IMF LOANS AS CATALYSTS FOR PRIVATE FOREIGN INVESTMENT

By

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Abstract: The governments of low-income countries are reluctant to borrow from the IMF, as harsh credit conditions weaken their political support from special interests and the general public. This paper argues that some governments nevertheless ask for IMF loans to signal their creditworthiness to foreign banks. Their search for commercial loans includes commitments to accept a reform-contingent IMF loan to signal their ability to repay. The ability of more-competent governments to separate themselves from less-competent governments hinges not only on differences in their respective competencies, but also on the political equilibrium between government and special interests. The paper establishes sufficiency conditions for a unique separating equilibrium, as well as necessary conditions for the possibility of multiple separating equilibria.

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1. Introduction

Most programs of the International Monetary Fund and other International Financial Institutions (IFIs) affect the world's financial system far beyond their intended purposes. They have catalytic effects, as they send signals to third parties about the creditworthiness of governments that make use of their programs. Private lenders, lacking in expertise and resources to collect information on a government's repayment ability, look for signals to reduce their lending risks. A signal might be sent by a lending IFI with the explicit intent of lowering the information barriers for private lenders.[1] Alternatively, a signal can be sent by a borrowing government, especially if IFIs are unable or unwilling to transmit information directly. [2] Governments might choose to subject themselves to the "costly" conditions of an IFI loan in order to signal their creditworthiness to private lenders.

This paper concerns itself with the second kind of signaling. Specifically, it describes a government that needs funding for an investment project, is highly competent in bringing the project to a success, but deals with foreign commercial lenders who are unable to observe its superior competency. The government, therefore, considers a reform-contingent IFI loan to signal to foreign lenders that it is highly competent. The government views the IFI loan as a costly signal, because the attached conditions require economic reforms that will weaken its political support.[3] Its political support derives from both general public and special interests; and while reform-contingent loans benefit the general public, as they enhance the economy's total performance, they hurt special interests. Economic policy reforms lower economic rents earned by interest groups and, thereby, weaken the groups' abilities to support their government.

The main objective of this paper is to examine the forces which shape a government's ability to employ reform-contingent IFI loans to signal its competency to foreign commercial lenders. As is the case with other asymmetric information models, a government's ability to signal its superior competency is greatest when there are relatively few highly competent governments in the pool of all potential borrowers. This paper highlights other influences, both political and economic, that favor a government's ability to signal successfully. On the political side, the relationship between a government and its special interests is of great importance. It is shown that a government's signaling is more effective the less it benefits from this relationship. On the economic side, the key influence is the degree by which a more-competent government distinguishes itself from less-competent governments. The greater the performance gap between more- and less-competent governments, the easier it is for a more-competent one to signal its abilities to commercial lenders, even if the latter are unable to directly

[1] The IMF (2004, p.2) has used the term "signal" as "the conveying by the Fund of information that influences the financing decisions of outsiders, whether through some form of on/off mechanism or through the rendering of a multidimensional picture." The design of a suitable signaling mechanism has been an important concern of the IMF.

[2] The IMF's unwillingness to send negative signals, which the IMF (2004, p.32) identifies as a major problem in its attempt to design a signaling mechanism, might shift the burden of sending a signal from the IFI to the government.

[3] The Economist (2008, Nov. 1, p.87) has a more vivid description of these costs when it comments on the past reluctance of members to work with the IMF: "Time was when a bail-out by the International Monetary Fund was a uniformly horrid experience. Cold-eyed, sharp-suited men pored over your country's books, demanding painful structural reforms and bone-chilling fiscal stringency."

observe their competencies. There are two dimensions to the competency of a government. One is with respect to its ability to successfully implement investment projects funded by commercial lenders. The other is with respect to its ability to make good use of IFI loans designed to enhance the entire economy's performance.

The need to signal arises as more-competent governments try to overcome information barriers in the global capital market. Foreign commercial lenders, unable to verify the competency of a particular borrower, have no choice but to treat all borrowing governments the same way. The result is cross-subsidization of less-competent by more-competent governments. Under asymmetric information, less-competent governments end up with higher investment returns and more-competent governments receive lower returns than under symmetric information. More-competent governments, therefore, have an incentive to incur signaling costs provided they can succeed in convincing lenders of their superior competency. In this paper, the signal of choice is a loan from an IFI that comes with strings attached; it is contingent on implementing reform measures that, in conjunction with the loan, maximize welfare of the receiving government's people. The government, however, is interested in more than welfare of the economy and its general public. Its goal is to maximize political support that rests on both the economy's performance and support from special interests, to be received in form of campaign contributions. The latter are determined through bargaining between government and interest group. Actual contributions depend on the chosen economic policies and the government's bargaining strength. In the absence of any signaling through a reform-continent IFI loan, a government's policy choice is characterized by distortions that maximize the government's political support while keeping the economy's performance below its potential.

A government can signal its competency to commercial lenders by borrowing from the IFI first and approaching the commercial lender later, or by making an IFI loan part of the contract it offers to the commercial lender. Following Maskin and Tirole (1992) and Tirole (2006), our paper adopts the latter, such that the signal is sent through the contract itself rather than prior to the contract. A signaling government designs a contract which spells out terms for both the project loan from the commercial lender and the reform-contingent loan from the IFI. Signaling succeeds if the contract meets two conditions. Commercial lenders must be assured to receive a non-negative expected return on their investment, and signaling costs must be sufficiently high that less competent governments have no incentive to mimic more competent governments.

The paper distinguishes between three types of contracts: a *pooling contract*, a *separating option contract* at the *low-information-intensity optimum*[4], and alternative *Pareto-improving separating option contracts,* where the improvement is relative to the low-information-intensity optimum. A *pooling contract* specifies the same loan conditions for all governments which borrow from commercial lenders to finance their investment projects, and none of them subjects the government to an IFI loan program in order to signal its superior competency. A *separating option contract* at the *low-information-intensity optimum* consists of two sets of loan terms: one intended for more-competent governments and the other for less-competent governments. This option contract protects commercial lenders from losses, sets repayments by less-competent governments such that they earn no rent (as would be the case under symmetric information), and specifies repayments to commercial lenders and economic reform conditions on an IFI loan for more-competent governments. The contract maximizes the more-

[4] For a definition of the "low-information-intensity optimum", see Tirole (2006, p.254, n.48) or Maskin and Tirole (1992), where it is called the "Rothschild-Stiglitz-Wilson" allocation.

competent government's political support, but must be incentive-compatible such that less-competent governments have no incentive to choose the same contract terms. A *Pareto-improving separating option contract* also consists of separate sets of loan terms intended for more-competent and less-competent governments. But it raises political support of both less-and more-competent governments, compared to the levels attained at the low-information-intensity optimum, without hurting commercial lenders. It does so by lowering repayments to commercial lenders for less-competent governments, while raising these repayments and accepting less painful IFI conditions for more-competent governments.

The paper examines which type of contract will be adopted by more-competent governments whose ability to benefit from private foreign investments is compromised by information barriers. We determine conditions under which more-competent governments are able to separate themselves from less-competent ones and, if separation is feasible, which kind of separating contract enables a more-competent government to attain its highest level of political support. We establish necessary and sufficient conditions for each type of contract choice and examine how political and economic factors influence the likelihood of these conditions to be satisfied. On the political side, we identify the importance of a government's bargaining strength in its relationship with special interests. On the economic side, we highlight the influence of the competency gap between more- and less-competent governments, primarily with respect to implementing the investment project but also with respect to employing the IFI loan.

Section 2 sets up a simple fixed investment model to show how asymmetric information hurts more-competent governments. Section 3 introduces signaling by a more-competent government through an IFI loan, and it explains the nature of the option contract offered by this government to commercial lenders. Section 4 describes the political economy in the borrowing country, with a government whose political support depends on the economy's performance and the financial backing from special interests; and it shows how special-interest-favoring policies and the groups' financial backing is determined through bargaining. Section 5 defines the signaling costs of more-competent and the mimicking costs of less-competent governments in terms of reduced political support. Section 6 proceeds with designing the option contract that establishes a low-information-intensity optimum. Section 7 does the same for Pareto-improving option contracts. It then uses a diagrammatic approach to establish criteria for a more-competent government to adopt a specific type of contract: pooling, separating at the low-information-intensity optimum, or separating that Pareto-improves on the low-information-intensity optimum.

2. Borrowing in the Private Market

The government of a low-income country seeks funding for a domestic investment project. The cost of the project is known to be $I > 0$, and foreign private financial institutions – in short called foreign banks – are the only potential source of funding. If successful, the return on the investment is $R > 0$. Success of the project is, however, not certain. The probability of success depends on the government's competency in implementing projects. The probability of success is denoted by p_i, where i denotes the government's competency level. This paper limits competency to two levels: good, with probability of success p_g, and bad, with probability of success p_b, where $p_g > p_b$.

