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The Role of International Organizations in the Bretton Woods System

Kathryn M. Dominguez

With the world at war, participants from each of the Allied countries convened on 1 July 1944 in Bretton Woods, New Hampshire, to create a new international monetary system. The breakdown of the interwar gold standard, and the mutually destructive economic policies that followed, convinced leaders that a new set of cooperative monetary and trade arrangements was a prerequisite for world peace and prosperity. The outcome of the conference, known as the Bretton Woods Agreement, included the creation of an adjustable peg exchange rate system and the establishment of two international organizations that would maintain economic cooperation among the participating countries. To this end, the conference participants drafted charters for the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (the World Bank). At the Havana conference in 1947, participants formulated a charter for the International Trade Organization (ITO).¹ Member

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1. Discussions and disagreements between the United States and Britain on trade policy began as early as 1940 and continued throughout the war in the context of Article VII of the Mutual Aid Agreement (Lend Lease). In September 1943, the two countries reached a short-lived "understanding" on trade, the Washington Principles. But by 1944 the United States backed away from this broad, across-the-board approach to trade liberalization, and the United Kingdom followed suit. As a consequence, the British delegation to the Bretton Woods conference was under a strict cabinet directive not to discuss trade policy with their U.S. opposite numbers. The United Kingdom reluctantly agreed to support a U.S. proposal for an international conference on trade and employment (the Havana conference) during the Anglo-American Financial Agreement negotiations.

countries subsequently ratified the charters for the IMF and the World Bank,² while the General Agreement on Tariffs and Trade (GATT) eventually subsumed some of the original goals of the ITO.

This paper examines the roles played by these organizations in maintaining the Bretton Woods system. Theory indicates that, even if countries understand that cooperation will lead them to a Pareto superior outcome, they need not cooperate unless they are convinced that other countries are also committed to doing so. In this context, international organizations can facilitate cooperation by serving as commitment mechanisms. Cooperation in the Bretton Woods system involved the maintenance of stable exchange rates and unrestricted trade among member countries. The commitment mechanisms that the Bretton Woods institutions provided member countries included rules of cooperation, financial resources to enable them to play by the rules, and a centralized source of information on each others' commitment to the rules.

In practice, the two Bretton Woods institutions and the GATT had limited success convincing their members to maintain cooperative arrangements. The evidence suggests that both the carrot and the stick that the institutions employed were weak commitment mechanisms. First, the main institutional carrot, financial assistance, was not always available to countries that played by the rules of the game. Countries were ineligible for assistance once their accumulated debt exceeded their capacity to repay. Second, the historical record shows that the institutions rarely wielded the stick, in that they did not consistently enforce the rules of the system. Third, the GATT's relatively relaxed rules of the game effectively provided countries a trade controls escape route from the limits that the IMF required be observed for exchange controls.

While all three organizations were ultimately unable to convince countries to maintain the cooperative behavior envisioned by their architects in the 1940s, the organizations survived the collapse of the Bretton Woods system by evolving with the changing economic environment. The IMF, in particular, broadened its role as a centralized source of information on member country economic performance. Postwar history suggests that information monitoring and sharing has been a relatively effective commitment mechanism for all three international organizations.

The paper is organized as follows. Section 7.1 describes the international cooperation problem in theory. A stylized exchange rate game is presented to highlight individual country incentives to cooperate. Practical difficulties in achieving decentralized cooperation are then described along with three potential solutions to the problem. Section 7.2 examines the goals of the architects of the Bretton Woods system and the institutions that were created to facilitate the achievement of those goals. Section 7.3 presents two examples that illustrate the conditions under which institutions can provide countries

2. With the exceptions of the Soviet Union, Liberia, and New Zealand, all the nations that participated in the Bretton Woods conference ratified the charters for the IMF and the World Bank.

effective incentives to maintain cooperation, and section 7.4 presents empirical evidence on the actual performance of the postwar institutions. Section 7.5 discusses the more recent evolution of the IMF's role in maintaining international cooperation. Section 7.6 presents conclusions and lessons for future cooperative arrangements.

7.1 The International Cooperation Problem in Theory

Many of the participating countries at the Bretton Woods conference contributed both to the establishment and to the breakdown of cooperative arrangements in the interwar period. They were thus well aware of the incentives that led countries to defect from the gold standard. Game theory allows us to examine these incentives formally. When two countries interact in a game in which each can do better individually by taking a particular action, a unique Nash equilibrium exists in which both take the action even though they are jointly worse off. In such games, it is easy to show that an outcome in which neither country takes the action is Pareto superior to the uncooperative solution to the game. Even when both countries understand this, it is typically difficult to arrive at this better equilibrium without the help of a commitment mechanism. Neither country will cooperate unless each can be convinced that the other is also committed to doing so.

Section 7.1.1 provides a stylized example of the sort of exchange rate game played by countries in the interwar period. In the game, countries have an incentive to devalue but can be made better off if they commit not to do so. Section 7.1.2 discusses why the Pareto-superior cooperative solution is difficult to achieve, and section 7.1.3 presents three possible solutions to this problem.

7.1.1 The Devaluation Game

Consider a model in which two countries, home (H) and foreign (F), face an established fixed exchange rate system. Assume that both countries initially declare par values against gold. Each country in this model then has two policy options, to defect from the system by devaluing the domestic currency against gold or to maintain the par value of the domestic currency. If one country devalues and the other maintains its par value, the country that devalues gains a trade surplus (α).³ However, a country that devalues also incurs a cost (C) for defecting from the fixed exchange rate system. The existence of this devaluation cost is a common assumption in the literature. Eichengreen describes it as “a transactions cost associated with the existence of more than one currency (analogous to extra costs of interstate trade in the United States if there existed 50 state monies, all floating against one another)” (Eichen-

3. This abstracts from complications arising from J-curve effects and the failure of the Marshall-Lerner condition to hold.

green 1987, 7). More generally, countries would presumably not agree to be members of a fixed exchange rate system unless they believe to some degree that exchange rate instability is costly. Assume, however, that the benefits from unilateral devaluation outweigh the costs ($\alpha > C$). The payoffs for each country in this game are described in figure 7.1.

This game is an example of the classic prisoner's dilemma and has an equilibrium in dominant strategies in which both countries devalue. And, as long as devaluation is costly ($C > 0$), this is the only Nash equilibrium for the game.⁴ Moreover, when $C > 0$, the Nash equilibrium is Pareto inferior to the cooperative solution where neither country devalues.

This is the type of cooperation problem that participants at the Bretton Woods conference in 1944 had in mind when they set about creating a new international monetary system. During the 1930s, many countries defected from the gold standard system that was established after World War I. Countries engaged in competitive devaluations, hoping both to conserve gold and to shift world demand toward domestic output. The devaluations largely offset each other, but countries combined beggar-thy-neighbor exchange rate policies with trade and capital restrictions that left all countries worse off.⁵

Much of the discussion that led up to the Bretton Woods conference centered around the creation of international organizations that would insure against a repeat of the collapse in cooperation that occurred in the 1930s. Before examining the possible roles of these organizations in the maintenance of the system, it is useful to determine whether there exist conditions under which countries have individual incentives to achieve the cooperative equilibrium. The Folk Theorem suggests that, if we place our model in a repeated game setting, a cooperative outcome may emerge without the help of external institutions.⁶

In the one-period game, each country maximizes its payoff taking the actions of the other as given. If, instead, the game is played repeatedly, countries can condition their actions in each period on what has occurred in the past. Let P_t^H (P_t^F) be the payoff to the home (foreign) country in period t and π^H (π^F) its total stream of payoffs from the game, appropriately discounted,

$$(1) \quad \pi^H = \sum_{t=0}^{\infty} \delta^t P_t^H,$$

where δ is the common discount factor ($0 < \delta < 1$).

4. If devaluation is costless ($C = 0$), the only Nash equilibrium will be one in which both countries devalue, but it no longer involves the use of (strongly) dominant strategies.

5. Bordo (chap. 1 in this volume) suggests that the perception, during and after World War II, that countries' policies in the interwar period were destructive was incorrect. However, for purposes of explaining the goals of the participants at the Bretton Woods conference, it is the perception, and not the reality, that is important.

6. For a general discussion of equilibrium concepts in repeated games, see Kreps (1990, chap. 14).

		FOREIGN	
		NOT DEVALUE	DEVALUE
HOME	NOT DEVALUE	0,0	$-\alpha, \alpha - C$
	DEVALUE	$\alpha - C, -\alpha$	$-C, -C$

Fig. 7.1 Payoff matrix for devaluation game

Consider the following strategy:

1. If no country in the past history of the game has devalued, do not devalue.
2. If a country in the past history of the game has devalued, devalue.

This tit-for-tat strategy can be shown to lead to a subgame perfect equilibrium. In other words, if both countries follow this strategy, then neither benefits from deviating from either phase 1 (cooperation) or phase 2 (punishment). During phase 2, both countries play their one-shot equilibrium strategies, so punishment is sustainable. A comparison of the gains from deviating in any one period, less the costs incurred during the punishment phase, against the gains from following the proposed strategy shows that the cooperative phase is feasible.

If the home country follows the cooperative strategy, its expected payoff is zero ($\pi^{H*} = 0$). If the home country deviates in any period, it stands to gain ($\alpha - C$) immediately, but will incur costs (C) forever after.⁷ The expected payoff is therefore

$$(2) \quad \pi^H = \alpha - C + \sum_{t=1}^{\infty} \delta^t (-C) = \alpha - \frac{C}{1 - \delta}.$$

In order to sustain cooperation, the payoffs to cooperation must exceed the payoffs from devaluing ($\pi^H \leq \pi^{H*}$). This implies

$$(3) \quad \alpha - \frac{C}{1 - \delta} \leq 0, \quad \text{or} \quad \delta \geq 1 - \frac{C}{\alpha}.$$

Thus, as long as the cost of devaluation is positive ($C > 0$) and the discount rate (δ) is high enough, the cooperative solution is one possible subgame perfect equilibrium. If devaluation is costless ($C = 0$), then the threat of reversion to the devaluation equilibrium has no bite, and the cooperative solution is not feasible.⁸ This result, therefore, suggests that countries can maintain

7. This assumes that, once a country devalues, it is never forgiven; its reputation as a defector is irreversible. An alternative assumption is that, after the defecting country has been punished with a retaliatory devaluation, both countries return to the cooperative equilibrium. In this case, costs are incurred in only two periods. Axelrod's (1984) version of tit for tat is of this latter form; it is a one-round punishment strategy. The qualitative results of the game do not depend on which of these assumptions holds.

8. Of course, if devaluation is costless ($C = 0$), then the payoffs in the cooperative and competitive devaluation equilibriums are identical, so there is no incentive to cooperate.

cooperative behavior (fixed par values) as long as the game is repeated and there exist positive costs to devaluation.

7.1.2 Practical Difficulties with Decentralized International Cooperation

While the devaluation game illustrates that a cooperative outcome is both feasible and sustainable under fairly unrestrictive conditions,⁹ the experience of countries in the interwar period indicates that there must be more to the problem than the game suggests. The game abstracts from at least three important and potentially interrelated problems: the existence of more than two countries, incomplete information, and asymmetries among countries.

The number of potential equilibrium outcomes increases when more than two countries are introduced to the model. As the number of countries increases, it becomes less likely that countries will achieve the cooperative outcome. The problem is a classic one, collective action. As the number of countries increases, so also does the number of potential defectors.

In the two-country game, both countries were assumed to know with certainty both the benefits and the costs of devaluation. Moreover, in order to focus on generic incentives, benefits and costs were assumed to be identical across countries. In practice, neither class of assumptions is likely to hold. The benefits of a unilateral devaluation are likely to be a complicated function of the magnitude of the devaluation, the elasticities of import and export demands, and the prospective actions of the other country. It is unlikely that each country can predict the effect of its own devaluation, let alone the costs that such an action might impose on other countries. Each country's incentive to maintain cooperation necessarily depends on its knowledge of the costs and benefits of defection; if these are uncertain or unknown, then the likelihood of a cooperative outcome may be reduced.

The benefits and costs of devaluation in practice may also vary across countries. The effect of a devaluation is likely to be greatest for smaller countries with the most open economies. Country heterogeneity could affect the equilibrium outcome of the game in various ways depending on the relative sizes of α and C for each country. For example, if both α and C are large for the smaller country and small for the larger country, a cooperative solution may still be feasible. However, if countries share the same C but one receives a larger α , that country will have a greater incentive to defect and a better prospect that the other country, recognizing the asymmetry, will not defect in response.

7.1.3 Three Possible Solutions to the Cooperation Problem

There are several different approaches that one can take to solve the cooperation problem. Economists often focus on rules-based solutions, while po-

9. The cooperative outcome also depends on the assumption that both countries follow the tit-for-tat strategy.

litical scientists are more likely to study the role of institutions and negotiations in the achievement of cooperative outcomes. Rules-based solutions are typically designed to be simple but rigid. Rules are formulated to be simple, so that they can easily be followed, but rigid, so that countries cannot maneuver around them. Institutions and negotiations tend, in contrast, to be flexible but to allow for complexities in arrangements.

The advantage of a rules-based solution is that, once formulated, it is easy to implement: "If appropriate rules can be found, rule-based regimes have the advantage over non-cooperative regimes of leading to superior outcomes, while at the same time preserving the reality of national autonomy and decentralization in economic decision-making" (Cooper 1985, 1227). A major problem with the rules-based approach is formulating rules that are acceptable to all countries. Rules typically predetermine the distribution of the gains from cooperation, and countries that perceive that they have bargaining power may be reluctant to play by the rules.

