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Overcoming Barriers to Reform:
On Incentive-Compatible International Assistance

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Abstract

International financial assistance (loans and grants) can potentially raise recipients' welfare in two ways, by affecting a direct resource transfer and by facilitating efficiency-enhancing reforms. In practice, barriers to reform limit the potential of assistance to deliver these two dividends. In this paper, we analyze assistance programs designed to ensure that recipient governments voluntarily adopt reforms and overcome barriers associated with: (i) the reaction of special interests to the prospect of reform; (ii) the possibility of default and political instability in the recipient country; and (iii) adverse selection and moral hazard. Reform barriers raise the cost of incentive-compatible assistance and may result either in no assistance being forthcoming or assistance that ensures repayment but not the implementation of reforms. Critical to the choice of assistance programs is the size of the rent accruing to special interests in the absence of reform and the limited liability rents needed to ensure that repayment terms do not threaten the country's political stability. Optimal assistance contracts feature flexible repayment terms related to real economic growth in recipient countries.

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I. INTRODUCTION

International assistance programs, such as the loans and grants administered by official bilateral creditors and the International Financial Institutions (IFIs), are appealing because they can potentially raise the recipient country's welfare in two ways: first, they represent a direct resource transfer that adds to the recipient's capital stock (broadly construed) and enhances its production possibilities. Second, by facilitating productivity- and welfare-enhancing policy and institutional reforms, these programs can help improve the efficiency with which all the country's resources are employed. In practice, international assistance has a mixed record in delivering these two dividends. While policy reform has been strong in some countries receiving international assistance, it has been weak in others.[2] In particular, experience shows that assistance strategies containing long lists of measures that are beneficial in and of themselves will not lead to meaningful reform if they are not a government priority. Programs will also not deliver promised reforms if they ignore the state of—or overestimate progress in—the recipient's implementation capacity.

To realize their full potential, international assistance programs must incorporate incentives for recipient governments to implement welfare-enhancing reforms voluntarily in light of their preferences and constraints. Informational frictions and political economy constraints reduce the willingness of some governments to undertake reforms. The inability to monitor many reforms combines with political economy constraints to lower the power of reform incentives in various components of the government machinery. Overcoming these low-powered incentives seems critical in strengthening reform implementation, but it comes at a cost.[3]

In this paper, we present a formal model in which the international community's information about the recipient's policy implementation capacity and effort is imperfect. The resulting moral hazard and adverse selection problems raise the cost to the international community of providing incentive-compatible assistance. Two types of political economy constraints in recipient countries add to the cost of incentive-compatible assistance. First, special interest groups in some recipient countries exert strong influence on political and economic decision-making. When interest groups are entrenched, economic policy choices are unresponsive to the needs of the public. This, of course, is related to the notion that limited domestic "ownership" of reforms will result in half-hearted reform effort. Second, countries that implement reforms occasionally fall into hard economic times, exacerbating domestic conflicts and divisions. The terms of international assistance need to ensure that domestic

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[2] On the record and effectiveness of IFI-supported programs, see Dollar and Svensson (2000), Ivanova and others (2005), and Mussa and Savastano (1999).

[3] Rodrik (1996, p. 31) emphasizes the information frictions present in official creditor-debtor relationships. Dixit (2000, 2002, 2003) stresses the agency costs associated with informational asymmetries, special interest politics, and the public sector nature of recipients.

political and distributional tensions do not get aggravated to such an extent that they threaten the country's political stability or cause it to default on its international obligations. For these reasons, informational barriers and political economy constraints limit the power of the reform incentives that can be embedded in international assistance programs.[4]

We examine barriers to reform in an asymmetric information version of the model of special interest politics developed in earlier work (see Mayer and Mourmouras, 2004, 2005, 2007). The model features loans by an international financial institution (IFI) to a government that is influenced by a single domestic interest group. The interest group favors distorted policies and makes political contributions, a-la Grossman-Helpman (1994, 2001) and Dixit, Grossman and Helpman (1997). The government maximizes its political support, which depends on national welfare and interest group payments. The status quo is characterized by second-best policies that are determined by the political relationship between the interest group and the government in the absence of IFI assistance. National output in the recipient country is stochastic, depending on the state of nature as well as the amount of international assistance received. The probability of good economic performance depends on whether reforms are implemented.

The loan-providing IFI designs the terms of its loans consistent with its mandate to safeguard its capital. The IFI gets its chance to be a player when an exogenous shock lowers the economy's income, which prompts the government to reconsider its political calculations. To ensure incentive compatibility of reforms, the magnitude and terms of the IFI's loan must take into account several features of the environment. First, the government possesses private information about its efficiency and about the intensity with which it will pursue reforms, resulting in adverse selection and moral hazard. In addition, as argued by Acemoglu and Robinson (2006), reforms must be consistent with recipient's continued political stability. The prospect of political instability is an issue at the stage of IFI loan disbursement, when countries must ordinarily compress domestic demand. It is also a consideration at the stage of repayment of IFI assistance when the country makes reverse transfers to the IFI. Repayments must not be excessively large, especially if unexpected terms-of-trade or other negative shocks hit the economy. We assume that political stability would be threatened if, under an IFI-supported program, domestic consumption and investment were to fall below a threshold, taken for simplicity to be the level that would obtain in the absence of assistance. Finally, the terms of assistance must take into account the possibility that the authorities might default on

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[4] An expanding literature examines ownership issues in the context of formal political economy analyses of conditional lending. Early treatments focused on perfect information models. See Drazen (2002), Boughton and Mourmouras (2004), and Mayer and Mourmouras (2005). More recently, this literature has begun to examine the implications of asymmetric information for international assistance programs. Ivanova (2006) presents a formal common agency model but does not consider the possibility of sovereign default or political instability. See also Drazen and Isard (2004), who present an analytically informed discussion of the role of public debate in disseminating information about the objectives of reform programs and overcoming informational frictions.

the loan. A sovereign government will fail to pay if the penalty for defaulting is less than the stipulated repayment. Following Eaton and Gersovitz (1995), we assume that the magnitude of the penalty in the default state is not known at the time the program is negotiated. What is known at the program-design stage, based on past experience, is the probability distribution of future penalties. In determining the loan repayment, the IFI, will therefore take into account the possibility of offering to renegotiate the repayment amount.

The information and political economy barriers to reform add to the IFI's cost of providing incentive-compatible assistance. In the remainder of the paper we analyze the limits reform barriers place on the incentive schemes—rewards and punishments—IFIs can use. We explore the effect of political economy and information costs on

- The amount of incentive-compatible assistance provided and whether the IFI finds it worthwhile to offer any such assistance at all.

- The cost to IFIs of granting incentive-compatible assistance vs. assistance that does not aim to facilitate reforms.

- The expected gain the IFI derives from the assistance program.

- The expected political support to the recipient government.

II. THE MODEL

The recipient economy's total output, X, depends on three influences: the country's initial resources, ρ, the output-expanding effect of the IFI loan, T, and the economy's state of nature, as reflected in the value of y. The country's aggregate production function is:

$$X = g(T)y\rho, \tag{1}$$

where $\rho > 0$ measures its resource base and $y\rho$ is the economy's output in the absence of a loan $(T=0)$. The function $g(T)$ expresses the magnifying influence of the loan, T, on the economy's performance. It is assumed that $g(0) = 1$, whereas $g'(T) > 0$ and $g''(T) < 0$ for $T > 0$, such that returns to the loan are positive but diminishing. The government's decision to approach the IFI for assistance is triggered by a major shock to the economy's resource base. Prior to this shock, $\rho > 1$ and after the shock $\rho = 1$. Hence, after the shock, but before the loan is received, the economy's total output is given by $X = y$. The value of y, in turn, is stochastic and depends on the economy's state of nature. The economy is "strong" when $y = \bar{y}$ and "weak" when $y = \underline{y}$. The value of $\Delta y = (\bar{y} - \underline{y}) > 0$ measures the *economy's output volatility* due to exogenous changes in the state of nature.

