



Weak Property Rights and Market Access

Colin Rowat*

Department of Economics, University of Birmingham

Jayasri Dutta*

Department of Economics, University of Birmingham

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INTRODUCTION

The following argument is one of the most standard in economics: when a factor of production – like capital - is relatively scarce, the return that it earns in a competitive economy should be high. This has posed a paradox in the context of poor countries, in which capital tends to be scarce. The argument would obviously predict high returns to capital – high interest rates – for them. These, in turn, would create incentives for investors in richer countries (with lower returns to capital) to invest in the poorer country. In this way, poor countries would grow, catching up to richer countries.

In practice, however, only some poor countries have been growing quickly; others continue to languish in poverty. Further, people in very poor countries often send their wealth abroad – precisely the opposite of what the argument above would suggest. Research has found that these flows can be quite large as a share of domestic wealth. Table 1 shows that this is particularly true in Sub-Saharan Africa.

	1980 – 1989	1990 – 1998
Sub-Saharan Africa	0.276	0.301
Latin America and Caribbean	0.085	0.090
South Asia	0.047	0.076
East Asia and Pacific	0.045	0.050

Source: Collier, Hoeffler and Patillo (2004)

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* Colin Rowat email: c.rowat@bham.ac.uk,

* Jayasri Dutta email: j.dutta@bham.ac.uk

A natural question to ask, then, is why the theory seems at odds with the data. A partial answer that seems compelling involves property rights. In addition to having little capital, many poor countries also have weak property rights. This may be a number of reasons for this: more traditional societies may have implicit, rather than formal, understandings of ownership; strong community and family bonds may encourage a perception that property is communally rather than privately owned; inequalities in society may allow more powerful members to simply take the property of poorer members. For whatever reason, while the intrinsic return to capital may be high in the poor country, this may mean little to its owners if they cannot take full advantage of it themselves. Thus, they may prefer to invest abroad, trading off the lower intrinsic return against the certainty that their property is theirs to do with as they please.

This argument was developed over a decade ago by two economists, Aarón Tornell and Andrés Velasco. In a 1992 paper, they assumed an extreme situation in which there were no property rights in the hypothetical poor country under study. As a consequence, all the capital in the country could be thought of as residing in a 'commons', from which any member of society could draw with equal facility.

This simplifying assumption then allowed them to analyse the situation as a 'differential game'. While still relatively uncommon within economics, differential games are natural extensions of optimal control problems to situations of more than one agent. They are defined by two objects: an equation of motion that governs the evolution of the 'state' variable – the domestic capital stock, in this case; and agents' objective functions (in this case, agents benefit from consuming resources drawn from the commons, but dislike the effort of seizing those resources). The ensuing game is called 'differential' because the equation of motion is a differential equation.

Tornell and Velasco then compared two situations. In the first, residents of the poor country could not borrow or save. Thus, their consumption at any point in time was constrained by their income at that point. In the second situation, residents could access foreign capital markets, allowing them to save the resources that they transferred abroad from their country for later, or to borrow against future transfers.

As a result of their analysis, Tornell and Velasco concluded that access to foreign capital markets could increase welfare in the poor country by putting "a floor on the common-access asset's rate of return and, thus, a ceiling on the appropriation rate". Clearly, allowing more flexibility in scheduling consumption and labour effort, access to capital markets (in this case foreign ones) can be beneficial.

Surprising about Tornell and Velasco's result, however, was the absence of an equally apparent negative effect: if residents of the poor country expect their compatriots to transfer resources in the commons abroad (thus reducing that remaining for them), they may respond by trying also to grab assets from the commons, securing their claim to them by depositing them abroad. While in their narrow interests to do so, this harms society as a whole: instead of capital staying at home, where it earns high returns, it is transferred abroad, where it earns low returns.

A later paper, Tornell and Lane (1999), does take a darker view of this second effect, terming it the 'voracity effect'. This reinterpreted the Tornell and Velasco model entirely domestically: there is a formal economy in a country which enjoy high returns, and an informal economy which enjoys low returns. The formal sector, however, is subject to taxation. As government policy is controlled by powerful interest groups, they can use the government's power of taxation to extract resources from the formal economy, turning it into a commons. By contrast, the informal sector is assumed to be 'hidden', and therefore beyond the influence of these interest groups.