Alternatively, hegemonic theories suggest that countries with more bargaining power are more likely to agree to rules because they can set the rules: "Hegemonic structures of power, dominated by a single country, are most conducive to the development of strong international regimes whose rules are relatively precise and well obeyed" (Keohane 1980, 132).

Apart from the problems for countries of setting and agreeing to abide by rules, this solution often collapses in the face of change. Rules are unlikely to cover all contingencies, and, as soon as conditions change, countries are unlikely to stick to the rules.

A second solution to the cooperation problem, international negotiations, is the starkest alternative to cooperation by rules. Negotiations provide a process of communication between countries. This process can potentially lead to the formulation of rules or the creation of an organization, the third solution, but it need not. International negotiations often take the place of the rules solution when cooperation is in danger of collapsing.¹⁰ More generally, negotiations are typically ongoing and not necessarily cumulative; thus, they represent one of the most flexible means for countries to achieve a cooperative solution.

International negotiations may also serve to promote cooperation at the domestic level. In countries in which there is no policy consensus at the domestic level, governments may welcome the pressure to comply with policies agreed on in international negotiations. In this manner, "international negotiations sometimes enable government leaders to do what they privately wish to do, but are powerless to do domestically" (Putnam 1988, 457).

The third potential solution to the cooperation problem is the creation of international organizations. Organizations often serve to promote cooperation

10. Indeed, the G7 summit negotiation process arose in the wake of the Bretton Woods system's collapse (Putnam and Bayne 1987).

by enforcing rules-based solutions and providing a forum for international negotiations. In addition, organizations can serve to promote cooperation by providing a centralized source of information to their members. Milgrom, North, and Weingast (1990) show that, when information problems are substantial, repeat play and tit-for-tat strategies are insufficient to sustain cooperation. They study the medieval “law merchant” system in this context and find that, by efficiently gathering and disseminating information to traders, the organization played a pivotal role in history: “The history of long-distance trade in medieval and early modern Europe is the story of sequentially more complex organization that eventually led to the ‘Rise of the Western World’. In order to capture the gains associated with geographic specialization, a system had to be established that lowered information costs and provided for the enforcement of agreements across space and time” (Milgrom, North, and Weingast 1990, 4).

The participants at the Bretton Woods conference incorporated all three solutions to the cooperation problem in the creation of the new international monetary system. The par value system was rules based, and institutions were created to facilitate compliance with the rules, provide a forum for further negotiations, and establish a centralized information system.

7.2 Postwar Goals and the Bretton Woods Agreement

With the breakdown of gold standard arrangements in the early 1930s, countries engaged in numerous policy actions that led to exchange rate instability. Countries resorted to competitive depreciation, exchange controls, and tariff warfare¹¹ in unilateral efforts to emerge from the world depression at the expense of neighboring countries. In a classic study, the League of Nations (1944) warned of the self-defeating nature of these beggar-thy-neighbor policies. It was against this background that leaders in various countries recognized the need for a new approach to international cooperation.

7.2.1 Goals

Seven hundred thirty participants from forty-five countries met on 1 July 1944 in Bretton Woods, New Hampshire, to create a new international monetary system.¹² While the United States was the official host, the conference was the culmination of the efforts of two men: John Maynard Keynes and Harry Dexter White.¹³ Keynes and White both began circulating proposals for a new international monetary system domestically as early as 1941. Both men

11. For example, the United States passed the Smoot-Hawley Tariff in 1930.

12. Prior to the main conference, technicians from seventeen of these countries met for a preliminary drafting conference in Atlantic City, N.J., in June 1944.

13. An excellent detailed account of the prehistory of the Bretton Woods conference and the negotiations that took place at the conference is contained in Horsefield (1969).

believed that the economic stresses that countries faced in the interwar years contributed to the start of World War II. While significantly different in detail, both proposals included a return to a modified gold standard exchange rate system and the creation of international organizations that would facilitate cooperation among member countries.

One of the main concerns of the United States at the time centered around the growth of preferential trading systems from which its exports were excluded. The most important of these arrangements was the imperial preference system. The trading blocs served to divert trade away from countries outside the bloc using a combination of differential tariffs and exchange controls. It was this latter policy that White's plan was most bent on eliminating. The White plan centered on the creation of two organizations, an international stabilization fund and a bank for reconstruction and development. The Fund's roles included promoting currency stability, encouraging capital flows, and facilitating international settlements. The stabilization Fund was to be contributory, with total resources of \$5 billion (the U.S. contribution was to be \$2 billion). While the U.S. plan gave the Fund limited resources, it granted it substantial decision-making power. Most important, the Fund was to have veto power over a country's decision to change its exchange rate.

Just as the American plan focused on the United States's main economic concerns, the British plan focused on the United Kingdom's main economic concerns: unemployment and the convertibility of sterling. In 1944, the U.K. economy was in disarray, and sterling balances were large relative to Britain's gold reserve. The key component of the Keynes plan was the International Clearing Union (ICU), a bank for central banks with its own international currency called *bancor*. Keynes's ICU resembled the British overdraft system. Debit balances in this system took the form of overdrafts rather than loans. In this way, the burden of balance of payments adjustments would rest with creditor countries, who were required to accept *bancor* as payment for net exports. Keynes's plan was both more tolerant of exchange controls and potentially more expensive for creditor countries. The U.S. burden, for example, could in principle exceed \$20 billion dollars, the total drawing rights of the other member countries.

The final Bretton Woods Agreement was a compromise between the two plans, with a more limited financial commitment from the creditor countries than the Keynes plan and a more tolerant view toward exchange rate management than the White plan. The compromise plan established two international organizations, the IMF and the World Bank. Both organizations required contributions from members based on their relative economic resources. Although exchange rates were to be fixed in value against gold, member countries were permitted to adjust the values of their currencies under certain conditions. Also, exchange controls were allowed on capital transactions but not normally on current transactions.

7.2.2 The Exchange Rate Arrangement

One of the principal duties given the IMF in the Bretton Woods Agreement was the promotion of exchange rate stability. The conference participants set out the rules for establishing and maintaining the new par value system principally in Articles IV and XX of the IMF charter. IMF members that were not occupied by the enemy during World War II were obliged to establish par values, expressed in terms of either gold or the U.S. dollar, within thirty days of the official commencement of the Bretton Woods system. All current account exchange transactions were to be made within 1% bands of the established par values. The rules did not permit members to change par values (other than a one-time change of 10%), except to correct a fundamental balance of payments disequilibrium and only after consultation with the IMF. Moreover, if a member changed the par value of its currency over the objections of the IMF, then that member would be ineligible to use IMF resources.

One of the more heated debates among the architects of the Bretton Woods system was over the scarce currency clause in Article VII of the IMF charter. The British and other European countries were concerned about the possibility of a postwar depression. They argued that this could lead to a circumstance in which the total amount that countries were in deficit to the Fund exceeded the amount of available credit. As a consequence, the IMF might not have the resources to provide adequate financial assistance, even though countries were following the rules of the game. The scarce currency clause effectively allows the Fund in this circumstance to put pressure on surplus countries. Once the Fund declares a surplus country's currency to be scarce, debtor countries have the right to discriminate against transactions in the scarce currency.

Under Article VIII of the IMF charter, countries that have declared par values are required to make their currencies convertible for current account transactions. Article XIV, however, provided countries a convertibility escape clause. This article allowed countries to maintain existing exchange controls for an initial three-year transition period after the establishment of the Fund and thereafter with the provision that they justify their position to the Fund.

7.2.3 Creation of International Organizations

Of the two organizations created at Bretton Woods, the IMF was the most important in terms of member country day-to-day operations. The World Bank was designed chiefly to supply the capital needed for postwar reconstruction and long-term development projects. Although the two institutions are explicitly separate in terms of charter, funding, and staff, membership in the IMF is a prerequisite for membership in the World Bank.

The main features of the IMF are similar to those in White's original plan. Each member of the IMF has a quota equal to its subscription to the Fund. The original quotas totaled \$8.8 billion with a U.S. contribution of \$2.75 billion. A member's quota determines its financial contribution, its voting

power in the IMF (based on one vote for each \$100,000 of quota), and its access to the financial resources of the IMF.¹⁴

Subscriptions called for by quotas represent the principal source of assets for the IMF. Members were required to pay 25% of their quota in gold and the rest in their domestic currency. The IMF also derives income from charges on member drawings and has the authority to borrow to augment quota resources when necessary.

As described earlier, the establishment of an initial par value is, by Article XX, Section 4(c), a prerequisite to the use of the IMF's resources:¹⁵ "The rules governing access to the use of Fund's resources apply uniformly to all members. However, Article V, Section 12(f) (ii) and (iii), allows the Fund to make balance of payments assistance available on special terms to 'developing members' in difficult circumstances" (Chandavarkar 1984, 31). Balance of payments assistance takes the legal form of a purchase or drawing (not a loan) of a strong currency (or SDRs)¹⁶ for the members' own currency.

Member drawings fall into four categories. Drawings up to the first 25% of a country's quota are in the *gold tranche*. The next three categories are called *credit tranches*. Transactions in the first credit tranche bring the IMF's holdings of a member's currency above 100% but not above 125% of its quota. Drawings in the second, third, and fourth credit tranches require substantial justification and typically involve *conditionality*, terms and conditions to guarantee that the country is able to repurchase its currency in a timely fashion. Any drawing or standby arrangement exceeding 25% of the member's quota within any twelve-month period (unless the IMF holds less of the member's currency than 75% of the quota) and any cumulative drawing that exceeds 200% of a member's quota require a waiver.¹⁷

Standby arrangements were first introduced in 1952. A standby arrangement involves the IMF granting financial assistance to members in advance of difficulties: "Indeed, a stand-by arrangement presents the contradiction that the drawing country does not have to establish need at the time the arrangement is entered into and the Fund in effect waives any power to judge need at the time the drawing is made" (Dam 1982, 122). While standby arrangements do not involve justification by the member country, they typically involve commitments to performance criteria (see Gold 1970).

The second organization created at the Bretton Woods conference was the International Bank for Reconstruction and Development. It was designed to help finance investment projects for reconstruction and development, particularly in underdeveloped regions. Along with providing long-term loans and

14. For a detailed description of the quota system, see Altman (1956).

15. Exceptions to this were possible for members whose metropolitan territories had been occupied by the enemy (Article XX, Section 4[d]).

16. Special drawing rights (SDRs) were introduced in 1969 to supplement reserves.

17. In the 1960s, the IMF established a number of compensatory financing facilities that granted automatic waivers of the 200% rule.

technical assistance, the World Bank was to promote private foreign investment by guaranteeing and participating in loans by private investors. Member countries' subscriptions in the World Bank take the form of shares of capital stock. Twenty percent of subscribed capital is paid in; of this, 2% is in the form of gold or U.S. dollars, and 18% is paid to the Bank in each member's domestic currency (and cannot be used for loans without the consent of the member whose currency is to be lent). The remaining 80% of the World Bank's subscribed capital is subject to call by the Bank only when required to meet its own obligations on its borrowings or guarantees.

The drafters of the Bank's Articles of Agreement were intent on avoiding the perceived capital market failures of the interwar period. To that end, the Bank's charter contains a number of protective provisions governing loans to be made or guaranteed by the Bank. World Bank loans "must be for productive purposes and, except in special circumstances, must be to finance the foreign exchange requirements of specific projects of reconstruction or development" (IBRD 1954, 7). The borrower need not be a member government, but the loan must be guaranteed by the member government in the country where the project is located. The borrower must be in a position to repay the loan, and the Bank is required to make arrangements to ensure that the loan is used for its original purpose. Finally, "the Bank must be satisfied, before making or guaranteeing any loan, that in the prevailing market condition the borrower would be unable to obtain the loan from private sources under reasonable conditions" (IBRD 1954, 7).

The division of labor between the IMF and the World Bank has always been somewhat blurred. In the first complete draft of his plan, White stated, "The objectives of the Bank, it will be noted, are similar in some respects to those of the Fund, but a careful examination will reveal that in their most important aspects they are different" (Oliver 1975, 297; cited in Feinberg 1988, 546). The Fund was to provide short-term balance of payments assistance, while the Bank was to provide longer-term project assistance. Keynes originally advocated close financial collaboration between the two organizations, but later changed his tune. In an often-quoted passage, Keynes stated, "I should like to see the Board of the Fund composed of cautious bankers, and the Board of the Bank of imaginative expansionists" (Moggridge 1980, 194; cited in Feinberg 1988, 547).

Resolution VII at the Bretton Woods conference recommended the creation of a third organization whose purpose was to promote cooperation in international trading arrangements. Preparatory discussion in 1946 and 1947 led to the Havana conference, which produced a charter for the International Trade Organization (ITO). The United States had pushed for a powerful ITO that would work to abolish tariffs, quotas, and preferential trading arrangements. Most of the other countries were concerned about safeguarding their weaker national economies against U.S. export competition. After extensive negotia-

tions, the original objectives of the ITO proposals were only nominally maintained. The combination of an equal vote for every country and escape clauses basically left every country to do as it liked. In this form, the charter was unacceptable to the United States, and the Senate failed to ratify it.¹⁸ During the deliberations on the ITO, a multilateral trade agreement known as the GATT was drafted as a stop-gap measure. Twenty-three countries signed the GATT in 1947, but it was not until the mid-1950s that the GATT officially became a permanent international organization.

