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Uncertainty, Entrepreneurship and the Organisation of Corruption*

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Abstract

We develop a model of occupational choice in which private agents have the option of either working in some costless, but low-yielding, activity (subsistence production), or undertaking a costly, but potentially more rewarding, venture (entrepreneurship). In the case of the latter, loans must be acquired from financial intermediaries and licenses must be obtained from public officials. Associated with these tasks are two potential sources of imperfection - an imperfection in financial markets due to asymmetric information and an imperfection in governance due to rent-seeking. Rent-seeking is risky because of a random probability that it will be detected and punished. Against this background, we show how corruption has different effects depending on the way that it is practised: in the case of disorganised corruption, bribe payments are uncertain and capital market imperfections are allowed to surface; in the case of organised corruption both of these features are removed. The implication is that, in terms of deterring entrepreneurial activity, organised corruption is likely to be the lesser of the two evils, even if bribe demands are higher in this case. This result may be used to explain the puzzle of why corruption appears to be much less damaging in some countries than in others.

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1 Introduction

It is now widely acknowledged that corruption is one of the most threatening, resilient and pervasive obstacles to economic and social development.[1] The fact that the most deprived countries of the world are often the most corrupt, and that this has been true for many years, is seen as being more than just a coincidence and evokes alarm that such countries have become trapped in a vicious circle of widespread poverty and wholesale misgovernance. There is considerable evidence to support these concerns, with numerous empirical studies identifying significant negative effects of corruption on growth (e.g., Gyimah-Brempong 2002; Keefer and Knack 1997; Knack and Keefer 1995; Li *et al.* 2000; Mauro 1995; Mo 2001; Sachs and Warner 1997), and numerous others indicating the reverse causation from growth to corruption (e.g., Ades and Di Tella 1999; Fisman and Gatti 2002; Frechette 2001; Montinola and Jackman 1999; Paldam 2002; Rauch and Evans 2000; Treisman 2000). There is also a fair amount of theoretical research which seeks to explain this evidence, together with addressing various other issues relating to the macroeconomics of migovernance (e.g., Acemoglu amd Verdier 1998, 2000; Blackburn et al. 2006, 2010; Blackburn and Forgues-Puccio 2007, 2009, 2010; Blackburn and Sarmah 2008; Ehrlich and Lui 1999; Rivera-Batiz 2001; Sarte 2000). Given all of this, it is not surprising that corruption has become a major (if not the foremost) topic of debate on the international development agenda.[2]

In spite of the above, there are reasons to be cautious about the strong condemnation of corruption as being a major impediment to growth. Whilst many countries have undoubtedly suffered considerably, others appear to have coped well - in some cases, extremely well - with the problem. The most striking examples form the basis of what Wedeman (2002a) has termed the "East Asian paradox". This paradox relates to countries such as China, Indonesia, South Korea and Thailand, all of which have displayed exceptional growth records despite their notoriety as having thriving corruption cultures. A similar puzzle is posed by some developed countries as well (most notably, Italy). Such observations suggest that the relationship between corruption

[1] The most commonly-used definition of corruption (to which we adhere in this paper) is the abuse of power by public officials for personal gain.

[2] For an appreciation of this, see the wealth of material devoted to the issue on the websites of the World Bank (www.worldbank.org/publicsector/anticorrupt), the IMF (www.imf.org/external/np/exp/facts/gov.htm), and the United Nations (www.unodc.org/unodc/en/corruption.htm/). For broad surveys of the literature on corruption, see Bardhan (1997), Jain (2001), Rose-Ackerman (1999) and Tanzi (1998). And for an up-to-date review of the empirical evidence on corruption, see Lambsdorff (2005).

and growth can be fairly tenuous in some cases, and it would appear that there is rather more to this relationship than at first meets the eye. What could account for these observations? Why do some countries seem so much more able to live with misgovernance than others? How might one explain the "East Asian paradox"?[3]

This paper aims to provide an answer to the above questions by appealing to the industrial organisation theory of corruption. The seminal contribution in this area is credited to Shleifer and Vishny (1993) who argued as follows. Suppose that, in order to conduct business, individuals must acquire various types of governmental good (licenses, permits, certificates, etc.) that are complements to each other and that are provided by different government agencies or departments. Under such circumstances, the extent to which public officials are organised in their extraction of bribes can have an important influence on the consequences of bribery. In the case of disorganised (or non-coordinated) rent-seeking, each bureaucrat acts as an independent monopolist, supplying his own governmental good in exchange for a bribe which he chooses so as to maximise his own illegal income without taking into account the negative externality that this imposes on the demand for other governmental goods and the bribe-taking capacity of other bureaucrats. By contrast, in the case of organised (or coordinated) rent-seeking, bureaucrats act together as a joint monopoly, choosing bribe payments that maximise their total illegal income whilst internalising any externalities. The implication is that the level of bribes will be lower, the provision of governmental goods will be greater and the scale of distortions will be smaller when corruption is organised than when it is disorganised.[4]

The foregoing argument is well-established and is typically what one thinks of when referring to the industrial organisation theory of corruption.

[3] Aside from the East Asian experience, there is other evidence which may be seen as casting doubt on the robustness of the relationship between growth and corruption. Thus several authors have argued that the relationship is contingent on a number of country-specific factors, such as the degree of financial openness, the quality of institutions and the way in which corruption practised (e.g., Aidt et al. 2008; Neeman *et al.* 2006; Svensson 2005). The present paper is concerned with the last of these factors.

[4] As also indicated by Shleifer and Vishny (1993), it is possible to obtain the opposite result if governmental goods are substitutes for each other, or if the same governmental good is provided by more than one bureaucrat. In this case competition between bureaucrats in the absence of collusion could drive down the level of bribes relative to the monopoly outcome in the presence of collusion. As noted by others, however, the conditions for ensuring a competitive equilibrium (such as zero search costs for individuals in their acquisition of information about bribe payments, and zero capacity constraints on bureaucrats in their supply of governmental goods) are fairly stringent and not obviously satisfied in practice (e.g., Bose 2004).

