Dispatchers

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June 13, 2008

Abstract

It is a well-established fact that the government bureaucracy in many developing countries is large, difficult to understand, little transparent and slow-moving. However, "de jure" bureaucratic procedures sometimes have little to do with how firms or individuals actually go about when dealing with the government bureaucracy.

One institution that has emerged in many countries is a specialized intermediary, henceforth called dispatcher, that helps individuals and firms in bureaucratic contacts. It is often the workings of this "de facto" institution, rather than the de jure procedure, that determines outcomes such as how many firms or individuals that go through a certain bureaucratic procedure, processing times, waiting times and financial costs.

In this paper, a model in which firms demand a license from the government bureaucracy is developed in order to address two key questions related to the use of dispatchers. First, how does the existence of dispatchers change the number of licenses awarded and prices that firms pay for licenses? How do these results depend on the organization of bureaucrats and dispatchers, on the regulatory framework and on the extent of corruption in the bureaucracy?

Second, what are the incentives of corrupt bureaucrats and dispatchers to try to make regulation more/less complicated? When are the incentives of bureaucrats and dispatchers to create "red tape" aligned? Ultimately and ideally, the answers to these questions can help in explaining why bureaucracies have proven so hard to reform.

JEL classification: O10; O17

Keywords: Dispatchers, Bureaucracy, Informality, Corruption, Red tape

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1 Introduction

It is a well-established fact that the government bureaucracy in many developing countries is large, difficult to understand, little transparent and slow-moving. In the countries with the slowest bureaucracies, it takes approximately a factor one hundred as long time to start up a firm as it does in the fastest countries. In the most expensive countries, it costs approximately a factor one thousand as much as in the least expensive countries (measured in relation to each country's GNI). For this same procedure (starting a firm), which should have roughly the same "social function" everywhere, the fastest and cheapest procedures are found in the developed world, the slowest and most expensive procedures are found in the developing world. Similar differences hold for other bureaucratic procedures (Djankov et al., 2002; World Bank, 2008A).

However, such reported "de jure" procedures sometimes have little to do with how firms or individuals actually go about when dealing with the government bureaucracy. One institution that has emerged in many countries is a specialized intermediary, henceforth called dispatcher, that helps individuals and firms in bureaucratic contacts. It is often the workings of this "de facto" institution, rather than the de jure procedure, that determines outcomes such as how many firms or individuals that go through a certain bureaucratic procedure, processing times, waiting times and financial costs.

In the strict meaning of the word, a dispatcher is someone that expedites tasks, that gets tasks out of his hands, that gets things done. Here, it also takes the meaning of facilitator as well as proxy and someone with power of attorney. That is, the dispatcher is a middleman that can represent an individual or a firm at the government bureaucracy, in order to expedite and facilitate tasks that the individual or firm needs to get done.

This paper is centered around two sets of questions: First, how does the presence of dispatchers, as an alternative to the bureaucracy, affect the number of licenses awarded and prices that firms pay for licenses? To what extent is the outcome affected by the organization of bureaucrats and dispatchers? How is it affected by the complexity of the bureaucratic procedure and the extent of corruption?

The second set of questions relate to the incentives of bureaucrats and dispatchers: What are the incentives of corrupt bureaucrats and dispatchers to try to make regulation more/less complicated? When are the incentives of bureaucrats and dispatchers to create "red tape" aligned? To what extent do the answers to these questions depend upon the organization of bureaucrats and dispatchers? Ultimately and ideally, the answers to these questions can help in explaining why bureaucracies have proven so hard to reform.

In the paper, a model where firms demand a license from the government bureaucracy is developed, combined with a time-saving rationale for firms to use one-stop shop dispatchers to get the license instead.

A result of the analysis is that dispatchers not only help firms that would acquire the license anyway, to save time. For complicated bureaucratic procedures that would be prohibitive otherwise, dispatchers expand the number of licenses awarded. This is much in line with procedures such as the start-up of firms in Brazil, where virtually all firms use a dispatcher at start-up, instead of going through the hassle of 18 different steps at different government authorities.

A ceteris paribus introduction of dispatchers is an a priori improvement for firms that choose to use them: the total time+financial cost is lower. It is not obvious however, that such a situation is upheld. Once in place, dispatchers - together with corrupt bureaucrats- often have incentives to create red tape. By allowing for variation in how bureaucrats and dispatchers are organized, the analysis highlights when such incentives are, and are not, at work.

Many of the results from the model, although framed in terms of firm-bureaucracy interaction, hold for individuals dealing with a cumbersome bureaucracy as well.

2 Stylized facts about dispatchers

Corruption and red tape in the government bureaucracy are phenomena that are fairly well-understood, at least from a theoretical viewpoint (see for instance Bardhan, 1998; Rose-Ackerman, 1999 and Svensson, 2003). Much less is known about dispatchers in general, the relation to corruption and the interplay between bureaucrats and dispatchers. This section presents stylized facts about dispatchers in different parts of the world and provides a rationale for the model to be presented.

Different types of intermediaries helping with bureaucratic contacts, "dispatchers", are common throughout the developing world. Myrdal (1968) documents their existence in India and Oldenburg (1987) goes further with a more formal account of the role of intermediaries in a land consolidation program in Uttar Pradesh. Oldenburg identifies different roles of intermediaries within and outside the bureaucracy and details the functions of "brokers", "touts", "scribes", "consolidators", "helpers" and "barkers" within the land consolidation program. Levine (1975) documents the existence of intermediaries in the interface between the Ghanaian bureaucracy and firms and individuals.

The prevalence of "despachantes", used in bureaucratic contacts in Brazil, is documented by Rosenn (1971). When studying formalization of firms, Stone et al. (1996), Zylbersztajn and Graça (2003) and Zylbersztajn et al. (2007) provide evidence that using "despachantes" is the most common way to formalize a firm in Brazil. Husted (1994) describe how "coyotes" help individuals in obtaining drivers' licenses in Mexico. Such "coyotes" are an example of "tramitadores", a more general and widely used term for (mostly) informal intermediaries present

in most of (Spanish-speaking) Latin America, helping individuals and firms with bureaucratic procedures ("tramites"). Proética (2006) documents, for Peru, the degree of individuals' usage of "tramitadores" in different bureaucratic contacts. Lambsdorff (2002) refer to "tramitadores" helping out with the bureaucracy in El Salvador. Examples of reports documenting the use of such intermediaries by firms, at formalization, are CIEN (2001) for Guatemala, IFC (2008) for Honduras, IFC (2007A) for Peru and CIET (1998A, B) and IFC (2007B) for Bolivia[1]. Gancheva (1999) describes the use of similar intermediaries by firms in Bulgaria.

Although none of the papers above, with the possible exception of Oldenburg (1987), is a specific study of the dispatcher function, they point at different functions performed by such intermediaries. In some settings, the main reason why individuals use dispatchers seem to be the dispatchers' knowledge of how bureaucratic procedures actually work. In many countries with large and non-transparent bureaucracies, actually finding out what is required to do in order to get, say, a passport, is a challenge in itself. Rosenn (1971) says: "The despachante functions effectively because he knows how to fill out the bewildering variety of forms, to whom the copies should be delivered, and what documentation will be required" (p. 537). Honduran firms claim that they use "tramitadores", when becoming formal, because of lack of unified information from the authorities regarding the formalization procedure (IFC, 2008). The same holds in a small sample of microenterprises in Guatemala (CIEN, 2001). For Bulgarian firms obtaining an operations permit, "the procedures are not clear, nor are they easily accessible to potential licenses applicants" (Gancheva, 1999, p.22).