This same structure may also help the analysis of more economically familiar situations. For example, an industrial may seek to borrow money to finance a new factory, whose profits will be earned, in part, by emitting pollutants into the atmosphere, or dumping toxins into a river or lake. Here, the atmosphere, river or lake is a commons, the degrading of which earns profits which can be transferred to and from capital markets with secure rights. Perhaps an even more standard situation is the following: the owner of a fishing vessel opens a bank account in which to deposit the income earned by fishing. Here, the fish stock may be communally held.

We have written two papers to help us understand problems of weak rights and market access. The rest of this article describes these papers and their results. Interested readers are referred to the original papers for more detailed accounts.

1. A TWO PERIOD MODEL

Rowat and Dutta (2004) considered the simplest situation that we could imagine in order to develop clear intuitions. Thus, we imagined a hypothetical poor country that lasted for two periods. In each period, its residents had to decide how much of the national capital stock (stored in a commons) to appropriate. Resources left in the commons after first period earn a return on investment, growing at rate, a ; those left in the pool after the second time period are 'wasted' as no further activity occurs beyond that point. When this hypothetical poor country does not have access to capital markets, the resources appropriated from the commons can only be consumed. We call this situation one of 'autarky'. When it does have capital market access, the resources can either be consumed or transferred into the foreign capital markets. Assets deposited into these markets grow at an interest rate, $r < a$. This inequality both captures the sense that the return to capital should be higher in a poor country, and makes the problem more interesting: individuals would like to keep their capital at home, where they earn higher returns, but also recognise that doing so gives others the ability to appropriate it.

When the country has access to capital markets, its residents may also borrow from them at the same rate, r . Technically, this access replaces the budget constraints that individuals face each period under autarky with a single, intertemporal constraint. We performed our analysis under two different assumptions about how people behave. Under the first, each sees herself as small, and unable to influence events. Thus, she does not believe that her decisions to appropriate affect the rate at which resources are drawn from the commons. Of course, in the aggregate, her decisions do. This assumption is therefore similar to the 'price taking' assumption typically made when analyzing competitive markets. Here, though, people are 'appropriation rate takers'.

Under the second assumption, people understand and take into account the effect of their appropriation decisions on the communal stock. These 'strategic' agents resemble those studied by game theorists. In both cases, the agents are assumed to be identical in their tastes and abilities.

With this framework in mind, we first asked how quickly the country's capital stock is transferred into private accounts: would the rate of appropriation be high enough to exhaust it in the first period? Would it be exhausted in the second period? Would it survive beyond then to the end of the analysis?

For large capital stocks, it did not make a difference whether or not agents were competitive or strategic: the country was wealthy enough that the costs associated with exhausting the commons were not worth bearing. On the other hand, for some poor countries, if agents were strategic, they could delay the commons' depletion. The reason for this is simple: competitive agents have little incentive to conserve society's resources as they do not believe that cutting back on their extraction will leave any more resources for them to consume later. By contrast, strategic agents understand that it will. Next, we asked about the consequences of capital market access. Figures 1 and 2 illustrate the only two possibilities. In all cases, the country's initial capital stock is plotted along the horizontal axis while its level of welfare is plotted along the vertical axis. (As each member of society is assumed to be identical, the discounted utility of any member mirrors societal welfare.) Each panel displays two curves: the upper one corresponds to countries with market access, while the lower corresponds to autarky.

The left panel of Figure 1 illustrates a situation in which, however rich or poor the country is initially, it gains from access to markets. Thus, the ability to flexibly schedule consumption and appropriation always outweighs the negative effect of accelerated extraction of assets. The scallop in the autarkic curve occurs at the point where the initial capital stock becomes large enough to allow the commons not to be exhausted in the first

period. (Market access smoothes the scallop by allowing agents greater flexibility in deciding when to consume the wealth that they have extracted.) For larger stocks yet the curves become flat: at this point the capital stock survives beyond the period of study.

