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Red Tape, Corruption and Finance

By

Keith Blackburn and Rashmi Sarmah

Centre for Growth and Business Cycle Research, Economic Studies,
University of Manchester, Manchester, M13 9PL, UK

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Keith Blackburn and Rashmi Sarmah
Centre for Growth and Business Cycles Research
Economic Studies, University of Manchester

Abstract

We study the effects of red tape and corruption in a model of occupational choice, entry regulation and imperfect capital markets. Red tape is the set of rules and regulations that private agents are obliged to comply with in order to engage in entrepreneurial activity. Corruption is the payment of bribes to public officials for the purpose of circumventing red tape. Capital market imperfections are the asymmetries of information between borrowers and lenders about the returns to entrepreneurship. We show that both red tape and corruption deter entrepreneurial activity, but that only corruption affects financial market outcomes, including the probability of bankruptcy and the costs of verifying bankruptcy claims. The existence of corruption compounds the effects of both aggregate uncertainty and capital market frictions, each of which compounds the effects of corruption. We examine the interactions between red tape and corruption when both are endogenous to the bureaucratic process.

1 Introduction

Recent years have witnessed a burgeoning literature on the economics of corruption. Underlying this has been a growing awareness of the importance of governance in determining the functioning of society's public institutions.[1]

*__Address for correspondence:__ Keith Blackburn, Economic Studies, University of Manchester, Manchester M13 9PL, England. **Tel:** 0161-275-3908. **Fax:** 0161-275-4928. **E-mail:** keith.blackburn@manchester.ac.uk.

[1]The concepts of governance and corruption are intimately connected: just as bad governance fosters corruption, so corruption undermines good governance. Other important aspects of governance include transparency, accountability, political stability, social order, the rule of law and the like.

A hallmark of the literature is its departure from the standard economic paradigm of honest, law-abiding agents whose pursuit of what is best for themselves entails no malevolence towards others; in place of this is a much harsher, more cynical environment, where agents are often devious, predatory and subversive. The issue of corruption has become a leading concern amongst international development agencies with the recognition that good quality governance is vital if the poorer nations of the world are to stand any chance of escaping from their predicament. In this paper we study how corruption can undermine economic performance through its connection with entry regulation, occupational choice and financial market imperfections.[2]

Corruption can occur on various scales, in many shapes and forms and at all levels within public office. It is generally defined as the abuse of authority by public officials for personal gains. One manifestation of this is when state-appointed bureaucrats exploit their powers of discretion, delegated to them by the government, to further their own interests by engaging in illegal, or unauthorised, rent-seeking activities.[3] The incentives to do this reflect the hierarchical structure of public organisations, within which there are almost inevitable conflicts of interest and asymmetries of information between superiors and subordinates. As a consequence, the objectives of the former may be compromised by the decisions of the latter to act strategically and dishonestly in pursuit of their own hidden agenda. At a partial equilibrium level, much research has been devoted towards understanding the microfoundations of such behaviour and the implications for efficiency and welfare (e.g., Banerjee 1997; Carrillo 2000; Klitgaard 1988, 1990; Rose-Ackerman 1975, 1978, 1999; Shleifer and Vishny 1993). At a general equilibrium level, other research has been directed towards analysing the macroeconomics of misgovernance, including the relationship between corruption and development (e.g., Acemoglu and Verdier 1998, 2000; Blackburn *et al.* 2006; Blackburn and Forgues-Puccio 2007; Ehrlich and Lui 1999; Murphy *et al.* 1991; Sarte 2000).

Empirical work on corruption has flourished over recent years.[4] This has

[2]For surveys of the corruption literature, see Aidt (2003), Bardhan (1997), Jain (2001), Rose-Ackerman (1999) and Tanzi (1998). For an appreciation of the importance of corruption to international policy makers, see the World Bank and IMF web-sites, www.worldbank.org/publicsector/anticorrupt and www.imf.org/external/np/exp/facts/gov.

[3]This is referred to as bureaucratic corruption, as distinct from political and legislative corruption which may also arise within the public sector (e.g., Jain 2001). By rent-seeking one typically means the extraction of bribes, and it has been estimated by the World Bank (2004) that more than $1 trillion is paid in bribes each year around the world.

[4]For more detailed discussions of the main issues involved and the main results obtained, see Jain (1998), Lambsdorff (1999, 2005), and Treisman (2000).

been due to the publication of several cross-country datasets that are widely regarded as providing reliable measures of corrupt activity. These datasets, or corruption indices, have been compiled by various international organisations based on questionnaire surveys sent to networks of correspondents around the world.[5] Each one gives a ranking of countries in terms of the extent to which corruption is perceived to exist. Whilst differing in their precise construction and whilst being susceptible to the usual caveats associated with survey data, the indices are all highly correlated with each other and all highly correlated with key economic variables, properties which suggest that they are, in fact, measuring the same phenomenon and that problems of bias are not a major issue. Given this, a number of authors - including Gyimah-Brempong (2002), Keefer and Knack (1997), Knack and Keefer (1995), Li *et al.* (2000), Mauro (1995) and Sachs and Warner (1997) - have estimated significant adverse effects of corruption on economic performance. These and other studies also provide evidence on various ways in which corruption might take hold, such as lowering rates of investment (e.g., Mauro 1995), creating obstacles to doing business (e.g., World Bank 2002), reducing inflows of foreign investment (e.g., Wei 2000) and causing misallocations of public expenditures (e.g., Mauro 1997; Tanzi and Davoodi 1997).[6]

To many observers, bureaucratic corruption is an inevitable product of the administrative machinery of state intervention. In many areas of economic activity, private individuals must comply with various rules and regulations that are costly in terms of time and effort, efficiency and productivity. These institutional hurdles - the red tape of bureaucracy - provide an opportunity for rent-seeking as individuals may be willing to pay bribes to circumvent them. It has been argued that, because of this, corruption may actually do more good than harm (e.g., Huntington 1968; Leff 1964; Leys 1970; Lui 1985). Known as the "speed money" hypothesis, the argument contends that bribery can be a means of improving efficiency by helping to overcome cumbersome regulations that create obstacles to doing business. Whilst plausible at first glance, the hypothesis can be challenged on both conceptual and em-

[5]The most commonly-used index is the Corruption Perception Index of Transparency International. The same organisation provides a Bribe Payers Index, whilst the World Bank reports a Graft Index. Various other indices include those of Business International Corporation, Political Risk Services Incorporated, the World Development Report and the Institute of Management Development.

