IN SEARCH OF THE HOLY GRAIL: POLICY CONVERGENCE, EXPERIMENTATION AND ECONOMIC PERFORMANCE

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Abstract

We consider a model of policy choice in which appropriate policies depend on a country's own circumstances. The presence of successful countries ("leaders") generates informational externalities for latecomers. On the positive side, some corrupt governments are reined in. On the negative side, some honest governments are disciplined inefficiently, resulting in too little "policy experimentation." Our model predicts a U-shaped pattern in economic performance as we move away from the leaders in the relevant space of characteristics: close neighbors should do very well, distant countries moderately well on average with considerable variance, and intermediate countries worst of all.

I. Introduction

There has been a remarkable convergence of views over the last two decades among both scholars and policy makers on what constitutes desirable policies to promote economic growth. Yet economic performance is more heterogeneous across the world than it has ever been. Growth rates in the developing world have been lower on average in the past two decades than they were in the 1960s and 1970s. And the dispersion in growth rates across countries has become wider (see Mukand and Rodrik, 2002, Table 1). Why this disappointing performance if we have apparently learned so much about what we need to foster economic convergence?

One possible answer is that the divergence in performance is due to the failure of governments around the world to adopt the consensus policies. Yet countries that have in fact tried hard to implement Washington Consensus-style reforms have often done poorly. Consider Latin America, for example. Most Latin American countries have undertaken significant amount of structural reform, including trade and financial liberalization, tax reform, privatization and opening up to capital flows since the middle of the 1980s.[1] Yet economic performance in Latin America has been quite disappointing over this period. Virtually all Latin American countries have grown at slower rates during the 1990s than they did prior to the 1980s (with Chile being the only clear exception). Of course, the relationship between "structural reform" and growth is a complex one, and there is only a limited conclusion that one can draw from such a broad-brush look at the evidence. But the Latin American experience does suggest that the growth payoff reaped by the most ambitious reformers has been meager at best.

Another important strand of evidence comes from the last two decades' success cases. China and India stand out here. These two large countries have experienced significant increases in their growth rates - China since the late 1970s, and India since the early 1980s - in a period when most other developing countries have gone the opposite way. Indeed, China's and India's performance overshadows the disappointing outcomes elsewhere, making the last two decades a developmental success on a population-weighted basis. The policies that have enabled this performance present a very awkward fit with the usual list that has been on the agenda of reformers in Washington and elsewhere. China's reforms have been marked by partial liberalization, two-track pricing, limited deregulation, financial restraint, an unorthodox legal regime, and the absence of clear private property rights. India's reforms have been less distinctive, but still marked by significant departures from the rulebook. Even after the trade reforms of the early 1990s, for example, India remained one of the world's most protected economies. One could argue that these economies would have grown even faster had they embarked on a more orthodox reform agenda. But the difficulty with this argument is that those countries that adopted the orthodox policies - such as in Latin America - for the most part did worse than China and India, not better.

We entertain a different possibility in this paper. We consider a world in which appropriate policies

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[1]Morley et al. (1999) provides a quantitative picture of these reforms. Their index of structural reform for Latin America rises from around 0.47 in the early 1970s (out of a maximum of 1) to around 0.55 in the early 1980s, and then jumps up to 0.82 by 1995.

and institutional arrangements have a large element of specificity, and experimentation is required to discover what works locally. Reforms that succeed in one setting may perform poorly or fail completely in other settings. Two-track reform may work well in Deng's China but not in Gorbachev's Soviet Union. Gradualism may be appropriate to India, but not Chile. Import-substitution may foster competitive industries in Brazil, but not in Argentina. Industrial policy may produce results in South Korea, but not in much of Africa.

Such specificity could arise from differences in historical trajectories, geography, political economy, institutional settings, or other initial conditions. It could help explain why successful countries - China, India, South Korea, and Taiwan among others - have almost always combined unorthodox elements with orthodox policies. It could also account for why important institutional differences persist among the advanced countries of North America, Western Europe, and Japan - in the role of the public sector, the nature of the legal systems, corporate governance, financial markets, labor markets, and social insurance mechanisms, among others.

We do not mean to suggest that economic principles work differently in different places, or that economics itself needs to be tailored to local conditions. We make a distinction instead between economic principles and their institutional embodiment (Rodrik 2003). Most first-order economic principles come institution-free. Incentives, competition, hard-budget constraints, sound money, fiscal sustainability, property rights are central to the way that economists think about policy and its reform. But these principles do not map directly into institutional solutions. Effective property rights can be implemented through common law, civil law, or, for that matter, Chinese-type socialism. Competition can be maintained through a combination of free entry and laissez-faire, or through a well-functioning regulatory authority. Macroeconomic stability can be achieved under a variety of fiscal institutions. Institutional solutions that perform well in one setting may be inappropriate in other setting without the supporting norms and complementary institutions. In the words of North:

> " economies that adopt the formal rules of another economy will have very different performance characteristics than the first economy because of different informal norms and enforcement. The implication is that transferring the formal political and economic rules of successful Western economies to third-world and Eastern European economies is not a sufficient condition for good economic performance." (North 1994, 8)

In addition, since policy makers always operate in second-best environments, optimal reform trajectories-even in apparently straightforward cases such as price reform - cannot be designed without due regard to prevailing conditions and without weighting the consequences for multiple distorted margins.

A paper that takes these issues seriously has a triple burden. It must explain why countries do converge on "consensus" policies even when their circumstances call for different arrangements. Second, to the extent that some countries choose to experiment rather than imitate, it must provide a reason why they do so. Finally, it must provide a plausible accounting of the pattern of economic performance that emerges when there is a tendency for countries to converge on similar policies. This paper contains some first steps in all three directions.

We consider a model in which there is uncertainty about which policies (or equivalently, institutional arrangements) represent the best fit for a country's circumstances. Policies that are well matched with circumstances produce higher output than policies that are not. Policy makers are better informed than the electorate about the requisite policies, but they may be also tempted to implement corrupt policies that siphon rents to themselves. The voters observe the policy choice of their government, but not the resulting output or the rent transfer (which do not materialize until the end of the government's full term in office). They have an opportunity to kick the government out of office midstream. Since they can potentially save on the economic rents that would otherwise accrue to a corrupt government, voters are more likely to do so the higher the probability that the policy in place is corrupt. Policy makers like to remain in office (i.e., they derive "ego" rents from holding office) and, everything else being the same, would rather stay in office than be kicked out.

We focus on the stage game where the governments and their electorates in a "follower" country have already observed a successful policy in a neighboring country (called the "leader"). The follower government faces the following dilemma. It can imitate the leader's policy, and thereby signal that there will be no corruption, but at the cost of adopting a policy that may not be appropriate to domestic circumstances. Or it can choose a policy that targets as closely as possible its private signal, in which case it incurs the cost of being perceived as corrupt (along with the cost of experimentation).