Time-saving in bureaucratic procedures is a related reason why individuals and firms use dispatchers. By frequent interactions with the authorities, dispatchers learn the procedures and acquire a superior "technology" to handle the government bureaucracy. Stone et al. (1996), as well as Zylbersztajn and Graça (2003) indicate that firms use despachantes to become formal because these act much like "one stop shops", saving time in the start-up procedure.

Recent data from the World Bank Enterprise surveys confirm that time spent dealing with government varies a lot between different parts of the world, and is substantial in Latin America. Whereas the OECD average is 3% of a work week, the world average is 6.9% and the Latin American average is by far the highest at 11.4% (World Bank, 2007). A 1996 report studying only a few countries showed similar values for the Latin American countries (World Bank, 1996). The numbers confirm earlier work by de Soto (1989).

A closer look at the dispatching activity reveals that the time-saving argument is not the full story. The dispatching activity is common in countries which also rank high on bureaucratic corruption. Although newspaper reports

[1] Another generic name, much in use in some parts of (Spanish-speaking) Latin American, for the type of middleman function in mind, is "gestor".

and anecdotes about the role of intermediaries in corruption abound, there are very few systematic studies. Bertrand et al. (2007) provide evidence that the way to obtain a driver´s license in Delhi, India, without actually learning how to drive, is through an intermediary ("agent" in their terminology). They also show that bureaucrats, by failing driver´s license applicants irrespective of driving ability, encourage use of intermediaries[2].

Fjeldstad (2003) documents that a dispatcher sector emerged after an anti-corruption campaign in the Tanzanian Revenue Authority. As part of the program, all employees had to re-apply for their jobs and one third of all employees were not given new jobs. Many such former employees, however, set up their own "agencies". In the words of Fjeldstad: "These persons had intimate knowledge of the tax administration and of loopholes etc. Since many of their former colleagues remained in the tax administration, good connections to the inside were assured" (p. 172).

The rationale for indirect, rather than direct, corruption, comes from the fundamental difference in the relationship between the bureaucrat and the dispatcher on one hand, and between the bureaucrat and the individual or firm on the other hand. The relationship between the bureaucrat and the dispatcher is characterized by frequent interactions whereas firms are more likely to meet a certain bureaucrat only once. This implies that anti-corruption policies are more likely to be effective in the bureaucracy-firm relationship than when the dispatcher is involved[3]. The model to be presented in this paper is one in which there is no direct corruption.

The Tanzanian case, as well as the paper by Bertrand et al., are examples of corruption "bending the rules", via the use of intermediaries (getting a license without knowing how to drive and tax evasion, respectively). The Brazilian case, with despachantes to help in a multitude of bureaucratic contacts, is probably mainly characterized by much small-scale "according to rules"-corruption. That is, bureaucrats take bribes, through despachantes, not to bend the rules but to give a speedier treatment and/or to do the job at all[4]. It is with such "according to rules"-corruption that this paper is concerned.

[2] The model of Hasker and Okten (2007) concerns such "bending the rules"-corruption and the role of intermediaries. In their model the demand for intermediaries is derived from a moral hazard problem in the relation between individuals and bureaucrats. That is, bureaucrats can take bribes from individuals in order to "bend the rules". Because they interact only once with each individual however, after having received the bribe, bureaucrats may choose to not respond to the bribe. Well-established intermediaries, on the other hand, have a repeated interaction with bureaucrats, and can therefore be assured a reduction in regulation for their clients. Individuals wanting a reduction in regulation therefore prefer to use intermediaries.

[3] Similar to the reasoning in Hasker and Okten (2007), the government can give clients incentives to expose corrupt bureaucrats whereas the mutually beneficial relationship between dispatchers and corrupt bureaucrats is more difficult to reveal.

[4] It is probably what Rosenn (1971) has in mind when stating: "Most importantly, he (the despachante) operates expeditiously because he has cultivated friends in the bureaucracy. This cultivation is frequently fertilized by the turnover of a portion of his fee or by appropriate Christmas or birthday presents" (p. 537).

To sum up: in this paper dispatcher demand is derived from time saving considerations. Dispatchers are one stop shops. We are concerned with the everyday "petty" interaction between firms/individuals and the bureaucracy. Related to such interaction is the "petty" corruption in which bureaucrats seek to gain extra income through bribes, but still performing their job according to the bureaucratic rules. Finally, in the baseline model there is indirect corruption only[5].

The outline of the rest of the paper is as follows. The model is presented in section 3 and solved in section 4. The following two sections turn to the main questions of the paper, the effects on license allocations and prices in section 5 and the discussion of bureaucracy and dispatcher profits and red tape in section 6. The final section discusses the main predictions of the model and suggests directions for future work.

[5] In section 6.6 an extension to the model, in which there is indirect as well as direct corruption, is briefly discussed.

3 The model

The model is static and has three actors. First, there are firms that demand a license that brings a production benefit to the firm. The license can be obtained by going through a bureaucratic procedure consisting of n steps. The second component of the model is thus the bureaucracy consisting of n bureaucrats. The third component is the dispatcher sector, consisting of dispatchers that offer the same completion of the bureaucratic procedure as the bureaucracy, but as a "one stop shop". As motivated above, in the model there is indirect but no direct corruption.

3.1 Firms

Firms, indexed by superscript i, differ in their baseline production parameter A^i, which is distributed uniformly on the unit interval, $0 \leq A^i \leq 1$. There is a total measure of 1 of firms. Firms can get a production increase, from A^i to gA^i, where $g > 1$, if they go through a bureaucratic procedure. This is referred to as "getting a license". Not getting the license is referred to as "remaining informal". An example of a license procedure could be formalization of the firm, where potential production gains can come from better access to credit, more marketing possibilities, less uncertainty in investment decisions, etc[6].

3.2 Bureaucratic procedure

The bureaucratic procedure is modelled as n equal steps that the firm has to go through to obtain the license. Each bureaucratic step consists of one visit to the government bureaucracy in which the firm interfaces one bureaucrat, responsible for this step only. The bureaucrat completes this one step after which the firm has to undertake the next step of the procedure, facing a new bureaucrat. For each step of the procedure there is only one bureaucrat to which firms can turn, i.e. each bureaucrat is a "monopolist".

Each step is associated with a financial cost p that is the actual cost faced by the bureaucrat[7]. In addition, going through the bureaucratic procedure also means that the firm spends time in licensing rather than in production. This time cost, per bureaucratic step, is modelled as a cost t per unit of production, i.e. $A^i t$. Examples of time costs that fit into this framework are waiting times

[6] The model is equivalent to a two-period model in which the firm has productivity A^i in period 1 and gA^i in period 2 if it gets the license and remains with A^i in period 2 if it does not get the license.

[7] Throughout the paper the cost p faced by a bureaucrat can be thought of as being delivered by the bureaucrat to his superior, without any stealing on part of the bureaucrat. The actual step is always completed by the bureaucrat.

at each office, transport time to go to each office and time spent finding out how to do each step[8],[9].

3.3 Direct interaction only - no dispatchers and no corruption

Before introducing dispatchers and corruption in the bureaucracy, we first study the case where the only decision to be made is firms' acquiring the license through an honest bureaucracy, or to remain informal. This provides a benchmark case for the analysis to follow. For now there is thus only direct interaction between firms and honest bureaucrats and these charge the financial cost p per step.

Firms with productivity higher than or equal to A_b^i will get the license, where A_b^i is the bureaucracy productivity threshold solving

$$gA^i - np - A^i nt = A^i \qquad \Rightarrow \qquad A_b^i = \frac{np}{g-1-nt} \tag{1}$$

The LHS in (1) is net production when getting the license through the bureaucracy, the RHS is net production remaining informal. The larger the bureaucracy (n), the higher the associated costs (p,t) and the less there is to gain ($g-1$) from a license, the more informality. There is a nonlinear dependence on n. Note that no firm will get a license, because $A_b^i \geq 1$, if the size of bureaucracy n is above $n_{\max,b} \equiv \frac{g-1}{p+t}$.

