

# Governance and Growth

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## **Abstract**

Because of its inappropriability, protection of property rights is widely recognized as being the state's responsibility. Moreover, recent empirical evidence suggests that it leads to higher investment levels and faster growth. Nevertheless, the extent of property rights protection differs significantly across countries. This paper endogenizes the emergence of property rights within a simple growth framework. Drawing on North, 1990, we present a model where economic performance and enforcement of property rights may reinforce each other. Depending on initial conditions, the economy can converge to a high-income or a low-income steady state. The existing empirical evidence seems to offer a tentative support for this theory.

# 1 Introduction

Maintaining law and order, in particular, securing property rights, is probably the most acceptable economic rationale for government intervention. Theoretically, it is argued that enforcement of property rights being a public good, its provision can only be materialized through collective action. Empirically, several studies have reported robust correlations between the enforceability of property rights and measures of economic performance, specifically economic growth - see Barro, 1997, Knack and Keefer, 1995, Mauro, 1995, Svensson, 1998. More recent and detailed supportive evidence is provided in Chong and Calderon, 2000, Hall and Jones, 1999, and in a working paper, Kaufmann et al., 1999a. In the last study the authors find that a one-standard deviation increase in any of their governance indicators causes between a two-and-a-half and four-fold increase in per capita incomes. There are several channels and ways through which this relationship can be manifested. Knack and Keefer, 1997, and Mauro, 1995, for example, find that poorly protected property rights adversely affect physical investment. King and Levine, 1993, and Demirgüç-Kunt and Maksimovic, 1998, among others, present similar evidence with regard to investment in financial assets.<sup>1</sup>

Yet, economies differ greatly in the extent to which property rights are enforced. Several pieces of empirical evidence suggest, in particular, a strong positive association between the level of development and the enforcement of property rights. Bardhan, 1997, for example, cites the experience of Sin-

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<sup>1</sup> An especially devastating example of a wasteful struggle for resources in many developing countries is presented by ethnic cleavages; Easterly and Levine, 1997, claim that these are primarily responsible for low growth rates in Africa in the past several decades.

gapore, where recent economic growth has induced a drastic reduction in corruption, so that Singapore is now one of the world's least corrupt countries. Kaufmann et al., 1999b, provide an excellent dataset on the quality of governance across more than 150 countries, exhibiting six measures of the quality of governance. My own calculations based on these data suggest that the partial correlations between income per capita and the different measures of quality of governance across these countries hover between 0.70-0.90, and the correlation between income per capita and the rule-of-law variable is in the upper range of this interval.<sup>2</sup> Treisman, 2000, finds empirical support for the moderating effect of income level on corruption in his more rigorous statistical analysis. It is also interesting to compare the recent experience of some transition economies in East Europe in this regard. While countries like Estonia and Hungary have attained moderate scores on the quality of government and robust growth rates, the relatively more backwards countries such as Moldova and the Ukraine have achieved little on both counts. Moreover, in their authoritative account, two experts on the transition experience in Russia write:

”In developed market economies, a conventional system of property rights enforcement and contract implementation is provided by the government and the judiciary and paid for by taxes. However, even if this can be considered to represent the first-best solution, the immediate implementation of such a solution in the Russian case is hopeless... Widespread tax evasion has left the government without enough revenues to pay even those meager salaries

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<sup>2</sup>All linear regressions of income per capita on the measures of government quality yield highly significant results.

it offers to its law-enforcing officers (including the police force, prosecutors, and judges).” (Braguinsky and Yavlinsky, 2000)