Ex post, both government and IFI are able to observe and verify the value of y. Ex ante, however, neither government nor IFI know whether output, absent of any loan effects, will be $\bar{y}$ or $\underline{y}$. They do know, however, that the good outcome is more likely when the economy is reformed than when it is ridden by economic policy distortions; that is, the probability of the economy being strong, π, rises with the adoption of economic reforms. The *effectiveness of reforms* is measured by $\Delta\pi = (\pi_1 - \pi_o) > 0$, where $0 < \pi_1 < 1$ and $0 < \pi_o < 1$ indicate the probability of the economy being strong with and without reforms, respectively.

The developing country's economic policies are chosen by a political support-maximizing government. Following Grossman and Helpman (1994), the government's political support depends on an interest group's financial contributions, C, as well as on the general public's welfare, as expressed by the country's net income, V. The country's sole interest group is willing to support the government in return for economic policies that benefit the group. The group benefits consist of economic rents created by market-distorting policies that hurt the general public. Accordingly, the IFI's condition to reform the economy amounts to asking the government to eliminate the interest group's privileged position. The government's political support function is:

$$G = C + aV \tag{2}$$

where $V = X - Z - \theta T$ measures the country's net income. The symbol $Z \geq 0$ denotes the government's contractual repayment of loan T, while $\theta \geq 0$ expresses the government's unit cost of administering the loan program. The repayment amount, Z, is spelled out in the IFI's loan offer. As explained later, implementation of economic reforms calls for the creation of incentives that depend on the economy's performance. Hence, the value of Z depends on the economy being strong or weak at the due time for repayment. In addition, both size of loan, T, and amount of repayment, Z, are influenced by the government's effectiveness in administering the loan program. For a cost-effective or "good" government, the unit cost of administering the loan, θ_G, is lower than for a cost-ineffective or "bad" government, θ_B. Finally, the value of parameter a indicates the degree to which net income of the entire country translates into the general public's political support for the government.[5] The more the government depends on support from the general public, the larger is the value of a.

III. Economic Policy Distortions in the Presence of an Interest Group

When a loan-seeking government approaches an IFI, the latter is fully aware that the economic policy distortions create significant rents for the interest group. It is assumed that the interest group expects to receive R of economic rent when there are no economic

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[5] See Grossman and Helpman (2001, p. 119, n.5) for a discussion of the size restrictions on a.

reforms.[6] The size of this rent limits the contribution, C, the interest group is willing to make; that is, $C \leq R$, since the group has no incentive to contribute an amount that makes its members worse off than they would be if they simply became part of the general public.

Prior to the resource shock—which reduced ρ to a value of one—the government had no incentive to approach the IFI for a loan. It chose distorting economic policies under the influence of the interest group and did so because it gained at least as much total political support as it would have received had it reformed on its own. Expected government political support with interest group contributions and no economic reforms is:

$$E[G(\pi_o)] = C + a[\pi_o \, \overline{y} + (1-\pi_o)\underline{y}]\rho \qquad (3)$$

where π_o is the probability of a strong economy when no reforms are implemented. If, on the other hand, the government enacts economic reforms – and thereby foregoes the interest group's financial contribution – its expected political support would be:

$$E[G(\pi_1)] = a[\pi_1 \, \overline{y} + (1-\pi_1)\underline{y}]\rho \qquad (4)$$

where π_1 is the probability of a strong economy when reforms are implemented. Our assumption that the IFI confronts a government that employs distorted policies under the influence of an interest group implies that $E[G(\pi_o)] \geq E[G(\pi_1)]$, or stated differently, that:

$$C \geq \underline{C} = \rho a \Delta\pi \Delta y. \qquad (5)$$

The value of $\underline{C}$ is the minimum contribution the government must receive to refrain from reforming an economy with resource base ρ. Four factors raise the interest group's minimum contribution: the economy's resource base, ρ, the general public's political influence, a, the effectiveness of economic reforms, $\Delta\pi$, and the volatility of the economy's performance, Δy.

The actual contribution by the interest group, C, is generally determined through its negotiations with the government. For the purposes of our analysis, all we have to keep in mind is that $\underline{C} \leq C \leq R$. We must emphasize, however, that the value of C usually changes when the government approaches the IFI for a loan. Prior to the government going to the IFI, the interest group must contribute at least $\underline{C}$ in order to retain its influence on the government's economic policymaking. After the government approaches the IFI for a loan, the interest group will adjust its contribution in one of two ways. As shown later, the interest group's political contributions heavily influence the IFI's willingness to extend a loan that incorporates reform incentives. The higher the value of C, the lower is the IFI's expected loan return. There exists a contribution level, C^*, at which the IFI's expected return becomes
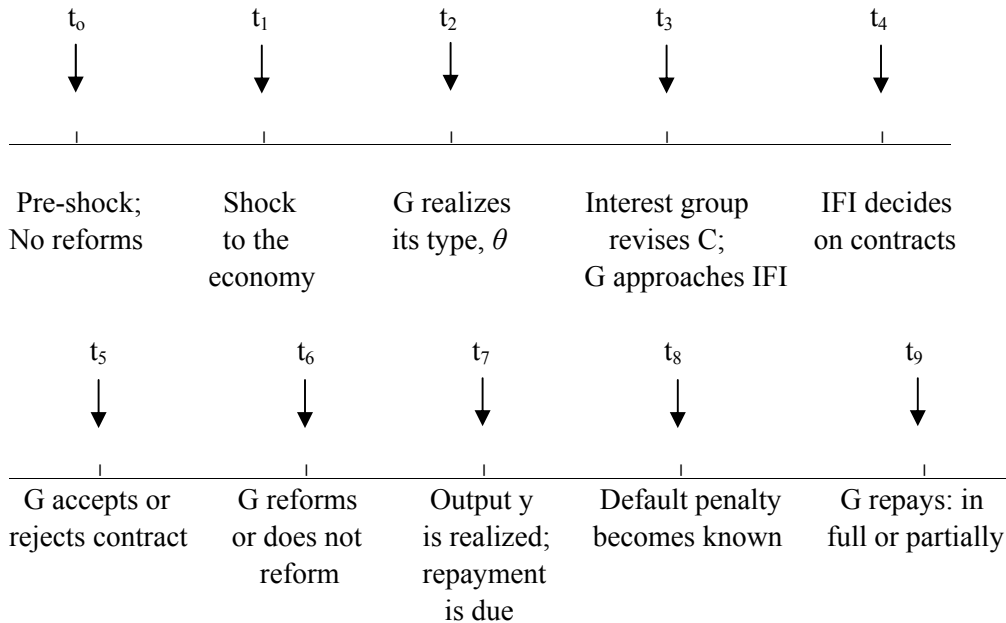
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[6] We are not explicitly modeling the type of distortions that bring about the rent.

zero. A well-entrenched interest group might earn rents that are so high that it can contribute at a level at which the IFI is no longer willing to offer an incentive-compatible loan: if $R > C^*$, the government's request for an incentive-compatible loan will be turned down. If, on the other hand, $R < C^*$, the IFI has an incentive to make an incentive-compatible loan that will, in effect, destroy the interest group. Making an incentive-compatible loan is, however, not the only way the IFI can respond. Section VIII demonstrates that there exists a contribution level $C^N < C^*$ at which the IFI is better off with a loan that does not incorporate reform incentives rather than with an incentive-compatible loan. Loans that do not aim to support reforms do not threaten the survival of the interest group. Accordingly, if $C^N < R < C^*$, the rent is sufficiently high to permit the group to raise its contributions to a level at which it can survive. The interest group is unable to block the IFI from making an incentive-compatible loan only if $R < C^N < C^*$. In this situation, the group dissolves and C becomes zero.