A note on terminology: The terms "licenses awarded" and "informality" will be used interchangeably. If all firms were to get a license (i.e. if $n = 0$), the number of licenses awarded would be 1 and informality would be 0. Informality is thus one minus licenses awarded.

[8] The assumption of the time cost being proportional to firm productivity can be interpreted as firm management (rather than "office boys") being involved in the licensing procedure, something which is supported by the studies cited in this paper. An alternative interpretation of the time cost is that it represents a delay in obtaining the license (and therefore in realizing the production gain) that is proportional to n.

[9] I abstract from sequential bargaining problems in the model. Olken (2007), in studying roadblocks holding up truck transports in Banda Aceh, Indonesia, discusses a model in which the bargaining problem at each roadblock changes as a truck travels along the road. Blanchard and Kremer (1997), in analyzing central planning vs. transition n-step production chains in Russia, also use a sequential bargaining model.

3.4 Corrupt bureaucrats

We now introduce corrupt bureaucrats, that can take bribes indirectly, through dispatchers, but not directly. As motivated above, it is then implicitly assumed that there is perfect government enforcement of the direct bureaucracy-firm relationship, but no enforcement in the bureaucracy-dispatcher relationship.

In the bureaucrat-dispatcher interaction, corrupt bureaucrats (mis)use their public office for private gain. Let there be m ($\leq n$) corrupt bureaucrats and, consequently, $n-m$ honest bureaucrats. Each corrupt bureaucrat completes his step according to the rules, incurs the cost p, and charges a profit-maximizing price b to the dispatcher. Each honest bureaucrat charges the price p to dispatchers[10]. The total price of a license, from bureaucrats to dispatchers, thus becomes $B = mb + (n-m)\,p$. By assumption, corrupt bureaucrats can not price discriminate. In the direct interaction with firms, all bureaucrats charge p.

In the analysis to follow we will first allow for corrupt bureaucrats to set prices independently of each other ("decentralized"). In section 6, we then allow for price setting in a coordinated ("centralized") fashion. In this latter case, bureaucrats internalize the horizontal externality that arises when prices are set independently[11].

3.5 Dispatchers

Dispatchers offer a "one stop shop" alternative for firms to obtain a license. Instead of paying np and a time cost of $A^i nt$ at the bureaucracy, firms can go to dispatchers that charge a profit maximizing price d for their service. Dispatchers in turn complete the n steps at the bureaucracy, paying each of the m corrupt bureaucrats the profit maximizing price b and the $n-m$ honest bureaucrats p per step. By assumption, dispatchers can not price discriminate and there is no time cost associated with using dispatchers[12].

The model will allow for variation in the number of dispatchers, defined as x, and for a mark-up in the dispatcher sector. The mark-up is derived through Cournot competition between dispatchers. This specification allows us to study, in a convenient way, how the market structure of dispatchers affects license allocations. Figure 1 summarizes the problem set-up.

[10] Note that $m = 0$ as well as $m = n$, corresponding to the cases of no corruption and full corruption, respectively, are allowed.

[11] Centralized/decentralized is the terminology of Shleifer and Vishny (1993, 1998). In the same terminology the type of corrupt bureaucrats in mind in this paper are "grabbing hand" bureaucrats "without theft". The terminology used here is "according to rules"-corruption.

[12] The zero time cost is obviously a limit case but a small time cost ($< t$) would not change the qualitative results of the analysis.

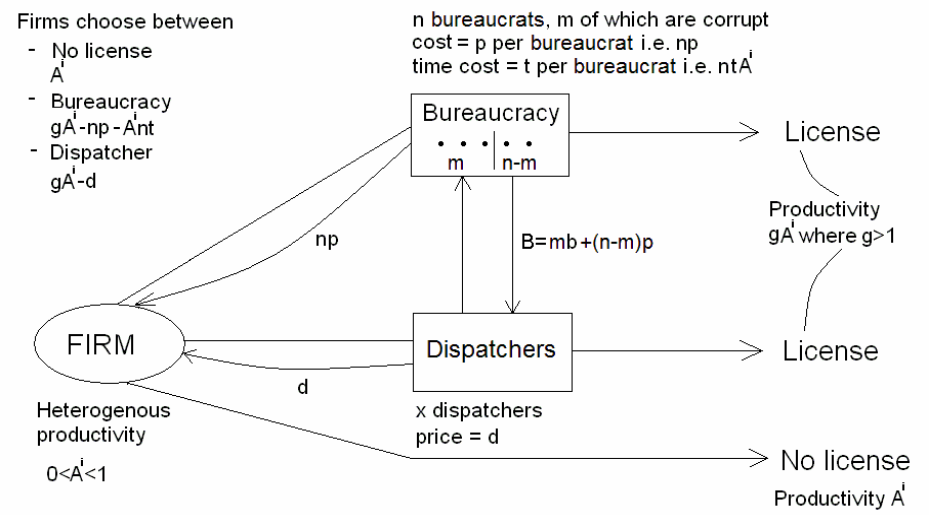

Figure 1. The problem set-up.

3.6 Solution method

There is complete information in the model. It is solved by backward induction in three stages. In the third stage, direct and indirect firm demand for licenses is derived as a function of bureaucracy and dispatcher prices. In the second stage, the profit maximization problem of dispatchers is solved. In the first stage, the corrupt bureaucrats solve their profit maximization problem. In implementing this solution, dispatcher and bureaucracy prices are best responses to each other.

In section 6, after introducing centralized bureaucrats, we allow for a joint profit-maximization - "vertical integration" - decision by bureaucrats and dispatchers. Bureaucrats and dispatchers then bargain over the surplus generated by eliminating the vertical double marginalization externality.

4 Solving the model

We now solve the model, going backwards from firms, to dispatchers and then bureaucrats. We then study the resulting license allocations, degree of informality and prices.

4.1 Firm demand

Firms choose between getting a license through the bureaucracy, through dispatchers or to remain informal. There are three productivity thresholds and which of these that apply depends on the optimal dispatcher price.

First, the relevant threshold for choosing between bureaucracy and informality is A_b^i, as derived above. Second, the relevant threshold for choosing between dispatcher and informality is A_d^i, which is the solution to

$$gA^i - d = A^i \qquad \Rightarrow \qquad A_d^i = \frac{d}{g-1} \tag{2}$$

The LHS in (2) is net production when getting the license through a dispatcher, the RHS is net production remaining informal. Intuitively, if d is low, such that $A_d^i < A_b^i$, all firms that get the license will go through the dispatcher.

The third threshold becomes relevant when d is instead high, such that A_d^i is larger than A_b^i and therefore does not apply. The bureaucracy now awards some licenses through the direct procedure. High-productivity firms however, will still go through the dispatcher (otherwise dispatchers would have no market, which would not be optimal).

The threshold between licenses awarded through the bureaucracy and through dispatchers is A_{bd}^i, which is the solution to

$$gA^i - np - A^i nt = gA^i - d \qquad \Rightarrow \qquad A_{bd}^i = \frac{d - np}{nt} \tag{3}$$

The LHS in (3) is net production when getting the license through the bureaucracy, the RHS is net production when getting the license through a dispatcher. As the firm gets the license in both cases, A_{bd}^i does not depend on the production gain $g - 1$. Note that all three thresholds are equal, that is $A_b^i = A_d^i = A_{bd}^i$, when d equals $\bar{d}$, given by

$$\bar{d} \equiv np\frac{g-1}{g-1-nt}. \tag{4}$$

At this dispatcher price, the firm which is indifferent between going through bureaucracy and remaining informal is also indifferent between going through dispatcher and remaining informal. Consequently, the same firm is also indifferent between bureaucracy and dispatcher.