Taken together, these pieces of evidence suggest a double feedback relationship between economic development and enforcement of property rights, in particular indicating that affluent economies are likely to more effectively enforce property rights than poor economies.<sup>3</sup> This paper is an attempt to capture this relationship in a simple model. The model is cast in a standard growth framework and is augmented with political economy features. In particular, it is assumed that a part of productive investment in the economy is subject to rent seeking redistributive activity. The fraction of resources available for such redistribution is endogenously determined through collective decisions on the extent of property rights enforcement. Specifically, property rights can be fully secured by incurring a cost. In line with the public good nature of property rights, we assume an indivisibility in the production of their enforcement. This ensures that enforcement of property rights will only take place in rich economies, where the individuals are affluent enough to be willing to meet the enforcement cost. But a better enforcement of property rights causes income growth, thus perpetuating the willingness to secure property rights. As a result, we show that two steady states are likely to be realized: one, with a full protection of property rights and a high income level, and another, with only a minimal protection of property rights and a low income level. One implication of this analysis em-

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<sup>3</sup>As North (1990) puts it, “economic history is overwhelmingly a story of economies that failed to produce a set of economic rules of the game (with enforcement) that induce sustained economic growth.”

phasizes the importance of commitment mechanisms to ensure enforcement of property rights; the absence of such commitment may induce lower investment and higher rent seeking thus lowering growth. Another implication indicates a role for international lending institutions in providing resources to implement governance reforms so as to allow a poor economy to take off.

This paper draws on the seminal contributions of North, 1990, and Olson, 1996, which stress the role of institutions for economic development and some of its results are also related to Olson's, 1982, emphasis on interest groups as an impediment to growth. Both authors acknowledge the importance of the double feedback relationship between institutions and economic performance, which is the point made in this paper as well. The specifics of the presented model are related to the literature on appropriation and growth. The papers Lane and Tornell, 1996, and Tornell, 1997, 1999, for example, focus on studying the effects of imperfectly protected property rights on growth. Ehrlich and Lui, 1999, also study the relationship between the quality of governance ("corruption") and growth, deriving multiple equilibria, similarly to the present work. These authors do not consider, however, the endogenous determination of the level of protection itself, which is an essential focus here.

The paper is organized as follows. The next section presents the model, whose static equilibrium is then analyzed in section 3. Section 4 studies the dynamic properties of the economy and contains the main results of the paper. Section 5 considers two extensions, to multiple interest groups organized for the purposes of rent seeking and to capital mobility across countries, section 6 discusses empirical findings and policy implications, and section 7 concludes with brief remarks.

## 2 Basic model

The economy consists of a measure one of households indexed  $i$  operating in discrete time  $t$ , each consisting of a parent and a child. The initial level of household income is  $y_0$ , and  $y_t$  denotes the income level in period  $t$ . Initially, the amount of law and order as reflected by the protected fraction of individual income is  $L_0$ ,  $0 < L_0 < 1$ , and  $L_t$  denotes the protected fraction of income in period  $t$ . We interpret the level  $L_0$  as a minimal level of protection being guaranteed by the prevailing social norms thereby not requiring any costs of enforcement. To obtain interesting results, it is assumed to be small. In contrast, levels of protection higher than  $L_0$  are costly. Because the households within a cohort will possess identical incomes, their burden in financing  $L_t$  will also be identical,  $T(L_t)$ , where  $T(L_0) = 0$ . We think of  $T$  partly as the cost of setting a legal framework, but mainly as the cost of monitoring, information gathering, and administering law enforcement, specifically, contract enforcement. To facilitate the analysis, we assume a binary production function of the protection of property rights, namely, either property rights are fully protected,  $L_t = 1$ , in which case  $T(L_t) = T$ , or they only receive minimal protection through "natural" law,  $L_t = L_0$ . While this extreme assumption is made for simplicity, for the paper's argument to work it is essential that the production function will contain increasing returns to scale. As will be seen later, the assumption ensures that an impartial enforcement of property rights can only be realized when the economy's surplus is large enough.

In each period, the individuals divide their income between paying taxes to meet the cost of law and order,  $T(L_t)$ , current consumption,  $c_{it}$  and

investment  $k_{it}$ , so as to satisfy the budget constraint:

$$y_t = c_{it} + k_{it} + T(L_t) \tag{1}$$

Each household is also endowed with one unit of time, which is allocated between productive activity,  $w_{it}$  and unproductive activity,  $u_{it}$ , according to the constraint:

$$1 = w_{it} + u_{it} \tag{2}$$

Next-period gross income of household  $i$ ,  $z_{it+1}$  is then produced using both capital and labor as inputs, according to the following technology:

$$z_{it+1} = Ak_{it}^\alpha w_{it} \tag{3}$$

where  $A > 0$  is an exogenously given production parameter to which all individuals have access, and  $0 < \alpha < 1$ .