We show that the informational externality created by successful leaders results in both an upside and a downside. Countries whose underlying state is close to the leader - i.e., the leader's neighbors by the relevant metric - choose to mimic the leader's policies, even when their governments may otherwise have followed corrupt policies. This yields a double benefit to the neighbors: they can forego the costs of experimentation, while reaping the benefits of the discipline that is imposed on potentially corrupt governments. Countries in the far periphery are unaffected by the leader's example, as their governments' incentives to experiment or adopt corrupt policies remain unaltered. The cost is borne by honest governments in the near periphery - i.e., by countries that are too far from the leader for mimicking to be welfare improving, but close enough for the informational externality to generate an incentive for honest governments to mimic. The last case entails inefficient disciplining of government policies. The shadow of corrupt governments imposes a cost on honest governments.

Therefore our model yields distinct predictions about the patterns of policy imitation, corruption, and economic performance as a function of a country's position vis-a-vis successful leaders. In particular, it predicts a U-shaped pattern in economic performance as we move away from the leader in the relevant space of characteristics: close neighbors should do very well, distant countries moderately well on average with considerable variance, and intermediate countries worst of all.

We believe this framework helps account for some of the salient features of the economic landscape of the last few decades. Countries in the vicinity of growth poles such as Japan and later the East Asian tigers have tended to do very well, in part by imitating many of the policies followed by these leaders. Countries whose underlying characteristics or geographic distance place them very far from the leaders have experienced highly variable fortunes. Superstars like China, Botswana and Mauritius, which have achieved success on the back of a great degree of policy experimentation, have occasionally

emerged from this group. Some of these experimenters in turn have become examples for others to follow, such as China in the case of Vietnam. And we would claim that many countries in between have been "inefficiently disciplined," adopting policies that are less corrupt and more transparent than in the past, but also perhaps less appropriate to their circumstances. The Latin American economies of the 1990s may constitute the chief examples of this last group.

The perspective we adopt in this paper has many antecedents in the literature. Economic historians have long emphasized that the fragmentation and diversity of early modern Europe was a source of economic strength that allowed Europe to eventually overtake the centralized empires in China, the Middle East, and the Indian sub-continent. Central here is the idea that decentralization enabled competition, not only in the market for goods and services, but also in market for institutional arrangements (see Landes 1998, North 1993, and Diamond 2001; the latter emphasizes the geographical sources of these historical trajectories). In the recent literature on development strategies, Evans (2001) and Rodrik (2000) have argued for the importance of local deliberation in ensuring a good fit between institutions being adopted and local conditions, while Besley (2001) notes that "adopting a policy is analogous to adopting new technologies with uncertain benefits." Dewatripont and Roland (1995) and Roland (2000) underscore the importance of uncertainty and experimentation in the context of transition economies.

Our paper also relates to the large literature on fiscal decentralization and interjurisdictional competition, as surveyed for example by Oates (1999). This literature considers policy experimentation as a possible benefit of fiscal decentralization, and touches on the information externality that is generated by the adoption of innovative policies (see Rose-Ackerman 1980). This literature differs from the approach adopted here in that it typically presumes policy makers are rewarded or punished based solely on their policies' success. Besley and Case (1995) provide an interesting analysis of interjurisdictional "yardstick competition" within the U.S. where voters make comparisons with neighboring states to overcome political agency problems. The public administration literature on policy innovation among U.S. states is discussed and evaluated in Berry (1994).

Perhaps most directly relevant to our research is a recent paper by Berkowitz, Pistor, and Richard (2003). This paper finds that countries that developed their formal legal orders internally, adapted imported codes to local conditions, or had familiarity with foreign codes ended up with significantly better legal orders than those that acquired their formal legal order from abroad without much adaptation and/or familiarity. Our paper is also related to Kremer, Onatski, and Stock (2001), who consider the role of experimentation in driving the pattern of incomes around the world. In their model, countries search among policies until they reach a satisfactory income level, at which point they stop experimenting. Our framework puts more structure on these issues, and also, more importantly, endogenizes the choice between experimentation and imitation.

The plan of the paper is as follows. Section II presents the model which we analyze in Section III. Section IV concludes.

II. The Framework

Countries and policies: We consider a world with a large though discrete number of countries. Countries differ from each other in terms of their geography, culture and other local conditions which make any given policy more or less "appropriate" across countries. We capture these country specific local conditions by assuming that each country i has a unique "state of the world" z_i, where $z_i \in \mathcal{R}$ and is drawn from a distribution $F(z)$.

The government gets to choose a policy a_j that persists for the entire period and affects national income, where $a_j \in \mathcal{R}$. There are two distinctive features of policies that we emphasize. The first is the state-contingent nature of policy making, with the impact of a policy on national output depending on the state of the world. It is useful to keep in mind that in our analysis a "policy" has very broad connotations and is not necessarily just related to the economic policy choice per se - it might well consist of institutional and political innovations. This broader interpretation of policies becomes particularly useful in understanding the second aspect of a policy that we highlight. We assume that some policies are conducive to the inefficient siphoning away of resources due to corruption and wastage (corrupt policies), while other policies encourage 'discipline' (honest policies).

Accordingly, if a country with the underlying state of the world z_i implements policy $a_{jh} \in \mathcal{A}^h$ where $\mathcal{A}^h$ is the set of "honest" policies, then private-sector income is $y_i = -\theta(z_i - a_{jh})^2$. Observe that the closer or more "appropriate" is the policy to the state, the higher is private income. In contrast, if the government chooses a policy a_{jc} which belongs to the set of corrupt policies $\mathcal{A}^c$ and the government is not kicked out of office midstream (see below), then private-sector income is given by $y_i = -\theta(z_i - a_{jc})^2 - R$, where the economic rents siphoned off by the government equal R. We also incorporate the fact that a corrupt policy results in a dead-weight loss to society as a whole, given by δ_{ic}, which is drawn from $G(\delta)$ - a symmetric single-peaked distribution with support $[\delta_L, \delta_H]$ where $\delta_L > 0$. We capture this effect by assuming that there is a country-specific corrupt policy a_{jc} that minimizes the dead-weight loss of corruption, where $a_{jc} = z_i + \delta_{ic}$. This dead-weight loss is privately observed by the government before it makes its policy decision.