The GATT's mission is to set and regulate a code of conduct for international trade. The GATT is founded on three principles: nondiscrimination among trading partners (the most-favored-nation clause), no export subsidies or quantitative restrictions, and offsetting reductions in old tariffs to compensate for any introduction of new tariffs. It was hoped that, if countries complied with these three principles, then at the very least trade restrictions between countries would not increase.

The GATT provides a rules-based cooperative solution for trade disputes among countries. In the context of GATT trade rounds, countries agree to provide tariff concessions as long as all other countries also do so. If a country raises its tariff above the agreed level or imposes a trade restriction on the product, then the other countries retaliate with a "compensatory suspension of concessions." The GATT was not equipped with either carrots or sticks to compel its members to honor negotiated trade agreements: "A violation of the General Agreement—for example, the nullification of a concession—leads not to the imposition of punitive measures, but rather to the creation of a mere right on the part of the injured contracting parties to withdraw concessions (or other GATT obligations) running to the offending contracting party" (Dam 1970, 21). While the IMF and the World Bank can refuse members access to resources if they deviate from the rules, all that the GATT can effectively do is allow its members to play a tit-for-tat strategy.

The architects of the postwar international order recognized that, if they did not coordinate rules on trade and exchange restrictions, countries could easily use one as an escape valve from rules against restrictions in the other. In order to avoid this possibility, Article XV:4 of the GATT provides that contracting parties shall not, by exchange action, frustrate the intent of the provisions of the GATT or, by trade action, frustrate the intent of the provisions of the Articles of Agreement of the IMF. The IMF for its part agreed to provide the GATT with both relevant statistical information on member country exchange restrictions and analysis of the causes and effects of import restrictions maintained for balance of payments reasons.¹⁹

18. Of the fifty-six nations represented in Havana, fifty-three signed the ITO charter, but only one nation subsequently ratified it.

19. For further discussion of the relation between the IMF and the GATT, see de Vries and Horsefield (1969, chap. 16) and Dam (1970, chap.).

7.3 Maintaining Cooperation—the Role of Financial Assistance

Whereas the IMF and the World Bank both provide member countries financial incentives to maintain cooperation, the GATT does not. Do carrots provide an effective commitment mechanism for organizations that hope to promote international cooperation? In this section, I analyze two games that illustrate under what conditions financial assistance can play an effective role.

7.3.1 The Role of Financial Assistance in International Negotiation

The most general mandated function of each of the postwar institutions was to promote cooperation by providing a forum in which members can consult and negotiate with each other on international monetary and trade matters. To investigate the role of financial assistance in international negotiations, an example is useful.

Consider first an example of domestic tax policy negotiations between opposing groups within the home government. Assume that both groups agree that taxes should be raised to eliminate an existing government budget deficit but that the groups disagree on the allocation of the total tax burden to be borne by each group. Assume further that, if the two groups cannot negotiate a compromise, the government will be forced to rely on an inflation tax to finance the deficit and that this will, in turn, force the country to devalue its currency. Alesina and Drazen (1991) characterize the process leading to the compromise as a “war of attrition.” Each group believes that, the longer it refuses to compromise with the other, the more likely it is that the other group will concede. Whichever group concedes first ends up bearing a disproportionate share of the tax increase. Even though the country as a whole benefits from any compromise, Alesina and Drazen suggest that compromises will often be delayed as groups attempt to shift the allocation of burdens in their favor.

One possible solution to this problem is for the executive branch of the government to take a more active role in the negotiating process. For example, the executive might declare that it will impose a penalty on whichever group refuses to support a government-sponsored compromise. Assuming that the executive is in office for a finite term, the problem with this solution is that, as long as the executive’s objective is to maximize the country’s welfare (defined as the unweighted sum of the welfares of both groups), it will never have an incentive to follow through with its threat. This is the classic problem of time consistency, that, once a compromise is reached, it is not in the executive’s interest to punish either group. If the groups are rational, they will foresee this and disregard the executive’s threat.

Alternatively, an outside party or organization, one that is not subject to the time inconsistency problem that the domestic government faces, can play an important role. Assume both that the IMF has a longer time horizon than the

domestic government²⁰ and that the IMF's objective is to maximize global welfare. During the period that the Bretton Woods system was in place, any set of domestic policies that would lead a country to devalue would reduce global welfare from the IMF's perspective. It is in the IMF's interest in this circumstance to provide the executive in the home government with an incentive to follow through with its threat. The IMF can offer the government financial assistance if it achieves a compromise and staves off a currency devaluation. As long as the value of the financial assistance exceeds the value of the penalty imposed on the group that refuses to compromise, the executive's threat will be credible.

Governments face similar credibility problems in the context of trade policy. Although a country can be made better off with less restrictive trade policies, certain import-competing industries have incentives to pressure members of the legislature not to agree to trade concessions. Any threats to penalize the protectionist groups will not be credible unless they are time consistent. But, without the ability to provide financial assistance, the GATT can do little to help governments forge a trade policy compromise.

7.3.2 The Role of Financial Assistance in the Par Value System

A second function primarily of the IMF, but also to some extent of the World Bank, is to provide members with financial assistance to facilitate their compliance with the par value system. A modified version of the devaluation game described in section 7.1 can clarify the potential role of financial assistance in an adjustable peg exchange rate system. The two countries, home (H) and foreign (F), now move sequentially, the home country making the first move (in period 1) and moving in all subsequent odd-numbered periods. Likewise, the foreign country moves in all even-numbered periods. This assumption allows us to examine countries' immediate reactions to each other's moves.²¹

Let e^H (e^F) be the price of one ounce of gold in units of the home (foreign) country's currency. To place the model in the Bretton Woods system context, the countries now have three policy options during a move: (i) a large devaluation against gold ($\Delta e = M$); (ii) a small devaluation against gold ($\Delta e = m$); and (iii) no devaluation ($\Delta e = 0$). Assume that a large unilateral devaluation produces a large trade surplus for the devaluing country ($\alpha = 1$). A small devaluation produces a smaller trade surplus ($\alpha < 1$). Assume initially that countries cannot borrow money.

The payoffs for each country in any given period (regardless of whose turn it is to move) will be $P_i - C$ if either devalues and P_i if neither does. Both

20. In other words, assume that the government has a higher rate of discount than does the IMF.

21. For an analogous alternating-move infinite horizon model setup, see Maskin and Tirole (1988).

countries incur a devaluation cost in period t if a country devalues in that period. Here international monetary stability is considered a public good so that the cost of its disintegration is borne by both countries (see Eichengreen 1987).

Let $\hat{P}_t^j = P_t^j - I_t C$ be the total payoff to country j ($j = H, F$) in period t , in which I_t is an indicator function equal to one if a country devalues in period t and zero otherwise, and let e_t^j be the price of one ounce of gold in units of country j 's currency in period t . The home country will receive one of five possible payoffs in each period, depending on its own actions and those of the foreign country:

$$(4) \quad P_t^H = \left\{ \begin{array}{ll} -1 & \text{if } e_t^H - e_t^F = -M \\ -\alpha & \text{if } e_t^H - e_t^F = -m \\ 0 & \text{if } e_t^H - e_t^F = 0 \\ \alpha & \text{if } e_t^H - e_t^F = m \\ 1 & \text{if } e_t^H - e_t^F = M \end{array} \right\}$$

Payoffs and costs accrue at the end of each period, and each country knows the full discounted stream of payoffs and costs in the future. The total discounted stream of payoffs for each country in the game is

$$(5) \quad \pi^j = \sum_{t=1}^{\infty} \delta^t \hat{P}_t^j = \sum_{t=1}^{\infty} \delta^t (P_t^j - I_t C).$$

The game starts in period 1 with inherited exchange rates $e^H = e^F$. If neither country devalues, the cooperative profits are zero ($\pi^{H*} = \pi^{F*} = 0$). Consider first each country's incentives to engage in a competitive devaluation strategy (CD). In the CD strategy, each country undertakes a large devaluation. If both countries follow the CD strategy, the total profits for each country are

$$(6) \quad \begin{aligned} \pi^{H^{CD}} &= \sum_{t=1}^{\infty} \delta^t [(-1)^{t+1} - C] = \frac{\delta}{1 + \delta} - \frac{\delta C}{1 - \delta}, \\ \pi^{F^{CD}} &= \sum_{t=1}^{\infty} \delta^t [(-1)^t - C] = \frac{-\delta}{1 + \delta} - \frac{\delta C}{1 - \delta}. \end{aligned}$$

The home country is better off than the foreign country in this case because it has the first mover advantage.²² As long as $C < 1 - \alpha$, the most profitable strategy for the home country is to devalue by a large amount. A proof that this competitive devaluation (CD) strategy leads to a subgame perfect equilibrium is provided in Appendix A.

Now consider each country's incentives to maintain fixed exchange rates.

22. We can rewrite $\pi^{H^{CD}}$ in terms of $\pi^{F^{CD}}$ because, if at t it is H 's turn to move, at $t + 1$ H will be in the same position as F in period t :

$$\pi^{H^{CD}} = \delta(1 - C + \pi^{F^{CD}}).$$

The stability strategy (s) involves each country maintaining a fixed exchange rate unless a devaluation occurred in the past and devaluing by a large amount (M) otherwise.²³ Using (6), the s strategy can be shown to be a subgame perfect equilibrium if the cost of devaluation lies between $(1 - \alpha)$ and $(1 - \delta)/(1 + \delta)$.²⁴ Countries have no incentive to devalue if there is no history of past devaluation and $(1 - \alpha) > C > (1 - \delta)/(1 + \delta)$ because in this case the payoff is negative ($\pi^{HCD} \leq 0$). If a devaluation has occurred, then, because the CD strategy is subgame perfect, there is also no benefit from deviating from the punishment phase of the s strategy. If both countries follow the s strategy, the payoff for both is zero ($\pi^{FS} = \pi^{FS} = 0$).

To summarize, under the assumption that $C < 1 - \alpha$, if the competitive devaluation outcome is Pareto inferior to the stability outcome, then the latter is sustainable as a subgame perfect equilibrium of this game. Otherwise, the competitive devaluation outcome is an equilibrium, but the stability outcome is not. If $C \geq (1 - \delta)/(1 + \delta)$, then the game has two equilibria. If $0 < C < (1 - \delta)/(1 + \delta)$, stability is not sustainable as a subgame perfect equilibrium.

The world as a whole loses when countries follow the competitive devaluation (CD) strategy, and the world's welfare in the CD equilibrium is lower the larger is C :

$$(7) \quad \pi^{HCD} + \pi^{FCD} = -2 \frac{\delta C}{1 - \delta}.$$

Further, there are winners and losers in the competitive devaluation equilibrium relative to the stable equilibrium. Losers are the second movers, those countries that react to devaluations by other countries. In particular, countries with hard currencies (currencies to which other currencies are pegged) are likely to be losers. It is, therefore, likely that hard currency countries would actively seek to devise a commitment mechanism that would ensure exchange rate stability. This may explain why the United States and Britain were so anxious to create organizations at the Bretton Woods conference that would provide incentives for countries to maintain fixed exchange rates.

Consider how the game changes when the IMF is introduced. The IMF requires countries to declare par values that are consistent with the long-run balance of their trade accounts. If a country experiences temporary balance of payments difficulties but is otherwise in compliance with the par value system, it is eligible to borrow from the IMF at an interest rate, r . A country is also allowed to change its par value to the extent needed to make the present discounted value of its trade deficits and surpluses zero.

23. It is worthwhile to note that defection in this example involves taking an action while cooperation involves no action. If our example of cooperation involved trade policy, the opposite would be true. Defection would involve no action, and cooperation would involve the removal of trade restrictions. This may provide yet another explanation for why cooperation in trade policy is so difficult to achieve.

24. A proof of this proposition is provided in Appendix A.

The key features of the IMF strategy (F) can be described in three parts:

1. If it is a country's turn to move and its balance of payments is intertemporally balanced, then it should maintain its par value.
2. If it is a country's turn to move and its balance of payments is not intertemporally balanced, then it should change its par value by an amount that is consistent with long-term balance.²⁵
3. If it is not a country's turn to move and it suffers a current account deficit, then it can draw on the IMF for funds equal to the deficit, provided it has followed F so far.

Finding the conditions under which F leads to a subgame perfect equilibrium where $\pi^{H^F} = \pi^{F^F} = 0$ is more complicated than was the case for the previously described strategies. Under F, countries must both borrow and devalue in reaction to balance of payments imbalances. But countries have a limited ability to borrow since accumulated debt cannot exceed a country's capacity to repay. This limit on borrowing leads to a breakdown of strict reusivity because a country's optimal strategy depends on the level of debt incurred so far.