For dispatcher prices smaller than $\bar{d}$, dispatchers have the entire market for licenses and the relevant threshold is therefore A_d^i. Note that in this case $A_d^i > A_{bd}^i$. For dispatcher prices larger than $\bar{d}$, dispatchers do not capture the entire market and the relevant threshold is therefore A_{bd}^i. In this case we instead have $A_{bd}^i > A_d^i$.

Summing up, we can write the demand function for the dispatcher service as $Q(d) = \text{Min}\left\{\int_{A_d^i}^{1} dA^i, \int_{A_{bd}^i}^{1} dA^i\right\}$, where Q is the total amount of licenses demanded from dispatchers. With the uniform distribution of A^i, this simplifies to

$$Q(d) = \text{Min}\left\{1 - \frac{d}{g-1}, 1 - \frac{d-np}{nt}\right\} \tag{5}$$

The demand function is displayed in figure 2.

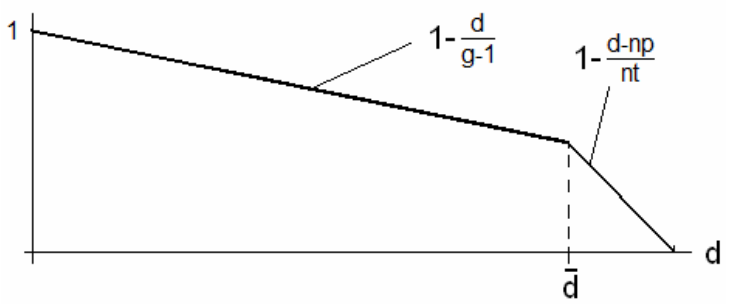

Figure 2. Demand function for the dispatcher service.

It should be stressed at this point that a main point in the analysis is how the solution to the problem varies with the size of the bureaucracy n. Figure 2 has been drawn for a fixed value of n and looks different for other sizes of bureaucracy (intersection of lines and slope of high-d demand curve change).

4.2 Dispatcher profit maximization

In order to capture different levels of competition within the dispatcher sector, Cournot competition between dispatchers is used. The number of dispatchers is defined as x.

An indirect demand function $d(Q)$ is derived by using (5) to solve for the dispatcher price d:

$$d(Q) = \text{Min}\{(g-1)(1-Q), np + nt - ntQ\} \tag{6}$$

For large numbers of licenses awarded by dispatchers, the dispatchers' price is determined by dispatchers having the entire market for licenses (first term in expression 6 is smallest, corresponds to $d < \bar{d}$). For small numbers of licenses awarded, the price is determined by dispatchers only having demand from firms becoming formal anyway (second term in expression 6 is smallest, corresponds to $d > \bar{d}$).

Each of the x identical dispatchers takes the cost of permits that they face at the bureaucracy, B, as given. They maximize profits by choosing their profit maximizing quantity, q, taking the total quantity choice of the other $x-1$ dispatchers, $(x-1)\tilde{q}$, as given. Note that $Q = q + (x-1)\tilde{q}$ and write the individual dispatcher's indirect demand function, by expanding expression 6, as $d(q) = \text{Min}\{(g-1)(1-(q+(x-1)\tilde{q})), np + nt - nt(q+(x-1)\tilde{q})\}$. Each dispatcher solves:

Choose q to maximize $qd(q) - qB$

After applying symmetry between all dispatchers and plugging the optimal quantities back into $d(q)$, we get the following optimal response functions:

$$\begin{array}{ll} d^{*}(B) = \dfrac{x}{1+x}B + \dfrac{1}{1+x}(g-1) & \text{when } B \text{ is such that } d^{*}(B) \leq \bar{d} \\ d^{**}(B) = \dfrac{x}{1+x}B + \dfrac{1}{1+x}(np+nt) & \text{when } B \text{ is such that } d^{**}(B) \geq \bar{d} \\ d^{\text{corner}}(B) = \bar{d} & \text{when neither } d^{*}(B) \text{ nor } d^{**}(B) \text{ apply} \end{array} \tag{7}$$

The response functions $d^{*}(B)$ and $d^{**}(B)$ capture the standard feature of Cournot competition, that is, a mark-up over cost (B) that gradually declines when the number of dispatchers, x, grows.

4.3 Bureaucrat profit maximization

Corrupt bureaucrats solve the profit maximization problem taking these dispatcher responses into account. Each corrupt bureaucrat sets his price b without taking into account the individual prices $\tilde{b}$ set by each of the other $m-1$ corrupt bureaucrats. The total bureaucracy price facing the dispatcher is thus $B = b + (m-1)\tilde{b} + (n-m)p$.

The profit function of a corrupt bureaucrat is bribe revenue minus cost, i.e. $b-p$, times demand. We plug in $d^{*}(B)$ and $d^{**}(B)$, from (7), in each of the components of the demand function in (5), to get the maximization problem of a corrupt bureaucrat:

$$\text{Choose } b \text{ to maximize } (b-p) \times \left(\text{Min}\left\{1 - \frac{d^{*}(B)}{g-1}, 1 - \frac{d^{**}(B) - np}{nt}\right\}\right)$$
$$\text{s.t. } d^{*}(B) \leq \bar{d} \text{ and } d^{**}(B) \geq \bar{d}$$

The two constraints assure that the calculated optimal bureaucracy price is consistent with the part of the dispatcher demand curve which was used to derive the optimal bureaucracy price itself.

In interpreting the maximization problem and the solution below, imagine first a small bureaucracy (n is low). Because the cost of going through the

bureaucracy is not very high, dispatchers will not find it optimal to capture the entire market for licenses, this would require a too low dispatcher price. Therefore, the second part of the demand curve, $1 - \frac{d-np}{nt}$, will apply in the optimum.

When the bureaucracy is instead large (n is high), it is very costly for firms to go through the procedure the direct way and dispatchers will capture the entire market for licenses. Therefore, the first part of the demand curve, $1 - \frac{d}{g-1}$, will apply in the optimum. For both these cases, optimal dispatcher and bureaucracy prices are such that that none of the two wants to deviate, given the choice of the other.

In an intermediate range of bureaucracy sizes, neither of these solutions apply, which is to be expected from the kink in the demand curve and the fact that the optimal solution moves along the demand curve. In this intermediate range, bureaucrats will find it optimal to set prices such that dispatchers will just choose to capture the entire market, that is $d = \bar{d}$. Bureaucrats then choose the one constraint above that gives highest profits, which, for a fixed d and therefore fixed demand, is the same as choosing B as large as possible. A high B means that the dispatcher is just about to raise the price from $\bar{d}$ and therefore (is just about to) not capture the entire market. The part of the demand curve that applies is therefore $1 - \frac{d-np}{nt}$, and the bureaucrats' price will be the B that solves $d^{**}(B) = \bar{d}$, from (7).

Formally, there are two bureaucracy size thresholds n^{**} and n^{*}, with $n^{**} < n^{*}$, and the solution can be written as follows:

Small bureaucracy sizes: $1 < n < n^{**}$

$$B^{**} = np + \frac{m}{1+m}nt \qquad d^{**} = np + \frac{(1+m+mx)}{(1+m)(1+x)}nt \tag{8}$$

Intermediate bureaucracy sizes: $n^{**} < n < n^{*}$

$$B^{\text{corner}} = \frac{(g-1)npx - (g-1-np-nt)nt}{(g-1-nt)x} \qquad d^{\text{corner}} = \bar{d}$$

Large bureaucracy sizes: $n^{*} < n$

$$B^{*} = np + \frac{m}{1+m}(g-1-np) \qquad d^{*} = np + \frac{(1+m+mx)}{(1+m)(1+x)}(g-1-np)$$

As expected, small bureaucracy prices (B^{**},d^{**}) are related to how much (time) a firm can save by using dispatcher instead of bureaucracy. They do not depend on the benefit of formality, because the firm would get the license anyway. Large bureaucracy prices (B^{*},d^{*}), reflecting a choice between dispatcher and informality, instead depend on the gain of formality, $g - 1$.