An investment turns into either full success or complete failure. If it fails, the investment is assumed to be worthless and its return is zero.[5] The expected return on the investment, therefore, is $p_i R$ for a government of competency i. This being a low-income country's government, it further is assumed that all loan contracts provide limited liability protection as governments own no marketable assets. Accordingly, government i must repay an agreed-upon amount, t_i, only when the project succeeds, but has no obligation when it fails. A government of competency i seeks project financing if the expected net return is non-negative:

$$p_i R - p_i t_i \geq 0, \qquad i = g, b. \tag{1}$$

Foreign banks, in turn, provide funding as long as expected repayments cover the initial investment expense:

$$p_i t_i - I \geq 0, \qquad i = g, b. \tag{2}$$

Foreign banks are assumed to operate in highly competitive capital markets, implying that (2) holds as equality.

In an ideal world of symmetric information, in which banks fully know each borrowing government's competency, a government of competency i can approach any bank, offer repayment $t_i = \frac{I}{p_i}$, and expect to earn a net return of $(p_i R - I)$. The investment project receives funding as long as its expected return covers the initial investment expense.

In the real world, foreign lending is greatly affected by information asymmetries. While governments know their own competency, foreign banks are unable to ascertain whether a particular government is good or bad. Banks only know that a certain fraction of governments, $0 < v < 1$, is good and the rest is bad. Banks which are unable to identify a government's competency charge the same pooling repayment, t_P, to all governments and fund projects only if:

$$p_M t_P \geq I, \tag{3}$$

where $p_M = [v p_g + (1 - v) p_b]$. The asymmetry of information between governments and foreign banks has two important implications for foreign investments. First, it leads to cross-subsidization from good to bad governments. The expected net return for the good (bad) government is lower (higher) under asymmetric information than under symmetric information.[6] Second, asymmetric information might lead to the inefficient allocation of resources. When $\left(p_g R - \frac{p_g I}{p_M}\right) < 0 < (p_g R - I)$, a good government seeks project funding under symmetric information, but not under asymmetric

[5] The basic assumptions are those of the "fixed-investment model" of Tirole (2006) which, in turn, is based on Holmström and Tirole (1997).

[6] With competitive foreign capital markets, each government repays the minimally acceptable amount: $t_i = I/p_i$ under symmetric information and $t_P = I/p_M$ under asymmetric information. Since $p_b < p_M < p_g$, it must be that $(p_b R - I) < \left(p_b R - \frac{p_b I}{p_M}\right)$ and $\left(p_g R - \frac{p_g I}{p_M}\right) < (p_g R - I)$.

information. When $\left(p_b R - \frac{p_b I}{p_M}\right) > 0 > (p_b R - I)$, a bad government seeks funding under asymmetric information, but not under symmetric information.

3. Signaling through an IFI contract

In a world of symmetric information, with banks facing governments of different competency, there are three possible responses to investment proposals: good and bad governments are creditworthy, only good governments are creditworthy, or neither good nor bad governments are creditworthy. This paper deals with the most interesting case, namely that of both good and bad governments being creditworthy under symmetric information. The effect of asymmetric information is to reduce a good government's investment return from $(p_g R - I)$ to $\left(p_g R - \frac{p_g I}{p_M}\right)$ and to have the good government evaluate whether it can signal its superior competency to foreign banks in order to separate itself from bad governments.

The signaling literature offers two alternative approaches for a good government to separate itself. One is to take costly actions *prior* to contracting with uninformed banks. The other is to incorporate costly actions in the lending contract and to signal through the contract itself. The first approach is based on Spence's (1973, 1974) signaling model; by restricting permissible out-of-equilibrium beliefs – in particular by invoking the Cho and Kreps intuitive criterion (1987) – one can obtain conditions for separating equilibria. The second approach is based on Maskin and Tirole (1992) and represents an informed-principal problem in which the signal forms part of the contract, and no restrictions on out-of-equilibrium beliefs are imposed. Our paper follows the less restrictive Maskin-Tirole approach.

To signal a good government's competency to uninformed foreign banks, the good government considers actions that inhibit bad governments from pretending to be good. The nature of the actions must make it too costly for bad governments to mimic the actions of a good government. This paper considers a reform-contingent IFI loan as the good government's signal. It is costly to both good and bad governments but, as shown in Section 5, the costs of submitting to the IFI's loan conditions are greater for bad than good governments.

Most low-income country governments view IFI loans as "politically" costly. Governments operate in a political environment in which they depend on the support from both general public and special interests. Consequently, economic policies that are chosen to maximize the government's political support include policy distortions that favor special interests. IFI loans, on the other hand, typically are contingent on reforming the economy, in particular with respect to policies that, while beneficial to special interests, distort the performance of the economy as a whole. Reform-contingent IFI loans yield a double dividend to the general public: they add to the economy's resources and improve on the efficiency of their allocation. Nonetheless, IFI loans are viewed as politically costly since they diminish support from special interests that often is critical for the government's survival.[7]

[7] In a recent characterization of IMF loans, *The Economist* (2009, April 11, p.70) writes: "An IMF loan has thus become shorthand for austerity, making politicians who turn to it (and the fund itself) unpopular …"

A government that intends to signal its competency is assumed to do so through the offering of an *option contract*, as discussed in Tirole (2006).[8] The contract consists of two sets of terms, one set intended for a good government and the other set intended for a bad government, among which the contract-offering government can choose after the lending bank has accepted the option contract in its entirety. Stated differently, once the bank has accepted the option contract, the offering government must exercise its option, choosing the contract terms intended either for a good or a bad government. The *contract terms for a good government* state how much it must repay the bank in case of project success *and* what kind of reform-contingent IFI loan it accepts. The IFI loan must be sufficiently costly, in terms of shrinking political support, that bad governments lack incentives to pretend to be good by accepting contract terms intended for good governments. The *contract terms intended for bad governments* only state their repayment to the bank in case of success; there is no requirement to borrow from the IFI. Finally, the option contract's terms must be acceptable to the bank. No matter what option the government exercises, the bank must expect at least to break even.

4. The Political Economy in the Borrowing Country

This section examines how a government, seeking support from both general public and special interests, chooses its economic policies. It first describes the interactions between government and special interests and concludes with the government's choice of policies, both with and without the impact of reform-contingent IFI loans.

Government and Interest Group

The government's objective is described by a Grossman-Helpman-type (1994) political support function, and for simplicity's sake we assume that there is only one interest group. The public's support rises with the expectation of a larger national income, and the interest group's support takes the form of campaign contributions. Specifically, political support for a government of competency $i = g, b$, which adopts economic policies $\omega_i \geq 0$, is defined as:

$$G_i(\omega_i) = p_i(R - t_i) + \{C_i(\omega_i) + aY_i[\omega_i, T(\omega_i)]\}. \quad (4)$$

The term $C_i(\omega_i)$ denotes campaign contributions by the interest group to a government of competency i when economic policy ω_i is chosen, and $a \geq 0$ is the rate at which national income, as an indicator of the general public's welfare, confers political support. The larger the value of a, the more dependent the government is on the performance of the economy. Expected income from the investment project, $p_i(R - t_i)$, is regarded in the same way as campaign contributions. It accrues to the government rather than the general public. But the latter is the beneficiary from the economy's performance, exclusive the project. The economy's performance is measured by its expected national income:

$$Y_i[\omega_i, T(\omega_i)] = y(\omega_i)\{\pi_i h[T(\omega_i)] + (1 - \pi_i)h(0)\} - T(\omega_i), \quad (5)$$

where $\omega_i \geq 0$ is an index of economic policy distortions, $y(\omega_i) \geq 0$ is national income when there is neither an IFI nor a bank loan, $T(\omega_i) \geq 0$ denotes the value of the IFI loan when the government

[8] The supplementary section in Tirole (2006, Ch.6) provides a detailed overview of contracts design by an informed party.

chooses policy ω_i, and $0 \leq \pi_i \leq 1$ stands for the probability of the IFI loan being a success in enhancing the economy's performance. Concerning the value of ω_i, it rises with the degree of distortions. In an economy without distortions, $\omega_i = 0$ and national income is at a maximum. National income decreases at an increasing rate with the severity of distortions, such that $y'(\omega_i) < 0$ and $y''(\omega_i) < 0$. The IFI loan, $T(\omega_i)$, enhances the economy's performance,[9] as reflected by the function $h(T_i)$. Its properties of $h(0) = 1,\ h'(T_i) > 0$, and $h''(T_i) < 0$ specify that a successful IFI loan enlarges national income at a decreasing rate. As was assumed for investment project loans, there is no guarantee for an IFI loan to succeed in enlarging national income. The probability of a loan of size T_i enlarging national income to $(\omega_i)h(T_i)$ is equal to π_i. This probability is again greater for a good government than a bad one, $\pi_g > \pi_b$. When the IFI loan is a failure, there is no national income enhancement effect and $h(0) = 1$. But, no matter the outcome, the IFI loan must always be repaid.

The interest group's goal is to maximize its welfare by making campaign contributions in return for receiving favorable economic policies. The group gains in the form of *rents* generated by distorting policies, $u(\omega_i)$, and the rent's size rises at a decreasing rate with the degree of policy distortions. The welfare function of the interest group, dealing with government i, is:

$$U_i(\omega_i) = u(\omega_i) - C_i(\omega_i), \tag{6}$$

where $u(0) = 0,\ u'(\omega_i) > 0$, and $u''(\omega_i) < 0$.