[6]From the opposite perspective, it has been estimated that a significant proportion of the variations in corruption indices can be explained by variations in per capita income levels (e.g., Ades and Di Tella 1999; Fisman and Gatti 2002; Frechette 2001; Montinola and Jackman 1999; Paldam 2002; Rauch and Evans 2000; and Treisman 2000). This suggests that corruption and development are linked in a relationship that is not only negative but also two-way causal. A theoretical analysis of this is given in Blackburn *et al.* (2006).

pirical grounds. Conceptually, there are at least two main problems: first, although bribery may speed up individual transactions with bureaucrats, both the sizes of bribes and the number of transactions may increase so as to produce an overall net loss in efficiency; second, and more fundamentally, the distortions that bribes are meant to mitigate are often the result of corrupt practices to begin with and should therefore be treated as endogenous, rather than exogenous, to the bureaucratic process. Empirically, the evidence offers very little support for the hypothesis: in Ades and Di Tella (1997), Mauro (1995) and Meon and Sekkat (2005) it is found that the correlation between growth and corruption is consistently negative (and particularly strong) in samples of countries with reputedly high levels of red tape, weak rules of law and widespread government inefficiencies (the type of environment where the argument is most relevant); in Kaufman and Wei (2000) it is found that the use of bribes to speed up the bureaucratic process is largely self-defeating as the amount of time negotiating bribes increases. Based on these observations, the prevailing consensus is that corruption does little, or nothing, to improve efficiency and, if anything, puts sand, rather than grease, into the wheels of bureaucracy.

It is possible that red tape has some positive social value, though the reasons are not yet very well understood. One argument is that it may function as a screening device to reveal information and to improve outcomes in otherwise unregulated markets (e.g., Acemoglu and Verdier 2000; Banerjee 1997; Guriev 2004). Another is that it may serve to contain corrupt activity by limiting the scope for discretion and favouritism on the part of bureaucrats through complex rules and procedures (e.g., Wilson 1989). As indicated above, the main problem is that the amount of red tape is typically determined by those who stand to benefit from producing too much of it in their quest to extract rents. And significantly, it is the poorer, more corrupt, countries of the world that appear to be mired with regulations in this way. The literature on corruption is replete with examples - particularly from developing and transition economies - of how red tape can impose significant costs on firms, of how corruption can do the same, of how firms often seek to avoid red tape by complying in corruption and of how corruption appears to proliferate the amount of red tape (e.g., Bardhan 1984; Bhagwati 1993; Brunetti *et al.* 1997; De Soto 1989, 2000; Djankov *et al.* 2000; Kaufman 1997a,b; Mbaku 2000; Shleifer 1997; Sjaifudian 1997; World Bank 2002, 2006). The following is just a handful of observations that have been made. De Soto (1989) recounts an investigation by the Institute for Liberty and Democracy into the costs of setting up a small, fictitious firm in Peru, a venture that took 289 days of full-time work, with bribe payments being asked for on 10 occasions (and being unavoidable in 2 instances). Kaufman

(1997a) reveals that 64 (44) percent of firms surveyed in the Ukraine (Russia) admitted to paying bribes to overcome red tape, and that 96 (43) percent of firms confessed to making illegal payments to obtain official licenses and permits. Brunetti *et al.* (1997) observes that, in a survey of firms around the world, red tape and corruption were ranked amongst the highest major obstacles to doing business (especially in the less developed regions). Similarly, the World Bank (2002) reports that between 50 and 80 percent of firms surveyed in developing and transition economies considered red tape and corruption to be significant constraints on their activities. In a subsequent study, the World Bank (2006) estimates that the average length of time to register a new business is usually more than 100 days in the poorer countries of the world, compared with less than 30 days in most of the richer nations. This accords with the results of Djankov *et al.* (2002) who use cross-country data on entry regulations to show that the costs of obtaining legal status to operate a firm decrease uniformly with per capita GDP. Finally, the World Bank (2006) also notes instances where reducing red tape (and presumably corruption along with this) appears to have had significant positive effects on business activity, as exemplified in Colombia and Ethiopia which experienced, respectively, 16 and 46 percent increases in new business registrations over a single year period following the simplification of entry regulations.

Red tape and corruption in entry regulation may be viewed as acting like taxes on business activity. Unlike other forms of taxation, however, the costs involved are typically incurred before production takes place and, in the case of corruption, are the result of illegal, clandestine transactions with rent-seeking public officials. As indicated above, the cost of red tape involves a large, non-pecuniary element in terms of the time and effort spent on complying with various administrative procedures to obtain official licences, permits and other documents of authorisation. By contrast, the cost of corruption is predominantly the monetary expenditure on bribe payments intended to achieve the same objective. This difference can be important, especially when individuals are resource-constrained and require external finance for their operations. Under such circumstances, extra bribe payments may demand extra borrowing, in which case the functioning of financial markets may play a crucial role in determining the effects of corruption. The presumption, of course, is that these effects will be more pronounced the more imperfect are these markets. Financial market imperfections may arise for a number of reasons such as problems of moral hazard and adverse selection associated with asymmetric information, and problems of default risk created by weak powers of contract enforcement. The consequent uncertainty for lenders' about the repayment of loans can lead to an increase in the cost of borrowing and a rationing of the amount of credit. Significantly, financial

market imperfections, like red tape and corruption, are characteristic features of less developed economies.

The foregoing discussion provides the motivation for this paper which addresses issues of red tape, corruption and finance in a model of occupational choice and entry regulation. Private individuals choose between two alternative activities that differ in terms of the payoffs expected, the risks involved, the skills demanded, the loans required and the regulations applied. Borrowing and lending take place through competitive financial intermediaries according to the terms and conditions of financial contracts. Capital market imperfections exist because of asymmetric information between borrowers and lenders, the latter of whom engage in costly state verification to prevent false claims of bankruptcy by the former. Corruption takes the form of bribe payments by private agents to public officials in return for being freed from red tape associated with the higher skilled, more entrepreneurial occupation. We show how both red tape and corruption reduce entry into this occupation, but that corruption has other implications as well. Specifically, corruption affects financial market outcomes. It does so by increasing the probability of bankruptcy amongst entrepreneurs and, with this, the expected verification cost of lenders. As a consequence, corruption compounds the problem of capital market imperfections and exacerbates the effects of uncertainty. At the same time, the greater is the extent of these imperfections and the greater is the degree of uncertainty, the more pronounced are the effects of corruption. Against this background, we address the "speed money" hypothesis by illustrating and then challenging it.