The comparative statics of m, the number of corrupt bureaucrats, on dispatcher and bureaucracy prices is straightforward. When m increases, bureaucracy and dispatcher prices increase because of the horizontal externality between corrupt decentralized bureaucrats. An increase in the number of dispatchers, x, instead decreases dispatcher prices, but does not affect bureaucracy prices.

The small bureaucracy solution (B^{**},d^{**}), where there is both direct and indirect demand for licenses, holds as long as d^{**} is larger than $\bar{d}$, or, equivalently up to $n = n^{**}$, where

$$n^{**} = \frac{(g-1)(1+m+mx)}{t+(p+mp+mt)(1+x)}.$$

Above this bureaucracy size, the corner solution binds. The dispatcher captures the entire market for licenses, and both B and d increase sharply with n. This has the effect of restricting demand due to high d. As long as the bureaucrat finds this solution optimal, it will apply.

The upper threshold n^* is the bureaucracy size at which bureaucrats are indifferent between choosing the corner solution (with a high price that restricts demand) and instead implementing the large bureaucracy solution (B^*,d^*). This solution is associated with somewhat lower prices. As a consequence, we will get a discontinuity in bureaucracy and dispatcher prices (and dispatcher demand), at n^*[13],[14].

The threshold n^{**} increases in the gain of getting a license, i.e. $\partial n^{**}/\partial(g-1) > 0$. When $g-1$ increases, the importance of the time loss of going directly through the bureaucracy decreases, and hence make dispatchers less advantageous to use relative to the bureaucracy. Therefore, a larger bureaucracy size is required to make the dispatcher-only solution apply. The effect of increases in the cost of going through the bureaucracy on n^{**} is the opposite, i.e. $\partial n^{**}/\partial p < 0$ and $\partial n^{**}/\partial t < 0$. Finally, more corruption in the bureaucracy ($m \uparrow$) and fewer dispatchers ($x \downarrow$) make dispatchers less attractive to use. As a result, $\partial n^{**}/\partial m > 0$ and $\partial n^{**}/\partial x < 0$[15]. The comparative statics of the large-bureaucracy threshold n^* is the same as above, i.e. n^* increases with $g-1$ and m and decreases in p, t and x.

[13] The threshold where $d^*(B) = \bar{d}$, from (7), turns out to be irrelevant because the bureaucrat prefers to maintain the corner solution at the bureaucracy size that corresponds to this threshold. It can be shown that the corner solution always exists, i.e. that $n^{**} < n^*$. It can also be shown that the bureaucracy size at which $d^* = \bar{d}$ is always between n^{**} and n^*.

[14] An analytical expression for n^* exists but is very complicated and is therefore not provided here. The comparative statics to follow have been done numerically.

[15] Note that when solving for n^{**} and n^*, the number of corrupt bureaucrats, m, was kept constant. An alternative set-up would have been to specify the fraction, instead of the number, of corrupt bureaucrats.

5 License allocations and prices

The solution, i.e. prices as a function of the bureaucracy size n in left panels, and resulting license allocations as a function of n in right panels, typically looks as in figures 3 and 4. The right panels show "licenses awarded", measured from the lower horizontal axis and up, or alternatively, "informality", measured from the upper horizontal line and down[16]. The downward sloping concave curve in the right panels, intersecting the lower horizontal axis at $n_{\max,b}$, indicates the amount of licenses that would have been awarded without dispatchers (from expression 1).

The upper panels is the monopoly dispatcher case ($x = 1$), the lower panels represent perfect competition ($x \to \infty$)[17].

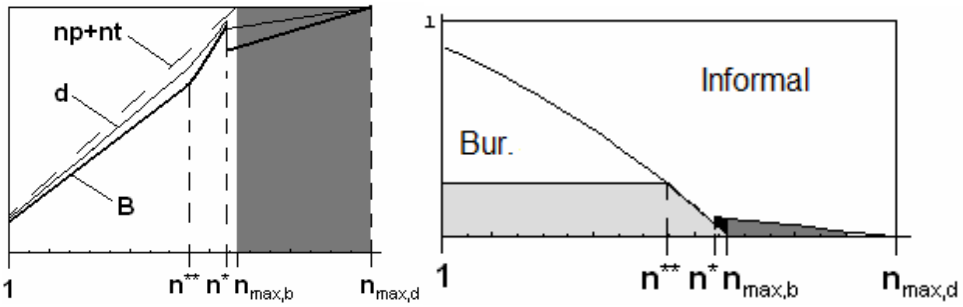

Figure 3. Left graph - bureaucracy and dispatcher prices when there is one dispatcher. Right graph - the corresponding demand for licenses from bureaucracy (Bur.) and the dispatcher (light grey, black and dark grey).

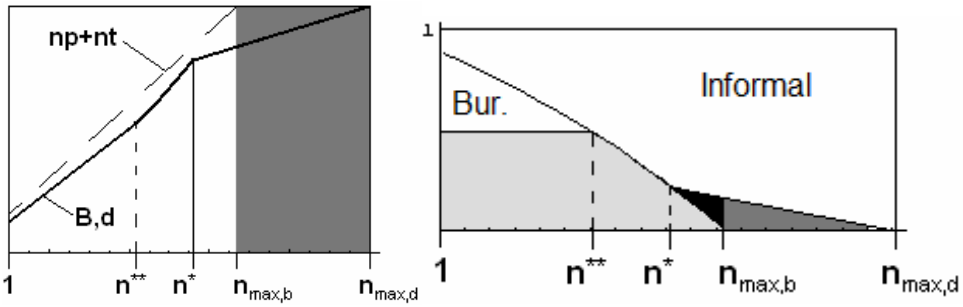

Figure 4. Left graph - bureaucracy and dispatcher prices when there is perfect competition between dispatchers. Right graph - the corresponding demand for licenses from bureaucracy (Bur.) and the dispatcher (light grey, black and dark grey).

[16] This also means, for the right panels, that the vertical axis could be firm productivity, $0 \leq A^i \leq 1$, measured from the upper horizontal line and down. It is the highest productivity firms that are closest to the lower horizontal axis and these firms are the ones that always use dispatchers.

[17] Parameter values are $g = 2$, $p = 0.1$, $t = 0.05$, $m = 1$. These same parameter values are used in all graphs in the paper.

The left panel of figures 3 and 4 show dispatcher prices to firms for monopoly and perfect competition dispatchers, respectively. For comparison, the $np + nt$-line represents the cost to the firm with highest productivity ($A^i = 1$), and therefore highest willingness to get a license, to go through the bureaucracy. In section 3.3, the largest possible bureaucracy size to award any license was given by $n_{\max,b} = \dfrac{g-1}{p+t}$, with dispatchers it is $n_{\max,d} \equiv \dfrac{g-1}{p}$, which is larger[18]. The dark grey area in the left panels thus represents by how much the existence of dispatchers extends possible bureaucracy sizes, with these bureaucracies still awarding licenses. Stated in a different way: although the de jure regulation can be very cumbersome (high n), for such large bureaucracy sizes it is the de facto institution of dispatchers that determines whether any licenses will be awarded at all.

The dark grey areas in the right panels represent the corresponding demand for such "additional" licenses, licenses that would not have been awarded without dispatchers, due to a prohibitively cumbersome bureaucratic procedure.