Bargaining over Contributions

How much the interest group contributes to the government is the outcome of an asymmetric Nash-bargaining game. The solution to the game is the contribution level $C_i(\omega_i)$ which maximizes:

$$[G_i(\omega_i) - G_i(0)]^{\tau_i}[U_i(\omega_i) - U_i(0)]^{1-\tau_i} \tag{7}$$

where $0 \leq \tau_i \leq 1$ is a measure of the *i*th government's bargaining power, and $G_i(0)$ and $U_i(0)$ are the government's and interest group's respective welfare should bargaining break down. When bargaining collapses, the interest group makes no contribution, $C_i = 0$, and the government is best off ridding the economy of all policy distortions, $\omega_i = 0$. Consequently,

$$G_i(0) = a\{y(0)[\pi_i h[T_i(0)] + (1-\pi_i)h(0)] - T_i(0)\} + p_i(R - t_i) \quad \text{and} \quad U_i(0) = 0, \tag{8}$$

where $T_i(0) > 0$ is the IFI loan size when there are no policy distortions.[10] Substituting (4), (5), (6), and (8) in (7) and maximizing with respect to $C_i(\omega_i)$ yields:

$$C_i^*(\omega_i) = \tau_i u(\omega_i) + (1-\tau_i)a\{Y_i[0, T_i(0)] - Y_i[\omega_i, T_i(\omega_i)]\}, \tag{9}$$

[9] The IFI loan should be viewed as a build-up of the economy's infra-structure and/or financial system.

[10] The value of $T_i(\omega_i)$ is chosen by the IFI to attain its objective, which is to maximize the welfare of the low-income country's general public.

as the interest group's contribution given policy ω_i. This negotiated contribution schedule is a weighted average of the rent earned by the interest group at policy choice ω_i and the loss in national income from choosing policies that support the interest group, whereby the government's bargaining power parameter serves as weight. For any government that maximizes its political support at some positive level of policy distortions, $\omega_i > 0$, contributions are larger the greater the government's bargaining power in dealing with the interest group, τ_i, and the stronger the influence of the public's welfare on political support, a.

The IFI's Loan Offer

The IFI makes a reform-contingent loan to a country with the objective of promoting the country's welfare. Specifically, the IFI's goal is to offer a loan that, given the government's chosen policies, maximizes the country's expected national income. Choosing T_i^* to maximize (5) for given values of ω_i, the first-order conditions require that:

$$y(\omega_i)\pi_i h'(T_i^*) \leq 1, \tag{10}$$

with equality holding for $T_i^* > 0$. Concerning (10), three observations are relevant for the remainder of this paper. First, there exists a level of policy distortions, ω_i^T, at and above which the IFI no longer makes any loans. This value is determined by $y(\omega_i^T)\pi_i h'(0) = 1$ and, since $y(\omega_i)$ is decreasing in ω_i, (10) holds as an inequality for all $\omega_i \geq \omega_i^T$. Second, for policies at which the IFI is willing to make loans, $0 < \omega_i < \omega_i^T$, the IFI offers a larger loan the smaller the distortion index, as $\left(dT_i^*/d\omega_i\right) < 0$. The largest loan, $T_i(0)$, is offered to a government that tolerates no policy distortions, $\omega_i = 0$, and $T_i(0)$ is determined by $y(0)\pi_i h'[T_i(0)] = 1$. Third, the IFI offers separate loan schedules for good and bad governments. Since $\pi_b < \pi_g$ and $h''[T_i(\omega_i)] < 0$, the loan offer to a bad government is always smaller than to a good government at all $\omega < \omega_g^T$.

The Government's Policy Choice

The government chooses its economic policy, ω_i^*, by maximizing the political support function of (4), given the optimal choices for interest group contributions, $C_i^*(\omega_i)$, and IFI loan offers, $T_i^*(\omega_i)$. The first-order conditions for maximizing political support require that:

$$u'(\omega_i^*) + ay'(\omega_i^*)\{\pi_i h[T_i^*(\omega_i^*)] + (1-\pi_i)h(0)\} \leq 0, \tag{11}$$

with equality holding for $\omega_i^* > 0$.[11] It is noteworthy that the government's optimal policy choice is independent of its bargaining power, τ_i, as it simply maximizes the combined benefits to interest group and government. Bargaining power comes into play in distributing the fruits of the policy choice. At the adopted policy of ω_i^*, greater bargaining power for the government translates into larger campaign contributions and, thereby, into stronger total political support. Consequently, when the government's acceptance of a reform-contingent IFI loan lowers total benefits shared by interest group and government, the loss in political support is greater the more bargaining power the government

[11] Equation (11) is obtained by maximizing $G_i(\omega_i) = \tau_i\{u(\omega_i) + aY_i[\omega_i; T_i^*(\omega_i)]\} + (1-\tau_i)a\{Y_i[0, T_i(0)] + p_i(R - t_i)$, using (5) and (10).

possesses. This implies that the effectiveness of IFI loans as a signaling device critically depends on a government's bargaining power in dealing with its interest group.

For policies which are so distorting that the IFI is unwilling to offer a loan, meaning that $\omega_i \geq \omega_i^T$, it follows that $h[T_i^*(\omega_i)] = h(0) = 1$ in (11); and the corresponding policy choice of ω_i^* is the solution to:

$$u'(\omega_i^*) + ay'(\omega_i^*) = 0. \tag{11'}$$

The value of ω_i^* is independent of the government's competency, as the influence of π_i vanishes in (11'). For the remainder of the paper, we assume that the government's initial policy choice, prior to submitting to IFI loan conditions, is characterized by (11'). Hence, both good and bad governments adopt exactly the same policies, and neither private banks nor IFIs can deduce the government's competency from observing its initial policy choices.

5. The Signaling Costs of IFI Loans

This section defines a good government's signaling costs and a bad government's costs of mimicking the signal. As mentioned above, initially both good and bad governments are assumed to maximize their political support without any IFI loan, choosing policy $\omega_g^* = \omega_b^* = \underline{\omega}^*$. A government's *signaling cost* is measured by its expected loss in political support as it accepts a reform-contingent IFI loan. Since the IFI offers separate loan schedules intended for good and bad governments, $T_i^*(\omega_i)$ for $i = g, b,$ each government can choose either schedule. Importantly, a bad government can pretend to be good by borrowing under terms intended for good governments.

The signaling costs of a good government, $S_g(\omega_g)$, are measured as the difference in political support without and with a reform-contingent IFI loan:

$$S_g(\omega_g) = G_g(\underline{\omega}) - G_g(\omega_g) = \tau_g s_g(\omega_g), \tag{12}$$

where $G_g(\underline{\omega})$ and $G_g(\omega_g)$ denote political support for a good government without, $\underline{\omega}$, and with, $\omega_g < \omega_g^T$, an IFI loan;[12] and where $s_g(\omega_g) = \{u(\underline{\omega}) + aY_g(\underline{\omega}, 0) - u(\omega_g) - aY_g[\omega_g, T_g(\omega_g)]$, as further elaborated in Appendix I.

When a bad government pretends to be good, it adopts the same policies and accepts the same loan offer as the good government, ω_g and $T_g(\omega_g)$, but has the bad government's bargaining power, τ_b, as well as its lower probability of success for the IFI loan, π_b. The bad government's mimicking costs, therefore, are:

$$S_b(\omega_g) = G_b(\underline{\omega}) - G_b(\omega_g) = \tau_b s_b(\omega_g), \tag{13}$$

[12] The policy choices of $\underline{\omega}$ and ω_g are political-support maximizing, as derived in (11). We now remove the asterisk used in (11) to reduce cluttering.

where$G_b(\underline{\omega})$ is political support for the bad government in the absence of an IFI loan, $G_b(\omega_g)$ is the bad government's political support if it accepts the IFI loan terms intended for the good government, and $s_b(\omega_g) = \{u(\underline{\omega}) + aY_b(\underline{\omega}, 0) - u(\omega_g) - aY_b[\omega_g, T_g(\omega_g)]$.

A first requirement for a good government to separate itself from bad governments is that its own signaling costs be less than the mimicking bad government's; that is, that:

$$S_b(\omega_g) - S_g(\omega_g) = [\tau_b - \tau_g]s_b(\omega_g) + \tau_g[s_b(\omega_g) - s_g(\omega_g)] > 0. \quad (14)$$

Since $[s_b(\omega_g) - s_g(\omega_g)] > 0$ for $T_g(\omega_g) > 0$, as stated in Appendix I, the condition of (14) is always satisfied, as long as $\tau_b \geq \tau_g$. We, therefore, have:

Lemma 1: ***A sufficient condition for the bad government's mimicking costs to be higher than the good government's signaling costs is that the good government's bargaining power in dealing with its interest group is no greater than the bad government's.***

Furthermore, the cost difference between signaling and mimicking is more pronounced the greater the advantage of the good government in using the IFI loan to enhance the economy's performance, as expressed by the value of $(\pi_g - \pi_b)$.[13] Finally, it should be pointed out that very strong bargaining power on the part of the good government can preclude signaling through an IFI loan, even if it has a substantial competency advantage. When the good government's bargaining power in dealing with its interest group is much greater than the bad government's, it is possible that the former's signaling costs are, in fact, larger than the latter's mimicking costs.