Suppose that the foreign country will play F forever and that the home country will deviate in its first n^* turns and adhere to F forever after. Recall that the home country moves in odd periods; thus, its last devaluation takes place at $t^* - 1 = 2n^* - 1$, and the foreign country's last devaluation occurs at $t^* = 2n^*$. In this case, the foreign country will accumulate debt (D_t) according to part 3 of F, where D_t obeys

$$(8) \quad \begin{aligned} \text{odd periods:} \quad D_{2v+1} &= \frac{(1+r)^{v+1} - 1}{r}, \\ \text{even periods:} \quad D_{2(v+1)} &= \frac{1+r}{r} [(1+r)^{v+1} - 1], \text{ for any } v \geq 0. \end{aligned}$$

The value of v that first raises the value of F 's debt beyond its capacity to repay, even under the best circumstances (i.e., when F 's last devaluation, at $2v^* + 2$, leads to a surplus equal to one), can be found using the following inequality:

$$(9) \quad \frac{1}{1-\delta} = \frac{1+r}{r} < \frac{1+r}{r} [(1+r)^{v+1} - 1],$$

$$\text{solving for } v: \quad v > \frac{\ln 2}{\ln(1+r)} - 1.$$

Define v^* to be the smallest integer value of v that satisfies the inequality. This tells us that, after time $t = \max[2v^* - 1, 0]$, the IMF will not provide full

25. Here we assume away issues of moral hazard. The IMF is assumed to be able to distinguish between countries that are truly experiencing balance of payments difficulties and those that claim that they are, when they are not, in order to receive IMF permission to devalue.

financing of *F*'s deficits. The discounted payoff to the home country for following the deviation strategy (D) in its first n^* turns is

$$(10) \quad \pi^{HD} = \frac{-\delta(1 - \delta^{2v^*})C}{1 - \delta} \leq 0 = \pi^{HF}.$$

More generally, at any given odd period $t = 2v - 1 < 2v^* - 1$, an additional deviation by the home country, followed by subsequent adherence to *F*, yields a negative gain of $-\delta C$. Therefore, any finite number of deviations, such that $0 < n^* \leq v^*$, does not pay. However, once the home country devalues the $n^* \geq v^* + 1$ time, *H* will force the foreign country beyond its borrowing limit. If the home country deviates for $v^* + 1$ periods, its discounted payoff is

$$(11) \quad \pi^{HD} = \frac{\delta}{1 - \delta} \left\{ \frac{(1+r)^{v^*+1} - 2}{r} - \left[1 - \delta^{2(v^*+1)} \right] C \right\}.$$

This indicates that, if the cost of devaluations is small enough, $v^* + 1$ deviations will pay. That is, from period $2v^* + 1$ onward, the game degenerates into either the CD or the *s* strategy game, although the foreign country is formally following the IMF strategy, *F*.

Next consider the foreign country's incentives to deviate from *F*. Assume that a number n ($0 < n < v^*$) deviations have occurred in the past and that it is the foreign country's turn to move. Under *F*, the foreign country must devalue in such a way as to obtain a surplus $\hat{\alpha} < 1$, yielding payoffs $-\delta C$. If the foreign country deviates from *F* by, for example, engineering a surplus equal to one, then it loses its right to borrow from the IMF in the future. Such a devaluation would also induce the home country to devalue in the following period. This indicates that, if the foreign country deviates from *F*, the game collapses into the CD game previously described.

These results are surprising in that they indicate that the promise of IMF financial assistance provides countries no more incentive to maintain fixed exchange rates than does the *s* strategy, which they can achieve without IMF participation. Once a country hits its borrowing limit, the necessary condition for *F* to lead to a subgame perfect equilibrium is $1 - \hat{\alpha} \geq C \geq (1 - \delta)/(1 + \delta) = r/(2 + r)$, which is identical to what we found earlier for *s*.²⁶ It is only under the strict condition that countries never hit their borrowing limit that the *F* strategy provides a subgame perfect equilibrium when *s* does not.²⁷

Much of the debate at the Bretton Woods conference between Keynes and White was over the level of financial resources that would be made available

26. For both the CD and the *s* strategies, α is an arbitrary constant, such that $\alpha \leq 1$. Under the *F* strategy, $\hat{\alpha}$ is the maximum surplus a country can obtain when trying to restore balance. That is, $\hat{\alpha}$ is the surplus that the foreign country needs to restore long-term balance after the home country has deviated n^* times.

27. In this case, the necessary condition for *F* to be a subgame perfect equilibrium is that the countries' discount rates are equal to the IMF's interest rate: $\delta^{-1} = 1 + r, r > 0$.

to member countries in need of assistance. White wanted to limit country access to resources because he felt that the United States would ultimately bear the bulk of the financial burden of a more generous system. According to Edward Bernstein, the chief technical adviser and spokesman for the U.S. delegation at Bretton Woods, under the White plan “the Fund would give each country the currency it needed to meet its deficit and the country would give its currency to the Fund. But then it would be obligated to repay the money it drew and it had to begin to correct its balance of payments. In the Keynes Plan there was no obligation to repay unless it developed a balance of payments surplus” (Black 1991, 37–38). In the context of the model presented in this section, under the Keynes plan countries would be less likely to hit their borrowing limit and, as a consequence, would have a greater incentive to stick to the rules of the game.

7.4 Empirical Evidence from 1944–71

The effectiveness of institutions for deterring breach of contract might best be judged like that for peacetime armies—by how little they are used. (Greif, Milgrom, and Weingast 1991, 1)

Each of the postwar institutions has come in for criticism, not so much because they have been little used, but because international monetary and trade relations did not achieve the level of cooperation that was first promised. An empirical assessment of this proposition, however, is difficult. First, it is difficult to formulate a testable hypothesis. What one might like to know is how countries would have behaved had the IMF, the World Bank, and the GATT not existed. If economic conditions were comparable before and after World War II, one could examine the different levels of cooperation achieved between countries in the two periods. Alternatively, had a significant number of countries not become members of the Bretton Woods institutions, one might compare economic growth and cooperative arrangements across the two groups of countries. But most of the developed countries (with the notable exceptions of Switzerland and the former Soviet Union) and the majority of developing countries are members, precluding any such comparison.

A second problem that arises with any quantitative study of the effectiveness of these institutions is that much of the requisite data remains confidential. This is particularly a problem for an assessment of the effectiveness of international negotiations within each of the organizations. For example, country requests for par value changes or drawings that were not approved by the IMF are not necessarily part of the public record.

In light of these problems, this section presents available empirical evidence on the main accomplishments of each of the three postwar institutions relative to their original missions. I begin with brief summaries of the activities of the World Bank and the GATT. There is less to say about these two

institutions because the goals of both are intrinsically open ended relative to those of the IMF. The empirical assessment of the IMF is provided in two parts. The IMF's role in the par value system is presented in section 7.4.1, and section 7.4.2 presents the IMF's record for balance of payments assistance.

The World Bank's original mission was to provide capital for European reconstruction. The World Bank's resources were from the beginning limited, but the intention was that the Bank would encourage private investment by providing loan guarantees. The president of the World Bank in 1947, John McCloy, "thought of the Bank as a temporary institution which would go out of business if it were successful, for it would no longer be needed as an intermediary between productive borrowers and private lenders" (Oliver 1975, 259). It was soon realized that the task of reconstruction was beyond the Bank's scope, and the Marshall Plan, implemented in 1948, largely took over the job.²⁸ The Bank then shifted its resources and focus to financing development projects in underdeveloped regions. Rather than serving as a guarantor of private investment, as the Bretton Woods participants had envisioned, the Bank took on an intermediary role, borrowing funds from private investors and lending them to developing countries.

The average yearly World Bank loan level for the period 1947–57 was only \$283 million. Average project lending in the next ten years increased substantially to \$764 million. But it was not until the late 1960s, after Robert McNamara became president, that lending steadily began to increase. In 1978 alone, World Bank loans exceeded \$6 billion.²⁹

The Bank's slow start was in part due to its passive approach toward development lending. In 1950, the president of the Bank, Eugene Black, explained that the reason that the Bank had not made many loans to developing countries "has not been lack of money but the lack of well-prepared and well-planned projects ready for immediate execution" (Mikesell 1972, 72). Applications for development loans reportedly consisted of lists of projects that the member governments had under review with no indication of priorities or feasibility. It was against this background that the Bank organized its first economic survey mission to Colombia in 1949. Although these missions initially received mixed receptions, the World Bank increasingly took the view that it needed to assist countries in formulating long-term development programs. Robert Garner, vice president of the Bank in 1947, reflected later that "advice was more important than money" (Oliver 1975, 255).

It is difficult to give an overall assessment of the Bank's record. After a shaky start, the Bank greatly expanded its loan portfolio and actively involved itself in analyzing and centralizing information on member country develop-

28. In 1947, the Bank did make four reconstruction loans: to France (\$250 million), the Netherlands (\$195 million), Denmark (\$40 million), and Luxembourg (\$12 million).

29. World Bank loan data are from various issues of *World Bank Annual Reports*.

ment programs. However, even given its impressive and improving recent record, the Bank's resources are meager compared to the financing needs of developing countries.

The ITO's mission, taken up by the GATT, was to facilitate an open, liberal, and competitive international trading system. To the GATT's credit, postwar trade restrictions have declined substantially, but cooperation in trade has not been uniform across countries or industries and has progressed slowly. The GATT's principles are subject to numerous exceptions. Customs unions, free-trade areas, and certain preferential trade arrangements are all excluded from the principle of nondiscrimination. Agricultural subsidies are excluded, as are import quotas for developing countries.

The GATT has been most successful in its role as facilitator of multilateral trade negotiations among developed countries. As a result of six major rounds of negotiations in the first twenty years of the GATT, tariff rates of the industrial countries fell from an average of 40% in 1947 to 13% by the late 1960s. There has been less success with liberalizing developing country trade policies.

Most recently, the GATT has come in for criticism over the relevance of its rules of the game. While the GATT continues to focus on reducing tariffs worldwide, countries have found an effective escape valve by creating so-called nontariff barriers. Countries have learned to replace tariffs with other forms of trade restriction that are not subject to GATT rules.

The IMF's two original responsibilities were to administer the par value system and to provide members financial assistance to enable them to maintain their par values in the face of short-term balance of payments shortfalls. The next two subsections present an empirical assessment of the IMF's record in these two areas.

7.4.1 The Par Value System

The IMF elected to treat an exchange rate change as unauthorized on only one occasion, France in 1948. "Indeed, the Fund on some occasions did not even require a member to assert that it was in 'fundamental disequilibrium' when passing upon a proposed change in par values. As time went on and it became apparent that a key problem under Bretton Woods was not the instability that White had feared but rather an unwillingness of members to make par value changes promptly enough, considerable effort was expended on making it clear that the 'fundamental disequilibrium' requirement was not really a limitation on prompt and small exchange rate changes" (Dam 1982, 92).

Initially, the IMF was determined that new members declare par values within the thirty-day period specified in Article XX 4(a). But, over time, the IMF became less resolute on this as well as some of the other exchange rate rules set out in the Articles. In a series of decisions over the course of 1947–51, the Executive Board declared that any change in a member's exchange

rates (whether or not it involved a change in the member's par value) was subject to review by the IMF. But on numerous occasions countries changed both exchange rates and par values without prior approval of the IMF.³⁰

There were forty-four proposed exchange rate changes between 1948 and 1949. In 1948, both France and Mexico suspended their par values without IMF approval and allowed their currencies to float. In 1949, both Belgium and Peru were granted permission by the IMF to allow their currencies to float temporarily. While Belgium declared a new par value two days later, Peru had yet to declare a new par value in 1965. Even without a declared par value, however, Peru was permitted to make IMF drawings.

During 1949, the Bretton Woods system experienced its first major round of devaluations. During the summer of 1949, gold and dollar reserves of the sterling area fell by over 30%. In September, the U.K. government finally asked for approval for a 30% devaluation; this was immediately approved by the IMF. The devaluation of the pound sterling was followed by major devaluations by the other sterling bloc countries as well as by all the Western European countries.³¹ Table 7.1 shows the extent of these devaluations; in all, nineteen countries devalued in 1949.

While there was some grumbling over the perception that the IMF had really just rubber-stamped the U.K. request to devalue, there was more serious discussion within the IMF over the approval of the subsequent devaluations:³² "The Latin American Directors, exercised lest the devaluations of the outer sterling area in line with that of the pound sterling should harm the export prospects of their countries, thought that there was a need for a 'definitional examination' of competitive depreciation" (de Vries and Horsefield 1969, 100). The countries that opposed the IMF's decision to approve the devaluations had reason to feel that this was an important issue. The countries that devalued in 1949 accounted for almost half the world's exports and about 60% of the exports of industrial countries.

In the years to follow, the IMF became increasingly tolerant of member countries' refusals to play by the rules of the par value system. In 1950, Canada informed the IMF of its decision to allow its currency to float because of a heavy capital inflow (mainly from the United States during the Korean War). After debating the issue at length, the IMF made no official pronouncement.

30. For detailed descriptions of member country exchange rate policies during 1945–65, see de Vries and Horsefield (1969).

31. Obstfeld (chap. 4 in this volume) refers to the 1949 devaluations as competitive—the very policies that the Bretton Woods system was set up to avoid. An alternative interpretation is given by Edward Bernstein: "In the environment of 1949, when European recovery had been only partially achieved, it was impossible to make fine distinctions between the appropriate change in the parity of the Netherlands guilder, for example, and the parity of sterling. That is why the European devaluations in 1949 were nearly the same" (Bernstein 1972, 53).

32. In Bernstein's recollections, he states, "Early in 1949, the U.S. Executive Director began to press for discussions on the devaluation of the European currencies" (Black 1991, 66). This may explain why the U.K. devaluation proposal was accepted by the Fund so quickly. Bernstein goes on to say that the U.S. view was not made public because of concern that this would lead to a speculative attack against the European currencies.

Table 7.1 Devaluations by Countries in the Bretton Woods System, 1949–50

Country	Devaluation Relative to \$ (%)	Country	Devaluation Relative to \$ (%)
Greece	33	Sweden	30
Denmark	30	France	22
Egypt	30	Germany	20
Finland	30	Belgium	13
Netherlands	30	Portugal	13
Norway	30	Canada	9
Sterling area except Pakistan ^a	30	Italy	8

Source: IMF, *International Financial Statistics*.

