by the bureaucrat. We do see some evidence that the easy availability of information matters: In the driving licence experiment Bertrand et al. (2007) report that there are two things that bribes cannot get around: One is the requirement of showing some proof of address and the other is the requirement of waiting at least 30 days after making the initial application for a learner's permit. Neither of these seem as important as being able to drive, especially in India where the driving licence is not always accepted as an identification, but violations of these rules is easy to observe, whereas the inability to drive properly is something that requires another test to verify. Therefore these are the rules that get enforced.

However the answer to the question of what rules gets violated in what way must also depend on who exercises which type of control rights and what information reaches whom, which all turns on the exact model of decentralization that gets adopted. More generally, theoretical work mapping the effects of alternative organizational forms on the choice of rules and corruption outcomes must be a high priority if this literature has to make progress.

²⁴Banerjee (2002) discusses many of these methodological issues in greater detail.

²⁵Bardhan and Mookherjee (2006) is a rare.

6 Conclusion: Where should the literature go next?

We have already discussed a number of the gaps in the literature: The point about more tightly modeling the effect of organizational forms made in the previous paragraph is of course one of them. Below we list a number of others.

6.1 Corruption and competition

Thinking about organizational forms naturally leads to the role of competition in reducing corruption, as emphasized by Rose Ackerman (1978). The way we modeled corruption takes as given the idea that the assignment of applicants to bureaucrats is random. This effectively places the applicants and the bureaucrat in a bilateral monopoly setting. However the nature of competition between bureaucrats ought to be a policy choice governed by the nature of the underlying incentive problems. This is an area that needs further exploration.

In particular competition is not always a plus. As pointed out by Shleifer and Vishny (1994) competition between a number of corrupt distinct and dis-coordinated authorities, who each has the power to block the "application" might be worse than a single monopolistic rent-seeker. Barron and Olken (2007), document this phenomenon using a unique data set that they collected in Indonesia of the bribes paid by truck drivers at road blocks. Reduction in the number of check-points along the road reduces the total amount of bribes collected from them. Credible evidence on the salutary effects of competition has so far been hard to found, though no doubt the right setting to look for them will emerge soon.

6.2 Implications of illegality and non-transparency

One reason that corrupt bureaucrats find it hard to coordinate with each other is that corruption is illegal. This essential non-transparency has a number of important implications that deserve further study. First, if the applicants for the slots differ in their ability to make illegal deals for either intrinsic or extrinsic reasons, then the playing field is no longer level, which introduces important distortions. This not merely a theoretical concern: Many countries have laws that forbid their firms to pay bribes in foreign countries, which could potentially act as a constraint on foreign investment in countries with high levels of corruption (see Hines (1995)).

Another fallout of this non-transparency that we already noted is the reliance on agents to intermediate bribe-taking.²⁶ The theory how the use of agents alters the nature of corruption is yet to be developed but Barron and Olken (2007) provide an interesting insight into it. They observe that in Indonesia, truckers can either pay a bribe at every check-post, or pay a single bribe to an agent at the starting city. However the contract with the agent tends to be very

²⁶See Bertrand et al. (2006, 2008), Roseen (1984).

simple – the amount of the single bribe does not depend on the load carried by the truck – probably because of the same lack of transparency. This means that only the most overloaded trucks pay the fixed bribe, and the shape of the total bribe paid as a function of the truck’s load is concave, whereas theory suggests that the optimal penalty function ought to be convex.

A third issue also came up earlier. We speculated that a lot of the drivers who try to get a licence without paying an agent probably do not know the rules of the game. This happens because corruption is meant to be secret. In other words, understanding the process by which the real rules of the game become (or fail to become) common knowledge between the bureaucrat and the applicants should be an integral part of the study of corruption.

Bertrand, Hanna and Mullainathan (2007) actually gather data about what individuals who are trying to obtain a drivers’ license know about the licensing process. They find that not much is known, and more surprisingly, many applicants believe the official process is more onerous than it actually is. They also found in their qualitative work that discovering the actual rules was surprisingly difficult given that they change periodically.