A government's bargaining strength is an important political factor influencing its ability to signal as it reflects a government's own dependency on distorted economic policies. Greater bargaining strength yields larger campaign contributions from the interest group and, therefore, greater government benefits from maintaining policy distortions. The relevance of a government's bargaining power for signaling is captured by:

Proposition 1: ***The political economy between governments of different competency and their interest groups critically affects a more-competent government's ability to signal. The less a government gains from its interactions with the interest group, the greater is its ability to signal.***

6. Option Contracts at the Low-Information-Intensity Optimum

Asymmetric information on governments' competency hurts good governments, as they must cross-subsidize bad governments. This loss in expected investment returns on foreign bank-funded projects creates incentives for good governments to use signaling to separate themselves from bad ones. A good government offers foreign banks an *option contract* that consists of two sets of loan terms: one is

[13] Again, consult Appendix I.

intended for a good government, the other for a bad government. The bank is willing to accept the option contract as long as it guarantees non-negative expected profits regardless of which set of terms the contract-offering government opts for. After the bank accepts, the good government exercises its option and chooses the contract designed for its competency type.

Contract terms intended for good governments specify the size of the project loan and amount of repayment to the foreign bank, as well as the size and repayment of an IFI loan and the accompanying conditions on the government's economic policy choices. For a loan of size I, the repayment of t_g must be sufficiently large to allow the lending bank to break even. The terms of the IFI loan, on the other hand, must be such that bad governments have no incentive to accept the same loan conditions, pretending to be good. The good government's contract terms are fully characterized by the combination of repayment to the foreign bank, such that the latter at least breaks even, and of economic policy dictated in the IFI loan deal, (t_g, ω_g).[14] The contract terms intended for the bad government must also assure that lending banks at least break even. This is accomplished by offering the private lender a repayment that equals what the bad government would repay under symmetric information, namely $t_b = I/p_b$.

Drawing on Tirole (2006, p. 267), we now state a program which generates an option contract that yields a *low-information-intensity optimum* described by terms (t_g^o, ω_g^o) for the good government and terms t_b^o for the bad government.[15] As stated above, t_b^o is chosen to equal the repayment under symmetric information, $t_b^o = I/p_b$. The values of t_g^o and ω_g^o, on the other hand, are chosen to maximize the good government's gain in political support, $\Delta G_g(t_g, \omega_g)$, made possible by the investment project. The gain in political support is maximized when the gain from expected project revenue, $p_g R$, net of expected cost of repaying the bank, $p_g t_g$, and of signaling through the IFI loan, $S_g(\omega_g)$, is at a maximum. Gains in political support are constrained by the requirements that the foreign bank at least breaks even and that bad governments are no better off accepting the good government's contract, (t_g, ω_g), than accepting the repayment terms intended for themselves, $t_b = I/p_b$:

$$Max \;\; \Delta G_g(t_g, \omega_g) = p_g R - p_g t_g - S_g(\omega_g) \tag{15}$$

$$s.t. \qquad p_g t_g - I \geq 0 \tag{16}$$

$$p_b R - p_b t_g - S_b(\omega_g) \leq p_b R - I. \tag{17}$$

[14] There is no need to state the IFI loan separately, since the IFI's loan schedule uniquely relates the loan's size, T_g, to the government's policy choice, ω_g. The IFI requires that the loan is repaid in full, even if it is not successful in enhancing national income.

[15] An option contract that maximizes the good government's political gains among all choices which assure non-negative profits for the bank and are incentive-compatible for bad governments establishes a *low-information intensity optimum.* In a separating equilibrium, the borrowing government must at least attain this low-information intensity optimum. As pointed out by Tirole (2006, p.267), for the program described by (15)-(17), one has to make sure that the *weak monotonic-profit condition* is satisfied. This condition requires that the bank at least breaks even if a good government borrows, but the contract terms are those of a bad government. It is easy to see that this condition is satisfied in our model.

It is no simple task to solve program (15)-(17) for the maximizing values of (t_g^o, ω_g^o) since the Kuhn-Tucker conditions are not satisfied without imposing further restrictions. One cannot determine the sign of either $S_g^{"}(\omega_g)$ *or* $S_b^{"}(\omega_g)$ and, therefore, there is no assurance that the objective function is strictly quasi-concave and the constraint set is convex. Fortunately, a slight rewriting of the program, combined with simple diagrams, enables us to determine sufficiency conditions for the existence of a *low-information-intensity optimum.* In rewriting the program, we define the variable $\underline{S_b} = S_b(\omega_g)$ and correspondingly $\omega_g = f(\underline{S_b})$ where $f'(S_b) < 0$. The good government's choice variables are now its own repayment and the bad government's mimicking cost, $(t_g, \underline{S_b})$, in place of its repayment and the policy distortion index, (t_g, ω_g). The amended program becomes:

$$Max\ \ \Delta G_g(t_g, \underline{S_b}) \ = \ p_g R - p_g t_g - S_g[f(\underline{S_b})] \tag{15'}$$

$$s.t. \qquad p_g t_g - I \ \geq \ 0 \tag{16'}$$

$$p_b R - p_b t_g - \underline{S_b} \leq p_b R - I. \tag{17'}$$

With this reformulation, the constraint set becomes convex. Although the objective function is still not strictly quasi-concave, it is possible to establish contract conditions that yield a *low-information-intensity optimum.*

Figure 1 illustrates how the terms of the option contract are determined. Focusing first on the constraint set, the LL-line portrays equation (16') when it is binding, implying that expected profit of the bank is zero. The contract choice of $(t_g^o, \underline{S_b^o})$ is limited to points on or to the right of LL. The CC-line, on the other hand, reflects the incentive-compatibility constraint of (17'). The bad government must be at least as well off with the contract terms designed for its own type, $t_b^o = I/p_b$,as it is when it pretends to be good by accepting the good government's contract terms and associated mimicking costs, $(t_g, \underline{S_b})$. Incentive-compatibility is satisfied for any combination of $(t_g, \underline{S_b})$ on or above the CC-line, whose slope equals $-p_b$. Consequently, the constraint set is described by the area on and to the right of the bold-line locus LE^{o}C.

The $G_g^j G_g^j$ curves, for $j = 0,1,2, \ldots$, are iso-political gain curves of the good government. The closer $G_g^j G_g^j$ is to the origin, the greater is the political gain for the government; lower repayments to the bank, t_g, as well as lower mimicking costs for the bad government, $\underline{S_b}$, (which accompany lower signaling costs for the good government) raise political gains for the good government. In the diagram, higher-numbered superscripts indicate greater political gains for the good government. As derived in the Appendix II, an iso-political gains curve's slope at a given point $(t_g, \underline{S_b})$ is:

$$d\underline{S_b}/dt_g = \ -p_g \frac{S_b'(\omega_g)}{S_g'(\omega_g)} \ = \ -p_g \left(\frac{\tau_b}{\tau_g}\right)\left(\frac{s_b'(\omega_g)}{s_g'(\omega_g)}\right), \tag{18}$$

where the terms $-S_g'(\omega_g) = -\tau_g s_g'(\omega_g)$ and $-S_b'(\omega_g) = -\tau_b s_b'(\omega_g)$ express the marginal costs of reforming the economy (lowering ω_g)for signaling good and mimicking bad governments, respectively.

While the slope of the iso-political gains curve is always negative, its curvature is not determinate. $G_g^j G_g^j$ might have concave-, as well as convex-to-the-origin segments.