Governments and the citizen: We assume that all policymakers are identical with an objective function given by $V_i = y_i + (\phi - 1)R + \epsilon$ where $\phi > 1$ and $\epsilon > 0$. Here ϵ is the "ego" rents from being in office and R is the "economic" rents from enacting a policy that allows corruption. Importantly, both are earned are reaped only if the government remains in power the full term. If the government is kicked out mid-term, there is a "caretaker" government that takes office and continues the incumbent's policies, with the associated deadweight loss (if any), but does not capture the economic or ego rents.[2]

Finally, each country i has citizens of unit mass, who live one period, with payoffs given by $u_i = y_i$. Midway through the government's term, citizens make the decision of whether to organize a coup, a revolt or force midterm elections and replace the incumbent at a stochastic cost $c_i \sim U[0, \bar{c}]$.

Information and experimentation: The citizens of a country do not know the location of their under-

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[2] This is a particularly simple mechanism that ensures that the probability of re-election is an increasing function of the perception that policies pursued are corrupt. Alternative more elaborate political underpinnings can also be provided, as in some variant of the career-concerns model.

lying state of the world, other than $z_i \sim F(z)$. However on assuming office, a government learns about the country's location z_i. We are interested in capturing the uncertainty inherent in the policy making process when experimentation is carried out. We capture this cost of experimentation by assuming that even though the government i knows its "ideal policy", it can determine the actual policy implemented only up to a random error term, $a_i = z_i + \eta$, with $\eta \sim N(0, \sigma_\eta^2)$. This is a relatively simple way of capturing the costs as well as the gains from experimenting with an untried policy. If, instead of experimenting, a country i picks up a policy off-the-shelf that has been tried in some other country, then there is no uncertainty associated with its implementation. We assume that $\delta_c^2 > \sigma_\eta^2$ for all δ – implying that experimentation generates a higher expected output than a corrupt policy.

The timing of events: The world consists of a large number countries where the entire set of countries is divided into two cohorts - the "leader" cohort makes policy choices at the beginning of period one and the "follower" cohort makes policy choices at the beginning of period two. At the beginning of period one, the governments in the leader cohort *privately* observe their location z_i and the dead-weight loss of a corrupt policy δ_{ic} and then choose the publicly observable policy a_i. Citizen-voters observe a_i, c_i, and then decide whether to retain or replace the incumbent with a caretaker government (as described above). At the end of the period, y_i is realized, and if the original government has survived, R and ϵ get "paid out". Information and the sequence of decision making in the follower cohort are identical to the above, except in one important respect. At the start of period two, citizens and governments in the second "follower" cohort observe policies and private-sector incomes in the leader cohort, i.e. they observe the period one history $h_1 \in \mathcal{H}_1$ where $\mathcal{H}_1$ is the set of all possible period one histories, and $h_1 = \{(a_1, y_1), ..., (a_N, y_N)\}$ is one element in this set ($\mathcal{H}_0 = \Phi$ for leader cohort).

In the next section we search for a Perfect-Bayes' equilibrium of the political game facing each country's government with objective function V_i. Such an equilibrium will consist of a government's strategy which is a function of $z_i, \delta_i,$ and $\mathcal{A}^j$ and that determines whether to experiment, imitate or choose a corrupt policy. Citizens in each country will observe a_i, c_i and h_t in making decision of whether to replace the government. Finally, the government's strategy and the citizen's beliefs have to be consistent with each other and derived using Bayes' rule.

III. Discipline and Corruption in the Search for Prosperity: Analysis

We begin our analysis by first examining the "leader" cohort. Consider the government of country i which has privately observed its true location z_i. The expected payoff of a government that chooses to experiment with an "honest" policy $a_{ih} = z_i$ is given by,

$$V_{ih}^{xpmt} = E(-\theta(z_i - a_{ih})^2 + \epsilon) = [-\theta\sigma_\eta^2] + \pi^X \epsilon \quad \text{if} \ \ a_i \in \mathcal{A}^h, \tag{1}$$

where π^X is the probability that a government which experiments with an honest policy a_h, remains in office for the entire period. A government faces uncertainty when it experiments with an untried policy, and this uncertainty results in an expected loss of output - the first term in the square brackets. However, this choice of experimentation (potentially) also affects the expected rents that may accrue

to the government - the second term above. Similarly, the expected payoff from a corrupt policy is,

$$V_i^{corr} = E[-\theta(z_i - a_{ic})^2 + (\phi - 1)R + \epsilon] = -\theta\delta_{ic}^2 + \pi^C[(\phi - 1)R + \epsilon] \text{ if } a_i \in \mathcal{A}^c. \tag{2}$$

The choice of a corrupt policy $a_{ic}(= z_i + \delta_{ic})$ results in not only a rent transfer but also a deadweight loss - the first term on the right hand side. The choice of a corrupt policy has an impact on the expected rents earned (the second term on the right hand side), by affecting (again, potentially) the probability of remaining in power(π^C).

This implies that a government prefers $a_i \in \mathcal{A}^h$ iff $V_{ih}^{xpmt} > V_i^{corr}$, which is true when $\theta(\delta_{ic}^2 - \sigma_\eta^2) > \pi^C[(\phi - 1)R + \epsilon] - \pi_h^X(\epsilon) = \pi(\phi - 1)R$. The latter equality arises because of the citizen's inability to distinguish between a corrupt and an honest policy, since output and rents are only observed at the end of the period, which implies that $\pi_h^X = \pi^C \equiv \pi$. Therefore in the leader cohort a citizen's re-election rule is independent of the policy choice observed, and is driven solely by whether the realized cost of replacement (c_i) exceeds the expected gains. The gains of replacement are the economic rents that would have been consumed by government, had it been allowed to complete its full term in office. Therefore, the probability of remaining in office for a government in the leader cohort equals $\pi = prob(c_i \geq \psi_{j1}R)$, where ψ_{j1} is the probability that any policy a_j chosen by the leader cohort, is corrupt. Notice that this probability that any chosen policy is corrupt, is endogenously determined and is a function of the distribution across countries of the dead-weight loss δ_c. In the lemma that follows we characterize this relationship between policy choices and the country's deadweight loss from corruption and demonstrate that it is a function of a cut-off δ_1^*.

LEMMA I. *There exists an equilibrium in the "leader" cohort's political game, such that all countries with $\delta \leq \delta_1^*$ choose corrupt policies while all those with $\delta > \delta_1^*$ prefer to experiment.*

PROOF: See Appendix.