But there is another aspect to this theory which merits equal attention. It is often claimed that an inevitable consequence of corruption is the creation of uncertainty. Perpetrators of corrupt practices have good cause for concealing their intentions and shrouding their behaviour in secrecy. The same individuals may, themselves, be unsure of the likelihood of being monitored and apprehended. Illicit deals and agreements are inherently risky because they lack the enforceability of legally-binding contracts. And free-entry into the rent-seeking sector can make bribe demands erratic and unpredictable. For these and other reasons, corruption is seen as introducing arbitrariness and randomness into the costs of doing business. Such considerations have been the focus of several empirical studies which suggest that corruption-induced uncertainty has significant positive effects on bargaining frictions in the bribe negotiating process (e.g., Fisman and Gatti 2006), and significant negative effects on rates of investment, including foreign direct investment (e.g., Campos *et al.* 1999; Wei 1997). An implication of these findings is that institutional structures under which corruption is more predictable are likely to be less harmful to efficiency and growth. One would imagine that this is the case under more organised bureaucracies which eliminate (or alleviate) the need for individuals to engage in a myriad of separate bi-lateral negotiations with different public officials. Thus an individual's total bribe payment may be more transparent and predictable when it is decided and received by a single consortium of bureaucrats pursuing a common objective than when it is the sum of independent payments made to a number of bureaucrats acting on their own. In the case of the former the size of bribe payment may be well-known in advance and only one such payment may be needed in order to acquire the requisite number of licenses. In the case of the latter the amount and frequency of kickbacks may be much less clear and the payment of one in exchange for a license may be no guarantee that other licenses will be obtained. Additionally, as Shleifer and Vishny (1993) point out, a joint monopoly of bureaucrats would have an incentive to limit the number of entrants into rent-seeking activity, thereby assuring individuals that they will not be surprised by the approach of new bribe-demanders. Whatever the reason, there is a strong presumption that the more organised is corruption the less is the uncertainty that it generates and the less is the damage that it inflicts.

The issues to which we have alluded are particularly relevant in the context of the East Asian experience. As noted by others (e.g., Hutchcroft 1994, 2000; Khan 1998, 2000; Lee 1995, 2000; Rock 1999, 2000; Wedeman 2002b), this region appears to be divided into three distinct groups of countries: the first - comprising Hong Kong, Malaysia and Singapore - are the low-corruption and high-growth economies in which corrupt practices have been

curbed by strong autonomous states; the second - consisting of the Philippines and South Asia - are the high-corruption and low-growth economies in which disorganised corrupt behaviour has flourished; and the third - consisting of China, Indonesia, South Korea and Thailand - are the high-corruption and high-growth economies in which organised corrupt activity has thrived. This empirical taxonomy accords well with the hypothesis that the effects of corruption depend on the type of corruption regime: in particular, the effects are less harmful when the regime is more organised, more centralised and more predictable.[5]

Why different corruption regimes exist is an interesting question which may well find an answer in the particular cultures, ideologies and institutions of countries. In China, for example, whilst corrupt dealings by individuals for the benefit of themselves are resented by most people, collective acts of corruption incur much less hostility (e.g., Hung 2007).[6] Gift exchange is a major social norm in Chinese bureaucracies and business transactions: bribes and other forms of kickback are routinely offered, accepted and reciprocated with appropriate favours of one type or another. Within the bureaucracy, itself, it is normal practice for subordinate officials to share their illegal income with superiors in return for obtaining tacit approval to engage in rent-seeking. Working together, bureaucrats establish an agreed, predictable pattern of rent extraction which is enforced through vigorous monitoring and which gives assurance to bribe payers that they will not be faced with unexpected bribe demands. These behavioural customs foster a collective acceptance of corruption and a common determination to sustain it. But gift exchange is not the only factor at work and nor is it unique to China: it occurs in many other developing countries as well. Another important factor that is distnctly more Chinese is the traditional affiliation of individuals to special work units, or *danwei*, that enforce a variety of group norms to influence member behaviour, with the threat of reprimands and possible expulsion should these norms be violated.[7] Such group conformance can reduce individuals' inclination to report illegitimate activities and may cultivate a collective rationalisation of

[5] There is even evidence to suggest that the correlation between corruption and investment, whilst being negative in most small developing countries, is actually positive for those large East Asian economies that have centralised corruption networks (e.g., Rock and Bonnet 2004).

[6] There are essentially three meanings of corruption in China - *tanwu* (the misappropriation of public property through embezzlement), *shouhui* (the extortion and acceptance of bribes) and *tequan* (the seeking of privileges and favours).

[7] At one time, the influence of *danwei* was so strong that individuals often needed official authorisation or approval from their work units before they could even marry or apply for a passport. Whilst the recent introduction of new laws (in 2002 and 2003) has meant that this is no longer true, the tie of employees to their *danwei* is still very strong.

these activities as being socially acceptable or justifiable. In addition, to the extent that collective malpractice entails collective effort, there may be a willingess to tolerate it, sanction it and protect it (e.g., Grieger 2005). The role of *danwei* in fostering organised illicit behaviour is evidenced further by the existence of numerous off-book accounts kept by government agencies. These secret slush funds, or *xiaojinku*, are seen as a form of collusive corruption, being set up by work units to finance unauthorised or illegitimate expenditures for the benefit of the unit as a whole (e.g., Hung 2007; Wedeman 2000). Billions of yuan have been uncovered in these accounts, and billions more are probably still undetected. These and other observations suggest that corruption in China is a well-organised activity based on a strong degree of cohesion and cooperation amongst rent-seeking public officials (e.g., Lu 2000).[8]

Since the original contribution by Shleifer and Vishny (1993), theoretical research on the organisation of corruption has not progressed by very much. Of the research that exists, Ehrlich and Lui (1999) are acknowledged as providing the first macroeconomic analysis of the issue in a model of growth based on occupational choice. The focus of that analysis is on the way in which opportunities to profit from bureaucratic malpractice create incentives for individuals to devote less resources towards growth-promoting activities (investments in human capital) and more resources towards power-seeking activities (investments in political capital).[9] Within this context, it is shown how growth may be higher in the case of a centralised bureaucracy (whereby bureaucrats act as a joint monopolist) than in the case of a decentralised bureaucracy (whereby bureaucrats compete over relative personal power). More recently, Celentani and Ganuza (2002) develop a game-theoretic model in which one group of agents (a constituency) appoints another group of agents (bureaucrats) to ensure some prescribed level, or quality, of activity (e.g., production) on the part of a third group of agents (providers). In return for bribes bureaucrats allow providers to engage in sub-standard activity, to which the constituency responds by prescribing lower levels of activity which reduce the gains from corruption. Against this background, it is shown how an organised syndicate of corrupt public officials would maximise its illegal income by limiting the number of corrupt transactions, implying a lower inci-

[8]Shleifer and Vishny (1993) draw the same conclusion about the recent history of corruption in South Korea. Likewise, Kuncoro (2006) describes how corruption under the Soeharto regime in Indonesia was carefully organised and controlled by the first family and military leadership, and was generally accepted by businesses because of its predictability and also its protection against harrassment from lower level bureaucrats.

[9]In a static context, other authors have attended to similar considerations regarding the misallocation of talent (e.g., Murphy *et al.* 1991, 1993).

dence of corruption and a higher quality of activity than in the case of disorganised rent-seeking. Finally, Blackburn and Forgues-Puccio (2009) present a model of growth in which firms pay bribes to bureaucrats in exchange for licenses to undertake research and development. When bribe-taking is organised, bureaucrats take account of the fact that raising their bribe demands reduces the bribe base by reducing the number of firms that enter the research sector. This leads to a lower level of bribes, a higher level of research activity and a higher rate of growth than in the case where bureaucrats act independently and ignore the externality effects of their actions.