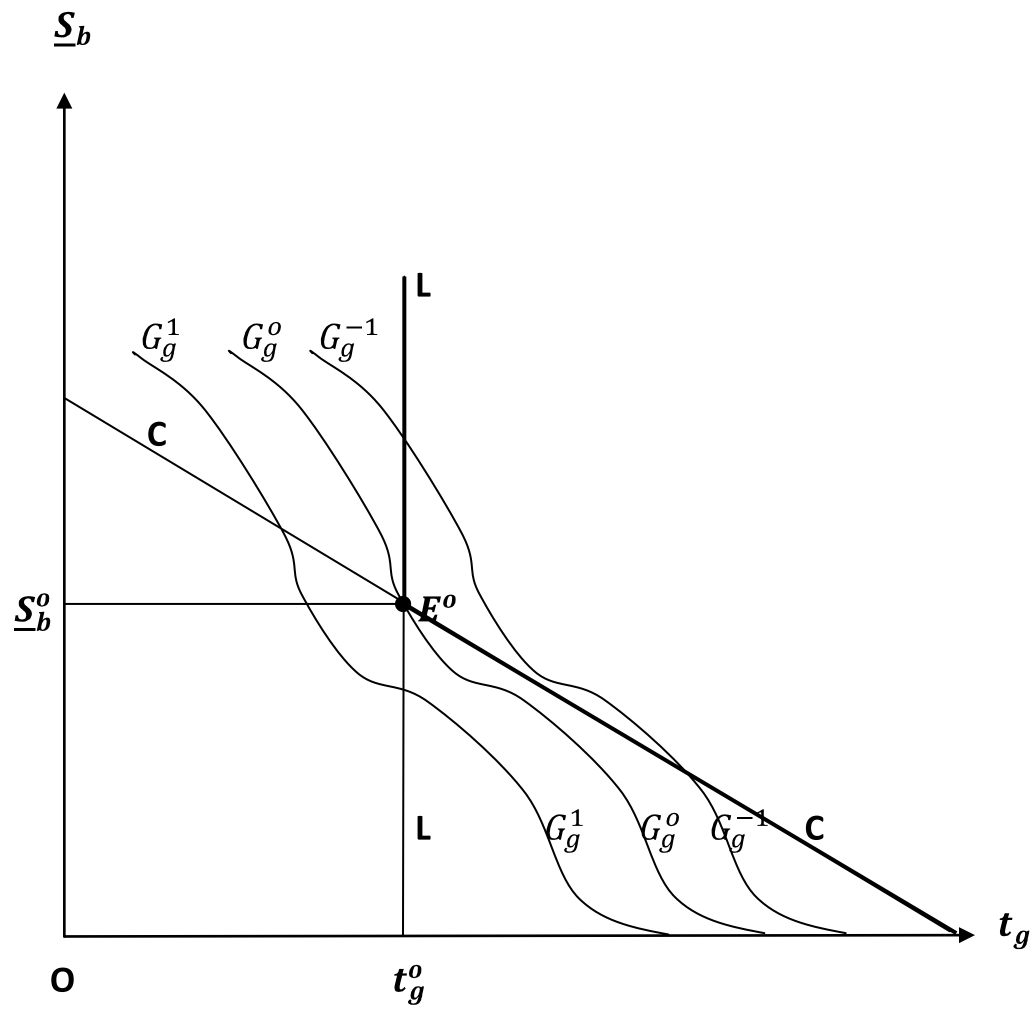

Figure 1: Existence of a Low-Information-Intensity Optimum

Inspection of Figure 1 reveals that contract terms (ω_g^o, t_g^o), attained at point E^o, establish a *low-information-intensity* optimum, provided $G_g^o G_g^o$ is steeper than CC at point E^o and at all other points along the bold segment of the $E^o C$ line. This requires that:

$$\frac{S_b'(\omega_g)}{S_g'(\omega_g)} > \frac{p_b}{p_g} \qquad \text{for all} \quad \omega_g^o \le \omega_g \le \omega_g^T. \tag{19}$$

The LHS of (19) states the marginal costs of reforming economic policies for the mimicking bad relative to the signaling good government at $\underline{S}_b^o$ and t_g^o. The RHS expresses the probability of project success for the bad relative to the good government. By definition of government competency, it always is the case that $\frac{p_b}{p_g} < 1$. Furthermore, from (A.9) of Appendix I, we know that $\frac{S_b'(\omega_g)}{S_g'(\omega_g)} \ge \frac{\tau_b}{\tau_g}$. Hence, a sufficient condition for (19) to be satisfied is that $\frac{(p_g - p_b)}{p_g} \ge \frac{(\tau_g - \tau_b)}{\tau_g}$; that is, compared to the bad government, the good government's advantage in competency is at least as large as its advantage in bargaining power.

Lemma 2: ***A sufficient condition for the existence of a low-information-intensity optimum contract is that*** $\boldsymbol{\frac{(p_g - p_b)}{p_g} \ge \frac{(\tau_g - \tau_b)}{\tau_g}}$.

Provided this sufficiency condition is satisfied, the content of the option contract portrayed at point E^o can be ascertained by solving (16') and (17') as binding constraints. This yields $[t_g^o = \frac{I}{p_g}$ and $\underline{S}_b^o = I\frac{(p_g - p_b)}{p_g}$ and implies an option contract with terms $[t_g^o = \frac{I}{p_g}, \omega_g^o = f(\underline{S}_b^o)]$ for the good government and $t_b^o = \frac{I}{p_b}$ for the bad government.

The option contract (t_g^o, ω_g^o) is a candidate for a separating equilibrium but might not be the contract the good government offers the foreign bank. The reason for the good government not choosing the option contract portrayed at point E^o is that it might not be Pareto-optimal. Other option contracts might exist that make both good and bad governments better off without violating the condition that the foreign bank at least breaks even. This possibility will be addressed in the next section. If, however, no alternative Pareto-improving option contract exists, then the equilibrium at point E^o is a unique perfect Bayesian equilibrium. The foreign bank, with initial beliefs that fraction v of all governments is competent, updates these beliefs upon receiving an option contract. The lender now knows that the government which offers the option contract is a good government.

7. Pareto-Improving Option Contracts

This section determines conditions under which alternative option contracts can be designed that, relative to the low-information-intensity optimum contract terms (t_g^o, ω_g^o) for the good and t_b^o for the bad government, are Pareto-improving. We describe an entire set of alternative contracts for which $t_b < t_b^o$ to make the bad government better off, $t_g > t_g^o$ to raise repayments by the good government in order to avoid losses by the foreign bank, and $\omega_g > \omega_g^o$ to compensate for the good government's increase in repayments by accepting a smaller IFI loan with less costly reform measures attached.

Starting with the bad government, the alternative contract specifies a reduction in its expected repayment from $p_b t_b^o = I$ to $p_b t_b = I - Z$ where $Z > 0$. This yields a rent for the bad government and definitely raises its expected political gains. Reduced repayments by bad governments, however, push the bank's expected income into the loss column. For a bank to accept this alternative option contract, the loss from bad governments' lower repayments must be offset by higher repayments from good governments. The bank accepts an alternative option contract if repayments from both good and bad governments are such that its expected profit remains non-negative; that is, if $[v(p_g t_g) + (1 - v)(p_b t_b)] \geq I$. After substitution for $p_b t_b = I - Z$, the foreign bank's *participation constraint* becomes:

$$v\big(p_g t_g - I\big) - (1 - v)Z \geq 0. \tag{20}$$

The loan terms intended for the bad government now yield political gains of $p_b(R - t_b)$. The mimicking costs of the bad government, for repaying the project loan to the foreign bank, $p_b t_g$ and for accepting the IFI loan conditions imposed on the good government, $\underline{S}_b$, must again be sufficiently high that the bad government prefers the contract intended for its type. Substituting for $p_b t_b = I - Z$, the incentive-compatibility constraint of the bad government becomes:

$$p_b R - p_b t_g - \underline{S}_b \leq p_b R - I + Z. \tag{21}$$

Equations (20)-(21) replace (16')-(17') of the preceding section as the constraint set under which the good government maximizes its gains in political support. Figure 2 illustrates this adjustment as Z is increased from $Z = 0$ to $Z > 0$. The LL-locus shifts to the right from $L^o L^o$ to $L^1 L^1$, and the CC-locus shifts down from $C^o C^o$ to $C^1 C^1$. At the intersection of $L^1 L^1$ and $C^1 C^1$, marked as point E^1, the reduced expected repayment from the bad government, $p_b t_b = I - Z$, is made up by an increased expected repayment from the good government, $p_g t_g = I + Z(1 - v)/v$. As the alternative loan terms intended for the bad government result in lower repayments and higher political gains for its type, less intrusive policy reforms and, therefore, a politically less costly IFI loan – meaning a higher policy distortion index ω_g and corresponding reduction in mimicking costs $\underline{S}_b$, – are acceptable to prevent mimicking by the bad government. At point E^1, the good government repays $t_g^1 > t_g^o$ and the bad government faces mimicking cost of $\underline{S}_b^1 < \underline{S}_b^o$. As portrayed, point E^1 is located on a (not-drawn) iso-political gains curve between $G_g^o G_g^o$ and $G_g^{-1} G_g^{-1}$. Accordingly, the alternative option contract (t_g^1, ω_g^1) is not Pareto-improving relative to the low-information-intensity optimum, with contract terms (t_g^o, ω_g^o).