Decision making in the "follower" cohort constitutes the heart of our analysis - and the remainder of our discussion focuses on it. As with the leader cohort, governments in the follower cohort continue to have the choice of either experimenting with an untried honest policy or adopting a corrupt policy. However, they now have an additional option - imitation of a policy that has been successfully tried-and-tested by a country in the leader cohort. Not only does imitation of such previously tried policies eliminate the uncertainty associated with experimentation, but it also potentially enables an incumbent to signal to the citizen that it has chosen a policy that is not corrupt - increasing his chances of remaining in power. In what follows, for simplicity, we restrict the set of policies that can be imitated to $\mathcal{A}_L^h$ – the set of policies that are perceived to be honest, since they have resulted in a sufficiently high income in the leader cohort, i.e. where $\mathcal{A}_L^h = \{a_L^h | y_{iL}(a_L^h) \geq \bar{y} = -\theta\delta_L^2 - R\}$, and $\mathcal{A}_L^h \subseteq \mathcal{A}^h$. We label all such high income countries in the leader cohort as "successful" leaders, with n_L being the number of such leaders.[3] Therefore the additional option confronting a government that has privately observed

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[3]At the cost of some work, it is possible to analyze the more general case, where we do not limit our analysis to the case of such "successful" leaders. This generalization follows from the fact that output follows a chi-square distribution (since η is normally distributed and the square of a normally distributed random variable is chi-square).

z_f is that of imitating any of the "successful" leaders. The expected payoff from such imitation of a successful leader's policy $a_{iL} \in \mathcal{A}_L^h$, equals,

$$V_f^{imit} = -\theta(z_f - a_{iL})^2 + \pi^I[\epsilon] = -\theta\Delta_{fL}^2 + \pi^I[\epsilon] \tag{3}$$

Here π^I is the probability of the government completing its term in office if it imitates the leader. Observe that the "successful" leader's policy is $a_{iL} = z_{iL} + \eta_{iL}$. We define $\tilde{z}_{iL} \equiv a_{iL} = z_{iL} + \eta_{iL}$ as the "effective" location of the successful leader i and $\Delta_{fL} = z_f - \tilde{z}_{iL}$ as the "effective distance" between the imitator and this leader.[4] As is clear from the above formulation, a government's payoff from imitating the policies of a leader is declining in the distance.

Policy choices made by the follower cohort are a function of the first period history h_1, i.e. the number and location of "successful" leaders (if any). To facilitate our analysis of decision making in the follower cohort, we propose the following equilibrium to the follower country's political game.[5] A country at a relatively small distance will always imitate and adopt the leader's policy. Countries at some intermediate distance will prefer to imitate if their government has a relatively high δ and choose a corrupt policy if δ is low. Countries at a greater distance will choose between a corrupt policy and experimenting with an honest one. Finally, if there is more than one "successful" leader, then a country which prefers to imitate does so by adopting the policy of the leader from whom it has the smallest effective distance. Therefore, under this proposed equilibrium, the payoffs to z_f from imitating (V_f^{imit}), experimenting (V_f^{xpmt}) and choosing a corrupt policy (V_f^{corr}) are (using (1), (2) and (3)),

$$V_f^k = \begin{cases} -\theta(z_f - \tilde{z}_{iL})^2 + \pi_f^I \quad [\epsilon] & \text{if} \quad a_f \in \mathcal{A}_L^h \\ -\theta\sigma_\eta^2 + \pi_f^X \quad [\epsilon] & \text{if} \quad a_j \in \mathcal{A}^h \\ -\theta\delta_{fc}^2 + \pi_f^C[(\phi-1)R + \epsilon] & \text{if} \quad a_i \in \mathcal{A}^c, \end{cases}$$

where (as earlier), π^k is the probability of remaining in office as a function of whether the government imitates, experiments or chooses a corrupt policy. In comparing the payoffs, recollect that due to the citizen's inability to distinguish between a corrupt or honest policy, we have $\pi_f^X = \pi_f^C$.

In what follows, we demonstrate the existence of an equilibrium where government decisions are a function of (δ, Δ).

Further we can check to confirm that a chi-square distribution satisfies the MLR property (see Milgrom, 1981), i.e. if the conditional density function of private-sector output is given by $f(y|a_j)$, where a_j can be corrupt or honest, then according to this property, it must be that $[f(y|a_c)/f(y|a_h)]$ is decreasing in y. The fact that the MLR property is satisfied ensures that when a follower country (and its citizens) observes and ranks output across countries in the "leader" cohort $y_1(a_1) \geq y_2(a_2) \geq y_3(a_3)... \geq y_N(a_N)$ - a higher output is associated with a greater probability of the policy being honest $(1 - \psi)$. A country observes its z_f and conditional on imitating, will adopt the policy of the "leader" which maximizes its payoff i.e. $V^{imit} = (1 - \psi)[-\theta\Delta_f^2 + \pi^I] + \psi[-\theta\delta^2 + \pi^C((\phi-1)R + \epsilon)]$. We conjecture that the lower the output of a leader, the smaller the associated "basin" of imitation.

[4] Observe that if there is more than one 'successful leader' country, then the effective leader will be the one whose "effective distance" is smaller. In other words if $a_f^* = z_i$, where $a_f^* = \text{argmax}_{a_i}\{V_f^{imit}(a_i) : a_i \in \mathcal{A}_L^h\}$.

[5] If there are no "successful" leaders in the first period, then there is no externality imposed on the follower cohort. This implies that the distribution of policy outcomes between experimentation and corruption across the two cohorts is similar.

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PROPOSITION I. *There exists a Perfect Bayesian Equilibrium where governments in the follower cohort make policy choices as a function of h_1, z_f, δ_{fc} and Δ_{fi} and citizens in each of these countries retain or replace the incumbent as a function of observed $a_f, c_i, \mathcal{A}_L^h$ if $n_L \geq 1$, such that:*
(a) if $\Delta_{fi} \leq \Delta_{1i}$, then $\forall \delta$, the government imitates and adopts the policy $a_f = a_{iL}$ of the "successful" leader with the smallest distance to it, $\forall a_i \in \mathcal{A}_L^h$
(b) if $\Delta_{fi} \in (\Delta_{1i}, \underline{\Delta}_{fi}]$ then governments with high δ imitate, those with intermediate δ experiment and those with small δ choose corrupt policies
(c) if $\Delta_{fi} > \underline{\Delta}_{fi}$ then countries with relatively small δ will choose corrupt policies while those with high δ will experiment.

PROOF: See Appendix.

We label as "neighbors" all countries whose location from the leader is sufficiently small, such that they all prefer to imitate the leader, irrespective of their δ (see Proposition I(a)). If a follower country falls within this "neigborhood" of two or more successful leaders, then it is defined to be the neighbor of the leader with whom its effective distance is smaller. In contrast, we label all countries that are located beyond this distance, as being located in the "periphery" of that particular leader country. We futher distinguish between those in the "near-periphery" or the "far-periphery". A country is defined as being located in the "far-periphery" if it is sufficiently distant, such that it will prefer not to imitate under any circumstances(see Proposition I(c)). Finally, countries that lie at an intermediate distance between the "neighbors" and the "far-periphery", are said to be located in the "near-periphery"(see Proposition I(b)).