In the analysis that follows we explore further the idea that the effects of corruption depend on the way in which corruption is practised. As in Blackburn and Forgues-Puccio (2009), our focus is on the role of rent-seeking in entry regulation and the costs of doing business. The framework we use is a model of occupational choice in which private individuals decide on whether or not to engage in entrepreneurial activity, for which various licenses must be obtained from public officials. These licenses are complementary in the sense that all of them must be procured - otherwise, entrepreneurship is not an available option. All officials are corrupt and each one of them exploits his monopoly over the issue of a license by demanding a bribe in exchange for it. We study the implications of this when bureaucrats act either individualistically (disorganised corruption) or collectively (organised corruption).

A key feature of our analysis is the treatment of uncertainty that may arise as a result of corrupt behaviour. Bribe-taking in entry regulation may be viewed as acting like a tax on business activity. Unlike other forms of taxation, however, the costs to individuals are often unpredictable for various reasons alluded to earlier. Although much has been written about this, there remains very little by way of formal theoretical investigation that would lend rigour and precision to the arguments involved. In addition, the investigations that do exist, whilst yielding some insights, tend to be rather stylised in their modelling of corruption-induced uncertainty and do not delve very deeply into the primitive causes of such uncertainty (e.g., Djumashev 2007; Wei 1997).[10] Our intention is to provide a more detailed account of events which also enables us to study how the degree of uncertainty might be contingent on the type of corruption regime. We do this by considering the case in which perpetrators of corrupt practices face a random probability of being caught which depends on both their own individual actions and the joint actions of them all. This leads to an optimal bribe payment that may

[10]Essentially, the uncertainty is modelled by simply assuming that rent extraction is a random variable which follows some exogenous stochastic process.

or not be random according to the extent to which bureaucrats coordinate their rent-seeking.

A further distinguishing feature of our analysis is the role played by financial markets in providing a channel through which corruption may take effect. The extra costs of doing business that corruption imposes can be particularly important when individuals are resources-constrained and require external finance for their operations. Under such circumstances, the need to pay bribes may mean a greater amount of borrowing, whilst uncertainty about bribes may mean a greater risk of defaulting. In either case the functioning of financial markets is likely to be important in determining the effects of corruption. For example, when these markets work imperfectly (because of informational asymmetries and/or weak powers of contract enforcement), an increase in uncertainty for lenders about the repayment of loans may lead to an increase in the cost of borrowing and/or an increase in the amount of credit rationing. We seek to incorporate some of these ideas into our analysis by considering the case in which corruption-induced uncertainty gives rise to an *ex post* informational asymmetry between lenders and borrowers, the former of whom are unable to directly observe the bribe payments of the latter. The moral hazard problem associated with this is solved through costly state verification under the terms and conditions of mutually agreeable loan contracts.

The main contribution of our analysis is to show how the effects of corruption can be different under different corruption regimes by illustrating how the degree of coordination in rent-seeking can influence the extent of corruption-induced uncertainty and the impact of capital market frictions. In the case of disorganised rent-seeking such uncertainty exists and such frictions are allowed to surface. In the case of organised rent-seeking both features disappear. The implication is that, in terms of deterring entrepreneurial activity, organised corruption is likely to be the lesser of the two evils, even if bribe demands are higher in this case. We also show that the greater is the incidence corruption when it is disorganised the more pronounced are the effects of financial market imperfections, and that the greater is the extent of these imperfections the more pronounced are the effects of corruption. These results are in accordance with the recent empirical findings of Ahlin and Pang (2008) who suggest that corruption and financial development have important interactions in the sense that the worse is either of them, the greater is the marginal benefit from an improvement in the other.

The remainder of the paper is set out as follows. In Section 2 we present a description of the model. In Section 3 we study the outcomes that transpire under disorganised corruption. In Section 4 we do the same for the case of organised corruption. In Section 5 we make a few a concluding remarks.

2 The Basic Set-up

We consider a small open economy in which there is a constant population of agents who are divided into two groups of citizens - private individuals (or households) and public officials (or bureaucrats). To save on notation, we normalise the size of each group to be a measure of unit mass. Each agent has the same risk neutral preferences and the same zero endowment of wealth. Households engage in productive activity based on a choice of project, or occupation, that gives access to a technology for generating output. For certain types of project to be undertaken and completed, loans must be acquired from financial intermediaries and licenses must be acquired from bureaucrats. There are two sources of imperfection in the economy: the first is an imperfection in capital markets due to problems of enforcement and moral hazard that influence the terms and conditions of financial contracts; the second is an imperfection in governance due to the opportunity for bureaucrats to extract bribe payments from households. The sequence of events runs as follows. Prior to any income being realised and any bribes being demanded, each household chooses an occupation so as to maximise its expected utility, given the loan contract offered by intermediaries. At the same time, intermediaries set the terms and conditions of contracts based on their expected returns from lending. Subsequently, incomes are realised, bribe demands are made, and loan repayments are called in. Our formal decription of this environment proceeds as follows.

Each household is faced with a choice between two types of production project. The first type involves the use of some basic (or traditional) technology in some routine activity that is costless. This is a subsistence occupation that requires zero capital outlay and zero effort, and that yields $s > 0$ units of output.[11] The second type entails the operation of a more advanced (or modern) technology in a venture that is more productive, but which is also costly. This is an entrepreneurial occupation that requires $I > 0$ units of capital outlay and $e > 0$ units of effort, and that yields an output of $A > s$. We assume that the amount of effort needed to operate the advanced technology depends (inversely) on an individual's technical capabilities (skills, knowledge, expertise and the like), attributes that are unimportant for subsistence production. We suppose that households are randomly endowed with these attributes, implying a distribution of e which accounts for agent heterogeneity. For simplicity, we specify e to be uniformly distributed on the interval $[0, 1]$ with probability distribution function $g(e) = 1$. Thus $\int_{e_0}^{e_1} g(\cdot)de = e_1 - e_0$

[11] The assumption that neither capital nor effort is needed to engage in this occupation can be relaxed without altering the results of the analysis. The assumption serves merely as a normalisation that saves on notation.

provides a measure of households for which $e \in (e_0, e_1)$.