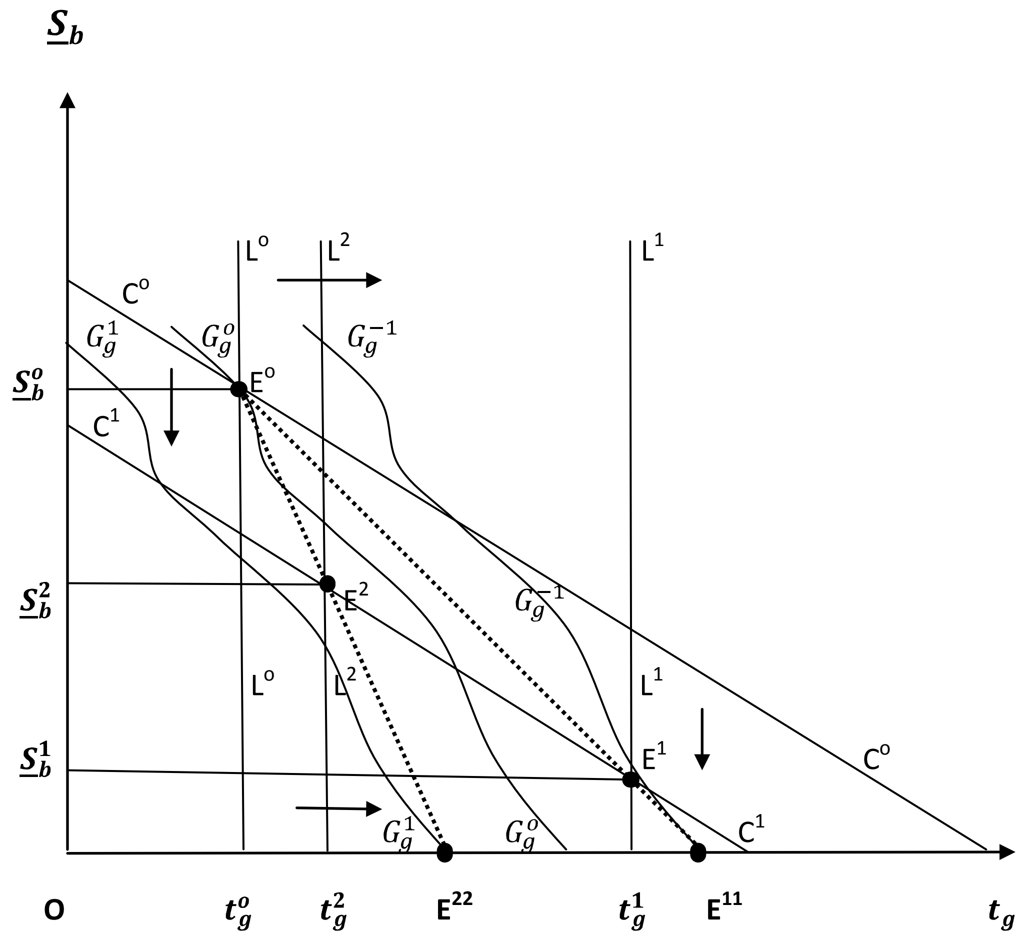

Figure 2: Choosing a Loan Contract that Maximizes Political Support

The location of point E^1 relative to E^o critically depends on the representation of good governments among the entire pool of governments pursuing foreign investments, v. The larger the value of v, the smaller is the rightward shift of LL for a given reduction in the bad government's loan repayment, Z. The position of CC, on the other hand, is independent of the value of v. Hence, in comparing two signaling situations, one with relatively few and the other with relatively many good governments, reducing the bad government's loan repayments by $Z > 0$ might result in a rightward shift of LL to L^1L^1 when there are relatively few and to L^2L^2 when there are relatively many good governments. In the presence of relatively many good governments, L^2L^2 intersects C^1C^1 at point E^2, which lies on an iso-political gains function between $G_g^oG_g^o$ and $G_g^1G_g^1$, indicating stronger political support than along $G_g^oG_g^o$. Accordingly, the alternative option-contract (t_g^2, ω_g^2), where $\omega_g^2 = f(\underline{S}_b^2)$, is Pareto-improving: cutting the bad government's repayment by $Z > 0$ raises expected political support for both good and bad governments, while keeping the foreign bank just as well off as at $Z = 0$.

Having shown that lowering the bad government's repayment by $Z > 0$ can make the good government better or worse off depending on the value of v, we next examine under what conditions such a Pareto-improving contract change is feasible. As a first step, we evaluate the slopes of the dashed-line paths from E^o to E^1 and beyond to E^{11}, when $v = v^1$, and from E^o to E^2 and beyond to E^{22}, when $v = v^2$, where $v^1 < v^2$. The paths from E^o to E^{jj} trace out possible contract combinations of t_g and $\underline{S}_b$, as Z gradually rises and the two constraints shift in the directions of the arrows. With both constraints binding, one can solve (20) and (21) for:

$$t_g^j = \left[I + \frac{Z(1-v^j)}{v^j}\right]/p_g; \qquad \underline{S}_b^j = I\left[\frac{(p_g - p_b)}{p_g}\right] - Z\left[1 + \frac{p_b(1-v^j)}{p_g v^j}\right] \tag{22}$$

for $j = 1,2$. An expression for the slopes of the E^oE^{jj} paths is be obtained by raising Z and evaluating:

$$\frac{(d\underline{S}_b^j/dZ)}{(dt_g^j/dZ)} = -\left[p_b + \frac{p_g v^j}{1-v^j}\right] < 0. \tag{23}$$

The slopes of the E^oE^{jj} paths are negative and independent of both $\underline{S}_b^j$ and t_g^j. But they do depend on the fraction of governments that are known to be competent, v^j, as well as on the probability of the investment project being a success for each type of government, (p_g, p_b).

Of particular interest are the contractual repayments by each type governments at point E^{jj}, where the value of Z is such that $\underline{S}_b^j = 0$. The repayments for good and bad governments, denoted by t_g^{jj} and t_b^{jj} respectively, pertain to contracts with no signaling and, therefore, no mimicking costs caused by a reform-contingent IFI loan. With no IFI involvement, both good and bad governments choose their economic policies at the political-support maximizing level of $\omega_g^{jj} = \underline{\omega}$. Returning to the second equation of (22), we set $\underline{S}_b^j = 0$, solve for $Z = I\left[\frac{v^j(p_g - p_b)}{[v^j p_g + (1-v^j)p_b]}\right]$ and substitute this expression in the first equation of (22), yielding:

$$t_g^{jj} = \frac{I}{[v^j p_g + (1-v^j) p_b]} = \frac{I}{p_M^j}. \quad (24)$$

Comparing (24) with (3), it can be seen that $t_g^{jj} = t_P$, meaning that the good government's repayment at point E^{jj} is the same as in a *pooling contract.*

Total repayment for a successful investment by a bad government also becomes:

$$t_b^{jj} = \frac{I-Z}{p_b} = \frac{I}{p_M^j}. \quad (25)$$

Hence, repayments at point E^{jj} are exactly the same for good and bad governments. And since $t_g^{jj} = t_b^{jj} = t_{P,}$ and $\omega_g^{jj} = \omega_b^{jj} = \underline{\omega}$, point E^{jj} is indeed the diagrammatic representation of a *pooling contract.* This contrasts with all other points along $E^o E^{jj}$ which describe the set of option contracts with positive signaling costs and loan repayments that differ for good and bad governments.

Lemma 3: ***The pooling contract is a limiting case of an alternative option contract with signaling that is potentially Pareto-improving.***

Having clarified the nature of the constraint set, we now are in a position to determine conditions under which a good government can successfully signal its type and separate itself from bad governments. This amounts to comparing political gains at all points between $E^o E^{jj}$ with what they are at point E^{jj}. To start with, compare the slopes of the $E^o E^{jj}$ line and the iso-political gain locus $G_g G_g$ at point E^{jj}. If $G_g G_g$ is steeper than $E^o E^{jj}$, such that

$$\frac{v^j}{1-v_j} < \frac{S_b'(\omega_g)}{S_g'(\omega_g)} - \frac{p_b}{p_g}, \quad (26)$$

evaluated at $\underline{\omega}$, then the good government can separate itself. As shown in Appendix I, when $\omega_g = \underline{\omega}$ and $T_g(\underline{\omega}) = 0$, the term $\frac{S_b'(\omega_g)}{S_g'(\omega_g)}$ reduces to $\frac{\tau_b}{\tau_g}$ and the RHS of (26) can be restated as $\left[\frac{(p_g - p_b)}{p_g} - \frac{\tau_g - \tau_b}{\tau_g}\right]$, where $\frac{(p_g - p_b)}{p_g}$ and $\frac{\tau_g - \tau_b}{\tau_g}$ measure the good government's respective advantages in competency and bargaining strength relative to the bad government. Furthermore, once the good government subjects itself to a reform-contingent IFI loan, such that $\omega_g^o \leq \omega_g < \omega_g^T \leq \underline{\omega}$ and $T_g(\omega_g) > 0$, then $\frac{S_b'(\omega_g)}{S_g'(\omega_g)} > \frac{\tau_b}{\tau_g}$. Consequently, we can state:

Proposition 2: ***a. A sufficient condition for a good government to separate itself from bad governments is that*** $\frac{v^j}{1-v_j} \leq \left[\frac{(p_g - p_b)}{p_g} - \frac{(\tau_g - \tau_b)}{\tau_g}\right]$.

b. The greater the good government's competency advantage and the less its bargaining strength relative to its interest group, the more likely it is that the good government can separate itself from bad governments.

If the condition $\frac{v^j}{1-v_j} \leq \left[\frac{(p_g - p_b)}{p_g} - \frac{(\tau_g - \tau_b)}{\tau_g}\right]$ is satisfied, there exists some reform-contingent *IFI* loan at which $\frac{v^j}{1-v_j} < \frac{S_b'(\omega_g)}{S_g'(\omega_g)} - \frac{p_b}{p_g}$. Hence, the iso-political gains locus $G_g G_g$ which runs through point E^{jj} must lie above the $E^o E^{jj}$ line at least for some $\omega_g^o \leq \omega_g < \omega_g^T$. Hence, there must be a point along $E^o E^{jj}$ at which stronger political support is attained than at E^{jj}. In Figure 2, this case is illustrated in comparing the slopes of E^oE^{11} and $G_g^{-1} G_g^{-1}$.