The above proposition establishes the existence of an equilibrium where follower countries in the proximity of a successful leader are "disciplined" into imitating its policies. Such imitation has both a positive and a negative aspect to it. The upside of imitation is that it minimizes uncertainty and corruption while the downside is that a country may adopt policies that are not appropriate for its individual circumstance. In our framework, the decision to imitate a leader has a political payoff - a government may complete its term in office by signaling to its citizens that corruption is unlikely. Therefore, while political considerations result in governments getting "disciplined", it is at the cost of adopting policies inappropriate to the country's local conditions. Indeed, there is the possibility that this disciplining may turn out to be inefficient.

This makes it especially important to systematically evaluate the welfare impact of this disciplining of nations. We do this in the next proposition.

PROPOSITION II. *There exists a Perfect Bayesian Equilibrium where the relationship between a follower country's location z_f and its national income with respect to a leader z_L is such that*
(a) "neighbors" are efficiently disciplined into imitating policies that enhance national income $\forall \delta$,
(b) some of the countries that lie in the "near periphery" are inefficiently disciplined into imitating the leader's policies, thereby resulting in lower expected income than in the "far-periphery" or the "neighbors",
(c) countries that are sufficiently distant and are located in the "far-periphery" do not get disciplined, choose between experimentation and corrupt policies, and have higher expected income than the inefficiently disciplined countries of the "near-periphery".

PROOF: See Appendix.

The above proposition establishes that countries within an intermediate distance of a leader are adversely affected by the informational externality generated by its economic success.

Despite the simple structure of our model, it yields several rich implications (where needed, these are formally demonstrated in the Appendix).

(i) *History and location:* In our framework, policy and institutional choices in the follower cohort of countries are determined by historical accident. The success or failure of experimentation with institutions amongst the leader cohort influences the pattern of institutional adoption and economic performance amongst the follower set of countries. In emphasizing a novel channel of institutional change, we throw light on some of the factors underlying institutional adoption by countries in the vicinity of successful leaders in Western Europe, Japan or China. In contrast, part of the difficulty in developing appropriate institutions in countries in Africa may well be location - the absence of a demonstrably "successful" leader in their vicinity.

(ii) *Neighbors: free riding and leapfrogging:* A follower country in the immediate proximity of a leader (i.e. with $\Delta_{fL} < \Delta_{1L}$) has the advantage that it for all δ it can free ride on this leader's previous experimentation. The downside of such free-riding is that the institutions it adopts may not be perfectly appropriate for its own individual circumstance. Imitating a leader's policies results in (expected) output that is decreasing with greater "effective distance". However ex post, some of these neighbors may leapfrog and achieve output that is even higher than the leader whose policies they mimicked. This is because depending on the realization of η_L and the "effective distance" Δ_{fL}, a leader country's output $y_L = -\theta(\eta_L)^2$ may be lower or greater than that of a follower country, which equals $y_f = -\theta(z_f - \tilde{z}_{iL})^2$.

(iii) *Near-periphery – imitation and inefficient disciplining:* Countries that are located at some intermediate distance from the successful leader, may get inefficiently disciplined into adopting the leader's policies. Indeed the greater the distance from the leader, the larger the proportion of countries in this region that get inefficiently disciplined. This inefficient disciplining can be of two kinds. First, there exist some countries that would otherwise have chosen to efficiently experiment (i.e. have high δ), but now end up imitating for political reasons alone. Second and more striking is the possibility of inefficient disciplining of otherwise corrupt governments. Here the economic gains of a reduction in corruption are more than offset by the fact that the government is following a leader who is too far (see Appendix). This inefficient disciplining of countries will result in expected national income that is lower than that of countries in the neighborhood of the leader, or that of countries in the "far-periphery".

(iv) *Far-periphery – experimentation and corruption:* Countries in the follower cohort who lie in the "far-periphery" of all successful leaders, are unaffected by the informational externality provided by the preceding cohort's institutional experimentation. Accordingly, some of these governments experiment with honest policies, while others adopt corrupt policies. Therefore, there is higher variance in outcomes, with the potential for some new spectacular performers, as well as some with disastrous economic outcomes.

(v) *Distance, growth and economic performance:* The most striking empirical implication of our framework is that it yields a U-shaped relationship between distance from the leader and economic performance. Follower countries in the close proximity of the leader get efficiently disciplined achieving a reasonably high level of economic performance with a "growth pole" around the leader.[6] As distance

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[6]The *mass* of countries in each "growth pole" may differ depending on the "successful" leader's location and the underlying distribution of countries $F(z)$. Therefore, a country such as Hong Kong may have fewer imitators than Western Europe.

from the leader increases national income declines, as the social cost of being disciplined into imitating inappropriate policies increases. However, despite this economic cost a government prefers to imitate because of its positive political payoff. Nevertheless, beyond a certain threshold distance the decline in output is sufficiently acute to outweigh any political gain from inefficient imitation. Therefore, in this last region some of these governments prefer to experiment resulting in a jump in expected national income. Taken together, the result is a U-shaped relationship between distance and expected income.

In the working paper version of this paper (Mukand and Rodrik 2002), we report a simple empirical test of our framework that focuses on the experience of post-socialist countries. These countries were forced to search for alternative policies once they abandoned socialism, so they constitute a useful sample for our purposes. For most of them, the model to emulate, if any, was the Western European example. We hypothesize that the geographic distance between each of these countries and Western Europe is an adequate (inverse) proxy for the suitability of European-style institutions to their circumstances. We then demonstrate that there is a robust U-shaped relationship between these countries' distance from Brussels and their post-transition growth rates. The U-shaped relationship survives when we control for a variety of other determinants, including the extent of "structural reform" undertaken, initial income, and years under socialism.

IV. Concluding Remarks

The principal innovation of this paper is a richer conception of policy making which allows for country-specificity of policies as well the possibility of learning from successful leaders. In our framework experimentation and imitation both have a useful role to play, but they also each have a downside. Experimentation allows countries to discover policies closer to their "ideal," but it necessarily involves taking risks. Imitation avoids those risks, but creates the possibility that imported policies will prove inappropriate. By endogenizing policy choice, we have shown that the informational externality generated by successful leaders benefit those countries that have a "close" degree of similarity to the leaders in their underlying circumstances, while it hurts countries that have an "intermediate" degree of similarity.[7]

In our framework, the informational externality generated by successful countries results in a sub-optimal level of policy experimentation. The reason is that the shadow of corrupt governments restricts the options available to honest governments. But by making the distinction between honest and corrupt policies clearer to observe, it also reduces the scope for corruption. We end by emphasizing that countries may be able to escape this tradeoff in the longer run by establishing political systems with a better track record of accountability and honesty.