In order to engage in entrepreneurial activity, a household must acquire a loan of size I as external finance for the fixed capital outlay. Loans are made by competitive financial intermediaries that have access to a perfectly elastic supply of funds at the exogenous world interest rate, r. Denoting by $R > 0$ the rate of interest on loans, an entrepreneur's debt repayment is $(1+R)I$. In addition, an entrepreneur must obtain licenses from public officials in order to conduct his business. These licenses, or permits, are complementary in the sense that all of them are required, though each one is issued separately by a different bureaucrat. In the absence of any rent-seeking, licenses are issued free of charge. In the presence of rent-seeking, licenses are granted only in exchange for the promise of bribe payments once the output of a project has been realised. We denote by $B > 0$ the total bribe payment that is extorted from an entrepreneur. This leaves $A - B$ units of output for the entrepreneur to dispose of in other ways (loan repayments and consumption). Our modelling of corruption can be likened to the case in which public officials receive kickbacks *ex post* in the form of a share of a company's profits. That such arrangements exist implies that, for one reason or another, firms find it worthwhile to adhere to their *ex ante* bribe promises. One reason might be the threat of being closed down or being denied licenses in the future if bureaucrats' demands are not met; another might be the fact that the output from a project is realised in stages, with bribe payments at one stage being a condition for progressing to the next.[12] The enforcement of illicit agreements between private and public agents is an issue worth pursuing, but it is not one that we address explicitly in the present analysis. Rather, our interest lies elsewhere, being focused on the question of how corruption might influence occupational choice and how it may do so to an extent that depends on the way in which it practised. As we shall see, one possible effect of corruption is to create uncertainty about the returns from entrepreneurship and, in doing so, to allow latent capital market imperfections (informational asymmetries) to surface.

The criteria governing a household's choice of occupation is given generically as follows. Let y denote the net return to entrepreneurship. The expected utility derived from this occupation is $E(y) - e$, whilst the utility derived from subsistence is s. It follows that entrepreneurship will be chosen if $E(y) - e \geq s$. This condition also allows us to determine the total population of entrepreneurs. Let $\widetilde{e}$ denote the value of e for which the condition

[12] A further possibility arises if one thinks of licenses as insitutional hurdles (red tape) which individuals can seek to avoid by promising the payment of bribes. Bureaucrats could then retaliate against renegers of promises by threatening to report them for running a business illegally, having failed to comply with official procedures.

holds with equality: that is,

$$\widetilde{e} = E(y) - s. \tag{1}$$

Then entrepreneurship is chosen by all households for which $e \in [0, \widetilde{e})$. The total population of entrepreneurs is therefore given by $\int_0^{\widetilde{e}} g(\cdot)de = \widetilde{e}$.

The behaviour of public officials is characterised as follows. Each one of them demands a bribe, b, from each entrepreneur, implying a potential total bribe income of $b_T = \int_0^{\widetilde{e}} bg(e)de = \widetilde{e}b$. As in other analyses, we assume that there is a cost to such behaviour, which we denote by $c > 0$ and which may be thought of as arising in a number of ways. For example, those who engage in corruption may need to spend effort and resources on arranging and concealing their illicit transactions, and may incur similar losses, or disutility, from having to alter their patterns of expenditure or dispose of their illegal income differently from legal income. They may even experience some moral shame or social stigma from abusing their privileged positions. It is plausible to imagine that these costs are higher the larger is the scale of the particular offence. We capture this by specifying the costs to be an increasing proportion of the bribe extracted from each entrepreneur. A convenient formulation is $c = b[1-\exp(-\frac{1}{\phi}b)]$, in which case a bureaucrat's net payoff, or utility, is $b_N = \int_0^{\widetilde{e}} b\exp(-\frac{1}{\phi}b)g(e)de = \widetilde{e}b\exp(-\frac{1}{\phi}b)$ $(\phi > 0)$. We also assume that each bureaucrat faces a random probability, $p \in (0,1)$, of successfully avoiding prosecution for his misdemeanours; with probability $1-p$, the bureaucrat is caught and his bribe income is confiscated. The randomness of p may be thought of as reflecting a random intensity, effectivenss and coverage of government monitoring. We further suppose that this probability is a decreasing function of a bureaucrat's own total bribe income, b_T, relative to the average bribe income of all bureaucrats, $\overline{B}$. This feature is meant to capture the idea that a bureaucrat is more likely to expose himself as being corrupt if he is more corrupt than others. With these considerations in mind, we specify $p = \pi\exp\left[-x\left(\frac{b_T}{\overline{B}}\right)\right]$ $(\pi \in (0,1))$, where x is a positively-valued random variable that is uniformly distributed on the interval $[\chi - X,\, \chi + X]$ with probability distribution function $f(x) = \frac{1}{2X}$ $(\chi, X > 0)$.[13] The value of x is realised at the time that bribes are demanded; it is unobservable to households and intermediaries when loans are made and occupations are chosen. Let z denote a bureaucrat's actual net payoff from bribery. Then $z = b_N$ with probability p and $z = 0$ with probability $1-p$. The bureaucrat's

[13] Clearly, x is always positively-valued under the parameter restriction $\chi - X > 0$. For reasons that will become clear shortly, we also assume that $\chi + X < 1$.

expected net payoff is therefore $E(z) = pb_N$, or

$$E(z) = \pi \widetilde{e} b \exp\left\{ - \left[x \left(\frac{\widetilde{e} b}{\overline{B}} \right) + \frac{1}{\phi} b \right] \right\}. \tag{2}$$

The problem that each bureaucrat solves is to choose a value of b that maximises the above expression.

Having described the basic set-up of our model economy, the remainder of our analysis is concerned with studying the implications of rent-seeking under alternative behavioural assumptions. We consider two such alternatives - disorganised (or non-coordinated) corruption and organised (or coordinated) corruption. The key difference between these is the extent to which bureaucrats take account of the externality effects of their own actions. These effects work through both $\overline{B}$ (the average bribe payment) and $\widetilde{e}$ (the number of bribe payers), variables on which a bureaucrat's expected payoff depends. The effect on $\overline{B}$ is self-evident as an increase in each bureaucrat's bribe demand raises the average value of bribes. The effect on $\widetilde{e}$, revealed in our subsequent analysis, is due to the fact that an increase in individual bribe payments raises the total bribe payment that an entrepreneur must make, leading to fewer households that choose to become entrepreneurs. We consider each of the two types of corruption regime in turn.

3 The Economy With Disorganised Corruption

By disorganised corruption, we mean the case in which each bureaucrat acts as an independent monopolist, choosing a level of bribe that maximises his own expected payoff without consideration of the aggregate implications of bribe-taking. More precisely, each bureaucrat selects a b so as to maximise $E(z)$ in (2), taking as given $\overline{B}$ and $\widetilde{e}$. The solution to this problem is stated as follows.