Comparing figures 3 and 4 shows the importance of the market structure of dispatchers in how many licenses are awarded and through what entity. Expressions (8) for d^{**} and d^* show that dispatchers add a margin that is decreasing in x. In figure 3, with one dispatcher only, there is a full double vertical monopolization externality and the number of licenses awarded through dispatchers is small, compared to the perfect competition case in figure 4. This difference is seen through the difference in the light grey areas between the right panels[19].

Because demand indicated by light grey would be awarded also without dispatchers present (it lies to the left of the concave curve), the main question for such licenses is the division between direct and indirect allocation and how much firms pay. Note that all demand satisfied through dispatchers - that is light grey, dark grey and black areas, represents firms that are better off than without dispatchers (firms *choose* to go to dispatchers because of the lower total cost). This effect of firms being better off, by going to dispatchers rather than directly to the bureaucracy, is bigger the more competition there is (lower dispatcher prices increase the size of the light grey area).

Differently from the division between direct and indirect allocation (left of the concave curve), the total number of licenses awarded above bureaucracy size n^* depends on the market structure of the dispatcher sector. This is illustrated by the difference, between figures 3 and 4, in the size of the black and dark grey areas in the right panels.

[18] This upper bureaucracy size does not depend on the other parameters of the problem. A dispatcher can be in the market until $d = g - 1$ (set $A_i = 1$ in expression 2). Because the large-bureaucracy price d^*, irrespective of the values on m and x, can be written as a weighted average between benefit to the firm $(g-1)$ and cost to the bureaucrat (np), the maximum value of np that is of interest is $g - 1$. This gives $n_{\max,d} = \dfrac{g-1}{p}$.

[19] The grey areas represent, for small bureaucracies, a demand for the dispatcher service of 1/4 and 1/2 of all firms, respectively. The difference comes from the expansion of demand that results in going from monopoly to perfect competition between dispatchers.

More decentralized corruption ($m \uparrow$) will have an effect that resembles less competition in the dispatcher sector, but more severe. Figures 3-4 were drawn for the best possible case, i.e. $m = 1$. More corruption means higher prices and that the light grey, black and dark grey areas will approach zero when m grows large enough.

The left panel of figure 3 illustrates what the corner solution implies for dispatcher and bureaucracy prices: the dispatcher margin $d - B$ decreases sharply when moving from n^{**} to n^{*}.

In the intermediate region there exists no solution in which both bureaucrats and dispatchers solve unconstrained optimization problems. Instead, bureaucrats can set a higher B than they would have, had an unconstrained solution existed. Dispatchers have no other choice than setting $d = \bar{d}$. This amounts to a "transfer of bargaining power" from dispatchers to bureaucrats and will be reflected in the relation between dispatchers' and bureaucrats' profits in the intermediate region.

In the section to follow, bureaucracy and dispatcher profits are studied more carefully. Before introducing the profit functions however, the incentives for within-bureaucracy "centralization", as well as vertical bureaucracy-dispatcher integration, are discussed.

6 Incentives, profits and endogenous red tape

The previous section highlighted the effects from the introduction of dispatchers and corruption in the bureaucracy on license allocations and prices. We now turn to bureaucracy and dispatcher profits and the effects of cooperation, both within the bureaucracy and between bureaucrats and dispatchers, on these profits. This leads to the discussion of endogenous red tape, i.e. the incentives of bureaucrats and/or dispatchers to try to maintain, simplify or complicate regulation. The question is whether the presence of dispatchers can help explaining why bureaucracies in many countries are large, and as a related point, difficult to reform.

We first study horizontal cooperation between bureaucrats and vertical integration between bureaucrats and dispatchers. We then turn to profits and endogenous red tape considerations. Some further IO aspects affecting profits of bureaucrats and dispatchers are then discussed. The section ends with a brief discussion of a possible extension of the model with not only indirect, but direct corruption as well.

6.1 Centralization of bureaucrats

In many bureaucratic procedures, several different government authorities are involved. An example is the start-up of firms, where the tax-, labor- and health regulation that new firms need to comply with are likely to be taken care of by different authorities[20]. Bureaucrats that act independently therefore seems as a natural starting point. Given a number of corrupt bureaucrats m however, each of these can be better off by setting a joint price that maximizes joint bribe profits. This is because the horizontal externality on total demand, arising when each bureaucrat sets the price independently, is internalized[21]. There is thus an incentive for corrupt bureaucrats in the government bureaucracy to cooperate[22].

The solution to the optimization problem when bureaucrats are centralized corresponds to the decentralized solution with $m = 1$. This *centralized* solution, subindexed c, is given below:

Small bureaucracy sizes: $1 < n < n_c^{**}$

$$B_c^{**} = np + \frac{1}{2}nt \qquad d_c^{**} = np + \frac{2+x}{2+2x}nt \tag{9}$$

Intermediate bureaucracy sizes: $n_c^{**} < n < n_c^{*}$

$$B_c^{\text{corner}} = \frac{(g-1)\,npx - (g-1-np-nt)\,nt}{(g-1-nt)\,x} \qquad d_c^{\text{corner}} = \bar{d}$$

Large bureaucracy sizes: $n_c^{*} < n$

$$B_c^{*} = np + \frac{1}{2}(g-1-np) \qquad d_c^{*} = np + \frac{2+x}{2+2x}(g-1-np)$$

The centralization of bureaucrats means that demand is restricted less than if bureaucrats were decentralized (and $m > 1$). Bureaucracy and dispatcher profits will therefore increase.

6.2 Joint price setting by bureaucrats and dispatchers

Centralization of bureaucrats also opens up for cooperation between bureaucrats and dispatchers, in a joint price setting vis-a-vis firms, and then bargaining over the extra surplus generated[23]. Such cooperation eliminates the vertical externality present when bureaucrats and dispatchers take individual decisions and it expands demand and profits.

[20] For detailed procedures for a number of bureaucratic procedures in any specific country, see World Bank, 2008A.

[21] The discussion much resembles Shleifer and Vishny, 1993.

[22] We do not consider bargaining problems that could arise between bureaucrats but instead assume that centralized corrupt bureaucrats split profits equally between each other.

[23] A bargaining problem between bureaucrats and dispatchers is not solved. Our interest lies in the allocation of licenses.

Assume that bureaucrats and dispatchers manage to establish and maintain such mutually beneficial cooperation. In solving the maximization problem, the expression for firm demand is still given by (5). The bureaucrat/dispatcher faces the cost np for licenses and sets the price d vis-a-vis firms in order to maximize profits:

Choose d to maximize $(d - np) \times \left(\text{Min} \left\{ 1 - \frac{d}{g-1}, 1 - \frac{d - np}{nt} \right\} \right)$

In the optimum, there will still exist a small bureaucracy, an intermediate bureaucracy and a large bureaucracy range. This *centralized* and *integrated* solution, subindexed ci, is:

Small bureaucracy sizes: $1 < n < n_{ci}^{**}$

$$d_{ci}^{**} = np + \frac{1}{2}nt \tag{10}$$

Intermediate bureaucracy sizes: $n_{ci}^{**} < n < n_{ci}^{*}$

$d_{ci}^{\text{corner}} = \bar{d}$

Large bureaucracy sizes: $n_{ci}^{*} < n$

$d_{ci}^{*} = np + \frac{1}{2}(g - 1 - np)$

The dispatcher prices from the centralized and integrated solution are lower than from the previous cases, resulting in expanded firm demand for licenses and an increase in total bureaucracy and dispatcher profits.

The large bureaucracy threshold n_{ci}^{*} is now the bureaucracy size that gives $d_{ci}^{*} = \bar{d}$ (whereas it was earlier characterized by the bureaucrat´s optimal choice for when the corner solution should stop binding)[24].