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[7]We note that there may be other mechanisms that generate an "excessive" incentive to imitate. For instance, suppose international capital markets expect that policies that constitute the Washington consensus are more likely to work for developing countries. If a government has information that suggests an alternative course of action might be superior, it is likely to be punished in the form of low capital inflows. In turn these lower capital flows, by lowering employment, may have a negative impact on the political survival of the government. Therefore, fear of lower capital flows (and its adverse political and economic consequences) may prevent governments from pursuing policies they know are likely to work best. See Mukand (1999) for an elaboration of this argument.

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Appendix

PROOF OF LEMMA I: We solve for a fixed-point δ_1^*, such that all countries in the leader cohort with $\delta \leq \delta_1^*$ prefer a corrupt policy, while all countries with a $\delta > \delta_1^*$ prefer to experiment. Consider first the citizen's voting decision: in period 1, the incumbent is retained with probability $\pi_1 = prob(c_i > \psi_1 R) = \frac{\bar{c} - \psi_1 R}{\bar{c}}$, since $c \sim U[0, \bar{c}]$. Now suppose that there exists a δ_1 such that $\psi_1 = prob(\delta < \delta_1) = G(\delta_1)$. This implies that from the citizen's perspective the probability that the government will be retained is given by the relationship $\pi_1 = 1 - \frac{RG(\delta_1)}{\bar{c}}$, such that associated with every δ is a corresponding π_1. Notice that this implies a negative relationship between π_1 and δ. We now turn to the government's problem. Here a government will be indifferent between experimentation or corruption if $V^{xpmt} = V^{corr}$. This latter equality is true if $-\theta\sigma_\eta^2 + \pi_1^X \epsilon = -\theta\delta^2 + \pi_1^C[(\phi - 1)R + \epsilon]$. Simplifying, we obtain $\pi_1 = \frac{\theta\delta^2 - \theta\sigma_\eta^2}{(\phi - 1)R}$. Observe that the government's optimization gives a positive relationship between δ and π_1. For there to be a fixed-point equilibrium, we need a δ_1^* that simultaneously solves both the government's policy choice rule as well as the citizen's optimal voting rule. Given the continuity of the underlying functions, since the relationship between δ and π_1 described by the citizen's problem has a negative slope while that given by the government's problem has a positive slope, there exists a unique cut-off δ_1^*.

PROOF OF PROPOSITION I: We are interested in finding whether there exist parameters such that our proposed equilibrium is satisfied, where for a given history h_1 the government's decision to experiment, imitate or choose a corrupt policy is a function of (Δ, δ). For expositional convenience, we reproduce the payoffs to government in follower cohort (z_f, δ_f) from imitating (V_f^{imit}), experimenting (V_f^{xpmt}) or choosing a corrupt policy (V_f^{corr}), (see also Figure 1)

$$V_f^k = \begin{cases} -\theta\Delta_{fL}^2 + \pi_f^I\,[\epsilon] & \text{if} \quad a_f \in \mathcal{A}_L^h \;\; (i) \\ -\theta\sigma_\eta^2 + \pi_f^X\,[\epsilon] & \text{if} \quad a_j \in \mathcal{A}^h \;\; (ii) \\ -\theta\delta_{fc}^2 + \pi_f^C[(\phi - 1)R + \epsilon] & \text{if} \quad a_i \in \mathcal{A}^c. \;\; (iii) \end{cases}$$

The opportunity cost of the government's choice of a corrupt policy is increasing in δ. Therefore, in our proposed equilibrium, the probability that an observed policy (conditional on no imitation) is corrupt, is decreasing in δ. The set of all possible period one histories $\mathcal{H}_1$ are divided three ways - the set of period one histories where (a) there is a sole "successful" leader ($n_L = 1$), i.e. $y_1 > \bar{y} = -\theta\delta_L^2 - R > y_j$, $\forall j \neq 1$, (b) there are two or more "successful" leaders, i.e $n_L \geq 2$, (c) there are no "successful" leaders, i.e. $n_L = 0$. In what follows we focus on (a) and sketch out (b) and (c).

We now begin by mapping V^{corr} and V^{xpmt} on (V, δ) space. Observe that $\frac{dV_f^{xpmt}}{d\delta} = \epsilon \frac{d\pi^X}{d\delta} < 0$ and that $\frac{dV^{corr}}{d\delta} = -2\theta\delta + [(\phi - 1)R + \epsilon]\frac{d\pi^C}{d\delta} < 0$. Since the citizen-voter cannot distinguish between a corrupt and an honest policy, we have $\pi^X = \pi^C = \pi$ – which implies that $\frac{dV^{xpmt}}{d\delta} < \frac{dV^{corr}}{d\delta}$. In order to ensure that both the downward sloping curves intersect in the relevant range on (V, δ) space (recollect that δ is bounded between δ_L and δ_H), we assume $(\phi - 1)R > \theta(\delta_L^2 - \sigma_\eta^2)$. This ensures conditions on the end-points of $(i) - (iii)$ such that: $V^{xpmt}(\delta = \delta_L) = \epsilon - \theta\sigma_\eta^2 < V^{corr}(\delta = \delta_L) = -\theta\delta^2 + \epsilon + (\phi - 1)R < V^{imit} = \epsilon$. Given the continuity of the payoffs and the restrictions on the end-points that we have imposed, we have an intersection between the curves V^{corr} and V^{xpmt} in the relevant (V, δ) space - where we denote the point of intersection $(\hat{\Delta}, \hat{\delta})$. Further, notice that V^{imit} ((i) above) is independent of δ and hence can be depicted as a horizontal line. Therefore we are now in a position to graph $(i) - (iii)$ on (V, δ) space - as illustrated in Figure 1.