Proposition 1 *The optimal bribe under disorganised corruption is given by*

$$b^D = \phi(1 - x). \tag{3}$$

Proof. The first-order condition for the bureaucrat's maximisation problem is

$$- \left[x \left(\frac{\widetilde{e} b}{\overline{B}} \right) + \frac{1}{\phi} b \right] \exp\left\{ - \left[x \left(\frac{\widetilde{e} b}{\overline{B}} \right) + \frac{1}{\phi} b \right] \right\} + \exp\left\{ - \left[x \left(\frac{\widetilde{e} b}{\overline{B}} \right) + \frac{1}{\phi} b \right] \right\} = 0.$$

In equilibrium $\overline{B} = b_T = \widetilde{e}b$. Substituting this into the above condition gives the expression for b^D. ■

The result in (3) shows that a bureaucrat will choose a larger size of bribe the higher is the value of ϕ (which implies a higher net payoff from bribery) and/or the lower is the value of x (which implies a higher probability of avoiding detection).[14] Of course, since all bureaucrats end up choosing the same bribe, then $\overline{B} = \widetilde{e}b$ in equilibrium so that the probability is the same, $p = \pi \exp(-x)$, for each one of them. The key feature of (3) is the appearance of the random variable x which obviously makes the bribe random, and with this, the return to entrepreneurship. In this way, corruption creates uncertainty for households about the relative payoffs from alternative occupations. For future reference, we note that the expected value of bribe payments is $E(b^D) = \phi(1 - \int_{\chi-X}^{\chi+X} xf(x)dx) = \phi(1 - \chi)$, whilst a measure of uncertainty about them is provided by the parameter X, an increase in which implies an increase in the variance of x (corresponding to a mean-preserving spread in the distribution of this variable).[15]

A household's net return from entrepreneurship is $A - B - (1+R)I$, where B is recalled to be the total bribe payment made to all bureaucrats. Since $B = b^D$, we can re-write this expression using (3) as $A - \phi(1-x) - (1+R)I$, where we assume that $A - \phi(1 - \chi + X) > 0$ as a sufficient condition for ensuring that x is never so low as to imply a full appropriation of output by bureaucrats. If $A - \phi(1-x) \leq (1+R)I$, then an entrepreneur is unable to make his loan repayment and must declare himself bankrupt. Such a possibility complicates the design of financial contracts because of an *ex post* informational asymmetry between borrowers and lenders: only the former know how much they must actually pay in bribes when bribes are demanded; the latter cannot directly observe these payments. This creates a problem of moral hazard as an entrepreneur may seek to default on his loan repayment by claiming falsely that he is bankrupt due to a high realisation of b^D. The solution to this problem involves costly state verification, whereby a lender spends resources on investigating a borrower whenever bankruptcy is declared with the view to observing the borrower's remaining (post-bribe) income and seizing as much of this as possible (e.g., Diamond 1984; Gale and Hellwig 1985; Townsend 1979). We suppose that, due to imperfect enforcement, a lender can seize only a fraction, $\delta \in (0,1)$, of this income, being unable

[14] The parameter restriction that we alluded to earlier, $\chi + X < 1$, ensures that $b > 0$ for all x.

[15] The variance of x is simply $\frac{X^2}{3}$ which is obviously increasing in X.

to lay his hands on the remainder before the borrower consumes it.[16] The borrower's payoff when he declares bankruptucy is therefore $(1-\delta)[A-\phi(1-x)]$. Given this, then bankruptcy will be declared (either truthfully or falsely) if $(1-\delta)[A-\phi(1-x)] \geq A-\phi(1-x)-(1+R)I$, or $\delta[A-\phi(1-x)] \leq (1+R)I$. When holding with equality, this condition determines a critical value of x, denoted $\widetilde{x}$, such that loans are repaid if $x \in (\widetilde{x}, \chi+X]$ and are not repaid if $x \in [\chi-X, \widetilde{x}]$. That is,

$$\delta[A-\phi(1-\widetilde{x})] = (1+R)I. \tag{4}$$

Correspondingly, there is a critical size of bribe payment, $\widetilde{b}^D = \phi(1-\widetilde{x})$, such that loans are paid back in the event of $b^D < \widetilde{b}^D$, whilst defaulting occurs if $b^D \geq \widetilde{b}^D$. Naturally, $\widetilde{x}$ ($\widetilde{b}^D$) is increasing (decreasing) in R: *ceteris paribus*, the higher is the interest rate on loans, the smaller must be the amount of bribe payment if an entrepreneur is to be able to repay his loan and not to claim otherwise. The probability of making such a claim (i.e., declaring bankruptcy) is $\int_{\chi-X}^{\widetilde{x}} f(x)dx = \frac{\widetilde{x}-\chi+X}{2X}$. We are now in a position to write the following expression for a household's net income from entrepreneurship:

$$y = \begin{cases} A-\phi(1-x)-(1+R)I & \text{if } x \in (\widetilde{x}, \chi+X], \\ (1-\delta)[A-\phi(1-x)] & \text{if } x \in [\chi-X, \widetilde{x}]. \end{cases} \tag{5}$$

The expected income from this occupation is therefore

$$\begin{aligned} E(y) = & \int_{\widetilde{x}}^{\chi+X} [A-\phi(1-x)-(1+R)I]f(x)dx \\ & + \int_{\chi-X}^{\widetilde{x}} (1-\delta)[A-\phi(1-x)]f(x)dx \end{aligned} \tag{6}$$

Financial intermediaries make loans to households in the knowledge that bankruptcy may be declared. If so, then households' proclamations are verified and intermediaries appropriate whatever income they can, less the costs of verification. We denote this cost by $k > 0$ which may be interpreted as a measure of the extent of capital market imperfections.[17] It follows that, if

[16] This other source of capital market imperfection may be seen as providing a motivation for entrepreneurs to honour their promises to pay bribes. For example, if the penalty for reneging is the closing down of business, then an entrepreneur is always better off by paying a bribe and retaining a fraction of output for himself, even in the event of bankruptcy.

[17] As in some other analyses (e.g., Agenor and Aizenman 1998a,b; Aizenman and Powell 2003; Gertler and Gilchrist 1993), one could think of k as also reflecting costs of enforcement if lenders need to spend resources on seizing the incomes of defaulters.

bankruptcy is declared (i.e., if $x \in [\chi - X, \widetilde{x}]$), an intermediary's net return from lending is $\delta[A - \phi(1-x)] - k$. Conversely, if bankruptcy is not declared (i.e., if $x \in (\widetilde{x}, \chi + X]$), the intermediary is paid back in full, earning a return of $(1+R)I$. Competition between intermediaries drives their expected profits to zero. Since the cost of borrowing is $(1+r)I$, this break-even condition is given by

$$(1+r)I = \int_{\widetilde{x}}^{\chi+X} (1+R)If(x)dx + \int_{\chi-X}^{\widetilde{x}} \{\delta[A - \phi(1-x)] - k\}f(x)dx. \quad (7)$$

For any given $\widetilde{x}$, this expression determines the contractual interest rate on loans, R. We may write the expression in a different way by combining it with (4) to obtain

$$\begin{aligned}(1+R)I - (1+r)I = &\int_{\chi-X}^{\widetilde{x}} \delta[A - \phi(1-\widetilde{x})]f(x)dx \\ &- \int_{\chi-X}^{\widetilde{x}} \{\delta[A - \phi(1-x)] - k\}f(x)dx \quad (8)\end{aligned}$$

