Multilateral Negotiations for Rescheduling Developing Country Debt

A Bargaining-Theoretic Framework

JEREMY BULOW and KENNETH ROGOFF*

A dynamic bargaining-theoretic framework is used to analyze multilateral negotiations for rescheduling sovereign debt. The analysis illustrates how various factors, such as the debtor's gains from trade and the level of world interest rates, affect the relative bargaining power of various parties to a rescheduling agreement. If creditor-country taxpayers have a vested interest in maintaining normal levels of trade with debtor countries, then they can sometimes be bargained into making sidepayments. The benefits from unanticipated creditor-country sidepayments accrue to both lenders and borrowers. But the benefits from perfectly anticipated sidepayments accrue entirely to borrowers.

IN SOVEREIGN DEBT contracts, borrowers are unable to offer collateral in the traditional sense. Instead, lenders must rely on the sovereign country's desire to maintain unfettered access to world capital and goods markets. But although the costs of being forced into economic autarky are almost certainly enormous for most debtor countries, the bargaining over debt repayments is not entirely one-sided. Debtor countries have some leverage because foreign lenders do not directly benefit by cutting them off from world markets. Moreover, in punishing a debtor who

* Mr. Bulow is a Professor in the Graduate School of Business at Stanford University.

Mr. Rogoff is a Professor of Economics at the University of Wisconsin, Madison. This paper was prepared while he was a visiting scholar in the Research Department of the Fund.

repudiates, lenders may also be inflicting damage on their own compatriots. In particular, they will be hurting any creditor-country citizens who benefit from trade with the debtor. A conflict of interest can arise among different groups in the creditor countries, pitting investors who want to enforce maximum repayments against consumers and exporters who want to maintain normal trade relations.

This paper attempts to develop a formal bargaining-theoretic model that takes into account the multilateral dimensions of developing country debt reschedulings. Previous efforts to model sovereign debt contracts have typically focused only on the bilateral relationship between the debtor nation and its foreign private creditors, taking the behavior of creditor-country governments as exogenous.[1] Because it would be rather difficult to develop a complete general equilibrium, game-theoretic model of international economic relations, we do need to treat some aspects of creditor-country policy as exogenous. In particular, we take the creditor nations' political and legal systems as given. Nevertheless, our analysis yields some insights that we believe would hold up in a richer model.

Our central result is that if creditor-country citizens enjoy sufficiently large gains from trade with the debtor country, they may be induced to facilitate rescheduling agreements by contributing money or by consenting to policy changes that would be favorable to .he debtor country or the banks (that is, by making "sidepayments"). They may be induced to make sidepayments even though all parties have a common interest in avoiding trade disruptions. But there is an important distinction between anticipated and unanticipated sidepayments. Unanticipated sidepayments benefit both debtors and bank stockholders. If, however, lenders anticipate receiving third-party sidepayments, they will be willing to lend more at any given interest rate. With competitive loan markets, the borrowing country is thereby able to extract the entire surplus.

I. Sovereign Debt Contracts Versus Domestic Debt Contracts

To motivate our bargaining-theoretic approach to analyzing developing country debt rescheduling negotiations, it is helpful to review why sovereign debt contracts work somewhat differently from domestic lending contracts.

---

[1] For an analysis of the case where bargaining is bilateral, see Bulow and Rogoff (1989a). See Eaton, Gersovitz, and Stiglitz (1986) for a discussion of the early literature, in which creditors are implicitly assumed to have all the bargaining power.

If a supranational legal authority capable of enforcing contracts across borders existed, there would be nothing unique about international debt contracts. One could, in principle, include the same clauses and covenants in international loan contracts that are typically built into domestic contracts, and one could have international bankruptcy courts parallel to domestic ones. There might still be frictions in international capital markets—that is, reasons for departure from the Arrow-Debreu world of complete (perfect) capital markets. Having a world legal authority does not eliminate adverse-selection and moral hazard problems.[2]

