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Demand for Contract Enforcement and Gains from Trade

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Demand for Contract Enforcement and Gains from Trade*

e ects of institutions that support exchange upon economic prosperity.[1] We explore the reverse. We ask under what conditions the existence of potential gains from trade can generate a demand for institutions that enforce contracts. In addition, we ask

Having established the conditions under which there exists a willingness to pay ‘impersonal exchange’ in pre-modern Europe to the emergence of Genoa as a state. Dixit (2004) surveys some more contemporary cases of economic governance. In addition, there is a literature that interprets certain types of organized crime as “a form of governance of the illegal marketplace.”[4] More recently, the example of Somalia[5] illustrates the variety of possible modes of economic governance that can arise in the absence of a well-functioning state.

In spite of this variety, North (1984) and more recently Acemoglu and Johnson (2003) offer a way to distinguish between two broad classes of economic governance: property rights institutions, and contracting institutions. They define “property rights” as protection from predation, and contracting institutions as the enforcement of private agreements. We focus squarely upon the latter.

Recent work on the economics of enforcement has largely concentrated upon property rights. The conventional economic rationale for property rights institutions to arise and provide welfare improvements hinges upon benefits from the centralization of force. If there are increasing returns to scale in defence, centralization eliminates over-investment in the “arms race” that would obtain in a decentralized (anarchic) society, as in Skaperdas (1992). Grossman (2001) suggests that effective property rights might result from an interplay between centrally and privately provided protection. Bös and Kolmar (2003) analyze the redistributive norms that might underlie the stability of an environment in which expropriation is possible.

We concentrate, instead, on contracting institutions. We develop.2(s)(ra)o3op(sp1.)-764.’(h) beneficial. Moreover, in Dixit (2003), interactions involve a PD with fixed payoffs, so that the outcome of a given match bears no direct consequence for the future payoffs of either agent. By contrast, in our setup the value of bringing a tradeable good to a marketplace is determined in equilibrium, depending on the frequency of contract violations, which, in turn, depends on the enforcement technology available to the third-party. Consequently, interactions may or may not have the payoff structure of a PD in our model in equilibrium.

In related work, Moselle and Polak (2001) develop a model in which welfare depends on the level of property rights, which in turn is determined by the behavior of the (potentially predatory) state. Unlike their model, in our model all interaction between agents is voluntary: thus, following the terminology of North (1984) and Acemoglu and Johnson (2003), their paper is about property rights whereas ours is about contract enforcement. Moreover, our model is dynamic. The possibility that the agents' goods may have a future use is critical to the results, and the discount factor turns out to playl

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vid.9(8)-0.7(1)5.1(4)-338.7(i)-2gai5.3(7(i)-2f7(1)-31om3(709)-3.3(1)10r5d(4)-338.2TJ1.4516f0.90(o)3

th4h6t9(4b35)3erj5iL5f6.91.r4a71f10.a90'(8L.t46D-70(.6246D10the46(2o)4k84D(mo0d12aT85[(a)-33..2(or9(13(1T1an)5B96)8

then receives an opportunity for a mutually beneficial project as described below. When an agent uses (or loses) her good, she leaves the market and is replaced by another agent. If after a match an agent retains her good, she is matched anew the following period.

Matches have two stages. In the first stage, the pair may sign a

[10] is straightforward. Taking the proportion of traders as given, an agent has to choose her best action. If she opts to trade, the payo is . On the other hand, if the agent robs and the partner chooses to trade, she earns and retains her good for continuation payo in the following period. Thus, the latter encounter yields the value of Finally, if both agents simultaneously attempt to rob, she expects to receive $\frac{1}{2}$, as she has a chance of a half to capture the possession of the other, while retaining her own. In this case, the payo conditional on the match is $- \frac{1}{2}$

of the transgression, particularly in the case of economic crimes. The second is when is a constant. This better describes cases in which the punishments are bounded by cultural norms or technological constraints.[12]

Parameter may be interpreted as reflecting limitations in the technology of surveillance and forensics. Probability of a successful enforcement might also depend on the structure of the internal organization of the enforcement agency, which we take as given. As mentioned in the introduction, we call the quality of institutions, and say that the agency is characterized by a pair. We will describe equilibria under all possible combinations , which we denote the supply of enforcement, and determine economic value generated by each combination.[13] To rephrase, we take “production technology” as given and determine enforcement demand for each level of output.