IV. TIME LINE OF EVENTS AND DECISION MAKING

The government's search for a loan agreement with the IFI is triggered by a shock to its economy. The resource base unexpectedly shrinks from $\rho > 1$ to $\rho = 1$. The accompanying drop in net income is the reason for the government's request for an IFI loan. The IFI, in turn, will be responsive if it can design a loan that yields at least a non-negative expected return and is acceptable to the loan-receiving government. Two types of loans are under consideration: an *incentive-compatible* loan designed to help the government overcome resistance to reforming the economy and another loan that does not incorporate reform incentives. In both cases, the IFI must allow for the possibility of default.

The following time line summarizes the timing of events and decision-making:

t_0	t_1	t_2	t_3	t_4
↓	↓	↓	↓	↓
Pre-shock; No reforms	Shock to the economy	G realizes its type, θ	Interest group revises C; G approaches IFI	IFI decides on contracts

t_5	t_6	t_7	t_8	t_9
↓	↓	↓	↓	↓
G accepts or rejects contract	G reforms or does not reform	Output y is realized; repayment is due	Default penalty becomes known	G repays: in full or partially

At t_o, the economy operates with a resource base of $\rho > 1$ and its government neither seeks nor receives any loans from the IFI. The economy is saddled with policy distortions, the result of government policies that favor the interest group, in exchange for which the group makes financial contributions to the government. The contributions must be sufficiently large to prevent the government from reforming on its own; that is, equation (5) must be satisfied. At time t_1, the economy suffers an unanticipated resource shock, as ρ shrinks from $\rho > 1$ to $\rho = 1$. This event motivates the government to obtain a loan from the IFI. At t_2, when the government approaches the IFI, the government knows its effectiveness in administering a loan program whereas the IFI does not share this information. The IFI does not know whether it is dealing with a cost-effective, *good*, or cost-ineffective, *bad*, government. The country's interest group, in turn, is aware of its government's attempt to obtain an IFI loan. At t_3, the interest group evaluates its ability to prevent economic policy reforms that might be made possible by the loan and that would destroy its economic rents. If its benefits from a distorted economy are sufficiently high, the interest group can raise its contributions to the government so as to make it unattractive for the IFI to offer any loan or, at least, an incentive-compatible loan.

The IFI decides on the type and amount of loan, if any, at t_4. Not knowing whether it is dealing with a good or a bad government, the IFI offers two stochastic contracts and lets the government choose between a contract designed for a good government and a contract designed for a bad government. Each contract spells out the amount to be disbursed and the repayment at the due date. The IFI offers stochastic contracts because creating the right incentives for economic reforms requires linking the amount of repayment to the state of the economy at the due date. In addition, each contract accounts for the possibility of default; should the government have an incentive to default at repayment time, the IFI offers to renegotiate the repayment amount.

The government decides on whether to accept the contract intended for its type at t_5. As explained below, acceptance requires the contract to contain the relevant participation and adverse selection incentive constraints. If accepted, the government faces, at time t_6, the issue of implementing economic reforms; it has an incentive to implement and enforce economic reforms if the relevant moral hazard incentive constraints are satisfied. At t_7, the IFI and the government both observe the economy's performance and the level of repayment as set in the contract. Before making this repayment, the government will consider the possibility of defaulting. At t_8, both IFI and government learn how much the government is penalized if it decides to default rather than repay the agreed-upon amount. Finally, at t_9, the government either repays the amount stipulated in the initial loan contract for the realized state of the economy or accepts a renegotiated lower payment to avert default by the government.

V. ACCOUNTING FOR THE POSSIBILITY OF DEFAULT

For any loan contract—incentive-compatible or not, with a good or bad government—the IFI must allow for the possibility of default. To understand how default affects the IFI's and

government's decisions, we model the possibility of default in the simplest possible way; following Eaton and Gersovitz (1995), we assume there is a penalty for defaulting but that, at the time the loan is made, neither IFI nor government knows the size of this penalty.

Default is not costless. A country that defaults on an IFI loan incurs a penalty, P. The idea is that default triggers several reactions that are costly to the country, such as trade sanctions, the inability to borrow from other IFIs, and loss of (or more restricted access to) private capital markets. At the loan due-date, the government compares the contractually agreed-upon repayment amount, Z, with the size of the penalty, P, and defaults if:

$$Z \geq P. \tag{6}$$

Both government and IFI learn about the size of the penalty at the repayment due-date. However, neither government nor IFI know the penalty when the loan contract is drawn. They do know, however, the density function, $f(p)$, where $p = P/y$ measures the penalty per unit of y, the economy's output in the absence of a loan. Given a repayment of Z, the probability that the government will default, meaning that $z = Z/y \geq P/y = p$, equals $F(z)$.[7]

At the time the loan contract is presented, the IFI is fully aware that the government might default. Should the default situation actually arise, the IFI can either accept default without repayment or offer an amended contract that reduces the repayment to an amount equal to the penalty. Since the IFI is always better off with partial repayment than no repayment, each initial contract contains such a default repayment clause. Consequently, the IFI's loan offer must account for the possibility of reduced repayment. Given a contractual repayment Z and a penalty distribution function $f(p)$, the expected repayment, $E(r)$, from the government to the IFI equals:

$$E(r) = \int_0^z Pf(p)dp + \int_z^\infty Zf(p)dp. \tag{7}$$

For $p \leq z$, repayment is adjusted to $P = py$; for $p \geq z$, repayment is the negotiated amount of $Z = zy$. After substitution and integration by parts, equation (7) can be restated as:

$$E(r) = y\int_0^z pf(p)dp + yz\int_z^\infty f(p)dp = y\left[z - \int_0^z F(p)dp\right] \tag{7'}$$

The expected repayment, $E(r)$, is smaller than the contractual repayment, which equals $Z = yz$; but it exceeds what the IFI expects to be repaid if it received nothing under default,

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[7] Note that for a given size loan, $Z = yz$, the probability of default is higher at a low income than at a high income of the country.

which is only *yz[1-F(z)]*. The expected repayment depends on whether the economy is strong, $\bar{y}$, or weak, $\underline{y}$, as well on whether the government is good or bad. Accordingly, expected repayments by a government of type $j = G,B$ can be denoted as $E(\bar{r}_j)$ when $y = \bar{y}$ and as $E(\underline{r}_j)$ when $y = \underline{y}$.

VI. DESIGNING AN INCENTIVE-COMPATIBLE LOAN

The IFI's goal is to design a loan program that maximizes its own expected return, which is equal to the expected repayment minus the loan's value. A necessary condition for a loan to be offered at all is that the IFI's expected return be non-negative. If both incentive-compatible and other loans yield positive expected returns, the IFI offers the loan with the highest expected return. If all loan programs result in expected losses, the IFI does not offer any loan.