In practice, of course, cross-border contract enforcement is generally limited. Indeed, the real question is why foreign investors are willing to trust sovereign debtors at all. If there were no direct or indirect costs to default, sovereigns would have no incentives to pay. Since one actually observes sovereign loans, there must be some costs to default, but what are they? Though foreign creditors may not always be successful in pressing their claims in debtor-country courts, they do in general have meaningful rights within their own countries.[3] Creditors' rights depend in part on their political influence at home, but also on their ability to employ the creditor-country legal system. Through the legal system, creditors can make it difficult for their fellow citizens to transact with any sovereign that stands in default. A recalcitrant debtor will thus have problems holding assets abroad, employing bank intermediaries to conduct trade, and even exporting and importing.[4] These inconveniences may appear minor, since gains from trade (in goods and financial assets) are a *flow*, and the flow is typically small relative to the *stock* of a borrower's debt. But if one recognizes that a repudiating country may suffer reduced gains from trade for an extended period, it is clear that the cumulative losses can be enormous.

Whereas a country's gains from trade are in some sense a form of collateral, three key differences serve to strengthen the negotiating position of a defaulting borrower relative to the standard domestic case. First, a sovereign debtor has considerable potential to reduce tempo-

[2] Even if no special problems enforcing contracts across national borders existed, one still could not index legal contracts to variables that are only observed by one of the two contracting parties, or to variables that both parties observe but that are prohibitively expensive for a third party (for example, a court) to verify.

[3] An alternative view holds that sovereign debtors repay mainly to preserve their reputation for repayment in world capital markets. For a skeptical assessment of this view, see Bulow and Rogoff (1989b).

[4] For a discussion of the empirical evidence on lenders' ability to punish borrowers, and of some of the underlying legal issues, see Alexander (1987) or the Appendix to Bulow and Rogoff (1989a).

rarily its exposure to penalties while bargaining with its lenders. For example, a debtor can use circuitous, and presumably more costly, trade routes and trade mechanisms to avoid seizure of its property during negotiations. Second, most of the penalties at the disposal of lenders involve large deadweight costs. In the case of a domestic bankruptcy, creditors can, in principle, simply carve up and sell a firm's productive assets.[5] Lenders gain no such direct benefit by forcing a country into economic autarky. On the contrary, creditors may have to bear significant legal and lobbying costs. Third, the punishments inflicted by lenders on sovereign debtors may also harm other creditor-country citizens. If lenders are successful in stemming a debtor's trade flows, exporters and importers in creditor countries also lose. This externality gives both creditors and debtors a certain amount of bargaining power in relation to other citizens in the creditor country.

For all the reasons discussed above, bargaining issues seem particularly central to developing country debt contracts.

II. Bilateral Rescheduling Negotiations: The Basic Model

Before turning to multilateral debt rescheduling negotiations, we first review the bilateral case in which the behavior of creditor-country governments is treated as exogenous. We will deliberately try to keep the underlying macroeconomic model quite simple, in order to focus on bargaining factors.[6]

Consider a small country facing an exogenously given world interest rate r; initially it has no foreign debt. The country's utility function is given by

$$\Lambda_t = \sum_{i=0}^{\infty} C_{t+hi}/(1 + \delta h)^i, \qquad C \geq 0, \tag{1}$$

where C is domestic consumption of an imported good, $\delta(> r)$ is the country's discount rate, and h is the length of each period.[7]

Note that the country's utility function is linear in C. The assumption of risk neutrality greatly simplifies our later analysis of the dynamics of

---

[5] We are somewhat overstating the differences between domestic and international contracts here. Indeed, many of the bargaining issues analyzed here are present in the domestic setting, albeit in less acute form.

[6] The discussion of bilateral bargaining here is based on our earlier paper (Bulow and Rogoff (1989a)).

[7] Allowing the time interval to be of arbitrary length h will make it easier later to consider the limiting case of continuous bargaining.

debt rescheduling negotiations. However, because the country is risk neutral, it is not concerned with smoothing out its consumption over time. Consequently, the country's sole motive for borrowing is that its discount rate, δ, is greater than the world interest rate, r.