We are interested in obtaining the optimal policy choice for a government at z_f as a function of (Δ, δ). This is remarkably simple to obtain by mapping for each $\delta \in [\delta_L, \delta_H]$ the policy a^j corresponding
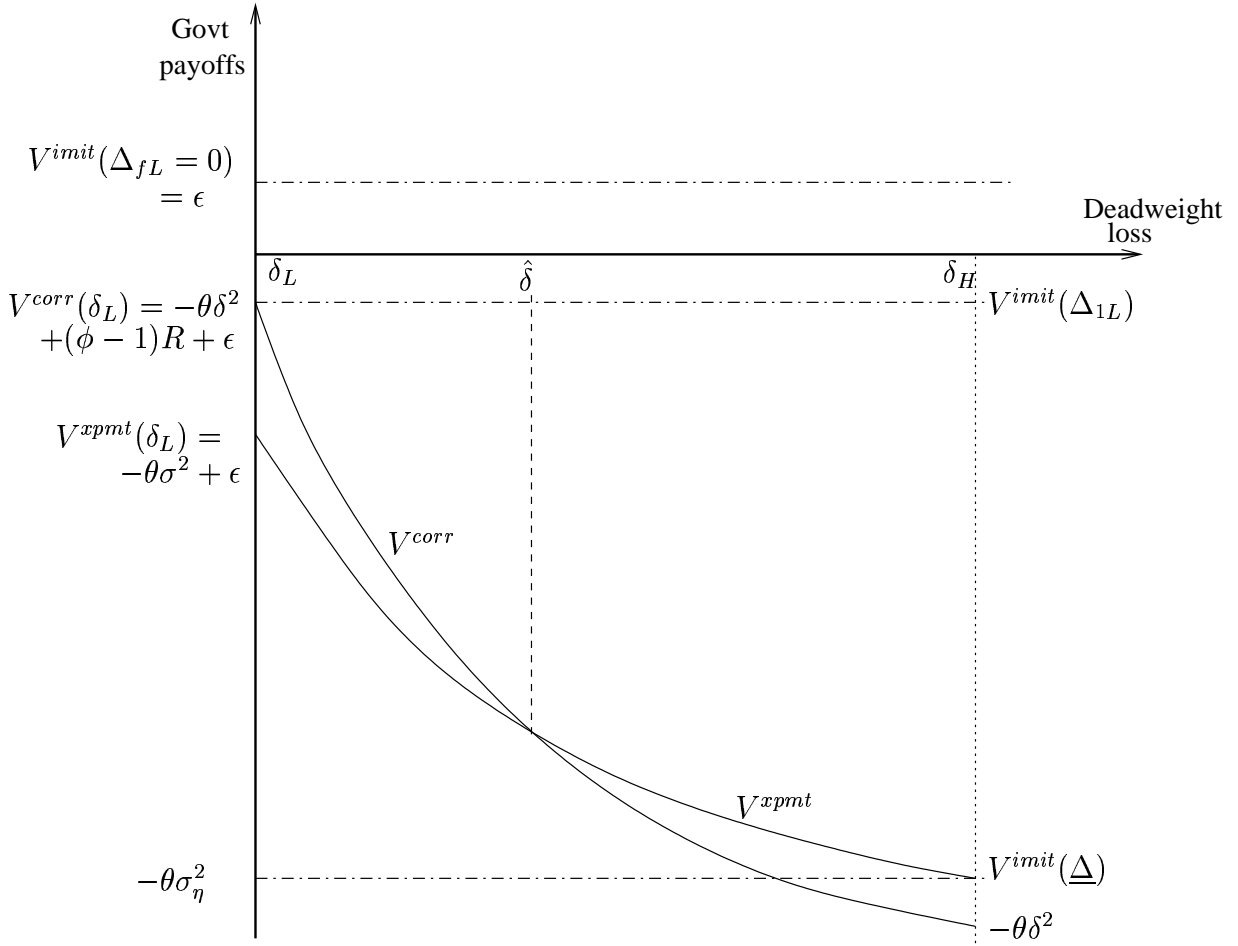
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Figure 1: Equilibrium policy choices

to the V^j that constitutes the *upper* envelope of the payoffs, i.e. for any δ, $a_j^* = argmax_{a_j}\{V_f^j(a_j) :$ $a_j \in \{\mathcal{A}^c, \mathcal{A}^h, \mathcal{A}_L^h\}$ $\}$. Keeping this in mind, observe that the payoff from imitation decreases as Δ_{fL} increases i.e. $dV^{imit}/d\Delta_{fL} = -2\theta\Delta_{fL} < 0$. A "successful" leader's "neighbors" are defined as the set of countries whose effective distance is sufficiently small such that they would prefer to imitate quite irrespective of the payoff from alternative policy choices for all δ, i.e. $-\theta\Delta_{fL}^2 \geq -\theta\delta^2 + (\phi - 1)R + \epsilon$. This simplifies to a distance $\Delta_{fL}^2 \leq \Delta_1^2 = \delta_L^2 - \frac{1}{\theta}[(\phi - 1)R + \epsilon]$. Therefore, all such "neighbors" of the leader imitate its policy. On the other extreme consider the cut-off for the "far-periphery". First, observe from Figure 1 that if distance from the leader is such that $V^{imit} \leq V^{xpmt}(\delta = \delta_H)$ (i.e. if $-\theta\Delta_{fL}^2 + \epsilon = -\theta\sigma_\eta^2$), we either have $V^{cor} > V^{xpmt} > V^{imit}$ for $\delta < \hat{\delta}$ or we have $V^{xpmt} > V^{cor} > V^{imit}$ for $\delta \geq \hat{\delta}$. Given the continuity of the payoffs over the relevant space, this establishes the existence of a cut-off distance $\underline{\Delta}_{fL}$, such that for all $\delta \in [\delta_L, \delta_H]$, governments located beyond this cut-off no longer imitate - giving us the "far-periphery". Countries that lie at some "intermediate" distance between the "neighbors" and the "far-periphery" (as defined above), constitute the "near-periphery". As can be readily observed from Figure 1, countries located in this region, may choose (as a function of their δ) imitation, experimentation or corruption as their policy choices. We next check the optimality

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of the citizen-voter's re-election rule. Here the citizen compares the realized cost of replacing the incumbent c_i, with the expected gain in rents if the policy adopted by the government is corrupt. Given the uniform distribution for c, the re-election probability π is continuous. This is because the citizen's payoff u_i is decreasing continuosly in the probability that the policy is corrupt since $\pi = prob(c_i \geq \psi_2 R)$. For instance, if $a_f \in \mathcal{A}_L^h$, then from Bayes' rule the citizen-voter knows for sure that the policy is honest - and hence $\psi \to 0 \Rightarrow \pi^I = 1$.

Now we sketch out alternative histories with two or more "successful" leaders, i.e. $n_L > 1$. Without loss of generality, suppose there are two leaders z_{L_1} and z_{L_2}. There are two possible sub-cases. First, is the possibility that none of the countries in the follower cohort lies simultaneously within a distance $\underline{\Delta}_{fL}$ of both the leaders z_{L_i}. In this case, the preceding analysis carries over and z_f's decision problem is as if there is a single leader. However, we note that $\bar{\Delta}_{fL}(n_L = 2) > \bar{\Delta}_{fL}(n_L = 1)$ since higher δ countries are more likely to imitate, thereby lowering the average δ (and hence π) of those who do no imitate. In diagrammatic terms, this is equivalent to a downward shift of the V^{corr}, V^{xpmt} curves - increasing $\bar{\Delta}_{fL}$. Observe that for any $F(z)$, we can always choose a θ large enough so as to ensure that this downward shift of the V^{corr} and V^{xpmt} is not so large so as to make imitation the dominant strategy for all countries in $F(z)$. Second, is the possibility that z_f lies between and within a distance $\bar{\Delta}_{fL}$ of two or more countries z_{L_1} and z_{L_2}, i.e. $|z_{L_1} - z_{L_2}| < 2\bar{\Delta}_{fL}$. In this case, a follower country's payoff is maximized by imitating the leader with whom it has the least "effective" distance and there is no experimentation by any of the countries located between these two "successful" leaders. Finally, if no "successful" leaders emerged in the leader cohort, then decision making in the follower cohort is identical to that in the leader cohort.