This leads to them speculate whether the bureaucrats deliberately try to make the rules more complicated than they need have been in order to extract more in rents. Antonassova, Bertrand and Mullainathan (2008) find that individuals who are supposed to receive subsidized allocations of food-grains in India are mis-informed about their exact entitlements and the qualitative evidence in this case suggests that the shopkeeper often manufactures “rules” that increase the scope for his corruption, such as that all grain must be bought on one of two days.

Thinking about this issue leads us to an interesting theoretical possibility: Is it the possible that the government’s attempts to change the rules, perhaps in order to fight corruption, generates so much confusion among the citizens that corruption actually goes up?

6.3 Learning among bureaucrats

The emphasis on learning brings up another important issue: While much of the work in the field has focused on innovations in fighting corruption, there has been little focus on the innovations in corruption. A change in policy/institutions may reduce the prevalence of corruption to start with, but over time, the bureaucrat may learn how to adapt to the new policy or institutions. For example, Camacho and Conover (2008) provide evidence that individuals were better able to game for the eligibility rules for social welfare programs in Colombia as rules for eligibility became more known over time. More generally, how much of the knowledge regarding how to conduct corruption is general knowledge, versus knowledge to a specific institution?

6.4 Reintroducing distributional concerns: Understanding extortion

Our assumption that the government maximizes total social welfare, ignoring the distribution of welfare between the beneficiaries and the bureaucrats is clearly wrong in many instances. One obvious example is tax collection: Tax collection is all about who pays. In such cases, the government might prefer an inefficient outcome because it achieves distributional outcomes better and may therefore create a more complex set of trade-offs than are permitted here.

Relatedly the fact that the outside options in our model are set up to allow people to walk away from getting the slot is also potentially problematic, especially because it says that the outside option does not vary by type. Think of a tax collection example: suppose you are trying to get a tax exempt certificate because you have no money. Then an undeserving tax-payer (a type L) who actually can afford to pay the taxes does have the option to walk away: If he does not have the certificate he can always pay the taxes and be done with it. The deserving tax payer (the type H) on the other hand, cannot pay the taxes and as a result if he tries to walk away from trying to get the certificate he is risking ending up in jail. His outside option is worse than that of the type L .

More generally, our assumption about outside options limits the possibility of extortion. However it has long been recognized that one reason many government functions cannot be privatized is because they open up possibilities of extortion. We need framework that can help us think better about these issues.

6.5 Screening on multiple dimensions

The assumption we make in our framework that there is only one dimension of asymmetric information is also very restrictive: The bureaucrat may want to know about both the beneficiary's type (because misallocation is punished) and his ability to pay (because he wants to make the more money) and they may not be perfectly correlated. A very simple example of what can happen in such cases is worked out in Banerjee (1997) but the general multi-dimensional screening case is not well-understood.

6.6 Modelling corruption

Our framework also embodies one very specific view of why there is corruption in equilibrium: it comes off the fact that the cost of violating rules varies across bureaucrats. However, as discussed at some length in Tirole (1986), there are others. For example the government may recognize that in some states of the world the bureaucrat and his clients are in position to cut a profitable private deal that the government would like to prevent, but lacks the information to be able to do so. Why not then simply recognize that the deal will happen and make it legal? One possible answer is that there many other states of the world where the same deal would be available but in these other states of the world the government is in a position to detect such behavior and prosecute the

bureaucrat and thereby prevent the transactions. However if the courts cannot distinguish between these states of the world where these private transactions are proscribed and the other states of the world where there are not, the bureaucrat could always claim that the transaction was allowed and get away with it. By banning all transactions between the bureaucrat and his client, the government is creating the possibility that the rules will be violated from time to time, but gaining in terms of being able to prosecute the bureaucrat if he goes too far.