While fraction  $L_t$  of this income is fully protected, the remaining  $1 - L_t$  is available for redistribution through unproductive or rent seeking activity. Letting  $Z_{t+1} = \int z_{it+1} di$  denote the aggregate income,  $(1 - L_t)Z_{t+1}$  is, therefore, the amount of income available for rent seeking. It is assumed that a spending of  $u_{it}$  on rent seeking secures individual  $i$  the fraction of  $r(u_{it}) / \int r(u_{it}) di$  of aggregate income, where  $r$  is increasing, concave, with

$r(0) = 0, r(1) = 1$ , and  $r(0) / \int r(0) di = 0$ . This specification is very common in the rent seeking literature - see Nitzan's survey, 1994. The net next-period income,  $y_{it+1}$ , is the sum total of work-generated income and income generated through rent seeking,

$$y_{it+1} = L_t z_{it} + (1 - L_t) Z_t r(u_{it}) / \int r(u_{it}) di \quad (4)$$

This income is bequested to one's child.

Each parent's preferences derive from consumption as well as from the amount of income transferred to the child. Assuming logarithmic preferences, we write:

$$V(c_{it}, y_{it+1}) = (1 - \beta) \log(c_{it}) + \beta \log(y_{it+1}), 0 < \beta < 1 \quad (5)$$

In each period, the adult individuals first determine the extent of property rights protection by collectively setting  $L_t$ . Then each parent makes his consumption-investment decision; thereafter the work-appropriation decisions follow.

### 3 Equilibrium analysis

Our assumptions guarantee that, despite the dynamic setting, the decision-making problem is essentially a static one and consists of equilibrium allocation made by the parents.

The analysis proceeds backwards starting with the determination of time allocation between work and rent seeking given the investment decisions. At this stage, parent  $i$  can be viewed as choosing  $u_{it}$  so as to maximize (5) subject to (2), (3) and (4). The first order condition is

$$-L_t A k_{it}^\alpha + (1 - L_t) Z_t r'(u_{it}) / \int r(u_{it}) di \leq 0 \quad (6)$$

which is satisfied with inequality when  $u_{it} = 0$ .

The households make investment choices in anticipating of the rent-seeking decisions. The first order condition which determines the optimal choice by parent  $i$  when she maximizes utility is:

$$-(1 - \beta)/c_{it} + A\alpha\beta L_t k_{it}^{\alpha-1} (1 - u_{it})/y_{it} = 0 \quad (7)$$

Given that all parents are identical, they will make identical choices. This allows us to rewrite the above first order conditions as follows:

$$-L_t + (1 - L_t)(1 - u_t)r'(u_t)/r(u_t) \leq 0 \quad (8)$$

and

$$-(1 - \beta)/c_t + \alpha\beta L_t/k_t = 0 \quad (9)$$

Differentiation of (8) reveals that the amount of time devoted to rent seeking,  $u_t$  is a decreasing function of the extent to which property rights are protected,  $L_t$ .

We can also solve for the optimal level of investment explicitly obtaining

$$k_t = \alpha\beta L_t(y_t - T(L_t))/(\alpha\beta L_t + 1 - \beta) \quad (10)$$

Differentiation of (10) reveals that, provided that the elasticity of  $T$  is not very large, the investment level,  $k_t$  is an increasing function of  $L_t$ .