^aIncludes Australia, Iceland, India, Iraq, the Union of South Africa, and the United Kingdom.

Canada's exchange rate floated for twelve years, yet the country was not denied access to IMF resources.³³

Ten years after the establishment of the par value system, only nine countries had accepted the obligations of Article VIII and had fully convertible currencies.³⁴ With the exceptions of the United States and Canada, all the developed member countries took advantage of the convertibility escape clause provided in Article XIV. Not only did they avail themselves of the automatic three-year transition period, but all the European currencies remained inconvertible for twelve years. Although most currencies were de facto convertible by 1959, the European countries did not officially assume Article VIII status until February 1961.

Although a number of developing countries accepted Article VIII status before the developed members, most of them experienced chronic balance of payments problems throughout the Bretton Woods era. As a result of these difficulties, many developing countries became increasingly dependent on a wide range of exchange and trade restrictions. By the mid-1960s, "while the industrial countries were able to maintain their external economic relations with few limitations on the acquisition or use of foreign exchange, many of the developing countries continued to rely on restrictions, sometimes in combination with multiple exchange rates" (de Vries and Horsefield 1969, 294).

By the end of 1966, the IMF had 104 members, twenty-three of whom had not established par values. After twenty years, only 58% of the member countries maintained 1% bands around fixed par values. However, table 7.2 shows that, if we include countries that maintained fixed unitary exchange rates, although without a par value, and countries with fluctuating rates that re-

33. However, in practice, Canada did not draw on Fund resources until 1962, the year it re-established a par value.

34. The nine countries with Article VIII status in 1956 included Canada (1952), the Dominican Republic (1953), El Salvador (1946), Guatemala (1947), Haiti (1953), Honduras (1950), Mexico (1946), Panama (1946), and the United States (1946).

Table 7.2 Adherence to Par Values, 1946–66

Year	All Members	Without Par Values	With Par Values	% Effectively Stable ^a
1946	40	8	21	70
1947	45	8	23	67
1948	48	8	23	63
1949	48	8	24	67
1950	49	9	24	61
1951	50	7	25	62
1952	54	10	20	57
1953	55	6	22	62
1954	56	7	20	59
1955	58	9	22	59
1956	60	11	24	57
1957	64	13	27	63
1958	68	15	31	63
1959	68	12	33	68
1960	68	9	37	72
1961	74	13	40	80
1962	82	17	47	84
1963	102	30	54	85
1964	102	30	54	84
1965	103	28	57	86
1966	104	23	64	87

Source: de Vries (1966, 506–7).

^aIncludes countries with minor multiple currency practices in addition to par values and countries without par values but with fixed or stable unitary rates.

mained stable for at least three years, then the percentage of countries with effectively stable rates in 1966 rises to 87%.

The par value system came under a new set of strains in the late 1960s and finally collapsed in the early 1970s: “This was due to rapid changes in competitive positions among the major industrial countries, reflecting divergent rates of productivity, growth in favor of continental Europe and Japan, to widening disparities in rates of inflation, and to the reluctance of many countries to make timely and adequate exchange rate changes” (Hooke 1982, 5). With the exceptions of devaluations by France in 1958 and 1969, revaluations by Germany in 1961 and 1969 and the Netherlands in 1961, and another sterling bloc devaluation in 1967, members of the developed countries made little use of exchange rate policy between 1950 and 1970.³⁵ The reverse was true for members from developing countries. Eighty-two percent of developing country members devalued by more than 30% between 1949 and 1966, and 25%

35. For detailed descriptions of member country exchange rate policies during 1966–71, see de Vries (1976).

of these devalued by more than 75% (see de Vries 1968). In 1970, Canada was the first country to allow its currency to float, but it was soon followed by Germany in 1971 and the United Kingdom in 1972. In March 1973, the par value system officially collapsed following the U.S. announcement that it would devalue the dollar by 10%.

The empirical evidence on the par value system indicates that the rules of the system were rarely enforced and that the goal of the architects of the system, stable exchange rates, was achieved only by a small number of countries for a short time period. During the so-called heyday of the Bretton Woods era, 1959–67, most developed countries did maintain stable and convertible exchange rates. However, few developing countries were able to maintain stable rates without the help of exchange and trade restrictions.

7.4.2 Member Drawings

The participants at Bretton Woods had originally envisioned use of the IMF's resources as a privilege granted to members that were otherwise in compliance with the IMF's rules and in need of short-term balance of payments assistance.³⁶ But, as was the case with the par value system, the IMF took on an increasingly broad definition of member eligibility for Fund resources.

Uruguay was the only original member that did not have the right to purchase exchange from the IMF because it had not agreed to a par value. Once Uruguay established a par value in 1960, however, the IMF decided to permit member countries to draw on Fund resources even if they had not established a par value.

France was the first country to be declared ineligible to use IMF resources because of noncompliance with the par value system. In 1948, France introduced multiple currency practices that were not approved by the IMF. The only other country to be denied access to IMF resources in response to a par value violation was Czechoslovakia in 1953. Czechoslovakia eventually left the IMF in 1955, partly over this issue.

Bolivia and Cuba were each denied access to IMF resources, in 1958 and 1964, respectively, for noncompliance with the conditions of earlier drawings. Bolivia was unable to carry out the conditions of its standby arrangement, and Cuba failed to repurchase its 1958 drawing within five years. Cuba, however, resigned from the IMF before the ban on future drawings was put in place.

Like the World Bank, the IMF got off to a slow start with its lending practices: "There was a sharp division in the Board between those who believed that members had automatic rights to draw on the Fund's resources and others . . . [who] took the line that access to the Fund's holdings of dollars should be made subject to fairly strict conditions. This atmosphere resulted in many

36. Keynes and White had a difference of opinion on this point. Keynes felt that members should, at the very least, have an indisputable right to draw from the gold tranche.

decisions by the Board which in effect tied the Fund's hands in its initial years: there were to be few transactions, no participation in European payments arrangements, and little action against restrictions" (de Vries and Horsefield 1969, 32). Indeed, in 1949, only \$102 million was drawn from the Fund. Nothing was drawn in 1950. In the years 1951–55, borrowings averaged less than \$100 million per year. Likewise, only five countries have ever been officially denied access to IMF resources.³⁷

In 1952, the Board decided to grant countries the unconditional right to draw up to 25% of their quota (the gold tranche) as a means of encouraging members to use IMF resources. However, the maximum amount that countries were eligible to draw from the IMF in any one-year period was 25% and not more than 200% of their quota in total. In 1953, in yet another effort to encourage more countries to make drawings, the IMF began routinely issuing waivers of the 25% rule.³⁸

IMF drawings beyond the gold tranche are subject to conditionality. Members are required to pursue specific economic policies in order to receive Fund resources. These policies vary from case to case but typically include ceilings on domestic credit and public-sector expenditures, elimination (or reduction) of restrictions on trade and payments, and elimination of price controls. Conditionality is intended to help countries attain viable balance of payments without resort to trade or exchange restrictions. However, at least publicly, countries are rarely pleased to relinquish their policy discretion to the IMF: "Typically some—and sometimes many—of the requirements embodied in the Fund's proposals for conditionality are difficult for the member to accept. . . . If performance clauses are not met, further drawings on the Fund automatically cease" (Polak 1991, 52).

The stringency of IMF conditionality increases with the size of a member's drawing. This may have discouraged members from making large drawings. Table 7.3 shows the amounts of member drawings over the period 1947–65. Before 1961, "no country had outstanding drawings or a stand-by arrangement with the Fund for amounts that in the aggregate exceeded 100% of its quota. The first approval for a larger amount was given in connection with a combined drawing and stand-by arrangement requested by Chile" (Mookerjee 1966, 432). The first sizable drawings in the fourth credit tranche did not occur until 1965.³⁹

In the IMF's first two decades of operation, drawings by industrial countries accounted for over half of total Fund credit. The share of developing country

37. For detailed descriptions of member country drawings over the period 1948–78, see de Vries and Horsefield (1969) and de Vries (1976, 1985).

38. Turkey was the first country allowed to draw over 25% of its quota over a twelve-month period starting in August 1953. Over the period 1956–65, waivers were granted in 144 of 155 standby arrangements and forty-three of seventy-five direct drawings.

39. This changed in the late 1970s when a number of developing countries were granted permission to draw amounts two and three times their quota. For example, in 1980, a standby arrangement for Turkey involved permission to draw up to 625% of its quota.

Table 7.3 **Amounts of Fund Transactions by Tranches, 1947–65**
 (in millions of U.S. dollars)

Year	From Net Creditor Position	Gold Tranche	First Credit Tranche	Second Credit Tranche	Third Credit Tranche	Fourth Credit Tranche
1947	...	398.8	68.9	...	...	...
1948	...	89.9	118.1	...	...	...
1949	...	56.7	44.8	...	...	...
1950
1951	...	6.6	28.0	...	...	...
1952	...	13.9	43.2	28.0	...	...
1953	...	158.5	62.5	8.5	...	...
1954	...	49.9	12.5	...	...	...
1955	...	12.5	12.5	2.5	...	...
1956	...	294.6	369.0	20.8	8.1	...
1957	...	421.2	452.1	103.2	.6	...
1958	...	54.6	55.7	211.7	16.0	...
1959	...	42.6	64.0	69.2	3.9	...
1960	...	61.7	106.9	104.5	6.6	...
1961	37.5	722.5	869.0	785.0	64.3	...
1962	24.3	167.6	214.1	93.4	64.0	20.2
1963	...	8.4	15.9	112.3	138.6	44.8
1964	157.5	1,140.7	514.2	60.2	18.7	57.5
1965	...	462.7	69.7	777.3	528.1	491.0

Source: Mookerjee (1966).

drawings did not exceed that for industrial countries until the late 1970s. Table 7.4 shows the relative magnitudes of drawings by developed and developing countries over the period 1947–78. The first large drawings on the Fund were made by the United Kingdom and France in 1948 before the Marshall Plan disbursements began. The Marshall Plan was in effect from 1948 through 1952, and, under its auspices, the United States provided \$11.6 billion in grants and \$1.8 billion in loans to European countries and \$950 million in grants and \$275 million in loans to Japan. Countries that were eligible for Marshall Plan funds were to make Fund drawings only in exceptional or unforeseen cases. But, even in this four-year period, when developed countries were essentially ineligible for Fund credit, total drawings by developing countries did not exceed \$250 million.

An increasing fraction of drawings after 1952 were in the form of standby arrangements. Although these arrangements were originally “considered as something in the nature of a confirmed line of credit that gave a member an absolute right to make purchases . . . [they have] become the main instrument for conditionality” (de Vries and Horsefield 1969, 533). This may explain why many of these credit arrangements were never actually used. Table 7.5 provides data on the amounts drawn under standby arrangements from 1947 to 1965. Only 23% of these arrangements were fully drawn on. This trend

Table 7.4 Drawings on the IMF, 1947-71 (U.S. \$million), 1971-78 (SDRs)

Year	Developed Countries ^a	Other Countries	No. of Countries
1947	431	37	8
1948	132	76	11
1949	29	73	6
1950	0	0	0
1951	0	35	2
1952	34	51	6
1953	129	100	6
1954	0	62	3
1955	0	27	2
1956	561	131	11
1957	540	437	20
1958	190	148	14
1959	50	130	12
1960	19	260	14
1961	1,775 ^b	703	22
1962	300	284	18
1963	30	304	15
1964	1,762 ^c	188	22
1965	1,885 ^d	443	23
1966	892	556	34
1967	425	410	29
1968	2,864 ^e	689	37
1969	2,476	395	36
1970	1,513	326	41
1971	1,473 ^f	427	35
1972	1,416 ^g	613	30
1973	599	577	26
1974	533	525	24
1975	3,228 ^h	1,874	50
1976	4,062 ⁱ	2,530	57
1977	2,874 ^j	2,036	55
1978	1,912 ^k	591	31

Source: IMF, *International Financial Statistics*.

^aIncludes *Industrial countries* (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, the United Kingdom, and the United States and *other developed areas* (Australia, Austria, Denmark, Finland, Iceland, Ireland, Israel, New Zealand, Norway, Portugal, South Africa, Spain, and Yugoslavia).

^b\$1,500 million of which was to the United Kingdom.

^c\$1,000 million of which was to the United Kingdom and \$525 million of which was to the United States.

^d\$1,400 million of which was to the United Kingdom and \$435 million of which was to the United States.

^e\$1,400 million of which was to the United Kingdom and \$745 million of which was to France.

^f\$1,362 million of which was to the United States.

^g\$1,312 million of which was to the United States.

^h\$1,942 million of which was to Italy.

ⁱ\$1,700 million of which was to the United Kingdom.

^j\$1,700 million of which was to the United Kingdom.

^k\$1,250 million of which was to the United Kingdom.

Table 7.5 Amounts Drawn under Standby Arrangements, 1947–65

Amount Drawn as % of Amount Available	% of Total No. of Standby Arrangements
0	30
1–25	6
26–50	16
51–75	13
76–99	12
100	23

Source: Mookerjee (1966).

continued in the late 1960s and 1970s. Over time, standby agreements served less as a financial resource and more as a signal to both private banks and investors that the country had the IMF's stamp of approval.