To the extent that we model corruption as distorting occupational choice, our analysis is in the spirit of Murphy *et al.* (1991) and Ehrlich and Lui (1999) who show how the prospect of rent extraction can lead to a misallocation of skills and talent in the economy. Our analysis may also be viewed within the context of the modern literature on income distribution which emphasises the role of capital market imperfections in determining occupational opportunities (e.g., Aghion and Bolton 1997; Banerjee and Newman 1993; Blackburn and Bose 2001; Galor and Zeira 1993). In terms of its contribution to the governance literature, the analysis provides insights into the connection between red tape and corruption, and the interactions of these phenomena with aspects of finance and uncertainty.

The remainder of the paper is organised as follows. In Section 2 we present a simple model of occupational choice and financial intermediation in a regulation-free and corruption-free environment. In Section 3 we re-examine this environment in the presence of red tape. In Section 4 we do the same in the presence of corruption. In Section 5 we study the link between red tape and corruption. In Section 6 we make a few concluding remarks.

2 The Basic Framework

We consider a small open economy in which there is a continuum of agents measuring a size of unit mass. Each agent has the same risk neutral preferences and the same zero endowment of wealth. Productive activity by an agent is 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, loans must be acquired from financial intermediaries under the terms and conditions of mutually agreeable financial contracts. Capital market imperfections exist because of asymmetric information between borrowers and lenders. In more detail, the model is described as follows.

Each agent 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 both costless and riskless for an agent. This is a subsistence occupation that requires zero capital outlay and zero effort, and that yields $A_0 > 0$ units of output with certainty.[7] The second type entails the operation of a more advanced (or modern) technology in an entrepreneurial venture that is expected to be more productive, but that is also both costly and risky. This is a skilled occupation that requires $I > 0$ units of capital outlay and $\epsilon > 0$ units of effort, and that yields a stochastic amount of output of $A_1(1+\alpha)$, where $A_1 > A_0$ and α is an identically and indepedently distributed random variable (a technology shock). For simplicity, we specify α to be uniformly distributed over the interval $[-a, a]$ with probability density function $f(\alpha) = \frac{1}{2a}$ $(a < 1)$. Evidently, since the expected value of α is zero, then the expected return from the advanced project is A_1 which we assume to be greater than the safe return from the basic project, A_0. A measure of uncertainty associated with the former is given by the parameter a, an increase in which corresponds to a mean-preserving spread in the distribution of α (i.e., an increase in the variance of the shock, which causes an increase in the variance of project returns). The amount of effort, ϵ, needed to operate the advanced technology depends (inversely) on an agent's technical capabilities (skills, knowledge, expertise and the like), attributes that are unimportant in the subsistence occupation. We suppose that agents are heterogeneously endowed with these attributes, implying a distribution of ϵ which we simplify, as above, to being uniform on the interval $[0, e]$ with probability density function $g(\epsilon) = \frac{1}{e}$ $(e > 0)$. Thus $\int_{e_0}^{e_1} g(\cdot) d\epsilon = \frac{e_1 - e_0}{e}$ provides a measure of agents for whom $\epsilon \in (e_0, e_1)$.

In order to engage in entrepreneurial activity, an agent must acquire a

[7] 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.

loan of size I as external funding for the fixed capital outlay. Loans are made by competitive financial intermediaries at a contractual interest rate of R. The loan repayment for an agent is therefore $(1+R)I$. Borrowing and lending take place prior to the realisation of project returns. Subsequently, only entrepreneurs are able to directly observe these returns. This *ex post* informational asymmetry (the source of financial market imperfections) implies that an entrepreneur may try to default on his loan repayment by claiming falsely that he is bankrupt due to a bad realisation of α. 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 and claiming all of the borrower's income (e.g., Diamond 1984; Gale and Hellwig 1985; Townsend 1979).[8] We denote this verification cost by c which provides a measure of the extent of capital market imperfections.

The utility of an agent that engages in subsistence activity is simply A_0. The utility of an agent that engages in entrepreneurial activity is

$$u = \begin{cases} A_1(1+\alpha) - (1+R)I - \epsilon & \text{if } \alpha \geq \overline{\alpha}, \\ -\epsilon & \text{if } \alpha < \overline{\alpha}. \end{cases} \tag{1}$$

The term $\overline{\alpha}$ defines a critical value of α, below which an agent is bankrupt and above which an agent is non-bankrupt. The former event occurs if $A_1(1+\alpha) < (1+R)I$, while the latter event occurs if $A_1(1+\alpha) \geq (1+R)I$. Accordingly, $\overline{\alpha}$ is determined from the condition

$$A_1(1+\overline{\alpha}) = (1+R)I. \tag{2}$$

Naturally, $\overline{\alpha}$ is increasing in R: *ceteris paribus*, the higher is the interest rate on loans, the more productive must be a borrower if he is to be able to make his loan repayment. The probability that he is unable to do this - i.e., the probability of bankruptcy - is given by $\pi = \int_{-a}^{\overline{\alpha}} f(\alpha)d\alpha = \frac{\overline{\alpha}+a}{2a}$. It follows that, prior to observing α, an entrepreneur's expected utility is

$$E(u) = \int_{\overline{\alpha}}^{a} [A_1(1+\alpha) - (1+R)I]f(\alpha)d\alpha - \epsilon. \tag{3}$$

An agent will become an entrepreneur provided that $E(u) \geq A_0$, a condition that we examine shortly.

[8] As in some other analyses (e.g., Agenor and Aizenman 1998a,b; Aizenman and Powell 2003; Gertler and Gilchrist 1993), one could also think of lenders as incurring costs of contract enforcement in the sense of having to spend resources (such as legal fees) on seizing the incomes (and any collateral) of bankrupt borrowers.

Financial intermediaries make loans to agents in the knowledge that bankruptcy may be declared. If so, then agents' claims are verified and intermediaries appropriate all of the proceeds from projects, less the costs of verification. Bankruptcy is declared only if $\alpha < \overline{\alpha}$, in which case an intermediary's return from lending is $A_1(1+\alpha) - c$. Alternatively, if $\alpha \geq \overline{\alpha}$, then the intermediary is paid back in full, earning a return of $(1+R)I$. Intermediaries have access to a perfectly elastic supply of loanable funds at the exogenous world rate of interest, r, implying a cost of borrowing of $(1+r)I$ for each loan that is made. Competition between intermediaries means that they operate at zero expected profit. This break-even condition is given by

$$(1+r)I = \int_{\overline{\alpha}}^{a} (1+R)If(\alpha)d\alpha + \int_{-a}^{\overline{\alpha}} [A_1(1+\alpha) - c]f(\alpha)d\alpha. \tag{4}$$

For any given $\overline{\alpha}$, this expression determines the contractual interest rate on loans, R.