The IFI alone determines the content of the loan contract. However, asymmetric information on both the government's effectiveness in administering the loan and on the actual implementation of economic reforms calls for very careful crafting of loan contracts. Each type of government must have the incentive to accept the contract designed for its type and, in the case of incentive-compatible loans, each government must have the incentive to implement and enforce the called-for economic reforms.

In this Section, we lay out the features of an incentive-compatible loan designed to help the government overcome barriers to economic reform. No limits are imposed on the type of punishments that can be incorporated in this incentive scheme. We postpone until Section VII the discussion of incentive-compatible loans that do not endanger the country's political stability.

At the time it is approached for a loan, the IFI is unable to judge the government's ability to administer the program. Administering a loan is costly and the cost of successfully doing so depends on both the size of the loan, T, and a cost-effectiveness parameter, θ. For a cost-effective or good government, the cost of administering one unit of the loan is $\theta_G > 0$; for a cost-ineffective or bad government, it is $\theta_B > 0$, where $\theta_B > \theta_G$. Whereas each government knows whether it is good or bad, the IFI lacks this information. All it knows is that the government is good with probability $0 < \gamma < 1$.

The IFI offers two stochastic contracts $[T_j, \bar{Z}_j, \underline{Z}_j]$ for $j = B,G$, one intended for a good government, G, and one intended for a bad government, B. Each contract states the loan amount, T_j, as well as repayments in the strong and weak state of the economy, indicated by $\bar{Z}_j$ and $\underline{Z}_j$ respectively. The contract also contains a clause stating that the repayment is reduced to the default penalty, P, whenever $Z_j > P$. Not knowing the government's type, the IFI's expected net return from the loan is:

$$E(I) = \gamma\left[\pi_1 E(\overline{r}_G) + (1-\pi_1)E(\underline{r}_G) - T_G\right] + (1-\gamma)\left[\pi_1 E(\overline{r}_B) + (1-\pi_1)E(\underline{r}_B) - T_B\right], \qquad (8)$$

where $E(\underline{r}_j)$ and $E(\overline{r}_j)$ are expected repayments by government type $j = B,G$ in a weak and strong economy, respectively, as defined in (7').

The IFI maximizes the expected return on its incentive-compatible loan subject to a set of constraints imposed by informational frictions and the other features of the economic and political environment. Specifically, a set of *participation constraints* ensures that each government type is willing to accept the loan contract. A set of *adverse selection incentive constraints* guarantees that each government type selects the contract designed for its type. A set of *moral hazard incentive constraints* makes sure that each government type has the incentive to reform the economy. Finally, a set of *limited liability constraints* ensures that the punishment-reward features of the IFI loan's repayment conditions do not endanger the recipient's political stability.

Before stating these constraints formally, we first define expected net income of a country with the *jth* type of government, evaluated at t_7 on our time line. At this loan due-date, output y has been observed and contractual repayments are due, but the default penalty remains unknown. The country's expected net incomes in a strong and weak economy, respectively, are:

$$\overline{V}_j = \left[g(T_j)\overline{y} - \theta_j T_j - E(\overline{r}_j)\right] \quad \text{and} \quad \underline{V}_j = \left[g(T_j)\underline{y} - \theta_j T_j - E(\underline{r}_j)\right]. \qquad (9)$$

In equations (9), the expectations are taken with respect to the probability distribution of default $f(p)$. We will use these expected net income measures to describe the constraint set faced by the IFI, as well as to restate (8), the objective function of the IFI.

Concerning the constraint set, each government type must find the IFI's offer of an incentive-compatible loan contract sufficiently attractive to accept it. A government's *participation constraint* is satisfied if its expected political support under full implementation of the incentive-compatible loan agreement is at least as strong as it would be without the IFI loan and without reforms. Since the IFI does not know whether it is dealing with a good or bad government, the participation constraint must hold for each government type, such that:

$$a\left[\pi_1 \overline{V}_G + (1-\pi_1)\underline{V}_G\right] \geq aE_o(y) + C \qquad (10)$$

$$a\left[\pi_1 \overline{V}_B + (1-\pi_1)\underline{V}_B\right] \geq aE_o(y) + C \qquad (11)$$

where $E_o(y) = \pi_o \bar{y} + (1 - \pi_o)\underline{y}$ is the country's expected net income with no loan and no reforms. The value of interest group contributions in the absence of a loan, C, is not explicitly determined. But, as we recall from (5), it must satisfy $C \geq \underline{C} = a\Delta\pi\Delta y$. Also recall that the probability of a strong economy is greater when it is reformed than policy-distorted, meaning that $\pi_1 > \pi_o$.

The *adverse selection incentive constraints* require that each government type has an incentive to select the loan contract designed for its type. Hence, the loan contract designed for the good (bad) government must be at least as favorable to the good (bad) government as the loan contract designed for the bad (good) government. In addition, since the good (bad) government's acceptance of the bad (good) government contract allows the former either to implement reforms or to cheat and keep the economy distorted, there are two adverse selection incentive constraints for each type of government. Letting $\Delta\theta = \theta_B - \theta_G > 0$, the adverse selection constraints require that

$$a\left[\pi_1 \bar{V}_G + (1 - \pi_1)\underline{V}_G\right] \geq a\left[\pi_1 \bar{V}_B + (1 - \pi_1)\underline{V}_B + T_B\Delta\theta\right] \tag{12}$$

$$a\left[\pi_1 \bar{V}_G + (1 - \pi_1)\underline{V}_G\right] \geq a\left[\pi_o \bar{V}_B + (1 - \pi_o)\underline{V}_B + T_B\Delta\theta\right] + C; \tag{13}$$

$$a\left[\pi_1 \bar{V}_B + (1 - \pi_1)\underline{V}_B\right] \geq a\left[\pi_1 \bar{V}_G + (1 - \pi_1)\underline{V}_G - T_G\Delta\theta\right] \tag{14}$$

$$a\left[\pi_1 \bar{V}_B + (1 - \pi_1)\underline{V}_B\right] \geq a\left[\pi_o \bar{V}_G + (1 - \pi_o)\underline{V}_G - T_G\Delta\theta\right] + C. \tag{15}$$

Each government type's incentive-compatible loan agreement must also satisfy a *moral hazard incentive constraint*. The agreement must create incentives for the government not only to accept the contract designed for its type but also to fully implement the asked-for economic reforms. Accordingly, the government's expected political support must be at least as strong when it accepts and implements the incentive-compatible loan contract as it would be if it accepted the loan and its repayment conditions without implementing reforms. This requires for the jth type government that $a\left[\pi_1 \bar{V}_j + (1 - \pi_1)\underline{V}_j\right] \geq a\left[\pi_o \bar{V}_j + (1 - \pi_o)\underline{V}_j\right] + C$, which, in turn, implies that

$$a\Delta\pi\left(\bar{V}_G - \underline{V}_G\right) \geq C \tag{16}$$

$$a\Delta\pi\left(\bar{V}_B - \underline{V}_B\right) \geq C. \tag{17}$$

The moral hazard incentive constraints assure the voluntary adoption of reforms. The gap between the country's expected net income when the economy is strong, $\bar{V}_j$, and when it is

weak, $\underline{V}_j$ must be sufficiently large to entice the government to reform and, thereby, raise the probability of a strong economy. As can be seen, the minimally required gap is the same for both types of government.