At the first stage, the parents determine the level of property rights protection. Thus, they choose  $L_t$  so as to maximize utility anticipating the subsequent investment and the rent seeking choices. Given the assumption about the production function of property rights enforcement, the optimal choice is at a corner, either  $L_t = L_0$ , or  $L_t = 1$ . In the former case,

$$u_t^0 = u = u((1 - L_0)/L_0) > 0, u' > 0 \quad (11)$$

and

$$k_t^0 = \alpha\beta L_0 y_t / (\alpha\beta L_0 + 1 - \beta) \quad (12)$$

which enables us to calculate the levels of consumption and next-period income:

$$c_t^0 = (1 - \beta)(1 - L_0)y_t / (\alpha\beta L_0 + 1 - \beta) \quad (13)$$

and

$$y_{t+1}^0 = A[\alpha\beta L_0 y_t / (\alpha\beta L_0 + 1 - \beta)]^\alpha (1 - u) \quad (14)$$

resulting in the utility level of

$$V_t^0 = (1 - \beta) \log\left[\frac{(1 - \beta)(1 - L_0)y_t}{\alpha\beta L_0 + 1 - \beta}\right] + \beta \log\left\{A(1 - u)\left[\frac{\alpha\beta L_0 y_t}{\alpha\beta L_0 + 1 - \beta}\right]^\alpha\right\} \quad (15)$$

whereas in the latter case,

$$u_t^1 = 0 \quad (16)$$

and

$$k_t^1 = \alpha\beta(y_t - T) / (\alpha\beta + 1 - \beta) \quad (17)$$

so that the levels of current consumption and next-period income are:

$$c_t^1 = (1 - \beta)(y_t - T) / (\alpha\beta + 1 - \beta) \quad (18)$$

and

$$y_{t+1}^1 = A\{\alpha\beta(y_t - T) / (\alpha\beta + 1 - \beta)\}^\alpha \quad (19)$$

with the resulting utility level of

$$V_t^1 = (1 - \beta) \log\left[\frac{(1 - \beta)(y_t - T)}{\alpha\beta + 1 - \beta}\right] + \beta \log A\left[\frac{\alpha\beta(y_t - T)}{\alpha\beta + 1 - \beta}\right]^\alpha \quad (20)$$

## 4 Dynamic evolution

We begin the analysis of the economy's dynamics by studying the equilibria obtained under each of the two cases,  $L_t = L_0$  and  $L_t = 1$ . Then we proceed by analyzing the equilibrium choice between the two regimes.

Comparing the consumption levels attained under the two regimes, we observe that consumption is higher under minimal protection of property rights than under full protection. The reason for this is twofold. First, minimal protection of property rights leaves the current generation more income as the need to pay taxes is alleviated. In addition, insecure property rights may cause a decrease in investment thus increasing consumption.

Note that, given that the productivity parameter  $A$  is large enough, under each regime, the economy converges to a steady state level of income. When  $L_t = L_0$  this is given by

$$y^0 = (A(1-u))^{1/(1-\alpha)} [\alpha\beta L_0 y^0 / (\alpha\beta L_0 + 1 - \beta)]^{\alpha/(1-\alpha)} \quad (21)$$

whereas when  $L_t = 1$ , the steady state income level is implicitly determined as the larger root of

$$y^1 = A\{\alpha\beta(y^1 - T)/(\alpha\beta + 1 - \beta)\}^\alpha \quad (22)$$

Moreover, provided that  $L_0$  is sufficiently small as we have assumed is the case,  $y^1 > y^0$ . And inspection of (14) and (19) reveals that when current income level is small enough, next-period income is lower under full

protection of property rights than under minimal protection. The reason for this is that the economic performance under full protection of property rights is adversely affected in the short run by the tax burden, but recovers afterwards.

These properties are summarized in Proposition 1 below and further illustrated in Figure 1.

*INSERT FIGURE 1 HERE*

**Proposition 1** *Current consumption is higher, but steady state income level is lower under minimal protection of property rights than under full protection. Next-period income is higher under the former if present income is low, but is higher under the latter when present income is high.*

The above results have direct implications for welfare comparisons between the two regimes. When present income is low, both consumption and next-period income are higher without full protection of property rights, so that this regime attains a higher level of welfare. In contrast, when present income is high enough, the resulting increase in next-period income under full enforcement of property rights more than compensates the lower level of consumption thus causing welfare to be higher. The intuition here is straightforward: while tax burden associated with the full enforcement is significant in a poor economy, in a rich economy it ceases being so, as taxes constitute a smaller share of income.