Given (4), we may re-write (3) as

$$\begin{aligned} E(u) &= \int_{-a}^{a} A_1(1+\alpha)f(\alpha)d\alpha - \int_{-a}^{\overline{\alpha}} cf(\alpha)d\alpha - (1+r)I - \epsilon \\ &= A_1 - (1+r)I - \left(\frac{\overline{\alpha}+a}{2a}\right)c - \epsilon. \end{aligned} \tag{5}$$

Accordingly, the condition for an agent to take on a loan and run the advanced project is that $A_1 - (1+r)I - \left(\frac{\overline{\alpha}+a}{2a}\right)c - \epsilon \geq A_0$. This defines a critical value of ϵ, denoted $\overline{\epsilon}$, that satisfies

$$\overline{\epsilon} = A_1 - A_0 - (1+r)I - \left(\frac{\overline{\alpha}+a}{2a}\right)c. \tag{6}$$

The advanced project is undertaken by any agent for whom $\epsilon \leq \overline{\epsilon}$, whilst the basic project is undertaken by any agent for whom $\epsilon > \overline{\epsilon}$. The total population of entrepreneurs is therefore $n = \int_0^{\overline{\epsilon}} g(\epsilon)d\epsilon = \frac{\overline{\epsilon}}{e}$.[9] The expression in (6) implies that $\overline{\epsilon}$ is a decreasing function of $\left(\frac{\overline{\alpha}+a}{2a}\right)c$, the expected verification cost, which is passed on by lenders to borrowers. This cost is higher the higher is c (meaning that more resources must be spent in the event of

[9] If $\overline{\epsilon} < 0$ ($\overline{\epsilon} > e$), then no (every) agent is an entrepreneur. Whilst this is perfectly feasible, it is possible to rule out such an outcome by imposing appropriate restrictions on parameter values. This follows from the fact that the lowest (highest) value of $\overline{\epsilon}$ is $A_1 - A_0 - (1+r)I - c$ ($A_1 - A_0 - (1+r)I$), corresponding to the case in which $\overline{\alpha} = a$ ($\overline{\alpha} = -a$). It turns out that $\overline{\epsilon} \geq 0$ by virtue of the restriction $A_1 - A_0 - (1+r)I - c \geq 0$ that we appeal to later in solving the optimal loan contracting problem.

verification) and the higher is $\overline{\alpha}$ (meaning that verification is more likely). An increase in either of these terms will therefore reduce the population of entrepreneurs.

Subtraction of (4) from (2) yields

$$(R-r)I = \int_{-a}^{\overline{\alpha}} [A_1(1+\overline{\alpha}) - A_1(1+\alpha) + c] f(\alpha) d\alpha. \tag{7}$$

This expression shows the interest rate spread between lending and borrowing.[10] The size of spread depends on how much a lender expects to lose when a borrower goes bankrupt and is unable to make his full loan repayment (i.e., when $\alpha < \overline{\alpha}$). To be sure, observe from (2) that the first integral term on the right-hand-side of (7) is equal to $\int_{-a}^{\overline{\alpha}} (1+R) f(\cdot) d\alpha$ which measures the expected amount of non-repayment as a result of bankruptcy. Conversely, the second and third integral terms on the right-hand-side of (7) give the expected amount of income that is claimed from a bankrupt borrower, net of verification costs. Accordingly, (7) implies that the contractual interest rate on loans 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 bankruptcy. This mark-up rule may be simplified to

$$RI = rI + \frac{A_1(\overline{\alpha}+a)^2}{4a} + \left(\frac{\overline{\alpha}+a}{2a}\right) c. \tag{8}$$

As above, there is a positive relationship between R and $\overline{\alpha}$: *ceteris paribus*, intermediaries set a higher contractual interest rate the more likely it is that bankruptcy will occur.

The expressions in (2) and (8) define a simultaneous system of two independent relationships between R and $\overline{\alpha}$. An analysis of this system leads to the following result.

Lemma 1 *Given that* $(1+r)I + c \leq A_1 < \frac{(1+r)I}{1-a}$, $\exists$ *a unique* $\overline{\alpha} \in (-a, a)$ *and a unique* $R > r$ *that solve (2) and (8).*

Proof. Combining (2) and (8) yields the quadratic equation

$$0 = A_1\overline{\alpha}^2 - 2(A_1 a - c)\overline{\alpha} - [4A_1 a - A_1 a^2 - 4a(1+r)I - 2ac].$$

Hence

$$\overline{\alpha} = a - \frac{c}{A_1} \pm \frac{\sqrt{4A_1 a[A_1 - (1+r)I - c] + c^2}}{A_1}.$$

[10] 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).

A sufficient condition for ruling out complex roots is $A_1 - (1+r)I - c \geq 0$. Given this, together with the fact that $\overline{\alpha} \leq a$, the only possible solution for $\overline{\alpha}$ is when $\frac{\sqrt{\cdot}}{A_1}$ enters negatively in the above equation. The restriction $A_1 < \frac{(1+r)I}{1-a}$ ensures that $\overline{\alpha} \geq -a$ as well. Since the solution for $\overline{\alpha}$ is unique, then so too is the solution for R. ■

We write the solution for $\overline{\alpha}$ as

$$\overline{\alpha} = a - \frac{c}{A_1} - \frac{\sqrt{4A_1 a[A_1 - (1+r)I - c] + c^2}}{A_1} \equiv \mathcal{A}(a, c, I). \tag{9}$$

The solution for R is then given similarly by $R = \mathcal{R}(a, c, I)$. Substituting (9) into (6) also yields

$$\overline{\epsilon} = A_1 - A_0 - (1+r)I - \left[\frac{\mathcal{A}(a, c, I) + a}{2a}\right] c \equiv \mathcal{E}(a, c, I). \tag{10}$$

The two key parameters in the model as it presently stands are a and c. As indicated earlier, the former - which determines the spread of the distribution of α - provides a measure of uncertainty, whilst the latter - which is the cost of verification - acts as an indicator of capital market frictions. It is straightforward to establish the following result.