PROPOSITION II: As a benchmark, we first describe the set of countries for whom the first-best policy involves imitation and adoption of institutions developed by a leader. A country will imitate a leader z_L rather than experiment if $V_f^{imit} \geq V_f^{expm}$, where this inequality is true so long as $\Delta_f^2 \leq \sigma_\eta^2 - \frac{\epsilon}{\theta}[\pi^X - \pi^I]$. However, the *first-best* policy entails imitation only if it is optimal to imitate in the *absence* of political considerations (i.e when ϵ equals zero). This implies that the efficient distance for imitation equals $\Delta^{eff} = z_f - \tilde{z}_L = \sigma_\eta$.

In what follows we begin by considering the history h_1, with $n_L = 1$. First, the "neighbors" are the set of countries whose distance from the leader is sufficiently close such that they imitate the leader all δ (see Figure 1), i.e. if $\Delta_1^2 \leq \delta^2 - \frac{\phi-1}{\theta}R$. Efficient discipline implies that imitation of a leader enhances private sector national income, either by reducing the costs of corruption or the cost of experimentation. Therefore, for disciplining to be efficient for any country $z_f(\delta, \Delta)$, it is the case that $V_f^{imit} \geq V_f^{corr}$. The latter is true when, $-\theta\Delta_{iL}^2 + \pi_f^I \geq -\theta\delta_{fc}^2 + \pi_f^C[(\phi-1)R+\epsilon] \Leftrightarrow \Delta_{fL}^2 \leq \{(\delta^2 - \frac{1}{\theta}(\pi^C[(\phi-1)R+\epsilon]+\epsilon)\}^2$. Now recollect that efficient imitation occurs when $\Delta_{fL} \leq \sigma_\eta$, where $\sigma_\eta < \delta_L$. Therefore, for the informational externality to cause efficient disciplining, the following two conditions must be met:(a) there exists a non-empty set of countries which are disciplined into imitating a leader for political reasons, but would not do so otherwise, and (b) for a subset of these countries, private-sector income increases due to the reduced corruption that results because of greater disciplining. Now for (a) to hold, parameters must be such that $V^{imit} > V^{corr}$ i.e. if $\delta^2 + \frac{1}{\theta}\{\epsilon(1 - \pi^C) - \pi^C(\phi-1)R\} \geq \Delta_{fL}^2$. On the other hand, for (b) to hold, parameters must be such that $-\theta\Delta_{fL}^2 > -\theta\delta^2 - R$. It is easy to check that both (a) and (b) are satisfied for a sufficiently low bound on δ_L and ϵ.

We now demonstrate that there exist parameters in the "near-periphery", that display "inefficient disciplining". There are two possibilities: (a) countries that would otherwise have preferred to experiment with an honest policy (i.e. those with high δ) are inefficiently disciplined into imitating a leader primarily for political reasons; (b) countries that would have chosen corrupt policies, are disciplined

into adopting honest policies, but the loss in imitating a policy of a distant country is greater than the gain due to a reduction in corruption. First, we describe parameters such that (a) is satisfied: i.e. $V^{imit} \geq V^{xpmt}$ iff $\sigma_\eta^2 + \frac{\epsilon}{\theta}(\pi^I - \pi^X) \geq \Delta_{fL}^2$. Since $\pi^I = 1$ and $\pi^X < 1$, we have inefficient imitation for a large enough ϵ (recollect that $\Delta^{eff} < \sigma_\eta$). (b) Now consider the possibility of inefficient disciplining of corrupt governments. For this to be true, distance Δ_{fL} has to be such that $V^{imit} \geq V^{corr}$, even though $-\theta\Delta_{fL}^2 < -\theta\delta^2 - R$. To see that parameters exist that satisfy these conditions, observe that $V^{imit} \geq V^{corr} \Leftrightarrow \delta^2 + \frac{1}{\theta}[\epsilon(\pi^I - \pi^C) - \pi^C(\phi - 1)R] \geq \Delta_{fL}^2$. Imposing the above condition implies that a sufficient condition is if $\delta^2 + \frac{1}{\theta}[\epsilon(\pi^I - \pi^C) - \pi^C(\phi - 1)R] \geq \Delta_{fL}^2 > \delta^2 + \frac{R}{\theta}$. Simplifying we obtain the following $\epsilon(\pi^I - \pi^C) > R(1 + p_C(\phi - 1))$ where $\pi^I = 1$ and $\pi^C < 1$. It is easy to check that this is true for ego rents that are sufficiently large - a restriction consistent with others in the paper.

In order to show that expected income in the "near-periphery" is lower than in the "far-periphery", examine Figure 1. From the preceding paragraph, there is inefficient imitation if $V^{imit} > V^{xpmt}$, even though such imitation results in a decrease in private national income as compared to experimenting, i.e. even though $-\theta\Delta^2 < -\theta\sigma_\eta^2$. Recollect that imitation is for political reasons (i.e. ϵ) when a government imitates despite the effective distance Δ_{fL} being greater than $\Delta^{eff} = \sigma_\eta$. Now suppose that such a government lies at some $\tilde{\Delta} > \Delta^{eff}$. Observe that for any country located at such a $\tilde{\Delta}$, political considerations ensure that the country inefficiently imitates, i.e. $V^{imit}(\tilde{\Delta}) > V^{xpmt}(\tilde{\Delta})$. Then there is inefficient imitation by all countries with $\delta \in [\tilde{\delta}, \delta_H]$. Observe that all countries with δ in this range but with $\Delta_{fL} > \underline{\Delta}_{fL}$ will witness an increase in income as all governments in this region prefer to experiment. Since $\Delta_{fL}^2 > \sigma_\eta^2$ for countries in this region, private national income from experimentation is greater than imitation. This implies a higher expected income for countries in this region. Finally, it is easy to check that for countries in the "far-periphery", none of the countries are disciplined into enacting honest policies. Those with a high δ, such that $V^{xpmt} > V^{corr}$, would have chosen honest policies in any case. However, since experimentation is being carried out in this region, the variance in income outcomes is high and given by σ_η^2.

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