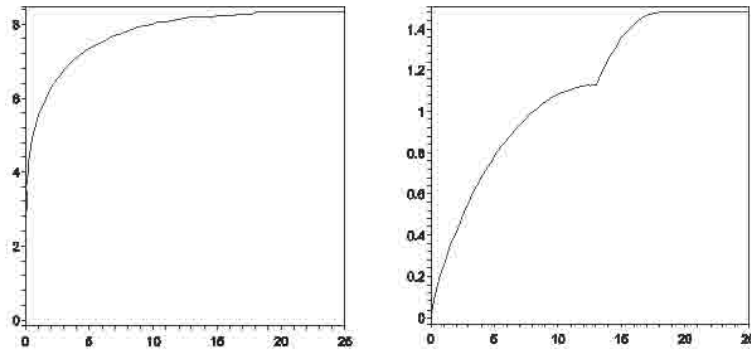


Figure 1: The two possibilities for welfare with competitive agents

In contrast, the society depicted in the right panel of Figure 1 can be harmed by market access for some wealth levels. For low levels of endowment, individuals extract the same amount from the commons, but those with market access are able to make better use of their proceeds. In high endowment levels, the resource is not scarce, and thus competition for it is weak, preventing premature extraction. Again, market access dominates as the resources that are extracted can be put to better use. For some intermediate endowment levels, individuals with market access will compete intensely, leaving less to grow at the commons' higher rate.

Which of these two panels applies to a given country? Technically, if the market discount factor is greater than the subjective discount factor, the right hand panel applies. Less technically, if the citizens of a country are so impatient as to always want to borrow at the world interest rate, if they could, the right hand panel is the relevant one. This is cautionary as this description may hold in poorer countries.

Figure 2 depicts the equivalent of Figure 1 for strategic agents. The main difference between the cases is that strategic agents benefit from having enough insight never to immediately deplete the commons. Again, impatience relative to the world interest rate leads to the right panel.

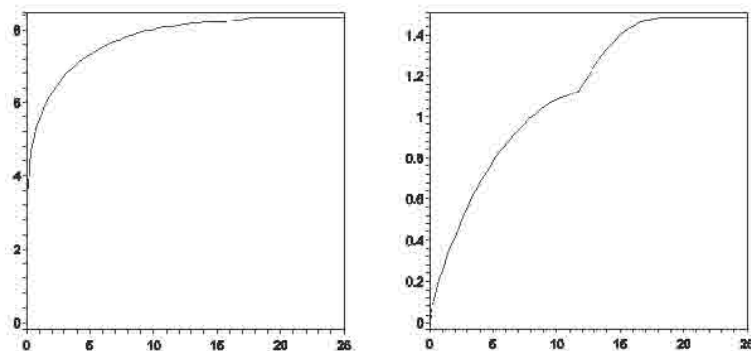


Figure 2: The two possibilities for welfare with strategic agents

2. AN INFINITE HORIZON MODEL

Dutta and Rowat (2004) consider a more complicated environment in which agents make decisions constantly into the infinite future. Thus, at every point in time, they are choosing both how much to extract from the commons, and how much to consume; otherwise, the model is the same as in the first paper described. As Tornell and Velasco's 1992 paper also worked in continuous time, this paper is closer to theirs.

There are still, however, a number of differences. First, we have only considered the case of competitive agents. We did this as proper consideration of strategic agents is technically more demanding: the agents' decision will now depend not only on the capital stock in the commons, but on their private savings – a detail not properly considered by Tornell and Velasco.

A second difference between our papers is that Tornell and Velasco restricted appropriation rates to be shares of the commons stock. This reduced the dimension of the problem, allowing each agent's strategy to be identified with a single fraction. In continuous time, however, this also precluded the possibility of exhausting the commons. Thus, the possibility of extreme capital flight could not be considered.

Again, we compare societal welfare under market access and autarky. As before, when the society is well endowed, market access is preferred: its negative effect – accelerated depletion of the commons – disappears as no one is concerned about the commons' scarcity. Also as before, a very poorly endowed society benefits from market access: the resource is sufficiently scarce that access to markets do not significantly speed up its depletion; against this, the markets again allow consumption to continue after the commons has been drained.

We then compare two extreme cases in which we think that market access may be at a disadvantage: that when individuals do not care about the timing of their consumption or extraction other than as a result of impatience. (In usual cases, satiation may lead them to prefer consuming regular amounts over time, rather than in sudden bursts; similarly, it may be easiest to extract steadily instead of in bursts.) We expected that these cases would favour autarky as they simplify an individual's problem to one in which she merely needs to consider the timing of extraction *or* consumption – not both. As she has a single tool under autarky (consumption and extraction being equal), that may suffice to solve this single problem. By contrast, in the usual cases, individuals must worry about the timing of both extraction and consumption; having two tools (consumption and extraction) should be advantageous in these cases. As expected, we did find that autarky could outperform market access for some of these cases. Reassuringly from an intellectual point of view, we find that this is so under conditions similar to those in the model described above, namely when impatience exceeds the world interest rate. Practically, of course, this may again be of concern.