At the time of the IFI's offer of the incentive-compatible loan, equations (10)-(17) must be satisfied. It can be shown that repayment conditions are such that each type government is punished severely in the weak state of the economy.[8] In this state, the country's expected net income (following the receipt and repayment of an IFI's incentive-compatible loan) can be shown to be *always less* than in the absence of such a loan if the loan is administered by a bad government, and it still *might be less* if the loan is administered by a good government.

For a country that suffered a severe resource decline, the possibility of a loan making it worse off than it would be without the loan makes the above-specified incentive scheme politically unacceptable. It threatens the country's political stability. The incentive system is designed to reward the strong economic outcome, whose prospects are promoted by economic reforms, and to punish the weak economic outcome, which is more likely if no reforms are implemented. Hence, the government and its people are severely punished when the economy turns out to be weak and they are generously rewarded when the economy turns out to be strong. Getting punished when the economy is already weak is a recipe for disaster. Social unrest, rioting, and the complete collapse of the country's political system could follow. The IFI, therefore, has to modify the incentive system by adding *limited liability constraints* that assure political stability. This is the subject of Section VII.

VII. INCENTIVE-COMPATIBLE LOANS WITH LIMITED LIABILITY

We now turn to incentive schemes that are politically feasible. To avoid political unrest, the IFI loan must, at a minimum, guarantee that repayments in the weak state of the economy make the general public no worse off with the incentive-compatible loan than it would be without it; that is, political stability requires the following limited liability constraints:

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[8] One can show that (11), (12), (16), and (17) are binding and then solve for: $\underline{V}_B = \underline{y} - \pi_o(C-\underline{C})/(a\varDelta\pi)$, $\overline{V}_B = \overline{y} + (1-\pi_o)(C-\underline{C})/(a\varDelta\pi)$, $\underline{V}_G = \underline{y} + T_B\varDelta\theta - \pi_o(C-\underline{C})/(a\varDelta\pi)$ and $\overline{V}_G = \overline{y} + T_B\varDelta\theta + (1-\pi_o)(C-\underline{C})/(a\varDelta\pi)$. The punishment is equal to $\pi_o(C-\underline{C})/(a\varDelta\pi)$. It rises with the size of the interest group's actual contribution in the absence of reforms, C. The following example demonstrates the harshness of the penalties contained in the optimal incentive scheme. Assume that $a=0.5$, so the government derives half of its political support from the interest group; $\pi_o = 0.35$ and $\pi_1 = 0.70$, so that reforms double the probability of good economic performance; and $\overline{y} = 1.30$ while $\underline{y} = 0.87$, so that $E_o(y) = 1$ and $E_1(y) = 1.16$, meaning that that reforms raise output by 16 percentage points of GDP on average. Finally, suppose that interest group contributions are three percentage points of GDP higher than the minimum required to keep the economy distorted. For these parameter values, the optimal penalty is six percent of average GDP. This penalty reduces domestic output when the economy is weak by seven percentage points of GDP, the equivalent of a very severe contraction.

$$\underline{V}_G \ge \underline{y} \tag{18}$$

$$\underline{V}_B \ge \underline{y}. \tag{19}$$

With limited liability, the two stochastic loan contracts offered by the IFI, $[T_B, \overline{Z}_B, \underline{Z}_B]$ and $[T_G, \overline{Z}_G, \underline{Z}_G]$, must satisfy the ten constraints of equations (10)-(19). The following proposition can be shown: If the *adverse selection incentive constraint* for the good government, as stated in (12), the *moral hazard incentive constraints* for both types of government, (16) and (17), and the *limited liability constraint* for the country with the bad government, (19), are binding, then all other constraints are satisfied as well.[9] Solving the four binding constraints for expected net income of the country in the weak and strong state of the economy, respectively, yields:

$$\underline{V}_B = \underline{y}, \qquad \overline{V}_B = \overline{y} + \left(\frac{1}{a\Delta\pi}\right)(C - \underline{C}) \tag{20}$$

for the country with a bad government, and:

$$\underline{V}_G = \underline{y} + T_B\Delta\theta \qquad \overline{V}_G = \overline{y} + \left(\frac{1}{a\Delta\pi}\right)(C - \underline{C}) + T_B\Delta\theta \tag{21}$$

for the country with a good government. For both types of government, the country's expected income is evaluated at a time when the state of the economy has been revealed but the default penalty remains unknown.

Equations (20) and (21) reveal immediately that, in every state of the economy, a country's expected income, independent of the cost-effectiveness of its government in administering the loan program, is at least as high as it would be without the loan program. This outcome is due to the limited liability constraints, which assure that punishments under the moral hazard incentive system do no cause any political turmoil. The worst possible outcome occurs for a country with a bad government when the economy turns out to be weak. Its expected net

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[9] In order to check whether (10), (11), (13), (14), (15), and (18) are satisfied when (12), (16), (17), and (19) are binding, we note that adding (12) and (13) implies that $(T_G - T_B) \ge 0$. (10) is satisfied, as can be seen after substitution of binding (16), writing $E_o(y) = \underline{y} + \pi_o\Delta y$, and using (5). To show that (11) holds, substitute binding (17) and (19), and again use $E_o(y) = \underline{y} + \pi_o\Delta y$ and (5). That (13) holds as well, one can see after substituting the RHS of binding (12) on the LHS of (13), and using binding (19). Equation (14) is satisfied, as one can see from substituting binding (12) in (14) and using $(T_G - T_B) \ge 0$. The same is the case for (15), after substituting binding (12), and using binding (16) as well as $(T_G - T_B) \ge 0$. Finally, (18) is satisfied, after substituting binding (12) in (10) and using binding (16), (17), and (19).

income is $\underline{V}_B = \underline{y}$, making it equally well off as without the loan. If the economy is weak in a country run by a good government, expected net income, $\underline{V}_G$, is raised above the no-loan level of $\underline{y}$ due to an *adverse selection information rent* of $T_B\Delta\theta > 0$. The IFI has to pay this information rent to a good government so the latter does not accept the contract designed for the bad government. It represents one form of information cost faced by the IFI and is reflected in the contract as a reduction in repayment.

A second form of rent accruing to the loan-seeking government is a *limited liability rent*. It is a consequence of the IFI's desire to avoid political instability that would be caused by punishing the government of a weakly performing economy. As mentioned in footnote 8, if there were no *limited liability constraints*, the punishment of a government in a weak economy would be $\pi_o(C - \underline{C})/(a\Delta\pi)$.[10] The need for political stability rules out this punishment. In addition, eliminating this punishment raises the country's expected net income not only in a weak economy but also in a strong economy. This is because the incentives for implementing economic reforms, as reflected in the binding *moral hazard constraints* of (16) and (17), require that a gap in expected net income of *C/(aΔπ)* be maintained between a strong and weak economy. Hence, the limited liability constraints raise the level of expected net income by $\pi_o(C - \underline{C})/(a\Delta\pi)$ not only under the worst possible scenario of a bad government in a weak economy, but for all types of governments and in all states of the economy. The limited liability constraints create an across-the-board reduction in repayments for all types of government and in all states of the economy.