Proposition 1 *The greater is the degree of uncertainty and/or the greater is the extent of capital market imperfections, the higher is the probability that an entrepreneur will go bankrupt and the lower is the number of agents who choose to become entrepreneurs.*

Proof. The probability of bankruptcy is $\pi = \frac{\mathcal{A}(\cdot)+a}{2a}$, and the population of entrepreneurs is $n = \frac{\mathcal{E}(\cdot)}{e}$. From (9) and (10), $\frac{\partial \pi}{\partial a} = \frac{[a\mathcal{A}_a(\cdot) - \mathcal{A}(\cdot)]}{2a^2} > 0$ and $\frac{\partial \pi}{\partial c} = \frac{\mathcal{A}_c(\cdot)}{2a} > 0$, whilst $\frac{\partial n}{\partial a} = \frac{\mathcal{E}_a(\cdot)}{e} < 0$ and $\frac{\partial n}{\partial c} = \frac{\mathcal{E}_c(\cdot)}{e} < 0$. ■

The effects of uncertainty are due to the fact that the loan repayment is a non-linear (specifically, concave) function of α. To be sure, recall that the repayment is $A_1(1+\alpha)$ if $\alpha < \overline{\alpha}$, but $1+R$ if $\alpha \geq \overline{\alpha}$. The expected repayment is therefore reduced by a mean-preserving spread of α.[11] Intermediaries compensate for this by charging a higher interest rate on loans ($\mathcal{R}_a(\cdot) > 0$) which increases the likelihood that bankruptcy will occur and so raises the expected

[11] This is simply an example of the well-known result of Rothschild and Stiglitz (1971) that the expected value of a concave (convex) function of some random variable is decreased (increased) be a mean-preserving spread in the distribution of that variable

verification cost. Since this reduces the expected profits from entrepreneurial activity, fewer agents have an incentive to engage in this activity. The effects of financial market imperfections operate in a similar way. An increase in c increases the expected verification cost which raises the contractual interest rate ($\mathcal{R}_c(\cdot) > 0$) and makes bankruptcy more likely. Faced with lower expected returns from borrowing, fewer agents find it profitable to take on loans. For future reference, we also note that an increase in the size of loan causes an increase in the probability of bankruptcy and a decrease in the number of entrepreneurs: that is, $\mathcal{A}_I(\cdot) > 0$ and $\mathcal{E}_I(\cdot) < 0$.

This completes our description of the basic framework that we use during our subsequent analysis. In that analysis we seek to introduce aspects of regulation and governance, and to examine how such aspects might bear on the issues of finance, bankruptcy and occupational choice.

3 Red Tape

As commented on earlier, individuals often spend a substantial amount of resources - especially, in terms of time and effort - on going through various procedures and regulations before they are entitled to engage in a particular activity or business. As also mentioned earlier, the benefits of red tape are not very well understood, though some plausible candidates exist. That some positive level of red tape might be socially-optimal is an issue worth-pursuing, but it is not one that we address explictly in the present analysis. Rather, our interest lies elsewhere, being focused towards the relationship between red tape and corruption, and the implications of this for financial market outcomes and entrepreneurial opportunities.

We introduce red tape as the set of institutional regulations that agents must comply with in order to obtain licenses to undertake the advanced project. Responsibility for implementing these regulations and issuing such licenses lies in the hands of public offcials (civil servants or bureaucrats) using the authority delegated to them by the government.[12] We assume that the process of license acquisition is costly for an agent, demanding t units of his time or effort. The greater is the amount of red tape, the more complicated

[12] As in other analyses (e.g., Blackburn *et al.* 2006; Guriev 2004; Rivera-Batiz 2001; Sarte 2000), we take the distinction between private and public citizens as given, and do not consider how individuals might choose their own status (i.e., choose between private and public sector occupations). This abstraction serves to simplify and focus the analysis, and may be thought of as reflecting an allocation process that is either purely random or else based on differences in individual attributes (e.g., endowments of job-appropriate skills).

or the more drawn-out is this process, and the more time or more effort is required from the agent. For the moment, we treat t as exogenous.

Given the above, we re-write (1) - the utility of an agent who becomes an entrepreneur - as

$$u = \begin{cases} A_1(1+\alpha) - (1+R)I - \epsilon - t & \text{if } \alpha \geq \overline{\alpha}, \\ -\epsilon - t & \text{if } \alpha < \overline{\alpha}. \end{cases} \tag{11}$$

Like before, $\overline{\alpha}$ is the value of α below (above) which bankruptcy occurs (does not occur). This critical value continues to satisfy the condition in (2). It follows that, in place of (3), the expected utility of an entrepreneur is

$$E(u) = \int_{\overline{\alpha}}^{a} [A_1(1+\alpha) - (1+R)I] f(\alpha) d\alpha - \epsilon - t. \tag{12}$$

Financial intermediaries are still subject to the zero profit condition in (4). Combining this with (12) yields the following revised version of (5):

$$\begin{aligned} E(u) &= \int_{-a}^{a} A_1(1+\alpha) f(\alpha) d\alpha - \int_{-a}^{\overline{\alpha}} c f(\alpha) d\alpha - (1+r)I - \epsilon - t \\ &= A_1 - (1+r)I - \left(\frac{\overline{\alpha}+a}{2a}\right) c - \epsilon - t. \end{aligned} \tag{13}$$

An agent continues to opt for an entrepreneurial (rather than subsistence) occupation if $E(u) \geq A_0$. Under present circumstances, this condition amounts to $A_1 - (1+r)I - \left(\frac{\overline{\alpha}+a}{2a}\right) c - \epsilon - t \geq A_0$, from which we deduce a new critical value of ϵ, denoted $\widehat{\epsilon}$, such that entrepreneurship is chosen (not chosen) by any agent for whom $\epsilon \leq \widehat{\epsilon}$ ($\epsilon > \widehat{\epsilon}$). That is, instead of (6), we have

$$\widehat{\epsilon} = A_1 - A_0 - (1+r)I - \left(\frac{\overline{\alpha}+a}{2a}\right) c - t. \tag{14}$$

As before, $\widehat{\epsilon}$ is a decreasing function of $\left(\frac{\overline{\alpha}+a}{2a}\right) c$, the expected cost of verification. Unlike before, $\widehat{\epsilon}$ is also a decreasing function of t, the amount of time and effort spent on going through red tape.