Provided (26) is satisfied, the next question is what kind of separating option contract will be chosen: the contract that establishes a low-information-intensity optimum at point E^o or a contract described by a point between E^o and E^{jj} which is Pareto-improving relative to the low-information-intensity optimum. To answer this question, we examine the term $\frac{S_b'(\omega_g)}{S_g'(\omega_g)}$ of equation (26) more carefully. As shown in Appendix I, the marginal mimicking costs of the bad relative to the marginal signaling costs of the good government, $\frac{S_b'(\omega_g)}{S_g'(\omega_g)}$, are independent of t_g and may rise or fall as ω_g declines with IFI-imposed reforms; but it always must be the case that $\frac{S_b'(\omega_g)}{S_g'(\omega_g)} > \frac{S_b'(\underline{\omega})}{S_g'(\underline{\omega})}$ for all $\omega_g < \omega_g^T \leq \underline{\omega}$. Hence, it follows:

Proposition 3: ***If the sufficiency condition for separation,*** $\frac{v^j}{1-v_j} \leq \left[\frac{(p_g - p_b)}{p_g} - \frac{(\tau_g - \tau_b)}{\tau_g}\right]$***, is satisfied, then the option contract at the low-information-intensity optimum, with terms*** (t_g^o, ω_g^o) **for the good** ***and terms*** t_b^o ***for the bad government, is the good government's choice. This contract represents a unique Bayesian separating equilibrium relative to the lenders' prior beliefs about government types.***

If condition (26') is satisfied at point E^{jj}, where $\omega_g = \underline{\omega}$, then the fact that $\frac{S_b'(\omega_g)}{S_g'(\omega_g)} > \frac{S_b'(\underline{\omega})}{S_g'(\underline{\omega})}$ for all $\omega_g < \omega_g^T \leq \underline{\omega}$ implies that, at all other points along $E^o E^{jj}$, the intersecting iso-political gains curve $G_g G_g$ is steeper than the $E^o E^{jj}$ line. Consequently, by gradually shrinking the value of Z from $Z = I\left[\frac{v^j(p_g - p_b)}{[v^j p_g + (1-v^j)p_b]}\right]$ at E^{jj} to $Z = 0$ at E^o, one moves to higher and higher iso-political gain curves. As *Z* cannot be negative, maximum political support for the good government is reached at $Z = 0$. This separating equilibrium is unique. It is a perfect Bayesian equilibrium since the foreign bank, with initial beliefs that fraction *v* of all governments is good, updates these beliefs upon receiving an option contract as specified above. The lender now knows that the government that offers the option contract is a good government.

Point E^{22} depicts a situation in which the iso-political gains curve, $G_g G_g$, is steeper than the $E^o E^{22}$ line, such that:

$$\frac{v^j}{1-v_j} > \frac{S_b'(\omega_g)}{S_g'(\omega_g)} - \frac{p_b}{p_g}, \tag{27}$$

evaluated at $\omega_g = \underline{\omega}$.. Any *small* departure from E^{22} in the direction of E^o moves us to a $G_g G_g$-curve that reflects smaller political gains. Consequently, there is no option contract in the neighborhood of the pooling equilibrium that would strengthen the good government's political support. However, what holds in the small neighborhood of E^{22} does not necessarily hold for all points along $E^o E^{22}$. Since $\frac{S_b'(\omega_g)}{S_g'(\omega_g)} > \frac{S_b'(\underline{\omega})}{S_g'(\underline{\omega})}$ for all policy reforms that are contingent on an IFI loan – that is, for all $\omega_g < \omega_g^T$, – it is quite possible that (27) is satisfied at $\underline{\omega}$, but $\frac{v^j}{1-v_j} < \frac{S_b'(\omega_g)}{S_g'(\omega_g)} - \frac{p_b}{p_g}$ for some $\omega_g^o \le \omega_g < \omega_g^T$. This observation allows us to state:

Proposition 4: ***A necessary condition for the adoption of a Pareto-improving option contract is that***

$$\frac{S_b'(\underline{\omega})}{S_g'(\underline{\omega})} - \frac{p_b}{p_g} < \frac{v^j}{1-v_j} < \frac{S_b'(\omega_g)}{S_g'(\omega_g)} - \frac{p_b}{p_g} \text{ for some } \omega_g^o \le \omega_g < \omega_g^T.$$

If the condition $\frac{S_b'(\underline{\omega})}{S_g'(\underline{\omega})} - \frac{p_b}{p_g} < \frac{v^j}{1-v_j}$ is not satisfied, then the option contract at the low information-intensity optimum will be chosen, as stated in Proposition 3. If, on the other hand, $\frac{v^j}{1-v_j} < \frac{S_b'(\omega_g)}{S_g'(\omega_g)} - \frac{p_b}{p_g}$ is not satisfied for some $\omega_g^o \le \omega_g < \omega_g^T$, then there cannot be an iso-political gains curve along $E^o E^{jj}$ at which the gains are larger that at the *pooling contract* point E^{jj}.

If the necessary condition for the adoption of a Pareto-improving option contract is satisfied, it opens up the possibility that there are *multiple separating option contracts* that yield greater political gains to the good government than the pooling contract. Although the value of $\frac{S_b'(\omega_g)}{S_g'(\omega_g)}$ must always exceed the value of $\frac{S_b'(\underline{\omega})}{S_g'(\underline{\omega})}$, it may rise within some and fall within other ranges of $\omega_g^o \le \omega_g < \omega_g^T$. Hence, a given $G_g G_g$-locus might intersect the$E^o E^{jj}$ line more than once. The possibility of multiple separating equilibria is illustrated in Figure 3, where points E^o, E^1 and E^{11}describe option contracts with equal political gains for the good government. Accordingly, we have:

Proposition 5: ***If the necessary conditions for a Pareto-improving option-contract are satisfied, there might be more than one separating option contract that maximizes the good government's political gains.***

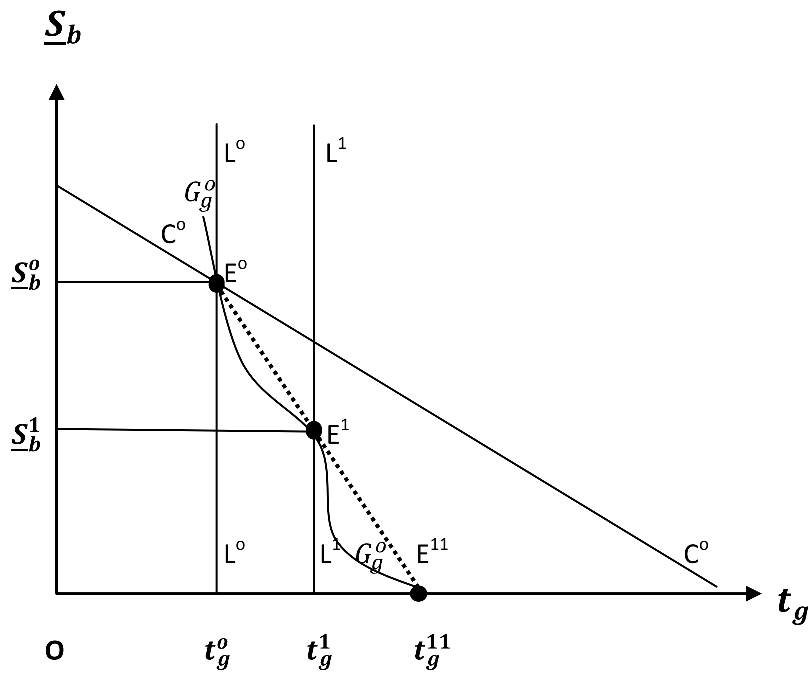

Figure 3: Multiple Separating Equilibria

Finally, we note that the likelihood of a separating option contract dominating the pooling contract is critically influenced by the beneficial impact of the IFI loan. The benefits from the IFI loan -- in terms of its enhancement effect on the performance of the entire economy – depends on two forces: the rate at which this enhancement takes place, as expressed by $h(T)$, and the probability that the enhancement is successful, indicated by π_i As shown in Appendix I, these values have an important bearing on the critical ratio of marginal costs of mimicking by the bad government to signaling by the good government, $\frac{S_b'(\omega_g)}{S_g'(\omega_g)}$.

Proposition 6: The necessary conditions for a Pareto-improving option contract are more likely to be satisfied the larger the enhancement effects of the IFI loan and the greater the good government's advantage in administering this loan.

The greater the average and marginal enhancement effects from the IFI loan, $[h(T)-1] > 0$ and $h'(T) > 0$ and the greater the competency advantage of the good government making use of these loans, $\frac{\pi_g}{\pi_b}$, the larger is the value of $\frac{S_b'(\omega_g)}{S_g'(\omega_g)}$. Whereas the competency advantage in administering the project loan, $\frac{p_g}{p_b}$, and bargaining strength advantage, $\frac{\tau_g}{\tau_b}$, are critical for determining the slope of the iso-political support curve at the pooling point E^{jj}, the IFI loan enhancement effects determine how much steeper the iso-political gains curve becomes as the loan value rises in return for declining policy distortions.

8. Conclusion

Reform-contingent loans provided by International Financial Institutions are intended to deliver a double-dividend to a borrowing country: they expand its resource base and they assure that the allocation of the economy's resources becomes more efficient. In spite of these unquestionable benefits, governments have been very reluctant to seek reform-contingent IFI loans as they disturb a country's political equilibrium and, most importantly, hurt entrenched interests that are critical for the political support of the government. Consequently, governments tend to view reform-contingent IFI loans as a cost rather than a benefit.