This shows the interest rate spread between lending and borrowing.[18] The size of spread depends on how much a lender expects to lose when a borrower claims that he is bankrupt and defaults on his loan (i.e., when $x \in [\chi - X, \widetilde{x}]$). To be sure, observe from (4) that the first integral term on the right-hand-side of (8) is equal to $\int_{\chi-X}^{\widetilde{x}} (1+R)If(\cdot)dx$ which measures the expected amount of non-repayment when bankruptcy is declared. Conversely, the second integral term on the right-hand-side of (8) gives the expected amount of income that is seized from a defaulter, net of verification costs. Accordingly, (8) implies that the contractual interest rate is set as a simple mark-up over intermediaries' cost of borrowing, where the size of mark-up is equal to the expected net income lost due to non-repayment of loans. This mark-up rule may be simplified to

$$(1+R)I = (1+r)I + \frac{\delta\phi(\widetilde{x} - \chi + X)^2}{4X} + \left(\frac{\widetilde{x} - \chi + X}{2X}\right)k \quad (9)$$

As above, there is a positive relationship between R and $\widetilde{x}$: *ceteris paribus*, intermediaries set a higher contractual interest rate the more likely it is that

[18] Results of this sort are fairly standard for the type of uncertain financial environment that we are considering (e.g., Agenor and Aizenman 1998a,b; Aizenman and Powell 2003; Azariadis and Chakraborty 1999).

bankruptcy will be declared. The term $\left(\frac{\widetilde{x}-\chi+X}{2X}\right)k$ is the expected verification cost of intermediaries. Naturally, this increases with the probability of defaulting, $\left(\frac{\widetilde{x}-\chi+X}{2X}\right)$, and the actual cost, k, that would be incurred if such an event.occur.

The expressions in (4) and (9) define a simultaneous equations system in $\widetilde{x}$ and R. An analysis of this system leads to the following result.

Lemma 1 *Given that* $(1+r)I+k \leq \delta[A-\phi(1-\chi)] \leq (1+r)I+\delta\phi X$*, there exists a unique* $\widetilde{x} \in [\chi - X, \chi + X]$ *and a unique* $R > r$ *that solve (4) and (9). The expression for* $\widetilde{x}$ *is*

$$\widetilde{x} = \chi + X - \frac{k}{\delta\phi} - \frac{\sqrt{4X\delta\phi\{\delta[A-\phi(1-\chi)]-(1+r)I-k\}+k^2}}{\delta\phi} \qquad (10)$$

Proof. Combining (4) and (9) yields the quadratic equation

$$\begin{aligned} 0 = {} & \delta\phi\widetilde{x}^2 - 2[\delta\phi(\chi+X)-k]\widetilde{x} \\ & - [4X\delta(A-\phi) - \delta\phi(\chi-X)^2 - 4X(1+r)I + 2(\chi-X)k] \end{aligned}$$

Hence $\widetilde{x} = \chi+X-\frac{k}{\delta\phi} \pm \frac{\sqrt{\cdot}}{\delta\phi}$, where $\sqrt{\cdot}$ is given in (10). A sufficient condition for ruling out complex roots is $\delta[A-\phi(1-\chi)] \geq (1+r)I+k$. Given this, together with the fact that $\widetilde{x} \leq \chi+X$, the only possible solution for $\widetilde{x}$ is when $\frac{\sqrt{\cdot}}{\delta\phi}$ enters negatively. Under the further restriction $\delta[A-\phi(1-\chi)] \leq (1+r)I+\delta\phi X$, then $\widetilde{x} \geq \chi - X$ is ensured as well. Since the solution for $\widetilde{x}$ is unique, so too is the solution for R. ■

Two important parameters on which $\widetilde{x}$ and R depend are X and k. As indicated earlier, the former - which determines the spread of the distribution of x - provides a measure of uncertainty about bribe payments, whilst the latter - which is the cost of verification incurred by intermediaries - acts as an indicator of capital market frictions. The effects of these are established in our next result.

Proposition 2 *Under disorganised corruption, the greater is the degree of uncertainty about bribe payments and/or the greater is the extent of capital market imperfections, the higher is the contractual interest rate on loans and the higher is the probability of defaulting on loans.*

Proof. Given $\widetilde{x}$ in (10), the contractual interest rate, R, can be determined from (4), whilst the probability of defaulting is given by $\frac{\widetilde{x}-\chi+X}{2X}$. Under the

conditions given in Lemma 1, $\frac{\partial \widetilde{x}}{\partial X} > 0$ and $\frac{\partial \widetilde{x}}{\partial k} > 0$. It follows that both R and $\frac{\widetilde{x}-\chi+X}{2X}$ are also increasing functions of X and k. ■

The effects of uncertainty are due to the fact that the loan repayment is a non-linear (specifically, concave) function of x. To be sure, recall that the repayment is $\delta[A-\phi(1-x)]$ if $x \in [\chi - X, \widetilde{x}]$, but $(1+R)I$ if $x \in (\widetilde{x}, \chi + X]$. The expected repayment is therefore reduced by a mean-preserving spread in the distribution of x. Intermediaries compensate for this by charging a higher interest rate on loans which increases the likelihood that defaulting will occur. The effects of financial market imperfections operate in a similar way. An increase in k increases the expected verification cost which raises the contractual interest rate and makes defaulting more likely.

Having established the above, we may now turn to the issue of occupational choice. To do so, we recall the expression in (6) which gives a household's expected income from entrepreneurship. Using (7), we may re-write this expression as

$$\begin{aligned} E(y) &= \int_{\chi-X}^{\chi+X} [A-\phi(1-x)]f(x)dx - (1+r)I - \int_{\chi-X}^{\widetilde{x}} kf(x)dx \\ &= A - \phi(1-\chi) - (1+r)I - \left(\frac{\widetilde{x}-\chi+X}{2X}\right)k. \end{aligned} \tag{11}$$

Stated this way, it is clear that an entrepreneur's expected payoff is a decreasing function of $\phi(1-\chi)$, the expected bribe payment to bureaucrats, and a decreasing function of $\left(\frac{\widetilde{x}-\chi+X}{2X}\right)k$, the expected verification cost of intermediaries.[19] As indicated earlier, the latter - which is passed on to entrepreneurs through the contractual interest rate, R - is higher the higher is k (meaning that more resources must be spent in the event of verification) and the higher is $\left(\frac{\widetilde{x}-\chi+X}{2X}\right)$ (meaning that verification is more likely). As we have also seen, the likelihood of verification (i.e., the probability of defaulting) increases with an increase in the cost, itself, and an increase in the degree of uncertainty about bribe payments.