Since (2) and (4) still hold, so too do (7) and (8), implying that (2) and (8) continue to determine the solutions for $\overline{\alpha}$ and R, irrespective of other changes in the model. Accordingly, Lemma 1 still applies, as does the expression for $\overline{\alpha}$ in (9). In contrast, (10) is replaced by

$$\widehat{\epsilon} = A_1 - A_0 - (1+r)I - \left[\frac{\mathcal{A}(a,c,I)+a}{2a}\right] c - t \equiv \mathcal{E}(a,c,I) - t. \tag{15}$$

The following result is now added to those in Proposition 1.

Proposition 2 *An increase in the amount of red tape has no effect on the probability of bankruptcy, but reduces the number of agents who choose to become entrepreneurs.*

Proof. The probability of bankrupcty is $\pi = \frac{\mathcal{A}(\cdot)+a}{2a}$, and the population of entrepreneurs is $n = \frac{\mathcal{E}(\cdot)-t}{e}$. From (9) and (15), $\frac{\partial \pi}{\partial t} = 0$, whilst $\frac{\partial n}{\partial t} = -1$. ■

Since red tape does not affect the size of loan that individuals need to run the advanced project, financial market outcomes - the terms and conditions of borrowing, and the probability of bankruptcy - are unchanged with the introduction of red tape. But the extra time and effort that needs to be spent on going through red tape means that fewer agents are willing to take on this project. There is, of course, an obvious implication of this.

Corollary 1 *Entrepreneurial activity is lower in the presence of red tape than in the absence of red tape.*

Proof. From (15), $\mathcal{E}(\cdot) - t < \mathcal{E}(\cdot)$ for any $t > 0$. ■

Naturally, as the model presently stands, the socially optimal amount of red tape is zero since any positive value of t acts as a pure cost to individuals, some of whom are induced to choose the subsistence occupation which they would not choose otherwise. As indicated already, we do not mean this feature - which arises by design - to be taken too literally since there may be instances where red tape has some social value. In principle, the model could be extended to allow for this, though such an exercise is unnecessary for the main purpose of our analysis. For this reason, we prefer to work with the model as it is and keep the analysis tightly focused on the issues of most interest to us.[13]

[13] As a simple illustration of how the model could be extended, suppose that productive activity associated with the advanced project generates some negative externalities for all agents (e.g., damages to the environment). The role of red tape is to ensure that project investors comply with certain regulations (e.g., environmental safeguards) designed to mitigate such adverse side effects. Let $X = x(\frac{\hat{\epsilon}}{e})$ be a measure of these externalities and $v(X)$ be the disutility incurred from them. The natural assumptions to make are that $x'(\cdot) > 0$ and $v'(\cdot) > 0$ (i.e., higher levels of productive activity imply greater externalities which imply greater disutility). Given these modifications, it is straightforward to repeat the above analysis and to determine a positive value of t that maximises social welfare (i.e., the sum of all agents' expected utilities).

4 Corruption

According to the above description of events, the cost to an individual of acquiring a license for undertaking the advanced project is the time and effort spent on going through red tape: the license, itself, is issued free of charge. In what follows we consider an alternative environment in which individuals make themselves eligible for entrepeneurial activity by bribing public officials: the cost of a license is now the amount of bribe that is paid. This kickback may be given two interpretations. The first is that it is the necessary payment demanded by bureaucrats who have the monopoly power to issue or withhold licenses at will. The second is that it is the optional payment which an individual can make as a means of circumventing red tape. In terms of our immediate concerns, it makes no difference as to which interpretation is used since our objective is simply to illustrate the effects of bribery. Subsequently, however, we focus on the latter interpretation for reasons that will become clear. Throughout our analysis we assume that bureaucrats are able to extract bribes without any risk of detection or punishment. This assumption (used in other analyses) is intended primarily as a simplification, though it is probably near the mark for many developing countries where the will and wherewithal to stop corruption are relatively weak.

The immediate effect of bribery is to increase the size of loan that is needed to engage in entrepreneurial activity. Let b denote the amount of bribe that an individual pays. Then the size of loan is $I + b$. Given this, we may proceed as before to determine the equilibrium outcomes in the economy.

The utility of an agent who becomes an entrepreneur is given by

$$u = \begin{cases} A_1(1+\alpha) - (1+R)(I+b) - \epsilon & \text{if } \alpha \geq \widetilde{\alpha}, \\ -\epsilon & \text{if } \alpha < \widetilde{\alpha}. \end{cases} \tag{16}$$

As indicated by this expression, the critical value of α at which bankruptcy occurs - $\widetilde{\alpha}$ - is different from before. This value is now determined from the condition

$$A_1(1+\widetilde{\alpha}) = (1+R)(I+b). \tag{17}$$

Ceteris paribus, the higher is the bribe payment, the more productive must be an agent if he is to repay his loan. It follows that the expected utility of an entrepreneur is

$$E(u) = \int_{\widetilde{\alpha}}^{a} [A_1(1+\alpha) - (1+R)(I+b)] f(\alpha) d\alpha - \epsilon. \tag{18}$$

Zero profits for financial intermediaries implies

$$(1+r)(I+b) = \int_{\widetilde{\alpha}}^{a} (1+R)(I+b) f(\alpha) d\alpha + \int_{-a}^{\widetilde{\alpha}} [A_1(1+\alpha) - c] f(\alpha) d\alpha. \tag{19}$$

Substituting this into (18) gives

$$E(u) = \int_{-a}^{a} A_1(1+\alpha)f(\alpha)d\alpha - \int_{-a}^{\widetilde{\alpha}} cf(\alpha)d\alpha - (1+r)(I+b) - \epsilon$$
$$= A_1 - (1+r)(I+b) - \left(\frac{\widetilde{\alpha}+a}{2a}\right)c - \epsilon. \tag{20}$$

If an agent is to choose an entrepreneurial occupation, then $E(u) \geq A_0$, or $A_1 - (1+r)(I+b) - \left(\frac{\widetilde{\alpha}+a}{2a}\right)c - \epsilon \geq A_0$. From this, we deduce a new critical value of ϵ - $\widetilde{\epsilon}$ - such that entrepreneurship is chosen (not chosen) by any agent for whom $\epsilon \leq \widetilde{\epsilon}$ ($\epsilon > \widetilde{\epsilon}$). That is,

$$\widetilde{\epsilon} = A_1 - A_0 - (1+r)(I+b) - \left(\frac{\widetilde{\alpha}+a}{2a}\right)c. \tag{21}$$

Thus, under present circumstances, $\widetilde{\epsilon}$ is a decreasing function of both $\left(\frac{\widetilde{\alpha}+a}{2a}\right)c$ and b, the expected verification cost and bribe payment.