In the presence of the enforcement agency the payo s change. Let ^{g} be the value of her tradeable to an agent who has signed a trading contract. Now, an agent who chooses trade and is matched with another who chooses rob earns ^{g} in expectation, as her good is reinstated if the violation (by her partner) is detected. If she meets a fair trader, the payo is as before. Hence, the expected payo to trading is

$$\text{trade} \qquad - \qquad ^{g}$$

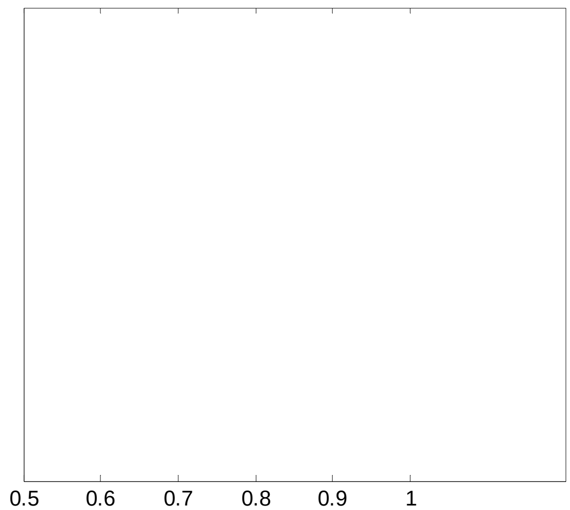
The payo to rob now takes into account that theft may be observed. If detected, an agent must pay the cost . Thus, if her partner trades, she earns $^{g} \equiv \quad -$

$$\text{rob} \quad {}^{g} \quad - \quad \left[- \quad {}^{g} \quad - \quad {}^{g} \right]^{,} \tag{2}$$

Finally,

$$ {}^{g} \quad \{ \quad \text{trade} \quad \text{rob} \} \tag{3}$$

The following proposition describes the structure of equilibria in this model. For extreme values of punishment, either su ciently high or su ciently low, an equilibrium is always unique: all agents trade or all of them choose to rob. For intermediate values of punishments, there are interior equilibria, in which some agents rob and the rest choose to trade. Importantly, the boundaries that describe the range of punishments for which interior equilibria exist vary with the parameters. It is this dependence that we will exploit later. Denote the parameters of the model by .

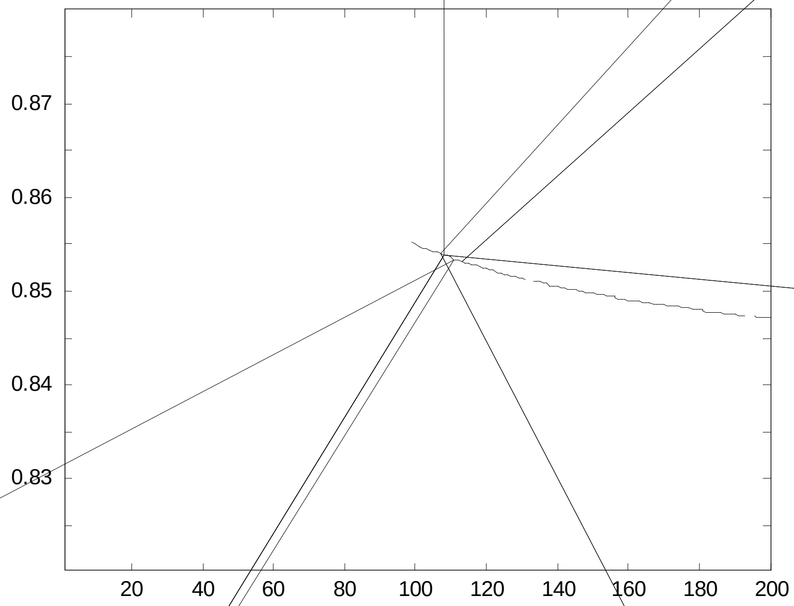

0.5
0.6
0.7
0.8
0.9
1

* represents an upper bound on the economic value created by endorsing contracts, provided this value is positive.[14]

In the introduction we asked: how does the willingness to pay for contract enforcement services depend on the potential gains from trade? Provided the punishment fits the crime, the relationship is positive.

Suppose punishment is proportional: . If an equilibrium with contracting exists, then * is increasing in the gains from trade .

The reason for the result is that, when , then the fraction of traders on


0.87
0.86
0.85
0.84
0.83
20
40
60
80
100
120
140
160
180
200

to verify that the structure of the equilibria (under symmetric contracts) does not change in that case, although more severe punishment is needed to induce trading behavior. This is intuitive as, under this alternative punishment scenario, theft leads to consumption by both even when it is detected, which tips the balance in favor of theft and decreases the equilibrium value of .