Each period, the country produces yh units of an export good. Production is exogenous; there is no investment. Each unit of the export good can be traded abroad for P units of the imported consumption good. Thus, the country's consumption in period t is given by

$$C_t = PT_t, \tag{2}$$

where T_t denotes exports in period t. If, however, the country stands in default on its foreign debt and has not yet reached a rescheduling agreement, creditors can prevent the country from trading. This assumption is extreme, but very similar results would obtain if the creditors were able to forestall only a fraction of the country's shipments. Although the country is unable to trade after repudiating its debt, it can store its export good while it negotiates. The storage technology is such that

$$S_{t+1} = (1 - \gamma h)S_t + yh - T_t, \qquad \gamma h < 1, \tag{3}$$

where S_t is the amount of the export good the country has in storage when entering period t, and γh is the depreciation rate. That is, the amount of the export good the country has in storage when entering period $t + 1$ is equal to the amount of the good it had in storage when entering period t, plus production of the good during period t, yh, less depreciation and less any amount traded abroad, T. The country need not be able to store its export good for extended periods. The good has to be kept in storage only long enough for the country to be able to exchange offers and counteroffers with its creditors.

We must now be more precise about our specification of international loan markets. When the country goes to borrow in the initial period, it can approach any one of a large number of competitive risk-neutral banking consortia. These consortia are willing to lend money as long as they anticipate receiving at least the market rate of return. We assume that, through cross-default clauses, a consortium can deal with the country as a unified entity. The type of bargaining model employed here is actually quite useful for analyzing the effects of conflicting interests among lenders, but these issues are not considered here.[8]

As we have already explained, the debtor country cannot offer collateral on loans, but it can sign legal contracts valid in lender-country

[8] The model here may be thought of as holding constant the aggregate bargaining power of the banks relative to the country. In the bargaining analysis below, this is tantamount to saying that the banks' share of the offers is fixed.

courts. These contracts allow lenders to seize the debtor's assets abroad in the event of repudiation (that is, if the country fails to fulfill its interest obligations and does not reach a rescheduling agreement).[9] There may be large deadweight costs associated with seizure (for example, legal fees), so that the value that lenders receive is less than the value that the debtor loses. We will assume that lenders do not benefit directly from interfering with the country's trade (only the lawyers benefit). None of the results below hinges on this assumption. The country's bargaining power actually derives from its ability to store its export good at home and avoid seizure while negotiating a rescheduling agreement. In practice, the ability to circumvent seizure is not the country's only source of bargaining power, but, for analytical purposes, the paradigm is a convenient one.

III. Equilibrium Under Bilateral B'rgaining

Because there is no uncertainty in the model, the country's lending limit is determined simply by the maximum amount lenders can bargain it into repaying.[10] If rescheduling negotiations were completely one-sided, lenders could extract repayments each period up to the full value of the country's output. In this case the country's borrowing ceiling would simply be (in the limit as $h \rightarrow 0$)

$$\Re = Py/r, \tag{4}$$

or, in words, the world market value of a claim on the country's entire future income. Of course, if the country has any bargaining power, lenders will realize that it cannot be forced into paying over its full gains from trade, and the country's true lending limit will be lower than the amount given by equation (4). To model the bargaining over rescheduling as two-sided, we adopt the alternating-offer framework first proposed by Rubinstein (1982) in his classic paper on bargaining. The debtor and the creditor take turns each period at making offers on how much the country has to pay to be allowed to trade freely its current production and any of the export good it has in storage. Whenever an agreement is reached, the banks sign a rescheduling agreement that

---

[9] The banking consortium typically includes representatives from all the borrower's major industrial country trading partners; this situation maximizes lenders' legal rights in the event of default.

[10] As Bulow and Rogoff (1989a) show, it is not difficult to allow for uncertainty in this framework. The focus here is on the extension to multilateral bargaining; our main results do not depend on the assumption of perfect foresight.

places the country in good standing on its debts until the next period. This agreement allows the country to trade freely provided that it makes the current payment specified in the rescheduling agreement.[11] If no agreement is reached, because the banks reject the country's offer or vice versa, the country places its production in storage to await further negotiations. The country's borrowing limit is then determined by the maximum amount creditors believe they can induce the country to repay through bargaining. It should be emphasized that the present problem differs from Rubinstein's problem in that here no agreement can be final. The debtor always retains the option of reopening negotiations at a later date.

Note that if lenders could really anticipate the outcome of this bargaining, they would know exactly how much they could lend the country without being forced to reschedule later. If uncertainty was introduced, of course, reschedulings would occur unless debt contracts were perfectly indexed to all disturbances. Reschedulings can also be explained by the desire to induce third-party sidepayments, as in the analysis in Section IV.