6.3 Profits

Figure 5 displays total bureaucracy and total dispatcher profits in the centralized *non-integrated* case from section 6.1 ($\pi_{\text{B},c}$ and $\pi_{\text{d},c}$)[25]. The case shown is when there is one monopolist dispatcher. The graph also displays joint bureaucracy/dispatcher profits in the centralized integrated case from section 6.2 (π_{ci}). The profit expressions for small, intermediate and large bureaucracies for the two cases are given below the graph.

[24] As in the previous analysis, the lower threshold ,n_{ci}^{**}, is the solution to $d_{ci}^{**} = \bar{d}$. It is again possible to show that the corner solution always exists, i.e. that $n_{ci}^{**} < n_{ci}^{*}$.

[25] Profits in the decentralized case look the same as in the centralized case when $m = 1$. For higher values of m both individual bureaucrat, total bureaucracy, individual dispatcher and total dispatcher profits are lower than in the centralized case.

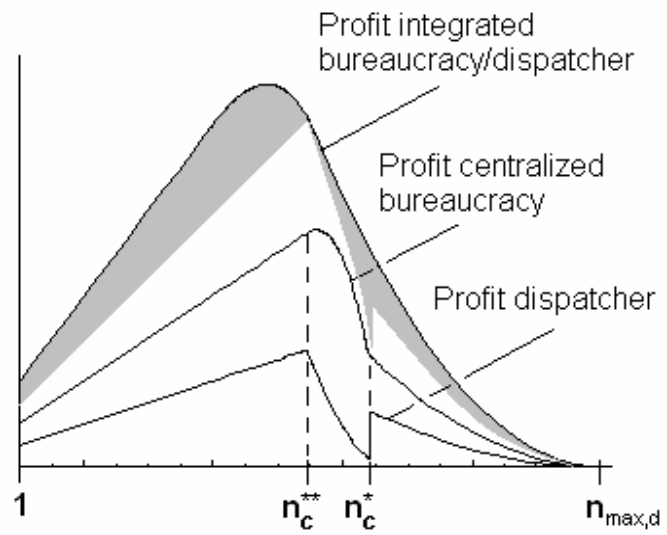

Figure 5. Profit functions. Uppermost curve: Profits for the centralized integrated problem from 6.2. The separate bureaucracy and dispatcher profit curves are for the centralized non-integrated problem from 6.1. The grey area is the difference in total profits between the centralized integrated and the centralized non-integrated case.

Centralized bureaucrats, non-integrated with dispatchers:

Small n

$$\pi_{\mathrm{B},c} = \frac{nt}{4}\frac{x}{1+x} \qquad \pi_{\mathrm{d},c} = \frac{nt}{4}\frac{x}{(1+x)^2} \tag{11}$$

Intermediate n

$$\pi_{\mathrm{B},c} = \frac{nt\left(g-1-n\left(p+t\right)\right)\left(1-g+n\left(p+t+px\right)\right)}{\left(g-1-nt\right)^2 x} \quad \pi_{\mathrm{d},c} = \frac{nt\left(g-1-n\left(p+t\right)\right)^2}{\left(g-1-nt\right)^2 x}$$

Large n

$$\pi_{\mathrm{B},c} = \frac{\left(g-1-np\right)^2}{4\left(g-1\right)}\frac{x}{1+x} \qquad \pi_{\mathrm{d},c} = \frac{\left(g-1-np\right)^2}{4\left(g-1\right)}\frac{x}{(1+x)^2}$$

Centralized bureaucrats, integrated with dispatchers:

Small n

$$\pi_{\mathrm{total},ci} = \frac{nt}{4} \tag{12}$$

Intermediate n

$$\pi_{\mathrm{total},ci} = \frac{nt\left(g-1-n\left(p+t\right)\right)np}{\left(g-1-nt\right)^2}$$

Large n

$$\pi_{\mathrm{total},ci} = \frac{\left(g-1-np\right)^2}{4\left(g-1\right)}$$

As is readily seen from the graph and from the small bureaucracy expressions, profits of corrupt bureaucrats and of dispatchers increase linearly in n. This is because dispatchers do not capture the entire market for licenses. When the size of bureaucracy grows, corrupt bureaucrats and dispatchers can fully compensate themselves from cost increases by raising prices B and d by the full amount np, without losing any market. Because the markup is related to firms' gain of using dispatchers, nt, so are profits.

For large bureaucracies, dispatchers capture the entire market. When firms choose between dispatchers and informality, dispatcher demand will be affected by increases in n. Dispatchers and bureaucrats will not be able to fully compensate themselves for increases in cost, np, and they will also lose demand (because they have the entire market). Profits will therefore decrease in the size of bureaucracy. These considerations for small and large bureaucracies are true for all versions of the model solved so far.

The graph also illustrates the imbalance in "bargaining power" between bureaucrats and dispatchers, in the non-integrated model, over the range where the corner solution applies[26].

It is clear from the graph that vertical integration is attractive to bureaucrats and dispatchers. As a numerical example, imagine a point in the small bureaucracy interval. Assume there is one dispatcher ($x = 1$) and that $nt = 0.2$. Non-integrated small bureaucracy profits are then (0.025) for bureaucrats and (0.0125) for dispatchers, whereas the integrated profit is 0.05. There is thus an additional amount equal to the dispatcher profit to bargain over. The gain from vertical integration, i.e. the bureaucracy-dispatcher bargaining space, has been marked in grey in the graph.

6.4 Endogenous red tape

Because profits increase up to a certain bureaucracy size, bureaucrats and dispatchers have a joint incentive to try to increase the number of steps in the bureaucratic procedure up to this size. Increases in n for such a purpose can be thought of as increasing the number of forms the firm has to fill in, requiring extra certification and authentication of documents etc. Such "endogenous red tape" put dispatchers and corrupt bureaucrats in a better position because firms will be willing to pay a higher price to avoid the increased time cost.

A corresponding incentive exists to try to simplify regulation that is too cumbersome[27].

[26] Note that the thresholds for small and large bureaucracies are not the same for the non-integrated and the integrated case. The thresholds for the non-integrated model, n_c^{**} and n_c^*, are shown in the graph, the corresponding ones for the integrated model are smaller.

[27] The discussion of profits and red tape was postponed until centralized corrupt bureaucrats had been introduced. It is unlikely that corrupt decentralized bureaucrats would be able to simplify bureaucracies, although it would be in their joint interest to do so, for large bureaucracies. A more likely case, as discussed by Shleifer and Vishny (1993), is that each decentralized

The discussion of endogenous red tape also relates to whether firms are better off in the presence of dispatchers. A ceteris paribus introduction of dispatchers and indirect corruption will make firms better off because firms have one more option in acquiring the license. However, as soon as dispatchers and corrupt bureaucrats are present, incentives to complicate legislation may start working. The ceteris paribus condition is then likely not to hold, the situation is rather one where n should be considered endogenous. Therefore, for small bureaucracies that bureaucrats and dispatchers have an incentive to try to complicate, the issue of firms being better off or not is unclear.

If the endogenous red tape argument is relevant, increases in n due to bureaucracy/dispatcher lobbying would give both more informality and higher prices for all firms that get the license (direct as well as indirect). This should be compared to the case where no dispatcher exists but where the bureaucracy instead is smaller. Then, high productivity firms may lose (they have to go to the bureaucracy instead of a dispatcher) but both the firms that would have been informal with dispatchers and now become formal through the bureaucracy (due to less regulation), and those that go directly to the bureaucracy in both cases, would gain.