Subtraction of (19) from (17) yields the interest rate spread between lending and borrowing,

$$(R-r)(I+b) = \int_{-a}^{\widetilde{\alpha}} [A_1(1+\widetilde{\alpha}) - A_1(1+\alpha) + c]f(\alpha)d\alpha. \tag{22}$$

Equivalently, we have

$$R(I+b) = r(I+b) + \frac{A_1(\widetilde{\alpha}+a)^2}{4a} + \left(\frac{\widetilde{\alpha}+a}{2a}\right)c. \tag{23}$$

An analysis of (17) and (23) reveals the following result.

Lemma 2 *Given that* $(1+r)(I+b) + c \leq A_1 < \frac{(1+r)(I+b)}{1-a}$, $\exists$ *a unique* $\widetilde{\alpha} \in (-a, a)$ *and a unique* $R > r$ *that solve (17) and (23).*

Proof. Combining (17) and (23) yields the quadratic equation

$$0 = A_1\widetilde{\alpha}^2 - 2(A_1a - c)\widetilde{\alpha} - [4A_1a - A_1a^2 - 4a(1+r)(I+b) - 2ac].$$

Hence

$$\widetilde{\alpha} = a - \frac{c}{A_1} \pm \frac{\sqrt{4A_1a[A_1 - (1+r)(I+b) - c] + c^2}}{A_1}.$$

A sufficient condition for ruling out complex roots is $A_1 - (1+r)(I+b) - c \geq 0$. Given this, together with the fact that $\widetilde{\alpha} \leq a$, the only possible solution for $\widetilde{\alpha}$ is when $\frac{\sqrt{\cdot}}{A_1}$ enters negatively in the above equation. The restriction

$A_1 < \frac{(1+r)I}{1-a}$ ensures that $\widetilde{\alpha} \geq -a$ as well. Since the solution for $\widetilde{\alpha}$ is unique, then so too is the solution for R. ■

We write the solution for $\widetilde{\alpha}$ as

$$\widetilde{\alpha} = a - \frac{c}{A_1} - \frac{\sqrt{4A_1a[A_1 - (1+r)(I+b) - c] + c^2}}{A_1} \equiv \mathcal{A}(a, c, I+b). \quad (24)$$

Substituting this into (21) gives

$$\widetilde{\epsilon} = A_1 - A_0 - (1+r)(I+b) - \left[\frac{\mathcal{A}(a, c, I+b) + a}{2a}\right] c \equiv \mathcal{E}(a, c, I+b). \quad (25)$$

Added to the findings in Prosposition 1 is the following result.

Proposition 3 *An increase in the size of bribe payment causes an increase in the probability of bankruptcy and a decrease in the number of agents who choose to become entrepreneurs.*

Proof. The probability of bankrupcty is $\pi = \frac{\mathcal{A}(\cdot)+a}{2a}$, and the population of entrepreneurs is $n = \frac{\mathcal{E}(\cdot)}{e}$. From (24) and (25), $\frac{\partial \pi}{\partial b} = \frac{\mathcal{A}_b(\cdot)}{2a} > 0$, whilst $\frac{\partial n}{\partial b} = -(1+r) - \frac{\mathcal{A}_b(\cdot)}{2a} < 0$. ■

Higher bribes imply that agents must borrow more if they are to run the advanced project. With a larger size of loan, an agent stands a greater chance of bankruptcy. Higher bribes also reduce the expected payoff from entrepreneurship. They do so both directly (by raising the expected loan repayment) and indirectly (by raising the expected verification cost). As such, they deter agents from becoming entrepreneurs. These results have an obvious implication.

Corollary 2 *Bankruptcy is higher and entrepreneurial activity is lower in the presence of corruption than in the absence of corruption.*

Proof. From (24) and (25), $\mathcal{A}(\cdot, I+b) > \mathcal{A}(\cdot, I)$ whilst $\mathcal{E}(\cdot, I+b) < \mathcal{E}(\cdot, I)$ for any $b > 0$. ■

A further implication may also be deduced.

Corollary 3 *Corruption exacerbates the effects of uncertainty and capital market imperfections, each of which exacerbates the effects of corruption.*

Proof. From (24), $\mathcal{A}_{ib}(\cdot) > 0$ and $\mathcal{A}_{bi}(\cdot) > 0$ $(i = a, c)$. It follows that $\frac{\partial \pi}{\partial i}$ and $\left|\frac{\partial n}{\partial i}\right|$ are increasing in b, and that $\frac{\partial \pi}{\partial b}$ and $\left|\frac{\partial n}{\partial b}\right|$ are increasing in i. ■

Compared to our previous results, we see that bribery has a similar effect to red tape in discouraging entrepreneurial activity. In both cases this activity is made more costly than it otherwise would be, though for different reasons: in the case of red tape agents must spend time and effort on acquiring licenses to undertake the advanced project; in the case of bribery agents must spend physical resources to obtain these licenses. This difference implies that bribery, unlike red tape, affects financial market outcomes - in particular, it causes an increase in the probability of bankruptcy amongst entrepreneurs and, with this, an increase in the expected verification cost of financial intermediaries. In this way, corruption serves to compound the inefficiencies of capital market imperfections. The effects of these imperfections are made more pronounced, as are the effects of uncertainty. At the same time, the greater is the extent of capital market imperfections and/or the greater is the degree of uncertainty, the stronger are the effects of corruption.

5 Endogenous Red Tape and Endogenous Corruption

To this point in our analysis, we have treated both the amount of red tape and the amount of bribe payment as exogenous and unrelated to each other. This has been useful for expositional purposes, allowing us to isolate the mechanisms at work in each case and to identify some important differences between these. It is well-recognised, however, that red tape and corruption are often intimately connected through the deliberate, purposeful decisions of public officials. As we have already indicated, this is because red tape offers the opportunity for officials to extract bribes as an alternative means by which individuals are able to obtain the legal status to conduct business. In the analysis that follows we seek to explore this connection.