Although reform-contingent loans are viewed as costly, governments might still seek them in order to attract private foreign investment. In a world of asymmetric information, governments consider such loans as signals to convey information about their creditworthiness to potential creditors. IFI loans, therefore, serve as catalysts for private investments even if they are not in the interest of a government. This paper models the use of IFI loans as signals that enable a more-competent government to separate itself from less-competent governments in facilitating success of private investment projects. More-competent governments offer an option contract to a foreign bank that assures non-negative profits for the bank and makes it unprofitable for less-competent governments to pretend to be more-competent.

The paper distinguishes two kinds of option contracts that enable a more-competent government to separate itself: a contract at the low-information-intensity optimum and a set of contracts that a Pareto-improving relative to the low-information-intensity optimum. The paper shows that a more-competent government's ability to separate depends on four different influences: First, there is the composition of the pool of investment-seeking governments. The smaller the number of more-competent relative to less-competent governments, the easier it is for the former to separate. Second, there is the political element of the government's dependence on distorting economic policies. The greater the government's bargaining power in dealing with special interests – which appropriate substantial rents from these policies – the stronger is the financial support of the government by the special interests, and the more costly it becomes for the government to subject the economy to IFI-dictated policy reforms. Hence, the less beholden a more-competent government is to its special interests, the more likely it succeeds in attracting private foreign investment. Third, the difference between more- and less-competent governments in facilitating success of the private investment is important. The larger this difference, the easier is separation. And, finally, the competency difference in making good use of the IFI loan in enhancing the economy's performance also favors separation.

Based on these influences, the paper established sufficiency conditions for a unique Bayesian separating equilibrium at the low-information-intensity optimum. When these sufficiency conditions are not satisfied, multiple equilibria are possible: pooling, low-information-intensity optimum, or Pareto-improving relative to the low-information-intensity optimum. With multiple equilibria, it is quite possible that "small" IFI loans with "small" reforms are not suitable for separation whereas "large" IFI loans with "large" reforms are.

Appendix

I. The Cost of Signaling and Mimicking

The signaling costs of the good government were defined in (12) of the text as:

$$S_g(\omega_g) = G_g(\underline{\omega}) - G_g(\omega_g). \tag{A.1}$$

Substitution of (9) and (5) in the $G_g(\omega_g)$ expression of (4) yields:

$$S_g(\omega_g) = \tau_g s_g(\omega_g), \tag{A.2}$$

where $s_g(\omega_g) = u(\underline{\omega}) + ay(\underline{\omega}) - u(\omega_g) - ay(\omega_g)\{\pi_g h[T_g(\omega_g)] + (1-\pi_g)h(0)\} + aT_g(\omega_g)$.

The mimicking costs of the bad government, which accepts the same loan conditions as the good government but has competency π_b and bargaining power τ_b, are:

$$S_b(\omega_g) = \tau_b s_b(\omega_g), \tag{A.3}$$

where $s_b(\omega_g) = u(\underline{\omega}) + ay(\underline{\omega}) - u(\omega_g) - ay(\omega_g)\{\pi_b h[T_g(\omega_g)] + (1-\pi_b)h(0)\} + aT_g(\omega_g)$.

Subtracting $s_g(\omega_g)$ from $s_b(\omega_g)$ yields:

$$s_b(\omega_g) - s_g(\omega_g) = ay(\omega_g)[\pi_g - \pi_b]\{h[T_g(\omega_g)] - h(0)\} \geq 0,$$

as $T_g(\omega_g) \geq 0$. Hence, $s_b(\omega_g) = s_g(\omega_g)$ if there is no IFI loan and $s_b(\omega_g) > s_g(\omega_g)$ if a reform-contingent IFI loan is received.

The marginal costs of *signaling* by the good government are:

$$-S_g'(\omega_g) = -\tau_g s_g'(\omega_g), \qquad \text{where} \tag{A.4}$$

$$s_g'(\omega_g) = -u'(\omega_g) - ay'(\omega_g)\{\pi_g h[T_g(\omega_g)] + (1-\pi_g)h(0)\}. \tag{A.5}$$

In deriving (A.5), we made use of equation (10) and the fact that $y(\omega_g)\left\{\pi_g h'\left(T_g(\omega_g)\right)\right\} = 1$ along the IFI's reform-contingent loan schedule for the good government.

The marginal costs of *mimicking* by the bad government are:

$$-S_b'(\omega_g) = -\tau_b s_b'(\omega_g), \qquad \text{where} \tag{A.6}$$

$$s_b'(\omega_g) = -u'(\omega_g) - ay'(\omega_g)\{\pi_b h[T_g(\omega_g)] + (1-\pi_b)h(0)\} \tag{A.7}$$

$$-a\{y(\omega_g)\pi_b h'\left(T_g(\omega_g)\right) - 1\}\frac{dT_g(\omega_g)}{d\omega_g}$$

Furthermore, one can show from (10) that:

$$a\{y(\omega_g)\pi_b h'[T_g(\omega_g)] - 1\} = ay(\omega_g)h'[T_g(\omega_g)][\pi_b - \pi_g] < 0 \quad \text{and} \quad \frac{dT_g(\omega_g)}{d\omega_g} < 0.$$

In interpreting the sign of $s_g'(\omega_g)$, it must be noted that for $\underline{\omega}$ to be the political-support maximizing choice in the absence of an investment project, it must be that $s_g'(\omega_g) < 0$, since $u'(\omega_g) + ay'(\omega_g)\{\pi_g h[T_g(\omega_g)] + (1-\pi_g)h(0)\} > 0$ for all $\omega_g < \underline{\omega}$.

Comparing the marginal costs of signaling and mimicking, we obtain:

$$s_b'(\omega_g) = s_g'(\omega_g) + a[\pi_g - \pi_b]\frac{dy(\omega_g)\{h[T_g(\omega_g)] - h(0)\}}{d\omega_g} \quad \text{(A.8)}$$

where $\frac{dy(\omega_g)\{h[T_g(\omega_g)] - h(0)\}}{d\omega_g} = y'(\omega_g)\{h[T_g(\omega_g)] - h(0)\} + y(\omega_g)h'[T_g(\omega_g)]\frac{dT_g(\omega_g)}{d\omega_g} \leq 0$ for $T_g(\omega_g) \geq 0$.

To interpret (19) of the text, we write:

$$\frac{S_b'(\omega_g)}{S_g'(\omega_g)} = \left(\frac{\tau_b}{\tau_g}\right)\left(\frac{s_b'(\omega_g)}{s_g'(\omega_g)}\right) \geq \frac{\tau_b}{\tau_g} \quad \text{(A.9)}$$

since $s_b'(\omega_g) = s_g'(\omega_g)$ for $T_g(\omega_g) = 0$ and $s_b'(\omega_g) < s_g'(\omega_g) < 0$ for $T_g(\omega_g) > 0$.

II. The Signaling Government's Objective Function

The goal of the signaling government is to maximize gains in political support made possible by the investment project, while incurring signaling costs from the IFI loan:

$$Max \ \Delta G_g(t_g, \omega_g) = p_g(R - t_g) + G_g(\omega_g) - G_g(\underline{\omega}) = p_g R - p_g t_g - S_g(\omega_g) \quad \text{(A.10)}$$

where $S_g(\omega_g) = S_g[f(\underline{S_b})]$ after redefining $\underline{S_b} = S_b(\omega_g)$ and $\omega_g = f(\underline{S_b})$. Since $S_b'(\omega_g) < 0$, it follows that $f'(\underline{S_b}) < 0$.

The slope of the iso-political gains curve in the $(t_g, \underline{S_b})$ plane is:

$$\frac{d\underline{S}_b}{dt_g} = -\frac{p_g}{\left[\frac{dS_g(\omega_g)}{d\omega_g}\right]\left[\frac{d\omega_g}{dS_b}\right]} = -p_g\frac{S_b'(\omega_g\,)}{S_g'(\omega_g\,)} = -p_g\left(\frac{\tau_b}{\tau_g}\right)\left(\frac{s_b'(\omega_g)}{s_g'(\omega_g)}\right). \qquad \text{(A.11)}$$

For $\omega_g^T \leq \omega_g \leq \underline{\omega}$, it is the case that $T_g(\omega_g) = 0$ and $s_b'(\omega_g) = s_g'(\omega_g)$, such that $\frac{d\underline{S}_b}{dt_g} == -p_g\left(\frac{\tau_b}{\tau_g}\right)$. For $\omega_g < \omega_g^T$, on the other hand, $T_g(\omega_g) > 0$ and $s_b'(\omega_g) < s_g'(\omega_g) < 0$, such that $\frac{d\underline{S}_b}{dt_g} < -p_g\left(\frac{\tau_b}{\tau_g}\right)$.

The curvature of the iso-political gains curve is:

$$\frac{d}{dt_g}\left(\frac{d\underline{S}_b}{dt_g}\right) = -\left[\frac{p_g S_b'(\omega_g)}{\left[S_g'(\omega_g)\right]^2}\right]\left[\frac{S_g''(\omega_g)}{S_g'(\omega_g)} - \frac{S_b''(\omega_g)}{S_b'(\omega_g)}\right]. \qquad \text{(A.12)}$$

Since the signs of $S_g''(\omega_g)$ and $S_b''(\omega_g)$ are indeterminate, the iso-political gains curve might have concave and convex to the origin segments.

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