We do not present here all the intermediate steps required to solve formally for a bargaining equilibrium; we will present the essential details for the multilateral case later. Besides, the most important result for our later discussion can be deduced just by noting that there is no private information in this model. (This assumption is equivalent to specifying that all agents have equal knowledge about all the parameters of the model.) It is well known (see Sutton (1986)) that in Rubinstein-type bargaining models an agreement will always be reached without delay under symmetric information for two reasons: because both sides can calculate what will happen if they continue to bargain and because both sides know that they will not be believed if they make outrageous threats. Thus, banks would disregard any country that said "give me almost everything or I'll stop negotiating." Banks can refuse the offer because they know the country must eventually return to the bargaining table. Because both the country and the banks are impatient to come to an agreement, it is not worthwhile for either to make offers that will surely be refused.[12] The equilibrium division of the gains from trade can be

[11] In practical terms, it is best to think of this payment as the net resource transfer from the country to its creditors. The net resource transfer is essentially the country's current interest payment minus any so-called new money loans.

[12] Although we do not stress it here, there is actually a fundamental difference between our model and Rubinstein's. In Rubinstein's model, once an agreement is reached, it cannot be renegotiated. Here, the country always has the option of asking for rescheduling of the agreement. To solve this problem in general is quite difficult, but it is possible to solve the model for the risk-neutral case considered here.

shown to depend on the relative rates of impatience of the two parties. Denoting q as the banks' share of the country's output, Py, one can derive

$$q = (\delta + \gamma)/(\delta + r + 2\gamma). \tag{5}$$

The numerator in equation (5), $\delta + \gamma$, is the sum of the country's rate of time preference, δ, and the rate at which the goods depreciate in storage, γ. This sum may be thought of as the country's effective discount rate. Similarly, the banks' effective discount rate is $r + \gamma$, so that each party's share is inversely proportional to its rate of time preference. Having solved for q, we can then write the country's lending ceiling as

$$\Re = qPy/r; \tag{6}$$

that is, the present discounted value of the maximum repayments banks can bargain the debtor country into making.

The case of symmetric information is certainly not completely realistic, and it is necessary to relax this assumption to explain delays in reaching agreements. The present analysis, however, still yields some useful insights; in addition, one might argue that this case helps to explain why international lending negotiations do not break down more often.

IV. Rescheduling Negotiations
Involving Creditor-Country Taxpayers

The preceding analysis is based on the implicit assumption that creditor-country taxpayers can precommit to staying out of any rescheduling negotiations, even if they would be hurt by a disruption of trade with the debtor. Here we show that, although creditor-country taxpayers might benefit from such a commitment, the taxpayers may not be able to make the commitment credible. This can be the case even if all the relevant parties believe that the debtor country and the banks would come to an immediate agreement without third-party involvement. The key parameter governing sidepayments is the relative magnitude of the two countries' gains from bilateral trade. On the one hand, if the creditor country enjoys gains from bilateral trade on the same order of magnitude as the debtor country, then the creditor country may be induced to make sidepayments to both the debtor and the banks. On the other hand, if the debtor's gains from trade are much larger, then it may be the debtor that has to make sidepayments to the creditor. (Obviously, political and strategic factors can also affect the benefits calculus, but we do not explicitly incorporate them here.)

Although we allow for creditor-country government participation in rescheduling negotiations, we continue to assume that the creditor-country legal system is constitutionally immutable and not subject to manipulation by the legislative or executive branches. Hence, borrowers can still sign contracts that give creditors meaningful legal rights in the event of default. Implicitly, the creditor country is assumed to be unwilling to undermine its valuable legal system just to improve its negotiating position in relation to a relatively small debtor. This assumption may be too extreme; in practice, creditor-country governments appear to exercise a considerable degree of latitude over the intensity of enforcement of sovereign debt contracts. Nevertheless, it might be very costly for the executive branch to avoid enforcing the contracts entirely, and this weaker assumption is all that is really necessary for our results.