To sum up,

**Proposition 2** *When the economy is poor enough, the regime of minimal protection of property rights leads to a higher welfare level; however, in a rich economy, full property rights protection is a preferable regime.*

Differentiating the utility levels attained under each regime, we obtain that welfare increases in income faster under full protection of property rights. Along with the above proposition this implies that there exists a unique threshold level of income that leads to indifference between the two regimes,  $y^*$ : when present income is higher than the threshold (and only then) is the regime of full protection of property rights superior to the regime of minimal protection. Also note that  $y^*$  must be higher than the level of income which makes next-period income equal under the two. The reason for this is that consumption is lower under full protection. Moreover, recalling that  $L_0$  is sufficiently small implies that  $y^* > y_0$  (because  $y_0$  is arbitrarily small) - see Figure 1.

We are now in a position to trace the intertemporal evolution of the economy. If the initial income level is below  $y^*$ , then the minimal protection of property right is welfare superior. As can be seen from Figure 1, this leads to the convergence to a lower steady-state level of income,  $y^0$ . In contrast, if the initial income level is above  $y^*$ , then full protection of property rights is selected, and the economy converges to a higher steady-state income level,  $y^1$ . Thus, the economy's evolution is history dependent and has multiple steady states.

In contrast, if  $L_0$  is moderate, then as can be seen from Figure 1, the economy converges to the high steady state, independently of the initial conditions. This is the case when even with a minimal protection of property

rights growth is sufficient to eventually enrich the economy so that full protection of property rights is subsequently preferred.

This, we obtain

**Proposition 3** *If the initial level of property rights enforcement is very low, the economy's intertemporal evolution exhibits multiple equilibria depending on initial income level: if it is low, the low level of property right's enforcement persists and the economy converges to a low steady-state income level; if it is high, the economy eventually embraces the regime of full protection of property rights and converges to a high income steady state. If the initial level of property rights protection is moderate, the economy eventually adopts full protection of property rights and converges to a high income steady state, independently of the initial income level.*

## 5 Extensions

### 5.1 Rent seeking competition among pressure groups

The above analysis assumes that rent seeking is done by individuals who lack the ability to organize a collective action in order to pursue their objectives more effectively. In contrast, in reality many times rent seeking activities are undertaken by various special interest groups, designed to promote the goals of their constituent members. Examples of such groups may include different professional organizations, trade unions, etc. The significance of organized rent seeking by interest groups for economic growth was recognized in Olson, 1982; Lane and Tornell, 1996, contains a more recent treatment.

To extend the analysis to the case of rent seeking by groups, suppose that the population is divided into  $M > 1$  groups of equal size, so that there are  $1/M$  members in each group. The groups are organized to promote the redistributive interests of its members, so that the amount of time devoted by each group member to unproductive activities is jointly determined by the group members. Thus, it is assumed that the groups successfully overcome the individual incentive to free ride. Let  $u_{jt}$  denote the amount of time devoted by each member of group  $j$  in period  $t$  to rent seeking. The resources extracted by a group through such unproductive activities are then equally shared by the group members. The situation considered above can be viewed as a special case of this one, with  $M$  tending to infinity.

These assumptions imply that the net next-period income of a household  $i$ , which belongs to interest group  $j$  is given by<sup>4</sup>

$$y_{it+1} = L_t z_{it} + (1 - L_t) Z_t \frac{r(u_{jt})}{\sum_{h=1}^m r(u_{ht})} M \quad (23)$$

Differentiating with respect to  $u_{jt}$  we obtain the following first order condition:

$$-L_t A k_{it}^\alpha + (1 - L_t) Z_t \frac{r'(u_{jt}) \sum_{h=1}^m r(u_{ht}) - r'(u_{jt}) r(u_{jt})}{(\sum_{h=1}^m r(u_{ht}))^2} M \leq 0 \quad (24)$$

and the first order condition with respect to the level of investment is as in the above analysis. Since identical individuals make identical choices, this can be rewritten as:

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<sup>4</sup>Please recall that, because the part of resources a group secures through rent seeking is equally allocated among its members, each member's share is  $1/M$ .

$$-L_t + (1 - L_t)(1 - u_t) \frac{r'(u_t)(M - 1)}{Mr(u_t)} \leq 0 \quad (25)$$

We thus obtain that with a minimal enforcement of property rights the amount of resources an individual spends on unproductive activities is

$$u_t^0 = u = u((1 - L_0)(M - 1)/ML_0) > 0, u' > 0 \quad (26)$$

This in particular implies a positive relationship between the number of interest groups and the amount of resources individually spent on rent seeking. But then the fewer is the number of interest groups the larger is the steady-state level of income under minimal protection of property rights and the larger is the welfare level attained in this case.

## 5.2 Globalization and governance

It has been recently argued in several empirical papers that globalization, by increasing competition over resources, reduces corruption - see e.g., Ades and Di Tella, 1999, and Larrain and Tavares, 2000.<sup>5</sup> Here I briefly illustrate how this effect can be captured in a simple extension of the above framework.

For the purposes of the present discussion, globalization will be conceived as capital mobility. Moreover, increased capital mobility is assumed to be associated with lower costs of capital investment. Letting  $p$  denote the unit cost of capital investment, budget constraint (1) can be more generally

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<sup>5</sup>Treisman, 2000, also presents supportive yet somewhat more tenuous evidence.

written as  $y_t = c_{it} + pk_{it} + T(L_t)$ , where a higher value of  $p$  implies that capital mobility is costlier.<sup>6</sup>

The equilibrium analysis proceeds in much the same way as above. In particular, solving for the equilibrium amount of investment we now obtain:

$$k_t = \alpha\beta L_t(y_t - T(L_t))/(p(\alpha\beta L_t + 1 - \beta)) \quad (27)$$

After appropriate substitution this enables us to calculate the rest of the equilibrium variables, specifically, present consumption and next-period income. Substituting these we then obtain the following expression for the equilibrium utility level:

$$V_t(L_t; p) = (1 - \beta) \log\left[\frac{(1 - \beta)(y_t - T(L_t))}{\alpha\beta L_t + 1 - \beta}\right] + \beta \log A\left[\frac{\alpha\beta L_t(y_t - T(L_t))}{(\alpha\beta L_t + 1 - \beta)p}(1 - u)\right]^\alpha \quad (28)$$

We then consider the derivative

$$d[V_t(1; p) - V_t(L_0; p)]/dp \quad (29)$$

Straightforward calculations show that, when  $L_0$  is small, this derivative is negative, indicating that lowering the cost of capital mobility makes full protection of property rights relatively more attractive.

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<sup>6</sup>A complete model would introduce specifically the cost of capital mobility, by differentiating between investment at home and abroad. The approach here should be taken as only illustrative.

## 6 Discussion

In this section we first discuss some relevant empirical findings and then consider two policy implications of the above results, the significance of commitment to the enforcement of property rights and a potential role for international lending institutions.

### 6.1 Empirical evidence

As mentioned in the introduction, quite a few empirical studies present evidence that the quality of governance has a robust effect on growth. Recently, the data have been expanded and the methodology upgraded in Hall and Jones, 1999, Kaufmann et al., 1999a, and Chong and Calderon, 2000. All three studies recognize that different observable measures of quality of governance can be construed only as proxies for the variable of interest, and all studies are aware of the simultaneity of the relationship between these measures and growth. Their econometric analyses take care of these issues.

Hall and Jones, 1999, is rooted in growth accounting and focuses on cross-country differences in income per capita arising in a steady state.<sup>7</sup> It employs subjective evaluations of aspects of quality of governance, such as bureaucratic efficiency, corruption, maintenance of law and order, supplemented by the degree of openness to international trade.<sup>8</sup> The authors use various geographic and linguistic measures of the effect of the Western cul-

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<sup>7</sup>The authors refer to their approach as "level accounting".