Entrepreneurship is chosen by any household for which the required level of effort, e, is no greater than the threshold level, $\widetilde{e}$, defined in (1). This threshold gives a measure of the total population of entrepreneurs. Using

[19] Note that, by virtue of (10), the direct effect of $\phi(1-\chi)$ is reinforced by an indirect effect through its impact on $\left(\frac{\widetilde{x}-\chi+X}{2X}\right)k$.

(11), the expression for it in the case of disorganised corruption is

$$\widetilde{e}^D = A - \phi(1-\chi) - (1+r)I - \left(\frac{\widetilde{x} - \chi + X}{2X}\right)k - s. \tag{12}$$

Some key properties of (12) are immediately identified.

Proposition 3 *Under disorganised corruption, the number of households that choose to become entrepreneurs is lower the greater is the expected value of bribe payments, the greater is the degree of uncertainty about bribe payments and the greater is the extent of capital market imperfections.*

Proof. The term $\left(\frac{\widetilde{x}-\chi+X}{2X}\right)k$ in (12) is an increasing function of $\phi(1-\chi)$, X and k. Thus $\frac{\partial \widetilde{e}^D}{\partial \phi(1-\chi)} < 0$ $\frac{\partial \widetilde{e}^D}{\partial X} < 0$ and $\frac{\partial \widetilde{e}^D}{\partial k} < 0$. ■

These properties are a direct reflection of the observations made above - namely, that a household expects to profit by less from entrepreneurship if it expects to pay more in bribes, if bribe demands are more uncertain and if bankruptcy claims are more costly to verify. Under any of these circumstances, there will be fewer households for which entrepreneurship is the preferred choice of occupation. A final result worth noting is the following.

Proposition 4 *Corruption exacerbates the effects of capital market imperfections which exacerbate the effects of corruption.*

Proof. From (10), $\frac{\partial}{\partial \phi(1-\chi)}\left(\frac{\partial \widetilde{x}}{\partial k}\right) > 0$ and $\frac{\partial}{\partial k}\left(\frac{\partial \widetilde{x}}{\partial \phi(1-\chi)}\right) > 0$. ■

As indicated earlier, recent empirical evidence suggests that there are important interactions between corruption and financial development. The above result is consistent with this: the worse is corruption (in terms of expected bribe payments) the worse is the marginal effect of an increase in financial market imperfections (the cost of verification) and so the greater is the marginal benefit from an improvement in financial development; similarly, the worse are financial market imperfections the worse is the marginal effect of an increase in corruption and so the greater is the marginal benefit from an improvement in governance.

4 The Economy With Organised Corruption

By organised corruption, we mean the case in which bureaucrats act together as a joint monopoly, choosing a level of bribe that maximises their expected payoffs in acknowledgement of the aggregate effects of their behaviour. These effects work through $\overline{B}$ and $\widetilde{e}$ in (2), variables which bureaucrats no longer treat as given when solving their maximisation problem: on the contrary, they take into account that $\overline{B} = \widetilde{e}b$, and that $\widetilde{e}$ depends similarly on their bribe-taking activity. We address the optimal bribe problem later as it requires knowledge of how $\widetilde{e}$ is determined. For the moment, we note one immediate implication of our change in behavioural assumption about rent-seeking.

Proposition 5 *Under organised corruption, there is no uncertainty about bribe payments.*

Proof. Since $\overline{B} = \widetilde{e}b$, (2) becomes $E(z) = \pi\widetilde{e}b\exp\left[-\left(x+\frac{1}{\phi}b\right)\right] = \pi\exp(-x)\widetilde{e}b\exp(-\frac{1}{\phi}b)$.Any b that maximises $E(z)$ is independent of x. ■

In choosing bribes collectively, bureaucrats recognise that they are determining the average bribe income, $\overline{B}$, which is, of course, the amount of bribe income for each one of them. They are therefore aware that, whatever choice they make, each of them faces the same random probability, $p = \pi\exp(-x)$, of not being caught. This is identical to the probability that emerged in the case of disorganised corruption, but it is now entirely exogenous to bureaucrats' decision making and does not influence the optimal size of bribe. Whatever this bribe turns out to be, it is perfectly predictable and is known with certainty by households and intermediaries at the time of making their own decisions.

Given the above, it is possible to identify a further notable aspect of organised corruption - namely, the removal of any risk of bankruptcy associated with entrepreneurship. As before, a household's net return from this occupation is $A - B - (1+R)I$. Unlike before, bureaucrats take into account that $B = b$. Let b^O denote the bribe that is chosen by the organised bureaucracy. In pursuit of its objectives, the bureaucracy would never choose a b^O for which $A - b^O < (1+R)I$: if it did, then no bribes could be extracted since there would be no entrepreneurs for the simple reason that intermediaries would never grant loans to individuals who are certain of going bankrupt. Thus any b^O that is chosen is one that allows loans to be repaid.[20] The obvi-

[20] As we shall see, the solution to the bureaucrats' maximisation problem implies an optimal bribe that satisfies this criterion.

ous implication of this is that the interest rate on loans is driven down to the world rate of interest, $R = r$, in accordance with intermediaries' zero profit condition. It follows that a households's net return from entrepreneurship is

$$y = A - b^O - (1 + r)I. \tag{13}$$

Compared to (11), this payoff is a similar decreasing function of the bribe payment, but is noticeably independent of any intermediation costs. These costs - associated with the verification of bankruptcy claims in the presence of asymmetric information - do not arise under organised corruption because the uncertainty about bribe payments and the prospect of defaulting are eliminated. In this way, coordinated rent-seeking prevents latent capital market imperfections from surfacing.

As previously, entrepreneurship is chosen by any household for which the required level of effort, e, is no greater than the threshold level, $\widetilde{e}$, defined in (1). Using (13), the expression for this threshold in the case of organised corruption is

$$\widetilde{e}^O = A - b^O - (1 + r)I - s. \tag{14}$$

An obvious implication of (14), similar to that of (12), is the following.

Proposition 6 *Under organised corruption, the number of households that choose to become entrepreneurs is lower the greater is the value of bribe payments.*

Proof. Trivially, $\frac{\partial \widetilde{e}^O}{\partial b} < 0$ in (14). ■

Of course, the key difference between (14) and (12) is the former's independence from any effects of uncertainty and capital market imperfections. When corruption is organised, the only aspect of it that influences occupational choice is the actual amount of bribes that households know they will need to pay if they decide to become entrepreneurs.

We are now in a position to determine the optimal bribe payment for an organised bureaucracy. This is the value of b that maximises $E(z)$ in (2), taking into account that $\overline{B} = \widetilde{e}b$ and that $\widetilde{e}$ is determined according to (14).