6.7 Norms of Corruption

The idea that the rules may be important in establishing a simple norm that the courts can easily interpret, suggests a further thought. Perhaps the rules that the government makes for bureaucrats has a signalling role: The bureaucrat or the citizen uses them to infer the society's preferences and therefore to figure out what they should and should not do. If the government formally allows its bureaucrats to extort money from its citizens, the citizens might take this as a signal that the moral standards of society are low, and therefore feel comfortable in extorting others. This could explain why governments continue to have rules on their books that are violated all the time.

On the other hand, a government that has rules on the books but does not manage to enforce them is also signalling something about its view of rules and rule-governed behavior that might spill over into other walks of life. For this reason and others, corruption may have a direct social cost, which is something our model does not take into account.

6.8 The social psychology of corruption

To fully understand how corruption (or lack of corruption) becomes the norm, there is a need to try to understand the psychology of when and where people feel more or less comfortable about engaging in corruption. For example, we often observe that there is a tendency to try to legitimize corruption. This could take the form of "excuse making," i.e. the bureaucrat not directly asking for a bribe, but instead discussing the costs of his or her time in providing a service to a citizen. Or alternatively, the citizen may suggest making a payment in kind, rather than a monetary bribe, to make the bureaucrat feel as if he or she is simply accepting a gift from a happy citizen, rather than engaging in an illegal act.

The concept of legitimization may be powerful part of our understanding why there is not as much corruption in the world as there could be. For example, even in the most corrupt countries, empirical antidotes suggest that the bureaucrats will often ask for a bribe to break a rule that goes against a given citizen, but will not threaten to punish him no reason. For example, traffic policemen often ask for a bribe if a citizen has committed a violation. However, they will not necessarily ask for a bribe if the person as done nothing wrong and yet it is not clear that the enforcement in these two cases is very different. Locating

the study of corruption in the broader context of how people relate to each other and to the state, may be very important in really getting a handle on why corruption exists in some settings, but not others.

7 Bibliography

References

- [1] Acemoglu, Daron and Thierry Verdier, "The Choice between Market Failures and Corruption", *American Economic Review*, March, 90 (2000), 194-211.
- [2] Atanassova, Antonia, Marianne Bertrand, and Sendhil Mullainathan, "Misclassification in Targeted Programs: A Study of the Targeted Public Distribution System in Karnataka, India, (2008), mimeo.
- [3] Adsera, Alicia, Boix, Carles, and Payne, Mark, "Are You Being Served? Political Accountability and the Quality of Government," *The Journal of Law, Economics, and Organization*, 19 (2003), 445-490.
- [4] Banerjee, Abhijit, "A Theory of Mis-governance." *Quarterly Journal of Economics*, 112 (1997), 1289-1332.
- [5] Banerjee, Abhijit, "The Uses of Economic Theory: Against a Purely Positive Interpretation of Game Theoretic Results", mimeo, MIT (2002).
- [6] Banerjee, Abhijit, Dilip Mookherjee, Kaivan Munshi and Debraj Ray, "Inequality, Control Rights and Rent-Seeking: Sugar Cooperatives In Maharashtra", *Journal of Political Economy*, 109 (2001), Feb., pp. 138-190.
- [7] Banerjee, Abhijit, Angus Deaton, and Esther Duflo, "Health Care Delivery in Rural Rajasthan, *Economic and Political Weekly*, 39 (2004), 944-949.
- [8] Banerjee, Abhijit, Esther Duflo and Rachel Glennerster, "Putting Band Aid on a Corpse: Incentives for Nurses in the Indian Public Health Care System," *Journal of the European Economic Association*, 6 (2007), 487-500.
- [9] Banerjee, Abhijit, Rukmini Banerjee, Esther Duflo, Rachel Glennerster, Stuti Khemani, "Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in India", mimeo, MIT (2008).
- [10] Bardhan, P., "Corruption and development: A review of issues," *Journal of Economic Literature*, 35 (1997), 1320-1346.
- [11] Bardhan, P. and D. Mookherjee. "Corruption and Decentralization of Infrastructure Delivery in Developing Countries," *Economic Journal*, 116, Jan 2006, 107-133.