In order to assess the IFI's willingness to offer an incentive-compatible loan, we next return to (8), which states the IFI's expected return on the loan. We evaluate (8), after using (20)-(21) and (9) to solve for $E(\bar{r}_j)$ and $E(\underline{r}_j)$ and after substituting the obtained expressions in (8), given that the loan value to both types of government maximizes the IFI's expected return:

$$E(I;\pi_1,T_j^*) = \gamma\left\{E_1(y)\Delta g(T_G^*) - T_G^*(1+\theta_G) - T_B^*\Delta\theta - \left(\frac{\pi_1}{a\Delta\pi}\right)(C-\underline{C})\right\}$$

$$+ (1-\gamma)\left\{E_1(y)\Delta g(T_B^*) - (1+\theta_B)T_B^* - \left(\frac{\pi_1}{a\Delta\pi}\right)(C-\underline{C})\right\}, \quad (22)$$

where $\Delta g(T_j^*) = [g(T_j^*)-1] > 0$, $E_1(y) = \pi_1\bar{y} + (1-\pi_1)\underline{y}$, and the asterisk indicates that the loan to a government of type $j = B,G$ maximizes the IFI's expected return. The optimal loans to a bad and good government, respectively, require that:

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[10] It should be noted that the moral hazard problem does not lead to information rents when the government is risk neutral, as implicitly assumed, and there are no limited liability constraints.

$$g\,'(T_B^*)E_1(y) = \left[1 + \theta_B + \frac{\gamma}{(1-\gamma)}\Delta\theta\right] \quad \text{and} \quad g\,'(T_G^*)E_1(y) = (1 + \theta_G). \qquad (23)$$

The IFI's criterion for its loan size to a good government is the same as it would be if the IFI had full knowledge that the government was indeed good; the marginal gain in expected gross income of the reformed economy, $g'(T_G{}^*)E_1(y)$, equals the marginal cost of spending and administering another dollar on the loan, $(1+\theta_G)$. Provided the IFI makes a loan at all—which requires that (22) is non-negative—the resulting allocation of loan funds is, therefore, efficient. The optimal loan size designed for a bad government, on the other hand, is different from what it would be if the IFI had full knowledge that the government was bad. The marginal gain in expected gross income must cover not only the marginal cost of spending and administering another loan dollar, but it must also cover the information cost of $[\gamma/(1-\gamma)]\Delta\theta$. The size of the loan offered in the contract to a bad government is, therefore, less than it would be if the IFI knew that the government it is dealing with was indeed bad.

The IFI's expected return from a loan contract equals, as stated in (22), the expected net value created by the loan, $E_1(y)\Delta g(T_j{}^*) - (1+\theta_j)T_j{}^*$, minus expected losses from paying an adverse selection information rent, $\gamma T_B^*\Delta\theta$, and from reforming the economy without causing political instability, $[\pi_1/(a\Delta\pi)]\cdot[C-\underline{C}]$. On the cost side, there is, of course the cost of making and administering the loan, $(1+\theta_j)T_j{}^*$. In addition, the IFI must reduce the good government's contractual repayment by the *information rent* of $T_B^*\Delta\theta$. If the IFI cuts the loan repayment by less than this amount, the good government has an incentive to accept the contract designed for the bad government. The magnitude of this loss to the IFI depends on the cost-effectiveness difference between good and bad government, $\Delta\theta > 0$, as well as on the size of the loan to the bad government, T_B^*. The larger the loan to the bad government, the larger is the information rent received by the good government. Furthermore, maintaining political stability requires payment of the *limited liability rent* $[\pi_o/(a\Delta\pi)]\cdot[C-\underline{C}]$. It is the price that must be paid if economic reforms are to be voluntarily implemented without endangering the country's political stability. The IFI must add to this limited liability rent payment compensation to the government for the net loss in political support it suffers as the interest group disappears. This compensation amounts to *(C-$\underline{C}$)/a*, where *(C-$\underline{C}$)* is the excess of actual over minimum contributions when the interest group is active. Combining the limited liability rent and compensation for losing interest group support, the *total cost of getting the economy reformed* is $\{[\pi_o/(a\Delta\pi)] + (1/a)\}[C-\underline{C}] = [\pi_1/(a\Delta\pi)][C-\underline{C}]$, as stated in (22).[11]

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[11] For the illustrative parameter values used in footnote 8, the cost of reforming the economy is 12 percent of average GDP. This is also the total cost of providing reform incentives if the optimal loan to a bad government, T_B^*, is close to zero, or if the difference in the efficiency of different government types, $\Delta\theta$, is small.

The IFI lacks complete information on the government's effectiveness in administering the loan, the government's effort to implement reforms, and the default penalty the government will incur if it does not repay. While the first two information problems add costs to the IFI's expected return calculation, the possibility of default does not, given our assumption of a risk-neutral government. If the probability of default were zero, the IFI's expected income would remain as stated in (22). The IFI avoids any default costs by raising repayments when there is no default in order to offset the shortfall in repayments when there is default.

The IFI offers no incentive-compatible loan contract unless its expected net return, as stated in (22), is non-negative. Ceteris paribus, there exists a marginal interest group contribution value of C^* at which the IFI is indifferent between making a loan and not making a loan. Setting (22) equals zero, this marginal contribution value is:

$$C^* = \underline{C} + \left[\frac{a\Delta\pi}{\pi_1}\right]\left\{\gamma\left[E_1(y)\Delta g(T_G^*) - T_G^*(1+\theta_G) - T_B^*\Delta\theta\right] + (1-\gamma)\left[E_1(y)\Delta g(T_B^*) - (1+\theta_B)T_B^*\right]\right\}. \quad (24)$$

C^* denotes the highest level of interest group contributions (influence) at which the IFI remains willing to offer an incentive-compatible loan contract. Should the interest group be in a position of contributing more than C^* to the government, then it has the ability to block any form of incentive-compatible loan offer. The IFI would incur a loss in expected return if it offered a loan that is attractive to the government, that induces economic reforms, and that does not threaten the country's political stability. Whether the interest group is in a position to contribute more than C^* depends, of course, on how much it benefits from the existing economic policy distortions. The larger the amount of economic rent, R, generated by existing policies, the more likely it is that no incentive-compatible loan contract is forthcoming.

It follows that, as long as

$$R > C^*, \quad (25)$$

the interest group is capable of raising its financial contribution to the government to such a level that the IFI's expected return from an incentive-compatible loan becomes negative. Note that the interest group, in anticipation of the government's intention of approaching the IFI for a loan, does not have to raise its contribution to R. All it has to do is to raise it sufficiently to discourage the IFI from making a loan offer. Hence, if $R > C^*$, then at t_3 of our time line, the interest group will revise its contribution to $C = C^*$. If, on the other hand,

$$R \leq C^*, \quad (26)$$

the interest group lacks the power to stop the government from accepting an incentive-compatible loan, the economy will be reformed, and the interest group will be dislodged. Accordingly, the interest group will no longer offer a contribution and *C = 0.*

While the value of *R* indicates the power of the interest group, the value of C^* reflects the benefits from the incentive-compatible loan. Such a loan enlarges the economy's ability to produce and it leads to reforms. As can be seen from (24), the value of C^* rises with the marginal effect of the loan in augmenting production, $\Delta g(T_j^*)$, and the effectiveness of reforms in raising the probability of good economic times, $\Delta\pi$. It also is directly related to the government's dependence on public support, *a*, and the economy's output volatility, *Δy*. It is negatively related to the cost of administering loans and to the adverse selection information rent.