Proposition 7 *The optimal bribe under organised corruption is given by*

$$b^O = \frac{[A - (1 + r)I - s + 2\phi] - \sqrt{[A - (1 + r)I - s]^2 + 4\phi^2}}{2}. \tag{15}$$

Proof. The first order condition for solving the bureaucracy's maximisation problem yields the quadratic equatuon

$$b^2 - [A - (1+r)I - s + 2\phi]b + \phi[A - (1+r)I - s] = 0.$$

Hence $b = \frac{[A-(1+r)I-s+2\phi] \pm \sqrt{\cdot}}{2}$, where $\sqrt{\cdot}$ is given in (15). It is straightforward to verify that $\sqrt{\cdot}$ must enter negatively for the second-order condition to be satisfied. It is also easily confirmed that $b^O > 0$. ■

As before, the optimal bribe is higher the higher is the value of ϕ (because the cost of corruption is lower). One may also note that $A - b^O > (1+r)I$ which verifies our earlier claim that the bribe is never so high as to push entrepreneurs into bankruptcy.

5 An Evaluation of Alternative Corruption Regimes

The foregoing analysis has revealed some important differences in the workings of organised and disorganised corruption networks. In the final part of our investigation we explore these differences further, comparing and contrasting the outcomes that transpire under the two scenarios. In particular, we identify conditions under which the incidence of corruption and the level of entrepreneurial activity are either higher or lower under one type of corruption regime than the other.

Our first result is the following.

Proposition 8 *$b^O \gtrless E(b^D)$ according to $A - (1+r)I - s \gtrless \frac{\phi(1-\chi^2)}{\chi}$.*

Proof. From (3), $E(b^D) = \phi(1-\chi)$. Comparing this with b^O in (15) gives the result. ■

In words, bribe payments under organised corruption may be greater or less than average bribe payments under disorganised corruption. Evidently, since the number of corrupt officials is the same in each case, the result implies that the incidence of corruption (measured by the total value of bribes) is generally different between corruption regimes. Whether the optimal bribe is higher in one regime or the other depends on two competing influences. On the one hand, when corruption is disorganised, each bureaucrat is wary that raising his own bribe demand will increase the probability that he will be caught; this tends to lower the bribe relative to the case in which bureaucrats

act collusively and recognise at the outset that each of them faces the same risk of being detected. On the other hand, when corruption is organised, bureaucrats have a different reason to temper their bribe demands, which is the mitigation of a reduction in the bribe base due to a fall in the number of entrepreneurs; this effect is absent when bureaucrats act independently and take the population of potential bribe-payers as given. These competing influences are reflected in the parameter condition that determines whether b^O is greater or less than $E(b^D)$. For example, a higher (lower) value of χ (A) makes it more likely that $b^O > E(b^D)$ ($b^O < E(b^D)$) by inducing a lower value of $E(b^D)$ (b^O) as bureaucrats moderate their non-collusive (collusive) rent-seeking in response to a higher expected probability of being detected (a lower number of potential entrepreneurs).

Our second result is the principal finding of the paper.

Proposition 9 *There exists a $\widetilde{b}^O > E(b^D)$ such that entrepreneurial activity is greater (lower) under organised corruption than under disorganised corruption if $b^O < \widetilde{b}^O$ ($b^O > \widetilde{b}^O$).*

Proof. From (12) and (14), $\widetilde{e}^O \geq \widetilde{e}^D$ if $b^O \leq \phi(1-\chi) + \left(\frac{\widetilde{x}-\chi+X}{2X}\right)k$. Since $E(b^D) = \phi(1-\chi)$, this condition implies $b^O \leq E(b^D) + \left(\frac{\widetilde{x}-\chi+X}{2X}\right)k \equiv \widetilde{b}^O$. Evidently, $\widetilde{b}^O > E(b^D)$. ■

If $b^O < E(b^D)$, then organised corruption is unambiguously less damaging to entrepreneurship than disorganised corruption. The above result shows that this may still be true even if $b^O > E(b^D)$ - that is, even if the amount of bribes paid to an organised bureaucracy is greater than what would be paid on average to a disorganised bureaucrcy. The reason, of course, is that organised rent-seeking removes the disincentives to engage in entrepreneurship that arise when households (and intermediaries) are uncertain about bribe payments. These disincentives are reflected in the reduction of entrepreneurial income associated with the cost to intermediaries of having to verify bankruptcy claims (a cost which intermediaries pass on through a higher interest rate on loans). The upshot is that fewer households may choose to become entrepreneurs under disorganised corruption, even though the average bribe paid is lower than the bribe demanded under organised corruption. The quantity $\widetilde{b}^O$ defines the maximum size of the latter for which such an outcome is true.

We emphasise that the above result is not meant to be seen as a prescription for the organisation of corruption to be a policy objective. Whether organised or not, corruption is always bad for entrepeneurship and output in

our model, and the best policy is to eliminate it altogether. What our analysis does show, however, is that the effects of corruption may be very different under different circumstances, which may help to explain why some countries of the world appear more immune than others to equally poor quality levels of governance.

6 Conclusions

Corruption can take many different shapes and forms: it can be the payment of a bribe, the embezzlement of public funds or the submission of fraudulent information; it can be the abuse of power by politcal leaders, or the illegal profiteering by bureaucrats; it can be a collusive arrangement between public and private agents, or a non-collusive act of opportunism by just the former; and it can be a coordinated strategy amongst a well-connected network of officials, or a non-coordinated set of actions in a more fragmented bureaucracy. There is no reason to believe that the effects of corruption will be the same in each case, and the diverse experiences of countries with similar corruption records suggest that the effects may be very different under different circumstances. The present paper has sought to provide an illustration of this.

Our particular focus of attention has centred on the distinction between organised and disorganised corruption regimes. By the former is meant the situation in which public officials coordinate their illegal activities for the purpose of maximising the benefits to all. By the latter is meant the opposite scenario in which each official acts individualistically so as to maximise his own personal payoff. There is a strong presumption that a more organised system of corruption is less damaging to growth because of two main factors - namely, the internalisation of externality effects that bear on demanders of bribes, and the reduction of corruption-induced uncertainty that impacts on payers of bribes. Whilst the first of these aspects has already been formalised in a number of models, the second has not, to our knowledge, received the same degree of rigorous exposition. A primary objective of our analysis has been to fill this gap.

The specifc context of our investigation has been the role of rent-seeking in entry regulation and occupational choice. We have considered a familiar scenario in which public officials demand bribes from private agents in return for issuing licenses that agents require in order to conduct business. To this we have added two extra ingredients - the potential for bribe demands to be random and, with this, the possibility of informational asymmetries between borrowers (entrepreneurs) and lenders (financial intermediaries). Our analy-

sis has shown how disorganised rent-seeking allows both corruption-induced uncertainty and capital market imperfections to surface, whilst organised rent-seeking prevents such outcomes. The implication is that the latter type of corruption regime is most likely to be the least harmful to entrepreneurial activity and economic performance. Significantly, it is precisely those countries in which corruption is reputedly well-organised that appear to have coped well (in some cases, very well) with bureaucratic malfeasance.

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