Thus far we have been describing the debtor country as small, and we will continue to assume that it is small in world capital markets. But we will now also assume that the debtor is large in the sense that the creditor country gains from their bilateral trade. There are two possible rationales for this assumption, and either can be used to motivate the multilateral bargaining analysis. The most straightforward assumption is that the debtor is large in the market for the good it produces. An alternative assumption, which turns out to be considerably more convenient here, is to posit that the debtor is one of a large number of suppliers of a good that the creditor country consumes heavily but does not produce. When the debtor reduces its exports, the price of the good rises. The benefits of the price rise are spread across a large number of producers, so that, to a first approximation, the debtor views its marginal revenue as equal to the price of its export good, P. The creditor country, in contrast, is the main consumer of the good, and the burden of the price rise therefore falls primarily on its citizens.

The objective function of the creditor country is to maximize the present discounted value of consumer surplus:[13]

$$\Psi_t = \sum_{i=0}^{\infty} (zPT_{t+hi} - B_{t+hi})/(1 + rh)^i, \tag{7}$$

where T represents imports from the debtor country, B represents side-payments to the banks and the debtor country (which can be negative), and zP represents the creditor country's gain in consumer surplus per unit of imports from the debtor. The creditor government's interest rate

[13] Note that we are assuming that the profits of bank investors do not enter into the creditor-country government's utility function. Similar results obtain as long as the creditor-country government values an extra dollar of bank profits less than an extra dollar of government surplus.

is taken as equal to the world interest rate r, but this assumption is easily modified.

The objective functions of the debtor country and the banks remain as described in Section II above, but to simplify the exposition we will assume that $\gamma = 0$, so that the good does not depreciate in storage. To close the model, it is still necessary to provide some details about the three-way bargaining process that governs debt rescheduling negotiations. We will again adopt a variant of the Rubinstein alternating-offer framework, but since three-player bargaining models have not been studied previously in the literature on sovereign debt, more detail is necessary here.

To calculate the borrower's debt ceiling, it is useful to assume initially that the debtor country owes an *infinite* amount, so that no trade can ever take place without a rescheduling agreement. The borrower's debt ceiling is then given by the present discounted value of the banks' receipts. In a nonstochastic model such as the present one, marginal increases in the face value of a borrower's obligations are meaningless once the debt ceiling is reached.

Any rescheduling agreement must be signed by both the banks and the debtor country. The creditor-country government's consent is required only if the agreement calls on it to make positive sidepayments.[14] (If the creditor country's gains from trade are small enough, it may actually receive sidepayments outside the context of the rescheduling negotiations; we consider this issue below.) In three-way rescheduling negotiations, each of the three parties takes turns making offers on how to divide the total gains from trade for the current period. An agreement is reached only when all three parties consent. If no agreement is reached, the debtor country adds current production to its stockpile, and all sides await the next round of offers.[15]

In any period t, the total surplus to be divided among the three parties is the sum of the creditor's gains from trade zPv_t, plus the debtor's gains from trade Pv_t. The term v_t denotes the total amount of debtor-country production available for current trade (including quantities of the good from storage). Our notation for describing the negotiation process under alternating offers is as follows. When it is the banks' turn to make an

---

[14] Note that the creditor-country's sidepayments can take many forms other than cash payments: military assistance, a lowering of tariffs, changes in immigration laws, and so forth.

[15] The analysis would be similar if the creditor country also could store some of its own export good. The key assumption here is that both sides' gains from trade are linear in the level of bilateral trade; the model is much easier to solve in the linear case.

offer, they offer themselves $100q$ percent of the total gains from trade, $Pv_t(1 + z)$, and they offer the creditor-country government $100w$ percent. Thus, if the banks' offer is accepted, the debtor country would receive $100(1 - q - w)$ percent. When it is the debtor's turn to make an offer, it offers the banks $100q'$ percent of the surplus, and it offers the creditor-country government $100w'$ percent. When it is the creditor-country government's turn, it offers the debtor $100(1 - q'' - w'')$ percent of the surplus, and it offers the banks $100q''$ percent. When an agreement is reached, the debtor country exports, the gains from trade are divided according to the agreement, and negotiation begins immediately on the gains from trade for the next period.