The evidence on drawings and standby agreements confirms that the original rules of the game set at the Bretton Woods conference did not remain hard and fast. There were few instances in which countries were declared ineligible for IMF resources, even when they did not follow the rules of the par value system. There were even fewer instances of countries getting close to their credit limits. One explanation for this pattern is that the IMF used conditionality as its stick. Countries were de facto ineligible for Fund resources if they did not agree to pursue IMF-dictated adjustment policies. Over the Fund's first three decades, the industrial countries were the major recipients of Fund resources and conditionality. However, since 1978, most drawings on the IMF have involved developing countries. With conditionality as the Fund's major means of enforcing its rules, this change in the IMF's clientele has effectively led to a two-tier membership system. Those developing countries that rely on IMF credit are subject to the rules of the game, while the developed countries are not.

7.5 The Evolution of the IMF's Role in Maintaining Cooperation

By the end of the 1960s, the IMF's role in promoting international cooperation had fundamentally changed. The participants at the Bretton Woods conference assigned the IMF two main tasks: to enforce the rules of the par value system and to provide members with financial assistance when necessary to enable them to observe the rules. But the historical record indicates that the par value system was never widely adhered to, and it was soon to be abandoned altogether. Likewise, as the world's private capital markets developed, developed countries no longer needed to rely on IMF resources for their financing needs.

The IMF responded to the changing economic environment by turning its focus from the developed world to developing countries. But, rather than

competing with private capital markets for business, the IMF took on a new role as a monitor of developing country stabilization programs. Although the commercial banks might have preferred that the IMF directly provide them information about the economic prospects of countries, the confidential nature of member country information precluded such an arrangement: "Commercial bankers were not in a position to monitor the borrowing government's implementation of economic policy measures, and they gradually came to view that the best approach was to ask the country to enter into an upper credit tranche stand-by arrangement with the Fund" (Mentre 1984, 31).

A simple two-period model of a country that wishes to borrow can provide insight into the potential monitoring role for an international organization. Section 7.5.1 presents the model, and section 7.5.2 presents empirical evidence.

7.5.1 A Monitoring Role for the IMF

Consider a model in which a country's population can be represented by a single agent, the government, with utility function $U(C_1) + \delta U(C_2)$, in which U is a standard concave function, δ is a discount factor ($0 < \delta < 1$), and C_i is i th-period consumption. The country enters period 1 with endowment Y to be allocated between consumption in period 1 and investment in period 1. The country can borrow an amount b in period 1. In period 2, the capital invested during period 1 produces according to a concave production function, $f(k)$, modified with an efficiency parameter θ . Debts must be repaid with interest accruing at rate r . If it is assumed that debt contracts are perfectly enforceable, then consumption is $C_1 = Y + b - k$ in period 1, and $C_2 = \theta f(k) - (1 + r)b$ in period 2. If the government chooses k and b to maximize utility, it will follow the golden rule: $\theta f'(k^*) = 1 + r$.

If contracts are not perfectly enforceable, then banks will need a means to punish debtors that default on their loans in period 2. It is common in the debt literature (see Bulow and Rogoff 1989, app.) to assume that banks cannot recoup anything from a sovereign country that defaults and cannot charge discriminatory interest rates. Adopting such a framework, the only recourse that banks have when a country defaults is to refuse to grant trade credit. This, in turn, causes a loss of a fraction ρ of the defaulting country's output. Given such a penalty, a country that invested k and borrowed b in period 1 will repay its debt when $\theta f(k) - (1 + r)b \geq (1 - \rho)\theta f(k)$. Banks can foresee this choice and will not lend more than a country will repay.⁴⁰ This establishes a credit ceiling $b^c = \rho\theta f(k)/(1 + r)$. As long as θ is fully observable by both the country and the bank and the credit ceiling is binding,⁴¹ the country will choose k to maximize utility such that

40. Eaton and Gersovitz (1981) present the classic analysis of lender and borrower incentives under these conditions.

41. If the credit ceiling is not binding, the maximization problem again yields the golden rule.

$$(12) \quad \theta f'(k^c) = \theta g'(k^c)(1 + r) + [1 - \theta g'(k^c)] \frac{U'(C_1^c)}{\delta U'(C_2^c)}, \quad \text{where } g(k) = \frac{\rho f(k)}{1 + r},$$

which says that capital is accumulated until its marginal productivity equals the effective interest rate, a weighted combination of the market rate and an implicit rate. The weights are proportional to θ , indicating that low- θ countries are likely to face higher effective interest rates than high- θ countries.

If θ is unobservable, the problem for the banks and the countries is more complicated.⁴² Assume that there are two types of countries, a proportion γ of low-efficiency types (θ_l) and a proportion $(1 - \gamma)$ of high-efficiency types (θ_h), with $\theta_h > \theta_l$. If banks can observe θ , they will offer low- θ types loans up to b_l^c and high- θ types loans up to b_h^c . The low- θ types will borrow all they can, and the high- θ types will borrow their optimal amount, $b_h^* < b_h^c$. On average, a representative country therefore receives $\gamma b_l^c + (1 - \gamma)b_h^*$ in loans. But if banks cannot observe θ , they can be sure to be repaid only on those loans that do not exceed the credit ceiling that applies to θ_l types, b_l^c .⁴³ In this case, low- θ countries are unaffected, while both the banks and high- θ countries are hurt. Banks earn fewer profits because potentially profitable loans to high- θ countries are not made. This inefficiency is difficult to avoid because low- θ countries have an incentive to imitate the behavior of high- θ types in order to borrow more.

Define $U(\theta_l, \theta_l)$ to be the level of utility of a correctly identified low- θ type, and let $U(\theta_l, \theta_h)$ be the utility of a low- θ type that imitates a high- θ type, such that

$$(13) \quad \begin{aligned} U(\theta_l, \theta_l) &= U(Y + b_l^c - k_l^c) + \delta U[\theta_l f(k_l^c) - (1 + r)b_l^c], \\ U(\theta_l, \theta_h) &= U(Y + b_h^* - k_h^*) \\ &\quad + \delta U\{\max[\theta_l f(k_h^*) - (1 + r)b_h^*; (1 - \rho)\theta_l f(k_h^*)]\}. \end{aligned}$$

Visually comparing these levels of utility, we see that a low- θ type that imitates a high- θ type can consume more in the first period than if it were correctly identified. This is because the consumption smoothing properties of a concave utility function assure that high- θ types consume more in both periods than low- θ types do.

42. Here the assumption is that θ is given but unobservable and that countries have no control over efficiency. This assumption leads to a classic adverse selection problem. Countries that know that they have low θ s will try to exploit the bank's inability to distinguish them from high- θ countries. An alternative assumption made by Gertler and Rogoff (1990) is that investment (k) is unobservable. Lenders observe the total amount borrowed, realized output, and the country's production function, but they do not observe what the borrower does with the funds. This assumption leads to a moral hazard problem. The IMF can serve an important role in the context of either problem. But if the problem is moral hazard, then the IMF rule would involve conditionality rather than monitoring.

43. Stiglitz and Weiss (1981) show that, even if banks can charge discriminatory interest rates, credit rationing will arise if borrowers are not distinguishable because the interest rate will itself affect the riskiness of loans.

One solution to this problem, from the standpoint of banks and high- θ countries, is for high- θ countries to signal their true type.⁴⁴ The problem for the high- θ country is to maximize its utility subject both to the credit constraint and to the constraint that an imitating low- θ country's utility is not higher than it would be if correctly identified, $U(\theta_i, \theta_h) \leq U(\theta_i, \theta_i)$. The first-order conditions from this maximization problem⁴⁵ indicate that a high- θ country is likely to borrow less when it needs to signal:

$$(14) \quad (1 + r) = \theta f'_h(k_h) \left\{ 1 - \lambda(1 - \rho) \left(\frac{\theta_l}{\theta_h} \right) \frac{U'[(1 - \rho)\theta_l f(k_h)]}{U'(C_{2h})} \right\}.$$

Borrowing adds to both the high- θ country's utility in period 1 and the imitator's utility because the latter depends on the actions of the country being imitated. The usual benefits from borrowing in period 1, $\delta\theta f'(k)U(c_2)$, are modified by the last term in the first-order condition. Under these circumstances, the costs of borrowing for the high- θ country will be larger the larger is θ_l/θ_h , and the lower is the loss of output to the imitator when it does not repay its loan (ρ). More generally, the high- θ types incur the full cost of repayment $(1 + r)U'(C_{2h})$ but do not reap the full benefits of investing because some of the benefits leak to the imitators.

This model suggests that countries can benefit from a credible monitoring technology that would help banks distinguish between low- θ and high- θ types. Assume that the cost of monitoring i countries is $C(i) = C + wi$, where $C(i)$ exhibits decreasing average costs or economies of scale in monitoring. This assumption reflects the fact that an organization, once set up, can monitor additional countries at small cost. Further, assume that the fixed cost C is high enough that it does not pay individual banks to incur the costs of monitoring. (Nor can high- θ types afford to pay for the costs of individual bank monitoring.) If there are j debtor countries and the IMF monitored all of them, its average monitoring cost would be $C/j + w$. As long as C and j are large enough, high- θ countries will request the IMF to monitor them and can even offer to pay for the service. Further, as long as monitoring is credible, low- θ types (that seek to imitate high- θ types) have no incentive to go to the IMF to be monitored because they will be found out. Therefore, the very action of going to the IMF conveys all the information to the banks that is needed to distinguish correctly between the true high- θ types and imitating low- θ types.

7.5.2 Empirical Evidence

The two oil crises in the 1970s were particularly damaging to the terms of trade of nonoil developing countries. While the IMF responded to these developments by introducing two temporary oil facilities in 1974 and 1975, it was the commercial banking sector that responded with substantial financial assistance. The proportion of external debt of developing countries owed to

44. For an analysis of a similar signaling problem, see Milgrom and Roberts (1982).

45. For details, see Appendix B.

private banks rose dramatically over the period 1973–82. Table 7.6 presents these data, along with the relatively smaller magnitudes of developing country debt owed to governments and international institutions over the same period.

Although the model described above suggests that the IMF could have helped private banks distinguish between types of developing country borrowers in this period, there is little evidence that any such certification took place. Commercial bank loans continued to be readily available for many developing countries throughout the 1970s, but banks gradually began to restrict capital flows toward certain regions. It was at this time that the IMF's information and monitoring role began to take shape: "Both in Eastern Europe and later in Latin America, certain countries found their access to capital markets restricted, partly because the debt problems in neighboring countries had changed bankers' assessment of their creditworthiness. In some cases, the Fund, at the request of the debtor authorities, has been the conduit of information between the countries and their creditors, in an effort to help ensure that market sentiments be guided by more comprehensive and reliable economic information" (Braun and Williams 1983, 14).

By 1978, certain heavily indebted countries began to have difficulty servicing their loans and approached both official and private creditors for debt restructurings. It was at this time that the IMF's monitoring role became established. Both official creditors and bank creditors began to require that countries experiencing payments difficulties negotiate upper credit tranche arrangements with the IMF prior to the conclusion of their restructuring negotiations. In thirty-nine of forty-seven restructuring negotiations with commercial banks over the period 1978–83, the new terms were made conditional on an IMF arrangement (see Braun and Williams 1983, table II, pp. 30–34).

Table 7.6 External Debt of Nonoil Developing Countries, 1973–82
(in billions of U.S. \$)

Year	Total Debt Outstanding	Government	International Institutions	Private Banks
1973	130.1	37.3	13.7	60.8
1974	160.8	43.4	16.6	77.9
1975	190.8	50.3	20.3	95.1
1976	228.0	57.9	24.8	114.8
1977	278.5	67.6	31.0	137.3
1978	336.3	79.1	38.4	169.1
1979	391.1	89.1	45.6	199.7
1980	467.6	101.7	53.2	229.5
1981	550.8	113.4	62.7	275.5
1982	614.2	125.7	71.0	300.8

Source: IMF, *Annual Report* (various issues).

Note: Nonoil developing countries include all Fund members except industrial countries and countries where oil exports account for at least two-thirds of total exports.

Upper credit tranche standby arrangements serve this monitoring role well because they typically involve substantial conditionality.⁴⁶ Further, the IMF disburses portions of its financial assistance over time, usually over the course of one or two years. This permits the IMF to monitor the adjustment program and potentially cancel financial support for a member that does not comply with the conditions of the arrangement.

7.6 Lessons for Future International Cooperative Arrangements

While the institutions created by the Bretton Woods Agreement (and subsequently) fell short of achieving the goals that were originally set for them, they all survived the collapse of the Agreement. The IMF was not able to maintain the par value system, the World Bank was not able to satisfy the financing needs of postwar reconstruction and development, and the GATT was not able to eliminate trade restrictions between countries. But, to their credit, each of these organizations had the flexibility to evolve with economic circumstances and take on new roles in the maintenance of international cooperation.

The models presented in this paper indicate that international organizations can facilitate cooperation by serving as commitment mechanisms. Even when countries understand that cooperation will lead to a Pareto-superior equilibrium, they will be reluctant to cooperate unless they are convinced that other countries are also committed to doing so. The postwar institutions all provided member countries with commitment mechanisms, but evidence suggests that some of these were not credible. The IMF and the GATT both provided member countries with a set of rules of cooperation. However, the record indicates that these rules were not consistently enforced. Likewise, the IMF and the World Bank provided members financial resources to enable them to play by the rules. But these resources were so restricted as to tie a country's incentive to cooperate to the level of its accumulated debt. All three institutions provided members a centralized source of information on each other's commitment to the rules. Of the three forms of commitment mechanism, evidence suggests that this was the most effective, in that it remains an important function for each institution.