6.5 Further IO aspects of the bureaucracy-dispatcher interaction

Although very little is known about the bureaucracy-dispatcher interaction in real life, the model highlights two other options for bureaucrats in order to earn profits higher than in the non-integrated scenario. Both are related to the fact that bureaucrats are likely to be able to control entry into dispatching. Corrupt bureaucrats can choose not to work with some dispatchers.

The first option is to work with one dispatcher only and make this dispatcher the residual claimant of the profits. That is, the m corrupt bureaucrats can jointly "sell the office" to one single dispatcher, then charge marginal cost p for each step, and then let the dispatcher maximize profits. Total possible profits, π_{ci}, adjusted for dispatcher entry costs, puts an upper bound on the value of the dispatcher office and the profit of the m bureaucrats[28].

The second option is for bureaucrats to promote competition between dispatchers. In the present model, the larger the number of dispatchers, the smaller is the markup of dispatchers and the larger is demand and hence bureaucracy profits. In the limit, with many dispatchers, these make zero profits and bureaucrats approach the profits corresponding to the case of vertical integration.

The latter case with much competition is probably unlikely to occur however, when there is some government enforcement of the bureaucracy-dispatcher

corrupt bureaucrat tries to add steps, to the detriment of all such corrupt bureaucrats (and all firms!).

[28] See Wade (1982) for an extreme case of corruption and such "two-part tariffs", where irrigation engineers in India buy their offices.

relation. Bureaucrats may instead prefer to restrict the number of dispatchers they work with, to minimize the risk of getting caught.

6.6 Extension of the model: Direct and indirect corruption

The model discussed in this paper is one in which the government is assumed, in the background, to effectively control direct corruption in the bureaucracy. Corruption moves to become indirect, through dispatchers.

In order to highlight how incentives of bureaucrats and dispatchers would change if there was direct corruption as well, consider the polar case in which there is no government control of corruption whatsoever. With direct corruption, bureaucrats still prefer to have dispatchers around, because it allows price discrimination of firms into two groups. The group which values time the highest will use dispatchers to get the license (and indirectly pay bribes), the other group will go directly to the bureaucracy (and pay direct bribes).

When direct corruption is allowed, increases in n always represents a cost to bureaucrats and make these worse off. Financial costs np increase and the size of the time cost nt only determines through which channel (direct or indirect) that the corrupt bureaucrats will award the licenses[29]. Because firm demand for dispatchers still increases in nt however, dispatchers have profits that increase in n for small bureaucracies. Dispatchers thus have an incentive to try to complicate regulation up to a certain point whereas corrupt bureaucrats do not.

Finally, the case of direct and indirect corruption is one in which firms suffer a lot. Few licenses will be awarded and prices will be high.

[29] For bureaucrats there is no "small bureaucracy" region in which bribe profits can increase, because for small bureaucracies there are bribe revenues through the direct channel as well. For large bureaucracies it is still true that dispatchers have the entire market. In this region, bureaucracy and dispatcher profits decrease in n (as before).

7 Discussion

In many countries, bureaucratic procedures tend to be very complicated. An example is the procedure to start up a firm in Brazil. There is an abundance of newspaper reports, studies and anecdotes about the bureaucratic hassle firms intending to become formal have to go through. The World Bank reports that it takes 18 different steps, 152 days and 10% of GNI per capita to start a firm. In line with such a time-consuming and costly de jure procedure is the fact that as much as 90% of Brazilian 1-5 person firms are informal (World Bank, 2008A; SEBRAE, 2005). The procedure to start a firm consists of paying registration fees, applying for an operations permit, registration at federal, state and municipal tax authorities, printing and authorization of the firm's receipts, different steps related to having employees in the firm, visits from the fire department, etc[30].

Still however, most firms that have become formal in Brazil seem to report having done so without much problems. Stone et al. (1996), Zylbersztajn and Graça (2003) and Zylbersztajn et al. (2007) study small- to medium sized firms in the garment industry. Firms have, by and large, paid one fee to a "despachante" and have had all papers in order after approximately 50 days. In interviews, firms confirm that time saving is the main reason to use "despachantes" and that it is very difficult to go through the procedure without "despachantes".

In studying the start-up procedure for firms in Bulgaria, Gancheva (1999) reports that the time elapsed to "start a firm" is shorter when an intermediary has been used. The time to "get a license" is also shorter if intermediaries are used. Across geographical regions, Gancheva also reports that the ratio of firms that have used an intermediary at start-up to those that have not, is positively correlated with the length of observed time of going through the de jure procedure. Standard errors are much too large to say anything conclusive, however.

The use of dispatchers, as portrayed in these Brazilian and Bulgarian studies, is in line with the predictions of the model in the "large bureaucracy" case, where all firms that go through the procedure use dispatchers. It is also consistent with the high degree of informal firms observed in Brazil.

In comparing with formalization of Chilean garment firms, for which the bureaucratic procedure is much simpler, Stone et al. (1996) indicate that Chilean firms have not used intermediaries[31].

[30] The exact number of steps depends on the sector in which the firm operates, geographical location, whether it falls under microenterprise regulation, etc. In two different studies on start up procedures for small firms in Brazil, Zylbersztajn and Graça (2003) and Zylbersztajn et al. report nine and seven "de jure" steps, respectively.

[31] The authors never state in writing whether Chilean firms use dispatchers, but write as if this is not the case and as if such intermediaries are not needed. The claim here is nothing more than that a more complicated bureaucracy should be correlated with more dispatcher usage. Obviously the institutional environment in Brazil and Chile can differ in many dimensions.

With respect to prices paid to dispatchers, much empirical work is needed, both in selecting a specific procedure and in selecting the sample of firms/individuals to go through the procedure. To the best of my knowledge, no specific study with the sole purpose of studying dispatchers has been made, with the exception of follow-up work to Bertrand et al. (2007, 2008).

Gancheva (1999) reports a huge variation in prices paid to intermediaries. In the study by Proética, 2006, the payment of side fees have been registered in the interaction between individuals and the bureaucracy for a range of 35 bureaucratic procedures in Peru. In this study, the variation in amounts paid, directly to bureaucrats, to police as well as to "tramitadores" is also huge. Without more specific information and the reasons for paying such "bribes", it is difficult to draw any conclusions.

The paper suggests one explanation for why bureaucracies tend to grow, that is, why "red tape" appears. In a scenario where direct corruption was never possible, dispatchers may have emerged as a means for bureaucrats to extract rents. Once this link was established, it provided an argument for raising the time cost nt because both dispatchers' and corrupt bureaucrats' profits then could increase. Efforts to increase nt could simply be by bureaucrats adding more steps if this is feasible. Alternatively, and more sophisticated, bureaucrats and dispatchers could lobby for more regulation, using arguments that such measures are "socially beneficial".

7.1 Future work

This paper points to a few areas where there is a need for more information and empirical work. The model presented here is based on a time saving argument in explaining demand for dispatchers. In settings where this is the main reason to use dispatchers, how common is it, what prices are paid and how does it vary with the size of bureaucracy? Are there other characteristics that differ between firms/individuals using dispatchers and those that do not?

Second, little is known about the interaction between bureaucrats and dispatchers. The relation is secret in nature and it is not obvious how to gather such information. The work by Bertrand et al., using trained actors to interview bureaucrats and "agents", is an important step forward in understanding how bureaucrats go about to "bend the rules". Similar interviews could be conducted to better understand the "technology" that Brazilian despachantes use in order to save time for individuals and firms.

Third, the endogenous red tape argument highlighted here may be potentially important in explaining why bureaucracies are hard to reform. Newspaper reports indicate, at least in the Brazilian case, that the different stakeholders in bureaucratic procedures resist simplification measures (Folha de São Paulo, 2008). A more systematic analysis of the response of different stakeholders, such as dispatchers, to bureaucratic reform, is much needed.

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