Having fully specified the model, it is straightforward to show that the following conditions must hold in any perfect equilibrium for all $s \geq 0$, where s is a multiple of 3:[16]

$$1 - q_s - w_s = [1 - q'_{s+1} - w'_{s+1}]/(1 + \delta h) \tag{8a}$$

$$w_s = \min[w'_{s+1}/(1 + rh), \quad z/(1 + z)] \tag{8b}$$

$$q'_{s+1} = q''_{s+2}/(1 + rh) \tag{8c}$$

$$w'_{s+1} = \min[w''_{s+2}/(1 + rh), \quad z/(1 + z)] \tag{8d}$$

$$1 - q''_{s+2} - w''_{s+2} = [1 - q_{s+3} - w_{s+3}]/(1 + \delta h) \tag{8e}$$

$$q''_{s+2} = q_{s+3}/(1 + rh). \tag{8f}$$

The intuitive interpretation of equations (8a)–(8f) is also straightforward. Equations (8a) and (8b), for example, state that when it is the banks' turn to make an offer, they will craft the offer such that both the other players are just indifferent between accepting the offer and waiting until the next period (when it will be the debtor country's turn to make an offer). The left-hand side of equation (8a) gives the value to the debtor country of accepting immediately, whereas the right-hand side gives the present discounted value to the debtor of reaching an agreement in the next period (when it will be the debtor's turn to make an

---

[16] The derivation of equations (8) follows the same algorithm presented in Bulow and Rogoff (1989a) for the bilateral case. In deriving the conditions for an equilibrium bargain, we have not allowed for history-dependent strategies. One can show, however, that the equilibrium considered in the text is the unique equilibrium of the limiting finite-horizon game, and it is also the unique equilibrium when strategies are continuous in the history of the game; see Sutton (1986).

offer). The debtor country discounts the share it would receive from a deal in the next period by $1/(1 + \delta h)$. Similarly, the left-hand side of equation (8b) gives the value to the creditor country of accepting the banks' offer, and the right-hand side gives the value to the creditor country of waiting for the next round; note that the discount rate it uses is $1/(1 + rh)$. The creditor-country's payoff is written as min $[\cdot]$ because we are assuming that the creditor country has to sign the agreement only if it is called on to make positive sidepayments. So if the creditor country's share from participating in rescheduling negotiations exceeds its own gains from trade, its commitment not to make sidepayments becomes credible, and the analysis is then the same as in the bilateral case. (There is even the possibility that the creditor country might be able to *extract* sidepayments from the debtor; we return to this question below.)

Formally, equations (8a)–(8f) comprise a system of first-order difference equations in which all the roots lie outside the unit circle. (In macroeconomic jargon, the system is saddle-point stable.) The unique equilibrium (in the limit of continuous bargaining as $h \rightarrow 0+$) is given by

$$q = q' = q'' = \delta/(2\delta + r) \tag{9a}$$

$$w = w' = w'' = \delta/(2\delta + r) \tag{9b}$$

$$(1 - q - w) = (1 - q' - w') = (1 - q'' - w'') = r/(2\delta + r). \tag{9c}$$

As in the case of bilateral bargaining, an agreement is reached immediately, and each party's share depends inversely on its discount rate (recall that we have set γ to zero here). A more patient player has greater capacity to threaten credibly to wait and therefore can demand a better offer.

We will focus first on the case in which the creditor's gains from trade are greater than its share of a three-way bargain, so that

$$zPy - Py\delta(1 + z)/(2\delta + r) > 0. \tag{10}$$

If the creditor country is making positive sidepayments in equilibrium, then both the banks and the debtor country get a larger payoff than in the absence of creditor-country participation:

$$Py\delta(1 + z)/(2\delta + r) - Py\delta/(\delta + r) > 0 \tag{11a}$$

$$Pyr(1 + z)/(2\delta + r) - Pyr/(\delta + r) > 0. \tag{11b}$$

The second term on the right-hand side of equation (11a) is the payoff to banks under bilateral bargaining (see equation (5), and recall that $\gamma = 0$). The first term is the payoff under three-way bargaining. Thus no

conflict of interest arises between the banks and the debtor country about whether to bring in the third party.