Our starting point is to consider the case in which agents can choose between going through red tape or paying bribes to bureaucrats in their endeavour to become entrepreneurs. From (13) and (20), the latter option will be preferred if $(1 + r)b + \frac{\widetilde{\alpha}}{2a}c < \frac{\overline{\alpha}}{2a}c + t$, where $\widetilde{\alpha}$ and $\overline{\alpha}$ are determined in (24) and (9). For a given t, any b that satisfies this condition will imply an $\widetilde{\epsilon}$ in (25) which is less than the $\widehat{\epsilon}$ in (15): that is, compared to red tape, bribery will discourage fewer agents from becoming entrepreneurs. This is

essentially the "speed money" hypothesis, according to which bribes can play a positive role in helping to circumvent institutional hurdles that create costs of doing business. As indicated earlier, this hypothesis may be challenged on a number of grounds, and we single out just two points of contention. First, as illustrated by our analysis, bribery may have effects that red tape does not have. In our case these are the effects on financial market outcomes. Thus, even if bribery admits a greater number of entrepreneurs, the fact that there is also a greater probability of bankruptcy means that there may be more entrepreneurs who fail to repay loans. Second, the institutional obstacles that bribes are meant to overcome are typically the result of corrupt practices to begin with. Indeed, they are often the very means by which public officials engage in illegal profiteering. In other words, rather than being taken as given by bureaucrats, t is an instrument of choice in the extraction of rents. As such, the amount of red tape is appropriately seen as being endogenous, rather than exogenous, to the bureaucratic process. Our analysis now proceeds to take this into account.

To fix ideas, we imagine that bureaucrats act collusively in their rent-seeking, forming an organised corruption network (an illegal syndicate) for the maximisation of bribe income. The total value of this income is given by

$$B = b\int_0^{\widetilde{\epsilon}} g(\epsilon)d\epsilon = \frac{b\widetilde{\epsilon}}{e} \tag{26}$$

In solving its optimisation problem, the bureaucracy takes into account the influence of its actions (its demand for bribes) on the size of the entrepreneurial sector (the number of bribe-payers, or bribe base). That is, it chooses a b so as to maximise the value of B in (26), whilst recognising the effect of b on $\widetilde{\epsilon}$ through (25). This leads to the following result.

Lemma 3 $\exists$ *a unique value of* b *that maximises (26) subject to (25).*

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

$$A_1 - A_0 - (1+r)(I+b) - \left[\frac{\mathcal{A}(a,c,I+b)+a}{2a}\right]c = b\left[(1+r) + \frac{c\mathcal{A}_b(a,c,I+b)}{2a}\right].$$

Since $\mathcal{A}(\cdot)$ is an increasing convex function of b (i.e., $\mathcal{A}_b(\cdot) > 0$ and $\mathcal{A}_{bb}(\cdot) > 0$), the left-hand-side (right-hand-side) of this expression is monotonically decreasing (increasing) in b. Hence there is a single value of b that satisfies the expression. ■

Let b^* denote the optimal bribe. Corresponding to this are an $\widetilde{\alpha}^* = \mathcal{A}(\cdot, I+b^*)$ and an $\widetilde{\epsilon}^* = \mathcal{E}(\cdot, I+b^*)$. Bureaucrats are able to extract b^* by setting the

amount of red tape at least equal to t^*, as determined from $(1+r)b^* + \frac{\widetilde{\alpha}^*}{2a}c = \frac{\overline{\alpha}}{2a}c + t^*$. This description of events is the opposite of that underlying the "speed money" hypothesis: it is bribery that governs red tape, not *vice versa*; and it is because bribes are chosen optimally that red tape is endogenous, not exogenous, to the bureaucratic process. In short, bribery and red tape go hand-in-hand, being merely two sides of the same coin.

Given the above, it is worth recalling our previous results which now take on a rather different complexion. No longer is it true to say that red tape is unrelated to financial market outcomes. After all, the purpose of red tape is to extract bribes, and bribes exert an important influence on such outcomes. If the amount of red tape increases, then it does so because of an increase in the demand for bribes which raises the probability of bankruptcy for entrepreneurs and, with this, the expected cost of verification for financial intermediaries. As indicated already, there is a mutual dependence between corruption, uncertainty and financial market imperfections: the effects of each of these factors are reinforced by the presence of the others. Significantly, one typically presumes that, in general, corruption is higher, uncertainty is greater and capital markets are more imperfect in the lesser developed countries of the world. As our analysis reveals, this combination of circumstances does not bode well for economic performance.

6 Conclusions

Our objective in this paper has been to analyse the effects of, and interactions between, red tape and corruption in a simple model of occupational choice, entry regulation and imperfect capital markets. Red tape is the set of rules and procedures that private agents must legally comply with in order to engage in entrepreneurial activity. Corruption is the payment of bribes by agents to public officials for the purpose of avoiding red tape. Capital market imperfections are the asymmetries of information between borrowers and lenders about the returns to entrepreneurship. The basic problem for agents is to choose whether or not to become entrepreneurs, given the terms and conditions of borrowing (as specified by financial intermediaries), and the terms and conditions of acquiring licenses (as set by bureaucrats). The former include the provision for intermediaries to verify any bankruptcy claims of agents, whilst the latter dictate whether licenses are issued based on agents' compliance with red tape or agents' compliance in corruption.

According to our analysis, both red tape and corruption are costly for agents, and both have the effect of reducing the number of entrepreneurs. Importantly, however, the type of cost is not the same: red tape involves

time and effort, whilst corruption entails monetary expenditures. It is because of this that only corruption affects financial market outcomes. It does so by increasing both the probability of bankruptcy of borrowers and the expected verification cost of lenders. As a consequence, corruption compounds the inefficiencies of capital market frictions and exacerbates the effects of uncertainty. At the same time, the more frictions there are and/or the more uncertainty there is, the stronger are the effects of corruption.

It has been argued by others that corruption may have beneficial effects by allowing agents to circumvent red tape. A major flaw in this argument is that it treats red tape as exogenous to bureaucrats' decisions. In reality the rules and regulations that agents confront are typically drawn up by the very individuals who are able to exploit them for their own personal gain. Far from being beyond bureaucrats' control, red tape is an instrument of choice that bureaucrats can use to extort bribes. Given this, then red tape has as much to do with corruption as bribery, itself. Our analysis takes this on board, providing a simple illustration of how the amount of red tape is determined endogenously in accordance with the optimising behaviour of rent-seeking officials.

The literature on corruption has been growing rapidly over recent years. Whilst many issues have been addressed, many others remain outstanding. One issue to which our analysis draws attention is the potential interactions between two major forms imperfection that may exist in an economy - that is, imperfections in governance and imperfections in financial markets. Significantly, it is among the poorest, least developed countries of the world where these imperfections are most severe and most pervasive.

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