- [12] Barron, Patrick, and Benjamin A. Olken, “The Simple Economics of Extortion: Evidence from Trucking in Aceh”, *NBER Working Paper*, 13145, (2007).
- [13] Bertrand, Marianne, Simeon Djankov, Rema Hanna and Sendhil Mulainathan, “Corruption in the Driving Licensing Process in Delhi,” *Economic and Political Weekly*, February 2, 2008, 71-76.
- [14] Bertrand, Marianne, Simeon Djankov, Rema Hanna and Sendhil Mulainathan, “Obtaining a Driving License in India: An Experimental Approach to Studying Corruption,” *The Quarterly Journal of Economics*, 2007, 122 (2007), 1639-1676.
- [15] Besley, Timothy, Rohini Pande, and Vijayendra Rao, “Participatory Democracy in Action: Survey Evidence from India,” *The Journal of the European Economics Association*, 3 (2005), 648-657.
- [16] Bjorkman. M. and Svensson J., ”Power to the People: Evidence from a Randomized Field Experiment of Community-Based Monitoring in Uganda”, *Quarterly Journal of Economics*, forth-coming.
- [17] Camacho, Adriana and Conover, Emily, *Manipulation of Social Program Eligibility: Detection, Explanations, and Consequences for Empirical Research*, (2008), Working Paper.
- [18] Chawla, Rajeev, “Bhoomi: Online Delivery of Land Titles in Karnataka, India,” Case study (2001), *World Bank*.
- [19] Di Tella, Rafael, and Ernesto Schargrotsky, “The Role of Wages and Auditing During a Crackdown on Corruption in the City Buenos Aires.” *Journal of Law and Economics* 46 (2003), 269-300.
- [20] Di Tella, Rafael, and Federico Weinschelbaum, “Choosing Agents and Monitoring Consumption: A Note on Wealth as a Corruption-Controlling Device,” NBER Working Papers 13163, (2007).
- [21] Duflo, Esther, Rema Hanna, and Stephan Ryan, “Incentives Matter: Getting Teachers to Come to School, “ (2008), mimeo.
- [22] Duggan, Mark, and Steven D. Levitt, “Winning Isn’t Everything: Corruption in Sumo Wrestling.” *American Economic Review*, 92 (2002), 1594-1605.
- [23] Fisman, Raymond, and Edward Miguel, “Corruption, Norms, and Legal Enforcement: Evidence from Diplomatic Parking Tickets”, *Journal of Political Economy*, 115 (2007), 1020-1048.
- [24] Fisman, Raymond, and Shang-JinWei. 2004. “Tax Rates and Tax Evasion: Imports in China.” *Journal of Political Economy*, 112 (2004), 471–496.