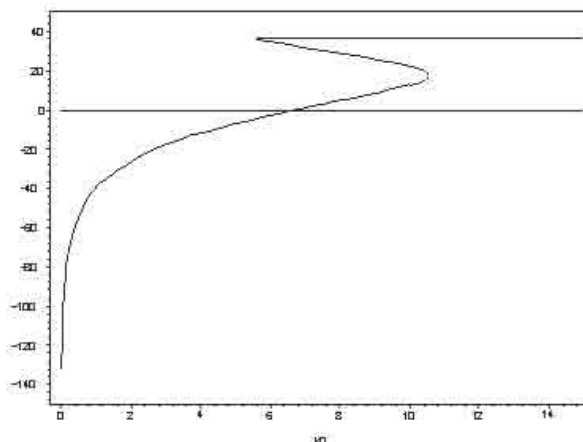


Figure 3: An example of welfare in continuous time

Figure 3 displays an example of our analysis. The axes are the same as those in the previous figures. (The negative numbers on the vertical axis are not a cause for concern: they can be rescaled without consequence.) The example has been picked so that societal welfare under autarky is constant, regardless of the initial capital stock. Welfare under autarky, then, is depicted by the horizontal line. Other parameter values would yield different diagrams: we have picked these values for their expositional simplicity. Societies with access to capital markets, on the other hand, display more complicated effects. Very poor societies do better to avoid capital markets: access will lead to a rush to strip out its already scarce resources. Very wealthy societies are unambiguously better off with capital markets. The abundance of their capital stock means that no one worries about its exhaustion and, in response, no one is prompted to hoard themselves. For societies of intermediate levels of wealth, a number of outcomes are possible. The capital stock may be quickly depleted: if everyone expects it to be exhausted, they will speed up their own appropriation to ensure that they get a share of it; if, on the other hand, everyone expects it to last, they will moderate their extraction, confident that they will get a share. While the outcome with rapid extraction is worse for society than autarky, that with slow extraction may be better.

An interesting feature of the outcome with slow extraction is that increases in the initial capital stock may actually harm society. If the capital stock is interpreted as natural wealth - e.g. oil or other mineral wealth - then this feature resembles a 'resource curse' (Sala-i-Martin and Subramanian, 2003; Bannon and Collier, 2003).

When compared to the two-period analysis, the harmful effects of capital market access look less unusual. This seems to reflect the negative effect's role in speeding up the date at which the commons is extinguished: when there are only two time periods, this can only be sped up from the second to the first period. In continuous time, by contrast, the negative effect has many more opportunities to speed extinction.

3. DISCUSSION

The analysis above suggests one channel by which some countries with weak property rights may experience negative consequences of market liberalization. This channel may not be an unusual one: while the "lowest common denominator" of development advice offered to poor countries often includes strengthening property rights and liberalizing markets (Williamson, 2000), it is generally easier to do the latter than it is the former. Liberalizing markets, after all, requires merely that a state relax existing controls; strengthening property rights, on the other hand, requires that it exert greater controls than it has previously. Thus, while it may be 'first best' to do both, we have shown that, in some circumstances, one taking one of these steps may be worse than doing neither - an example of the theory of the 'second best' (Lipsey and Lancaster, 1956). While theoretically plausible, we should also stress that the analysis above is purely theoretical at present. The examples presented were picked for expositional convenience: they are not based on real countries. The debate about when and how countries should liberalize markets - whether by relaxing capital controls or reducing trade barriers - is obviously a complicated one. (See Ishii and Habermeier, 2002, or Bakker and Chapple, 2002, for recent presentations of IMF research.) Thus, we would not want our exercise to be interpreted as arguing in favour of or against liberalization in any particular country. Recent writing on strengthening property rights seems to be less ambiguous. Besley and Burgess (2003), for example, assess the ability of commonly discussed policies for poverty reduction (e.g. foreign aid, debt relief) to meet the World Bank's stated aim of halving the number of poor by 2015. While pessimistic about the effectiveness of many of these policies, they conclude that strengthening property rights by half a standard deviation would suffice to halve global poverty. Acemoglu, Johnson and Robinson (2001) find that half the variance of GDP in post-colonial countries can be accounted for by a measure of protection against governmental diversion.

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