VIII. THE CONSEQUENCES OF RELAXING INCENTIVE-COMPATIBILITY CONSTRAINTS

The preceding section demonstrated that a loan will fail to be incentive-compatible if the interest group's rents are very high, or $R > C^*$. Either the IFI's expected return falls short of the break-even point or the IFI must relax some constraints in order to break even. Relaxing or removing the *limited liability constraints* would be most effective in raising the IFI's expected return. The risk of doing so is, of course, that the economy turns out to be weak at the time of repayment and the country experiences political turmoil. A second possibility would be to ignore the *moral hazard incentive constraints*. The problem with that, of course, is that the loan's reform incentives would disappear. In the latter case, the IFI offers a loan that does not contain incentives for policy reform. The loan might still benefit the recipient country by raising its stock of productive capital, but the second dividend stemming from the effect of improved policies on output will have vanished.

The purpose of this section is to analyze the consequences of loan programs that do not require incentive compatibility. As before, the IFI does not know the effectiveness of the government in administering the loan, there again is the possibility of default, and the terms of the loan must be consistent with the maintenance of political stability. The question we now address is whether the IFI will ever offer a loan that does not incorporate reform incentives in circumstances in which it does not find it worthwhile to offer a fully incentive-compatible loan.

The IFI's goal again is to maximize its expected return. With no reforms, the probability of a strong economy remains at π_o and the IFI's expected return becomes:

$$E(I^N) = \gamma\left[\pi_o E(\overline{r}_G^N) + (1-\pi_o)E(\underline{r}_G^N) - T_G^N\right] + (1-\gamma)\left[\pi_o E(\overline{r}_B^N) + (1-\pi_o)E(\underline{r}_B^N) - T_B^N\right] \quad (8')$$

where superscript N indicates that the loan program is not fully incentive compatible. In addition, as in (9), we define the country's expected net income at the due date of the loan as:

$$\overline{V}_j^N = \left[g(T_j^N)\overline{y} - \theta_j T_j^N - E(\overline{r}_j^N) \right] \quad \text{and} \quad \underline{V}_j^N = \left[g(T_j^N)\underline{y} - \theta_j T_j^N - E(\underline{r}_j^N) \right], \tag{9'}$$

for $j = B, G$.

The IFI's loan constraint set now consists of *participation constraints*, (10') and (11'), *adverse selection constraints*, (12') and (14'), and *limited liability constraints*, (18') and (19'), for each type of government:

$$\left[\pi_o \overline{V}_G^N + (1-\pi_o)\underline{V}_G^N \right] \geq E_o(y) \tag{10'}$$

$$\left[\pi_o \overline{V}_B^N + (1-\pi_o)\underline{V}_B^N \right] \geq E_o(y) \tag{11'}$$

$$\left[\pi_o \overline{V}_G^N + (1-\pi_o)\underline{V}_G^N \right] \geq \left[\pi_o \overline{V}_B^N + (1-\pi_o)\underline{V}_B^N + T_B^N \Delta\theta \right] \tag{12'}$$

$$\left[\pi_o \overline{V}_B^N + (1-\pi_o)\underline{V}_B^N \right] \geq \left[\pi_o \overline{V}_G^N + (1-\pi_o)\underline{V}_G^N - T_G^N \Delta\theta \right] \tag{14'}$$

$$\underline{V}_G^N \geq \underline{y} \tag{18'}$$

$$\underline{V}_B^N \geq \underline{y}, \tag{19'}$$

where we note that symbols a and C do not show up in any of the above constraints since they appear on both sides of the relations and, therefore, cancel out.

It can be shown that the participation constraint of the bad government, (11'), the adverse selection incentive constraint of the good government, (12'), and the two limited liability constraints, (18') and (19'), are binding. Solving the binding constraints for the country's expected net income yields:

$$\underline{V}_B^N = \underline{y}; \qquad \overline{V}_B^N = \overline{y} \tag{20'}$$

for a bad government in a weak and strong economy, respectively, and:

$$\underline{V}_G^N = \underline{y}; \qquad \overline{V}_G^N = \overline{y} + (T_B^N \Delta\theta)/\pi_o \tag{21'}$$

for a good government in a weak and strong economy, respectively. Consequently, when the IFI's loan is not intended to provide the recipient government incentives for policy reform, its loan repayments are structured in a way that the borrowing country's net income at repayment time is the same as it would be if there was no loan, except for a good government when the economy is strong. The good government must receive information rent when the economy is strong so that it will not select the loan contract designed for a bad government.

Substitution of (20') and (21') in (9') and solving for $E(\overline{r}_j^N)$ and $E(\underline{r}_j^N)$ enables us to restate the IFI's expected return, when there are no reforms and the level of IFI loans is expected return-maximizing, as:

$$
\begin{aligned}
E(I; \pi_o, T_j^N) = \gamma \left[E_o(y)\Delta g(T_G^N) - (1+\theta_G)T_G^N - T_B^N \Delta \theta \right] \\
+ (1-\gamma) \left[E_o(y)\Delta g(T_B^N) - (1+\theta_B)T_B^o \right]
\end{aligned}
\tag{22'}
$$

where the optimal loan choices, $T_G{}^N$ and $T_B{}^N$, require that:

$$
g'(T_G^N)E_o(y) = (1+\theta_G) \quad \text{and} \quad g'(T_B^N)E_o(y) = \left[1 + \theta_B + \frac{\gamma}{(1-\gamma)}\Delta \theta \right].
\tag{23'}
$$

As with incentive-compatible loans, the criterion for the size of an IFI loan designed for a good government is the same as it would be if the IFI had full knowledge that the government it was dealing with was indeed good; and the loan designed for a bad government is again less than it would be under full information. Also, comparing (23) with (23') and noting that $E_o(y) < E_1(y)$ and $g''(T) < 0$, one can see that insisting on incentive compatibility raises the size of loan, provided both types of loans are viable for the IFI; that is, provided both types yield a non-negative expected return for the IFI.

When the government comes to the IFI for a loan, the latter has three options: offer an incentive-compatible loan, offer a loan without insisting on full incentive compatibility, or offer no loan at all. The IFI offers no loan at all if both (22) and (22') are negative. In addition, the IFI offers an incentive-compatible loan if $E(I; \pi_1, T_j{}^*)$ is positive and greater than $E(I; \pi_o, T_j{}^N)$. In comparing the IFI's expected net returns for the two types of loans, one can see from (22) and (22') that the former depends on the magnitude of interest group contributions whereas the latter does not. Consequently, the ability of the interest group to contribute to the government's political support is critical for the IFI's decision about what form of loan it offers.

We next determine the range of interest group contributions for which the IFI offers a loan that does not incorporate reform incentives. To this end, we define another marginal

contribution level, C^N, at which the IFI is indifferent between making a loan that incorporates reform incentives and one that doesn't; that is, the value of C^N is such that $E(I; \pi_1, T_j^*) = E(I; \pi_o, T_j^N)$ or, after substituting (22) on the LHS of this equality, that:

$$\gamma\{E_1(y)\Delta g(T_G^*) - T_G^*(1+\theta_G) - T_B^*\Delta\theta\} + (1-\gamma)\{E_1(y)\Delta g(T_B^*) - (1+\theta_B)T_B^*\} - \left(\frac{\pi_1}{a\Delta\pi}\right)(C^N - \underline{C})$$

$= E(I; \pi_o, T_j^N)$. After further substitution of (24), we obtain:

$$C^N = C^* - \left(\frac{a\Delta\pi}{\pi_1}\right)E(I; \pi_o, T_j^N). \tag{27}$$

Recall that C^* is the contribution level at which the IFI's net return from an incentive-compatible loan is zero. Accordingly, the contribution level at which the IFI is indifferent between offering the two types of loan, C^N, is less than the contribution level at which it just breaks even from offering an incentive-compatible loan. It follows that there exists a range of interest group contributions at which the IFI opts for a loan that does not incorporate reform incentives rather than offering no loan at all.