Second, our model assumes the existence of property rights, in the sense that all agreements between private agents are reached voluntarily, even if these agreements are not necessarily followed in equilibrium. If property rights do not hold, however, it may be that agents can be coerced ment technology as given. Still, Proposition suggests that, provided the gains from trade are high enough, there might be profits to be earned from the provision of enforcement services. The fees that might be charged for notarization would depend on the structure of the market for enforcement itself. Nonetheless, since participation is voluntary, there may still be surplus for the agents in the interval * . For example, if the enforcement market is contestable and entry costs are low, then the profits to the agency may bems2(y)-0.9(a)31.s54.4(e)3(lun75k)28.75kto2c9tcipa6(a)569su4925Tc[(e

Assume that _ so that $_H$ is well de ned. Assume ^{D} so that the demand for enforcement is positive. Then * is concave in and in

Now suppose that the agency is a monopolist and is capable of selecting , subject to a standard strictly convex cost function. Note that if _ , then no contracts are breached, so that $_H$ in which case * is constant with It implies that HvRHãRaŽ¥‰€@nGvRå.ÖRQžpŽ7C‰ö'T$sBZ" – !›

Models of institutions resulting from agent interaction tend to concentrate on property rights institutions. In this paper, we define and study the value created by contracting institutions. To this end, we develop a model of contracting and exchange, in which agent interactions are subject to a voluntary participation constraint. Agents choose whether to notarize their contracts in order to commit themselves to trade, even though they may decide to break their promises later. As a result, trade may be facilitated by contracting institutions, and the exchange value of goods may rise as a result. We then use the model to ask whether the presence of potential gains from

respectively

$$t^g \quad \overline{\quad - \quad - \quad} \tag{4}$$

$$r^g \quad \frac{- \quad -}{- \quad - \quad -} \tag{5}$$

so that the value of a tradeable good introduced in the text, see is then

$$g \quad \begin{cases} t^g & \text{if} \\ r^g & \text{if} \\ t^g \quad r^g & \text{otherwise} \end{cases}$$

Let

$$t^g \quad - \quad r^g \tag{6}$$

$$\equiv \quad - \quad - \quad - \quad - \quad -$$

Note that , so the sign of coincides with the sign of the di erence ^{g} $-$ ^{g} : hence we concentrate upon finding roots of .

$$^2 \;_F \quad _F \quad _F$$

Since $_H$ $_H$, the upper root of is positive, = i $_H$ which is true whenever $_L$ where $_L$ is the lower root of the quadratic polynomial

i _ 2 _ ¢
2 i _ 2 3 ¢

It is easy to check that $_L \in$ provided as and

Assume that and = _ Then there are three equilibria: and a couple $_L$ $_H$

■

The two roots of the polynomial are

$$_L \equiv \frac{- \; _F \; p\_\_\_\_}{_F}$$

In the environment with endogenous contracts, if agents agree to a trading contract, then which reduces to

$$\_ \equiv \frac{\_}{\_ \quad \_} \tag{15}$$

In this event, is increasing in the gains from trade because it is linear in (for a fixed

Observe that _ Moreover, provided _ the demand is positively related to the gains from trade, keeping constant, $^*_G$ Then proposition stems from homogeneity of see Remark Lastly, we have to demonstrate that condition _ is equivalent to requiring $_D$

It is easy to check that the derivative of with respect to $_H$ is $-\sqrt{\quad_F}$ where $_F \quad ^2_F - \quad _F \; _F$ Therefore, $_H$ is decreasing with Moreover,

$$\frac{_H}{\qquad} \qquad \frac{_G \quad _H}{\sqrt{\quad _F}} \tag{22}$$

similarly,

$$\frac{_H}{\qquad} \qquad \frac{_c \quad _H}{\sqrt{\quad _F}} \tag{23}$$

■

> ! '%! 'T s '%! 'T s

so it is homogenous of degree two in i.e., F 2 F
for any provided By Euler's formula,

F F

To support the first claim notice, that $= \quad {}_H$ where ${}_H$ is the upper root of

$$\equiv \frac{F}{2} \equiv \qquad (34)$$

Thus

$$2 \; H \quad \frac{H}{} \quad \frac{H}{2} \qquad (35)$$

$$H \quad 2 \quad i \quad - \quad 2 \quad - \quad - \quad 2$$

always above _ In the other case, for big enough $_H$ will reach _ at which the demand is zero. Observe that the sign of $_G$ ¡ ¢ _ depends on and

$$_G \text{¡} \_ \text{¢} \quad \text{—} \quad \frac{}{\_ \; ^2} \tag{40}$$

First, $\frac{d}{d\delta}$ is negative by Next,

$$\frac{\quad H \quad}{\qquad} \frac{\quad H \quad}{\qquad} \tag{48}$$

Indeed, given that $_{y}$ $_{H}$ by it is enough to show that the polynomial, is decreasing in then its upper root, $_{H}$ will be decreasing with as well.[20] In the relevant range of the derivative $\frac{\partial}{\partial\delta}$ can be shown to be negative parameters, as well as on the action that agent chooses in period This dependence, however, is not important for the result. Indeed, with constant growth,

$$\sum_{t=0} {}^{t} \quad {}_{t} - {}_{t} \quad {}_{0} {}^{t} \qquad \sum_{t=0} {}^{t} \quad {}_{t} - {}_{t} \quad {}_{0}$$

Hence the structure of the model is identical to one without growth when gains to trade are $_0$ every period and the discount factor is replaced with , and hence the condition must be satisfied. ■

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