If creditor-country sidepayments are anticipated at the time of borrowing, the debtor country will be able to obtain a larger loan. The size of the maximum loan, $\Re$, depends on the present discounted value of the banks' share in any rescheduling agreement, so that

$$\Re = qPy(1 + z)/r. \tag{12}$$

There is an important distinction between anticipated and unanticipated creditor-country sidepayments. Unanticipated sidepayments benefit both the banks and the debtor country. The benefits of perfectly anticipated sidepayments, however, accrue entirely to the debtor country. Lenders are competitive, and thus earn zero profits on the loan (if there are no surprises). Therefore, the anticipation of creditor-country sidepayments just means that the borrowing country can take out a larger loan, with the creditor country effectively making the additional payments. As a detail, note that the amount by which the right-hand side of equation (12) exceeds the right-hand side of equation (6) does not quite equal the full discounted value of the creditor-country sidepayments, because the banks anticipate that the debtor country will be able to retain a larger share of its gains from trade when the creditor country becomes involved in negotiations.

How can the creditor-country taxpayers be induced to make sidepayments when they know that the banks and the debtor country would immediately arrive at a rescheduling agreement without their participation and, moreover, that this agreement would fully protect their gains from trade? The problem faced by the creditor-country taxpayers is that when their gains from trade are large enough, they cannot *credibly* refuse to bargain. The creditor country could, of course, avoid making sidepayments by abrogating the legal contracts between the banks and the debtor, thereby preventing the banks from impeding trade. We have assumed that the creditor country is unwilling to take this course, because the potential benefits are outweighed by the long-term damage to its legal system. Of course, if the creditor country planned on giving foreign aid to the debtor country anyway (aid in excess of the sidepayments it has to make in any rescheduling negotiations), the advent of debt merely converts a voluntary gift into a coerced contribution.

Thus far, we have focused on the case in which it is the creditor country that is called on to make sidepayments. If the inequality in equation (10) is reversed, then the creditor country's gains from trade are small enough for it to credibly commit to not making payments; with less to lose it can just outwait the other parties. It is even possible that

the creditor country will be able to extract sidepayments from the debtor in order to allow bilateral trade. Nevertheless, the debtor could still use bank loans to reduce the discounted value of the sidepayments it has to make. Bringing in the banks may actually enhance the bargaining power of the debtor, as in the case considered above. The critical question, again, is whether the creditor country is able to abrogate easily the banks' lending contracts and undermine their bargaining position.

V. Concluding Remarks

This paper has provided a general bargaining-theoretic framework for analyzing multilateral debt rescheduling negotiations. Because our main results were summarized in the introduction, we conclude by observing that our approach to international trade negotiations differs sharply from the traditional literature on tariff wars (for example, Johnson (1954)). Our analysis predicts that all efficient *contemporaneous* trades are made. Although both sides may make threats, these threats are never executed in equilibrium. Threats do govern the distribution of the gains from trade, but only credible threats matter; that is, threats that the bargainer would carry out if called on to do so. The debtor country's inability to commit not to bargain over repayments does, however, lead to distortions in *intertemporal* trade.

REFERENCES

Alexander, Lewis S., "The Legal Consequences of Sovereign Default," (unpublished; Washington: Board of Governors of the Federal Reserve System, 1987).

Bulow, Jeremy, and Kenneth Rogoff (1989a), "A Constant Recontracting Model of Sovereign Debt," *Journal of Political Economy* (Chicago), Vol. 97 (February, forthcoming).

——— (1989b), "Sovereign Debt: Is to Forgive to Forget?" *American Economic Review* (Nashville, Tennessee), Vol. 79 (March, forthcoming).

Eaton, Jonathan, Mark Gersovitz, and Joseph E. Stiglitz, "The Pure Theory of Country Risk," *European Economic Review* (Amsterdam), Vol. 30 (June 1986), pp. 481–513.

Johnson, Harry G., "Optimum Tariffs and Retaliation," *Review of Economic Studies* (Edinburgh), Vol. 21 (1954), pp. 142–53.

Rubinstein, Ariel, "Perfect Equilibrium in a Bargaining Model," *Econometrica* (Evanston, Illinois), Vol. 50 (January 1982), pp. 97–109.

Sutton, John, "Non-Cooperative Bargaining Theory: An Introduction," *Review of Economic Studies* (Edinburgh), Vol. 53 (October 1986), pp. 709–24.