If the IMF, the World Bank, and the GATT had not been established after the war, would it have been necessary to create them subsequently? It is difficult to find evidence that they were indispensable. History suggests that more recent architects would have less ambitious goals than the ones formulated at Bretton Woods. Further, the evolution of commitment mechanisms used by

46. De Long and Eichengreen (1991, 2) argue that it was the conditionality that went with the Marshall Plan financial aid that deserves the credit for that program's success: "Conditionality pushed governments toward political and economic orders that used the market to allocate resources and the government to redistribute wealth, and that turned out to be highly successful at inducing rapid economic growth."

the postwar organizations indicates that more recent organizations would have relied less on rules and more on the provision of centralized information to promote international cooperation.

Our postwar experience with international organizations provides us with three broad lessons. First, commitment mechanisms are effective only if they are credible. The IMF's original rules of the game were too strict and thus not credible. The Fund effectively turned to a more flexible commitment mechanism, conditionality, to influence member country behavior. Second, an international organization can convince domestic parties to undertake policies that improve global welfare by providing the country's government with financial incentives that override its time inconsistency problem. Governments can draw on IMF and World Bank resources to credibly forge compromises among conflicting domestic interest groups. Third, evidence suggests that international organizations can effectively promote cooperation by providing their members with a credible monitoring technology. Both the IMF and the World Bank are able to certify their members' commitment to cooperative behavior by exploiting access to confidential information on members' economic performance.

Appendix A

Proposition 1. The CD strategy induces a subgame equilibrium in the devaluation game when

$$C < 1 - \alpha.$$

Proof. Without loss of generality, assume that it is H 's turn to move at time t . As of this moment, the state of the game is summarized by Δ_t defined as

$$\Delta_t = e_{t-1}^H - e_{t-1}^F,$$

where $\Delta_1 = 0$, and, for $t > 1$, Δ_t can take any one of the values $\{-M, -m, 0, m, M\}$. In all these cases except the last one, $\Delta_t = M$, the CD strategy requires H to devalue at t , yielding profits $\pi^{H^{CD}} = \delta(1 - C + \pi^{F^{CD}})$. If $\Delta_t = M$, CD calls for no devaluation and yields $\pi^{H^{CD}} + \delta C$. Consider deviations that consist of setting e_t^H such that (recall $e_t^F = e_{t-1}^F$) $\Delta^H = e_t^H - e_t^F = \{m, 0, -m, -M\}$, assuming that, starting at $t + 1$, F will stick to the CD strategy. Equations (A1)–(A8) show that the payoffs to H from following any one of the deviations Δ^H are smaller than $\pi^{H^{CD}}$ and thus also smaller than $\pi^{H^{CD}} + \delta C$:

$$(A1) \text{ If } \Delta^H = m \text{ and } \Delta_t \neq m, \\ \text{then } \pi^{H^m} = \delta(\alpha - C + \pi^{F^{CD}}) < \pi^{H^{CD}}.$$

- (A2) If $\Delta^H = m$ and $\Delta_t = m$,
 then $\pi^{Hm,m} = \delta(\alpha + \pi^{FCD})$ and $\pi^{Hm,m} \leq \pi^{HCD}$
 if $\alpha \leq 1 - C$ as assumed.
- (A3) If $\Delta^H = 0$ and $\Delta_t \neq 0$,
 then $\pi^{H^0} = \delta(-C + \pi^{FCD}) < \pi^{HCD}$.
- (A4) If $\Delta^H = 0$ and $\Delta_t = 0$,
 then $\pi^{H^{0,0}} = \delta\pi^{FCD} < \pi^{HCD}$.
- (A5) If $\Delta^H = -m$ and $\Delta_t \neq -m$,
 then $\pi^{H^{-m}} = \delta(-\alpha - C + \pi^{FCD}) < \pi^{HCD}$.
- (A6) If $\Delta^H = -m$ and $\Delta_t = -m$,
 then $\pi^{H^{-m,-m}} = \delta(-\alpha + \pi^{FCD}) < \pi^{HCD}$.
- (A7) If $\Delta^H = -M$ and $\Delta_t \neq -M$,
 then $\pi^{H^{-M}} = \delta(-1 - C + \pi^{FCD}) < \pi^{HCD} - \delta^2 C$
 because $C \leq \frac{2}{\delta^2}$ as assumed.
- (A8) If $\Delta^H = -M$ and $\Delta_t = -M$,
 then $\pi^{H^{-M,-M}} = \delta(-1 + \pi^{FCD}) < \pi^{HCD} - \delta^2 C$
 because $C \leq \frac{2}{1 + \delta^2}$ as assumed.

Q.E.D.

Proposition 2. Strategy (S) is a subgame perfect equilibrium if

$$(1 - \alpha) > C > (1 - \delta)/(1 + \delta).$$

Proof. Assume that no devaluation has occurred in the past; then any devaluation triggers competitive behavior. If it is the home country's turn to move and the foreign country has just devalued, then the home country has four options, $\Delta e^H = \{-M, -m, m, M\}$. Clearly, $\pi^{H^{-M}} < \pi^{H^{-m}} < \pi^{H^m} < \pi^{H^M}$ so that the only sensible option consists of setting $\Delta e^H = e_t^H - e_t^F = M$, yielding the payoff π^{HCD} . But it was shown previously that $\pi^{HCD} < 0$ when $C > (1 - \delta)/(1 + \delta)$. If a devaluation already occurred, then the proof of proposition 1 assures that the punishment phase of strategy s is also one-step unimprovable. Q.E.D.

Proposition 3. Assume that $\delta^{-1} = 1 + r$, $r > 0$. Given the assumption of proposition 2, $1 - \alpha \geq C \geq (1 - \delta)/(1 + \delta) = r/(2 + r)$, and the necessary condition that $\alpha = \hat{\alpha}$, the F strategy induces stability as a subgame perfection equilibrium.

Proof. The arguments presented in the text indicate that, if F follows F, H will deviate either an infinite number of times or not at all. This is because any number of deviations $n \leq v^*$ is worse than not deviating at all. An infinite number of deviations is better than any finite number $n > v^*$. Thus, a first deviation by H implies an infinite number of deviations to follow. Under these conditions, the maximum discounted value of F's surpluses and deficits is

$-\delta/(1 + \delta)$, an amount that F does not have the capacity to repay. This implies that the game with the IMF collapses to the one described in proposition 2 during the very first period and that its outcome is the same as in that game, although F is formally following strategy F .

If F , reacting to H 's D strategy, deviates from F by devaluing by more than is necessary to maintain external balance, it gains π^{HCD} minus $(1 + r)\delta$ because it must still repay its accumulated debts to the IMF. But $-\delta C > -\delta(1 + r) > \pi^{HCD} - (1 + r)\delta$.

If F postpones adjustment two periods, F 's profits will be $-\delta^3 C - \delta^2 - \delta = -\delta(\delta^2 C + \delta + 1)$ net of payments to the IMF because F will not be eligible for loans in the intermediate periods. But $-\delta C + \delta^3 C + \delta^2 + \delta = \delta[(\delta^2 - 1)C + \delta + 1]$. This is nonnegative if $1 + \delta \geq C(\delta^2 - 1)$, which is true for any $C > 0$. Alternatively, putting off the payment triggers the CD outcome, as it makes any further IMF intervention impossible. Profits in this case are $-\delta(2 + r) - \delta^2 + \delta^2 \pi^{HCD}$, and this is smaller than $-\delta(1 + r) < -\delta C$. Q.E.D.

Appendix B

The borrowing country's maximization problem in the case where debt contracts are perfectly enforceable is

$$\begin{aligned} \max_{b,k} & U(Y + b - k) + \delta U[\theta f(k) - (1 + r)b], \\ \text{f.o.c.:} & U'(C_1^*) = \delta(1 + r)U'(C_2^*), \\ & U'(C_1^*) = \theta \delta U'(C_2^*)f'(k^*). \end{aligned}$$

Combining the first-order conditions, we obtain the golden rule for investment: $\theta f'(k^*) = 1 + r$, which determines k^* . Substituting k^* in either f.o.c. yields b^* . Assume that, while all countries have the same δ , $U(\cdot)$, and $f(\cdot)$, k^* and b^* differ among countries depending on the country's level of efficiency θ . In order to show that $k^*(\theta)$ and $b^*(\theta)$ are monotonically increasing in θ , first differentiate the golden rule with respect to θ :

$$\begin{aligned} f'[k^*(\theta)]d\theta + \theta f''[k^*(\theta)]dk^*(\theta) &= 0, \\ \text{rearranging: } \frac{dk^*(\theta)}{d\theta} &= \frac{-f'[k^*(\theta)]}{\theta f''[k^*(\theta)]} > 0. \end{aligned}$$

Next differentiate the first f.o.c. taking $dk^*(\theta)/d\theta$ into account:

$$U''(C_1) \left[db^* - \frac{dk^*(\theta)}{d\theta} d\theta \right]$$

$$\begin{aligned}
 &= \delta(1+r)U''(C_2) \left[-(1+r)db^* + f(k^*)d\theta + \theta f'(k^*) \frac{dk}{d\theta} \right], \\
 &\quad \text{rearranging: } \frac{db^*(\theta)}{d\theta} \\
 &= \frac{[U''(C_1) + \delta(1+r)\theta f'(k^*)U''(C_2)] \frac{dk^*(\theta)}{d\theta} + \delta(1+r)U''(C_2)f(k^*)}{U''(C_1) + \delta(1+r)^2U''(C_2)} > 0.
 \end{aligned}$$

If debt contracts with sovereign countries are not perfectly enforceable and the only recourse for banks when countries default is to refuse to grant trade credit, the country's maximization problem includes an additional constraint. Banks will not lend more than they expect will be repaid. Borrowing countries will therefore be faced with a credit ceiling, such that $b \leq \theta g(k)$. (Where $\theta g(k) = \rho \theta f(k) / [1+r]$ and ρ is the fraction of output, countries will lose if banks refuse to grant trade credit.) If this borrowing constraint is binding, the country's problem becomes

$$\begin{aligned}
 &\max_k U[Y - k + \theta h(k)] + \delta U[\theta f(k) - (1+r)\theta g(k)], \\
 &\text{f.o.c. } U'(C_1)[\theta g'(k^c) - 1] + \delta U'(C_2)[\theta f'(k^c) \\
 &\quad - \delta(1+r)U'(C_2)\theta g'(k^c) = 0,
 \end{aligned}$$

rearranging terms:

$$\theta f'(k^c) = \theta g'(k^c)(1+r) + [1 - \theta g'(k^c)] \frac{U'(C_1)}{\delta U'(C_2)}.$$

If θ is unobservable but there are two types of countries, high efficiency (θ_h) and low efficiency (θ_l), high- θ countries will have an incentive to signal to banks their true type. The high- θ country's problem is

$$\begin{aligned}
 &\max_{k_h, b_h} U(Y + b_h - k_h) + \delta U[\theta_h f(k_h) - (1+r)b_h], \\
 &\text{s.t.: } b_h \leq \theta_h g(k_h), \\
 &\quad U(\theta_l, \theta_h) \leq U(\theta_h, \theta_h).
 \end{aligned}$$

The first-order conditions when the credit ceiling is not binding are

$$\begin{aligned}
 U'(C_{1h})(1-\lambda) &= \delta \theta_h f'(k_h) U'(c_{2h}) \left\{ 1 - \lambda(1-\rho) \left(\frac{\theta_l}{\theta_h} \right) \frac{U'[(1-\rho)\theta_l f(k_h)]}{U'(c_{2h})} \right\} \\
 U'(c_{1h})(1-\lambda) &= \delta(1+r)U'(c_{2h}),
 \end{aligned}$$

combining:

$$(1+r) = \theta_h f'(k_h) \left\{ 1 - \lambda(1-\rho) \left(\frac{\theta_l}{\theta_h} \right) \frac{U'[(1-\rho)\theta_l f(k_h)]}{U'(C_{2h})} \right\}.$$

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Comment Alberto Alesina

The message of the paper by Kathryn Dominguez can be summarized by the following quote: “The IMF was not able to maintain the par value system, the

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World Bank was not able to satisfy the financing needs of postwar reconstruction and development, and the GATT was not able to eliminate trade restrictions between countries. But, to their credit, each of these organizations had the flexibility to evolve with economic circumstances and take on new roles in the maintenance of international cooperation.”

It should be noted that Dominguez’s paper is almost exclusively concerned with the IMF; the role of the other two organizations is analyzed very briefly. I find the first part of the paragraph too harsh, and based on an overestimation of what these organizations could achieve and an underestimation of what they did achieve.

In some sense, the statement *is* correct: the par value system did not last, and several devaluations occurred; the world is not a free trade area, and the World Bank did not solve all the financing need for reconstruction and development. I guess the question is what we can expect from international organizations like these. Can they really enforce “good behavior and cooperation” if key member countries do not want to cooperate? After all, the first twenty-five years after the Second World War were an economic dream, at least for the industrial countries, compared to the twenty-five years after the First World War.

The second part of the statement does not necessarily save the reputation of these organizations; the fact that they adapted to changing circumstances may just be an example of a successful struggle of inefficient international bureaucracies to survive. The fact that they survived is not enough credit, in particular given the rather negative judgment cast on their performance in the first thirty years of their lives in the first part of the paragraph.

I shall first discuss the theory of cooperation presented in the paper; then I shall turn to the empirical evidence.

Dominguez argues, quite correctly, that one can think of three methods of cooperation: (1) rule-based cooperation, which is the strongest but least flexible type of cooperation; (2) international negotiations with no rules, which is the weakest but most flexible type of cooperation; and (3) cooperation enforced with a combination of rules with escape clauses and international negotiations, in the context provided by international organizations. The type of cooperation chosen in the Bretton Woods Agreement is clearly the third one. Dominguez suggests that it failed or, at least, was largely unsuccessful.