Critical for the IFI's choice of loan program is again the amount of rent, R, which accrues to the interest group. If $R > C^*$, the group is always in a position to raise its contributions to a level at which it completely blocks an incentive-compatible loan. If $R < C^*$, on the other hand, then the IFI expects the incentive-compatible loan to yield a positive net return. Nonetheless, it will offer a loan that does not incorporate reform incentives if R is such that $C^N < R < C^*$. Only if $R < C^N$ is there no obstacle to a fully incentive-compatible loan that leads to economic reforms and maintains political stability.

IX. Conclusion

International financial institutions provide financial support (loans and grants) to governments implementing macroeconomic and structural reforms. The idea of tying assistance to the delivery of efficiency-boosting reforms is appealing. The resource transfer directly enhances the recipient's production possibilities while the implementation of reforms raises the efficiency with which it uses all its resources.

Political and information frictions help explain why assistance programs do not always succeed in delivering this double dividend. Politicians in recipient countries who derive substantial support from organized interest groups are reluctant to institute reforms that hurt those groups. This raises the cost of providing reform incentives to governments. Limited information adds to this cost. Recipient governments know their *type* (their ability to administer assistance) but international creditors do not, especially when recipient governments are newly installed and their competence untested. This *adverse selection* problem requires careful tailoring of assistance to ensure that each government type, with full

knowledge of its ability to implement the program, chooses the program designed for its type.[12] Recipient governments also know the extent of their reform implementation *effort*; in contrast, international creditors may be unable to monitor what governments are actually doing on the ground. This problem is likely to be more acute for reforms that have long and uncertain gestation periods and that could be challenged in the street or in courts. This *moral hazard* requires assistance programs to reward governments that preside over good economic times and "punish" governments that preside over bad ones.

This particular feature of incentive-compatible assistance presents a dilemma for its designers. While good outcomes are more likely following the arrival of international assistance and the implementation of reforms, and bad outcomes are more likely if recipients retain policy distortions, the relationship is not always tight. In addition to international assistance and domestic reform effort, good economic performance also relies on benign conditions in world commodity and financial markets, continued stability at home and in neighboring countries, and luck. Incentive schemes that incorporate significant penalties when economic conditions are already bad are likely to be unacceptable for political reasons. To avoid this, international assistance programs must satisfy certain *limited liability constraints* that restrict the harshness of the penalties they incorporate.

These political and information barriers to reform raise the cost to the international community (as represented by the IFIs) of offering incentive-compatible assistance and may even make it prohibitively expensive. We demonstrated that under certain conditions, IFIs might be better off providing assistance that does not embed reform incentives or offer no assistance at all. These conditions might arise even when IFIs have strong bargaining positions and purely selfish financial objectives (as assumed in this paper). To see why, note that the cost of offering incentive-compatible assistance is directly related to the nature and size of reform barriers in a country. From the IFI's perspective, the cost of providing assistance that embeds reform incentives rises—and its expected return declines—as the government becomes more dependent on interest groups. On the other hand, the expected return to the IFI from assistance that does not aim to facilitate reform is independent of these considerations. Even if an incentive-compatible program exists that generates a positive net expected return for the IFI, its adoption might not be in the IFI's best interest if the expected return from assistance that does not incorporate reform incentives is even higher. This assistance may well succeed in delivering a real resource transfer—the first dividend—and ensure repayment. Its drawback, of course, is that the incentives it incorporates are not powerful enough to deliver reforms and realize the second dividend. Careful analysis of barriers to reform, and the expected costs and benefits of their removal, can be helpful in guiding the expectations in the policy community and the public of what different levels of international assistance can and cannot achieve.

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[12] Tailoring of assistance is envisaged, for example, in the IMF's Conditionality Guidelines (2002).

In addition to highlighting the potentially high cost of incentive-compatible assistance, the analysis also emphasized the importance of maintaining repayment flexibility as a crucial feature of the optimal contract. Such flexibility is certainly present ex post in reality. While international assistance contracts are formally very similar to fixed interest-rate loans incorporating various subsidies, the international community periodically restructures and forgives official debts when growth in developing countries proves weak ex post. Our model suggests that menus of equity-like contracts whose repayment is indexed to real GDP growth in recipient countries may do a better job than fixed-rate loan contracts in overcoming reform barriers. Growth-indexed bonds have been advocated for commercial loans to developing countries as a way of enhancing the operation of automatic stabilizers and reducing the procyclicality of fiscal policies (see, e.g., Chamon and Mauro, 2005, p. 5). Knowledgeable observers also emphasize the quasi-equity nature of long-term official development lending (see, e.g., Gelb's remarks, in Isard and others, 2006, p. 23). The international community is involved in a long-lasting relationship with developing countries; hence, official donors and creditors are essentially taking shared bets on the recipients' long-term growth prospects. While ad-hoc debt forgiveness provides needed flexibility ex post, our analysis suggests that it may be better to acknowledge repayment flexibility when assistance programs are drawn. Systematic ex ante identification of the circumstances in which repayment would be lower could help, by lessening the need for messy ad-hoc debt forgiveness exercises and by shielding developing countries from the charge that they repeatedly fail to fulfill their contractual obligations.

Our theoretical analysis focused on incentive schemes that deliver reforms by directly altering the political relationship between the governments and existing interest groups. In reality, IFIs may be reluctant to employ such schemes. Creditor-country voters are likely to balk at the high cost of assistance that incorporates reform incentives, especially when this extra cost originates in unrepresentative and unresponsive political and economic systems in recipient countries. It may be more promising for international assistance programs to try to weaken entrenched interests indirectly. For example, international support could focus more on overcoming the collective action problems that inhibit the general public from organizing. The creation of organized constituencies in favor of reform would help counterbalance the political influence of existing anti-reform groups. IFI communication strategies, which highlight the true economic situation to the public and the objectives of reform programs, could draw more attention to the inefficient and opaque instruments facilitating political trades between politicians and special interests. IFI information, analysis, and persuasion could, over time, help unhinge reform barriers and alter political power relations in recipient countries.

Our analysis comes with another important caveat. In the model presented in this paper, the IFIs' are uninformed principals whose role as financiers is decoupled from their function as trusted advisors of sovereigns. In some important respects, however, IFIs may be better

informed than recipient governments on what needs to be done. IFIs are "knowledge banks" and "delegated monitors" that bundle the disbursement of their loans with the implementation of key policy recommendations. IFIs are well placed to play this role: their surveillance of national, regional, and global economic conditions and provision of specialized technical assistance services to governments allows IFIs to produce much information and analysis. Surveillance and technical assistance are justifiable IFI activities because they concentrate in areas with economy- or sector-wide spillovers that do not crowd out the private sector (see Rodrik, 1995, p. 8). IFI expert advice thus helps governments identify reform priorities and design and execute policy reform strategies; their readiness to commit financing, in turn, raises the credibility of IFI policy advice and makes it easier for recipients to implement reforms that may be costly in the short run. The design, monitoring, and agency cost of international assistance programs that tie together the provision of financing with that of information, analysis, and advice is an important research priority.

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