- [25] Fisman, Raymond, and Gatti, Roberta, "Decentralization and Corruption: Evidence across Countries," *Journal of Public Economics*, 83 (2002), 325-345.
- [26] Fredriksson, P. and J. Svensson, "Political Instability, Corruption and Policy Form," *Journal of Public Economics*, 87 (2003), 1383-1405.
- [27] Guriev, Sergei, "Red-tape and Corruption", *Journal of Development Economics*, 73 (2004), 489-504.
- [28] Guth, Werner, Rolf Schmittberger, and Bernd Schwarze (1982) "An Experimental Analysis of Ultimatum Bargaining," textquotedblright , *Journal of Economic Behavior and Organization*, 3:4 (December), 367-388.
- [29] Hines, James, "Forbidden Payment: Foreign Bribery and American Business after 1977," *NBER Working Paper* No. 5266, September 1995.
- [30] Holmstrom, B. and P. Milgrom, "Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design," *Journal of Law, Economics and Organization* (1991) v. 57, 25-52.
- [31] Hsieh, Chang-Tai and Enrico Moretti, "Did Iraq Cheat the United Nations? Under-pricing, Bribes, and the Oil for Food Program." *Quarterly Journal of Economics* 121 (2006), 1211-1248.
- [32] Hunt Jennifer, "How corruption hits people when they are down." *Journal of Development Economics*, 84 (2007), 574-589.
- [33] Huntington, Samuel, "
- [34] Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi, "Governance Matters III: Governance Indicators for 1996, 1998, 2000, and 2002". *World Bank Economic Review*, 18 (2004), 253-287.
- [35] Klitgaard, Robert, *Controlling Corruption*, University of California Press (1988).
- [36] Knack, Stephen and Philip Keefer, "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures." *Economics & Politics* 7, (1995), 207-227.
- [37] LaPorta, Raphael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, "The Quality of Government." *Journal of Law, Economics, and Organizations*, 15 (1999), 222 - 279.
- [38] Mauro, Paolo. "Corruption and Growth," *The Quarterly Journal of Economics*, 110, (1995), 681-712.
- [39] Mocan, Naci, "What Determines Corruption? International Evidence from Micro Data," *Economic Inquiry*, 46 (2008), 493-510.

- [40] Olken, Benjamin, "Monitoring Corruption: Evidence from a Field Experiment in Indonesia" *Journal of Political Economy*, 115 (2007), 200-249.
- [41] Olken, Benjamin, "Corruption and the Costs of Redistribution: Micro Evidence from Indonesia" *Journal of Public Economics*, 90 (2006), 853-870.
- [42] Pande, Rohini, "Understanding Political Corruption in Low Income Countries." *Handbook of Development Economics*, 4 (2007), 3155-3184.
- [43] Persson, Torsten, Guido Tabellini, and Francesco Trebbi, "Electoral Rules and Corruption." *Journal of the European Economic Association* 1, 4 (2003), 958-989.
- [44] Rauch, James E. and Evans, Peter B., "Bureaucratic structure and bureaucratic performance in less developed countries," *Journal of Public Economics*, 75(2000), 49-71.
- [45] Reinikka, Ritva and Jakob Svensson, "The Power of Information: Evidence from a Newspaper Campaign in Uganda," *Journal of the European Economic Association*, 3 (2005), 259-267.
- [46] Rose Ackerman, S. *Corruption: A Study in Political Economy*. Academic Press, State New York (1978).
- [47] Rose-Ackerman, S., *Corruption and Government*. Cambridge University Press, Cambridge, UK, (1999).
- [48] Rosenm, Keith, "Brazil's legal culture: The Jieto Revisited," *Florida International Law Journal*, 1 (1984), 1-43.
- [49] Shleifer, A. and R. Vishny, "Corruption", *Quarterly Journal of Economics*, 108 (1993), 599-617.
- [50] Sheifer, A. and R. Vishny, "Politicians and Firms", *Quarterly Journal of Economics*, 109 (1994)
- [51] Svensson, Jakob, "Who Must Pay Bribes and How Much? Evidence from a Cross-Section of Firms." *Quarterly Journal of Economics*, CXVIII, (2003), 207-230.
- [52] Svensson Jakob, "Eight Questions about Corruption." *Journal of Economic Perspectives*, 19 (2005), 19-42.
- [53] Thaler R., 1988, "The Ultimatum Game," " *Journal of Economic Perspectives*.
- [54] Treisman, Daniel, "The causes of corruption." *Journal of Public Economics*, 76 (2000), 399-457
- [55] Tran, Anh, "Can procurement auctions reduce corruption? Evidence from the Internal Records of a Bribe Paying Firm," (2008), Mimeo.

- [56] Transparency International Corruption Perceptions Index, (2008).
- [57] Wade, R., "The system of administrative and political corruption: Canal irrigation in south India." *Journal of Development Studies*, 18 (1982), 287–327.