Section 7.1 of the paper considers a standard repeated prisoner’s dilemma in which the “dilemma” is that noncooperative behavior leads to competitive devaluations. Dominguez argues that sovereign countries by themselves (i.e., simply by force of reputation and fear of retaliation) would have trouble enforcing cooperative behavior for several reasons, including information and monitoring costs. An international organization helps support cooperation by favoring diffusion of information, facilitating negotiation, and generally promoting mutual understanding. I agree with all these arguments. In fact, there is a direct connection between the role of international organizations and the

cost of noncooperative behavior. By joining, say, the IMF, a country set itself up in a situation in which, in order to devalue in a noncooperative fashion, it would have had to engage in some kind of discussion with the IMF, perhaps leave this organization, basically "make a fuss." Thus, joining an international organization raised the costs of noncooperative behavior; in the language of repeated games, the costs of "cheating" are increased by joining the organization.

Reputation and institutions complement each other; they are not substitutes. Even though institutional arrangements may increase the costs of noncooperation in the repeated prisoner's dilemma games, in the end it is always the fear of losing reputation and being retaliated against that prevents a country from behaving noncooperatively. This simple consideration implies that one cannot expect miracles from international organizations of independent and sovereign nations.

Up to this point, the paper considers each country as a homogeneous player. In section 7.3, the paper briefly touches on a very interesting issue: the interconnection between international cooperation and domestic political conflict. Recent developments in international relations theory emphasize how one cannot separate the dynamic of domestic political conflicts from the resolution of international policy coordination problems.¹ Putnam convincingly argues that politicians and bureaucrats engaged in international policy coordination play a "two-level game": one "level" within the context of domestic politics, one "level" in the international arena. This interplay is viewed by Dominguez as one in which the IMF is a sort of "international social planner" that maximizes world welfare. On the contrary, the governments of each individual country are short lived and short sighted, suffer from time-inconsistency problems, and cannot resolve domestic distributional struggles.

I have a lot of sympathy for this approach, particularly insofar as it captures domestic politics. However, the treatment of the IMF as essentially a "world social planner" maximizing "global welfare" is oversimplified. Is the IMF maximizing global welfare, or are IMF policies the result of some resolution of the conflicts of interests of different country members, which may or may not coincide with "global welfare"? More generally, how are the "weights" of the "global welfare function" derived?

I would have liked to see much more in this paper on the politics of IMF interventions, from the point of view of both domestic and international politics. For instance, it would have been useful to investigate more closely what the IMF can do to resolve domestic distributional "wars of attrition," which are discussed in the paper. De Long and Eichengreen argue that the difference between the successful adjustments in Western Europe after the Second World

1. See Robert D. Putnam, "Diplomacy and Domestic Politics: The Logic of Two Level Games," *International Organization* 43, no. 3 (Summer 1988): 427-60; and Robert Keohane and Joe Nye, "Transgovernmental Relations and International Organizations," *World Politics* 27 (1974): 39-62.

War and the much less successful ones after the First World War is precisely due to the fact that domestic distributional conflicts were resolved more quickly and more cooperatively after the Second World War.² This, in their view, was the result of the skillfully designed Marshall Plan. I wonder whether the more cooperative international climate that the three international organizations promoted had something to do with this success story. I found these “political” arguments very interesting and very innovative; I wish that they had played a more substantial role in Dominguez’s paper.

The empirical part of the paper documents the view that one should have expected a lot from these three organizations, and in particular from the IMF, but that they did not deliver. According to the author, the IMF never enforced the par value system and let countries devalue their currencies or fluctuate without even checking whether a “fundamental disequilibrium” really justified such devaluations.

The discussant’s role is to disagree, even though I have a lot of sympathy for the view pushed in the paper. I will make two points. First, the fact that the IMF never (except in a couple of cases) opposed a devaluation does not necessarily mean that its role was irrelevant. Other devaluations may not have been carried over in anticipation of difficulties with the IMF. Second, it is not completely clear what benchmark is to be used to decide whether there were too many (or too few!) devaluations and/or whether credit facilities were used too much or not enough. For instance, table 7.2 reports the adherence to par values in 1946–66. Is this rate of “effective stability” (see the last column of this table) high or low?

Dominguez explicitly acknowledges the difficulty created by this lack of an obvious benchmark. Nevertheless, she feels that, in the end, a negative judgment should be cast on the IMF. Such a judgment has, unavoidably, a certain amount of arbitrariness. Nevertheless, I applaud her strong stand; much better to provoke the reader to “think” than writing too much of a “two-handed” conclusion!

In the final part of the paper, Dominguez argues that, after the collapse of the Bretton Woods system, the IMF changed its role and became a monitoring agency geared toward reducing problems of asymmetric information between commercial banks and borrowing countries. A crucial, difficult question that is not truly addressed by the paper is, If the IMF did not exist, should it have been created in the mid-1970s after the collapse of the Bretton Woods system? Or did the IMF survive just because it was there? Do the new functions of the IMF justify its creation *ex novo* or only its survival? Did the IMF survive because of “sunk costs” arguments?

In summary, this paper reads as if, with the help of international organizations, it should have been relatively easy to make the world a harmonious

2. Bradford De Long and Barry Eichengreen, “The Marshall Plan as a Structural Adjustment Program” (Cambridge, Mass.: Harvard Institute of Economic Research Discussion Paper Series no. 1576, November 1991).

place in which trading partners cooperate on economic matters. Since we are still far from this ideal situation, international organizations must have failed. I take a much more cynical view. Incentives not to cooperate are strong. From the creation of modern nation-states five hundred years ago, countries have been at war with each other very often, including in this present century, the first half of which was one of the bloodiest periods of modern history. After the Second World War, industrial countries have managed to survive more cooperatively than ever before. We did not have another Great Depression as in the 1930s; trade restrictions were reduced; except in the mid-1970s growth was relatively high and stable. We did not have a Third World War; even the Cold War is over. It is difficult to tell whether we would have had the same economic outcomes without the three organizations. However, while reading this well-executed paper, I had to remind myself every once in a while how much better the post-Second World War adjustment has been than the post-First World War adjustment.

Comment William H. Branson

This paper provides an interesting new analysis of the role of the Bretton Woods institutions in the world economy, focusing mainly on the IMF. In a series of game-theoretic models, the paper shows the IMF playing several roles. It can provide a commitment mechanism in cases within countries where there may be prisoner's dilemmas between policymakers. Essentially, it can provide resources to support a ban on bad strategies. It can also provide information to private lenders via monitoring, giving countries incentives to be good borrowers. While illustrating the operation of the IMF, the paper also evaluates how the institutions, especially the IMF, have evolved with the changing world economic environment. I will come back to this evaluation at the end of this Comment.

The first series of models in section 7.1 begins with a two-country policy game in which the noncooperative static equilibrium is a prisoner's dilemma. The second model is a repeated version of the same game where tit-for-tat strategies yield cooperation. A many-country version of this model would face collective action and free rider problems. These models are presented to motivate a discussion of alternative solutions to the cooperation problem. These solutions are rules, which economists like but which are hard to write; international negotiations, which political scientists like but which yield indeterminate results; and international institutions, which can police the rules,

organize negotiations, and provide information and monitoring. I suppose international bureaucrats favor international organizations. The point of all this is to see in section 7.2 that the participants at Bretton Woods set up a system that provides some of all three. This is still true, even after the par value system broke down in the early 1970s. In this sense, the Bretton Woods system still exists and may be working pretty well!

A second model is introduced in section 7.3 to illustrate the link between cooperation within a country between two groups of decision makers and the IMF's provision of resources. Here we have two groups struggling over who pays the taxes to support the beneficial supply of government services. The executive would like to threaten to penalize any group that does not support the government compromise. But the threat is time inconsistent because the penalty will reduce national welfare. The role of the IMF is to provide resources that make the threat credible. It seems to me that this story requires that the penalty somehow be "wasted." Suppose that the penalty were transferred from the noncooperative to the cooperative group. Then, since national welfare is the sum of the two groups' welfares, there could be a zero loss to national welfare from the penalty. In the context of this model of the role of IMF or World Bank provision of resources, I would rather assume that the losing groups are being bought off by the external agent.

The second part of section 7.3 discusses the role of the IMF in providing resources to induce countries to maintain the par value system. The model is a dynamic version of the first devaluation game, in which the countries take turns deciding whether to change their gold price. The IMF provides financing for temporary current account deficits as long as the countries stay with the system. The result is an equilibrium in which the countries do cooperate as long as they have not reached their credit limits. This model is used to score a point for Keynes, who wanted no repayment for deficit countries, and against White, who wanted stricter credit limits.

The period 1944–71 is interpreted in the paper as the rules phase of the IMF's history, in which the rule was the par value system and the IMF was the enforcer. The experience of this period is evaluated in section 7.4. The verdict, with which I agree, is that the rules were too rigid. There were many devaluations early by the Europeans and later among the developing countries. By 1971, there were few fully convertible currencies, and one-quarter of the members had yet to declare par values. I think of the period after 1950 as one in which the center currencies were largely fixed to each other and the periphery was variable. This is in contrast to the period after 1971, in which the center currencies, now the dollar, yen, and ECU, float and the periphery generally pegs to some average. In the environment since the mid-1970s, no country can maintain a fixed exchange rate since the center is variable. The length of time it took for the Western European countries to establish full convertibility makes current suggestions that the Central and Eastern Europeans move immediately to full convertibility at least questionable.

After 1971, the IMF turned to its monitoring role, especially with respect to developing countries. In section 7.5, the paper lays out nicely the now-standard debt overhang model. Here, the banks are uncertain about which countries are good or bad borrowers, the bad borrowers have incentives to try to look like good ones, and monitoring is costly. In this case, the IMF can provide the monitoring via standby facilities, good borrowers come in for certification, and the private banking system lends to them. This is a nice model of IMF (and also World Bank) interaction with the borrowers.

The paper ends with an evaluation of the three institutions, the IMF, the World Bank, and the GATT. All these institutions have had to cope with major changes in the world economic environment. These changes continue today with the relative decline of the United States, the emergence of a three-bloc trade world, and the potential transformation in Central and Eastern Europe. The IMF and the Bank seem to have adjusted relatively well. The IMF has supported the change in the exchange rate system; the "Bretton Woods" system lives on with major currencies more or less floating. The World Bank has adopted policy-based "structural adjustment" lending, improving its accessibility to the developing countries. The GATT has fared less well. After several rounds of multilateral tariff cuts, the multilateral system seems to be collapsing, and the institution is not reacting as flexibly as the IMF or the Bank.

General Discussion

Sebastian Edwards argued that the IMF lost credibility for its exchange rate policy, not because there were too many changes in parities, but because the escape clause aspect of the adjustable peg made it difficult for the Fund to object to a proposed change. This problem was exacerbated by the clause preventing the Fund from objecting to a proposed change because of the domestic, social, or political policies of the member countries. He stressed the importance of conditionality, which developed in the 1950s and was legalized in the First Amendment to the Articles in 1968. One reason why the Fund's resources were not fully used was conditionality: at some point, many countries found that it was difficult to meet the conditions. Edwards pointed out that the seal-of-approval role of the IMF evolved slowly over time from a precedent set by the League of Nations. *John Williamson* agreed with Edwards that the problem was not that there were too many changes in par values. Rather, there were two problems in the way the Fund dealt with its responsibility in exchange rate supervision—it allowed overshooting, especially in the case of devaluation in 1949, and no pressure was applied for changes in par values that were inappropriate. *Dale Henderson* pointed out that there is a relation between the amount of resources the Fund has and the extent of its monitoring role.

Willem Buiter viewed the paper as documenting the progressive modernization of the IMF. The Fund originally had the joint roles of providing systemic order and individual country surveillance. The former role disappeared with the end of the official exchange rate component of Bretton Woods, when advanced countries realized that they no longer needed access to the Fund's resources. The latter role became important for countries that still needed the Fund's resources, especially less developed countries.

Edward Bernstein discussed the original mandate of Bretton Woods. It was to create the IMF and the World Bank. The International Trade Organization was not considered at Bretton Woods. This point was expanded on by *Leslie Pressnell*. Bernstein then discussed the nature of the fundamental difference between the positions of the United States and the United Kingdom at the conference. The British delegation wanted the responsibilities of Fund members to be effective as long as the Fund provided them with financing. The American delegation believed that, once members had made a commitment to the institution, they should be allowed to follow whatever methods were applicable to the given situation. Bernstein concluded that the most important contribution of the IMF—that has survived Bretton Woods—is its role as an institution where monetary problems can be discussed.

Max Corden expanded on the useful roles of the IMF. These include a monitoring role, a general information role, the important role played by the IMF's country missions, the IMF's role in creating a formidable climate of opinion, and a role as a propagator of economic orthodoxies.

Maurice Obstfeld felt that more emphasis should be placed on the constructive role of the GATT in promoting the growth of trade and income under Bretton Woods. He suggested modeling the GATT in terms of changing pay-offs in a game between governments and constituencies that favor free trade or protection within a country. Instead of the model used in the paper, that of the monitoring role of the IMF, one based on adverse selection, Obstfeld would prefer one based on moral hazard.

Lars Jonung remarked on how little discussion there had been on the role of markets and spontaneous order as opposed to government interrelations in creating the cooperation of the Bretton Woods era.