<sup>8</sup>These evaluations are provided by a private consulting firm, Political Risk Services, which specializes in providing assessments of countries' political risks. The measures of governance used by different researchers are typically based on such subjective judgements.

ture as instruments. Using cross-sectional evidence for 127 countries, the paper presents robust findings on the positive effect of good governance on growth, which significantly supplements the effect of physical and human capital accumulation. The authors argue that the extent to which a country has been historically exposed to Western influence has played a crucial role in its ability to design proper institutions for good governance.

Kaufmann et al., 1999a, is similar in many respects. It uses an enlarged dataset and constructs a much wider battery of measures of governance quality based on a variety of (subjective) sources, incidentally dismissing the trade openness variable. This study's conclusions by and large reinforce Hall and Jones', 1999, results.

Although the findings in both these studies are generally in line in line with this paper's theory, the work of Chong and Calderon, 2000, can be viewed as providing the most direct supportive evidence. There, the authors explicitly test for the mutual causality between good governance and growth, suggesting "multiple institutional equilibria," whereby good institutions promote growth, which then leads to the adoption of good institutions. They conclude that causality runs in both directions thus providing tentative support for the theoretical claim made above.

## **6.2 Policy implications: commitment to rules and international lending**

In contrast to the previously made assumption, suppose that the government cannot precommit itself to the rule of law. In other words, while the extent

of property rights protection is determined before the individuals actually engage in rent seeking, suppose that their investment choices have already been made. Thus, first come the investment decisions; then the choice of rule-of-law, then time allocation. Since investment - being now inelastic - is not affected by the enforcement decision, full enforcement is now less advantageous. Thus, the government has an ex post incentive to renege on its obligation of full enforcement. But correctly anticipating such a breach of commitment and the resulting intensive rent seeking effort, the individuals will tend to underinvest. This stresses the importance of a firm commitment to enforcement rules that in principle could be achieved by other ways such a constitutional commitment, by setting an independent judiciary etc.

The above results rest on the (quite reasonable) assumption that the world's capital market is imperfect, so that a poor country cannot borrow resources to finance a better enforcement of property rights. This indicates the importance of credit availability in order to implement the necessary reform of the judiciary and law enforcement agencies. Such credit can only be provided by international lending institutions. Thus, our analysis suggests an important role for such institutions implying particular ways of framing conditionality requirements on their loans. Indeed, the World Bank's loans for legal and judicial reform efforts worldwide are currently worth over \$380 million.<sup>9</sup>

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<sup>9</sup>See the transcript of the speech by the President of the World Bank on July 9, 2001, in St.-Petersburg, Russia, press release 2002/013/S, available on website <http://econ.worldbank.org/>

## 7 Concluding remarks

This paper formalizes the self-enforcing relationship between the enforcement of property rights and economic growth, first introduced in North, 1990, and Olson, 1982, 1996. A crucial aspect of the model is that law enforcement, while leading to a better protection of property rights (and, therefore, is growth-promoting) is costly and requires resources which only exist in sufficiently affluent economies. Thus, the analysis identifies two steady states: one with only minimal enforcement of property rights and low income, and the other with full protection of property rights and high income. The recent empirical findings are interpreted as being broadly supportive of this theory.

Our view of law enforcement as a public good, which the government is expected to provide under a contractual commitment, differs from some of the recent literature on predation with a more sinister attitude. A very interesting work such as Konrad and Skaperdas, 1999, and Moselle and Polak, 2001, exhibits a more suspicious attitude towards the state, arguing that it could be damaging even if the alternative is the relative absence of law enforcement. Grossman and Kim, 1995, present yet another alternative modeling whereby protection of property rights is not provided by the state, but by the agents themselves. Consideration of the implications of these contrasting approaches in a growth framework could constitute a worthwhile extension of the paper.

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Figure 1: Intertemporal income evolution