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INTERNATIONAL COORDINATION OF ECONOMIC POLICIES:  
SCOPE, METHODS, AND EFFECTS

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ABSTRACT

This paper discusses the scope, methods, the effects of international coordination of economic policies. In addressing the scope for and of coordination, the analysis covers the rationale for coordination, barriers to coordination, the range and specificity of policies to be coordinated, the frequency of coordination, and the size of the coordinating group. Turning to the methods of coordination, the emphasis is on the broad issues of rules versus discretion, single-indicator versus multi-indicator approaches, and hegemonic versus more symmetric systems.

In an attempt to shed some light on the effects of alternative rule-based proposals for coordination, we present some simulations of a global macroeconomic model (MULTIMOD) developed in the International Monetary Fund. The simulations considered range from "smoothing" rules for monetary and fiscal policy that imply only minimal international coordination, to more activist "target-zone" proposals that place greater restrictions on national authorities in the conduct of monetary and/or fiscal policies. The simulation results are compared to the actual evolution of the world economy over the 1974-87 period. Our findings suggest that simple mechanistic rule-based proposals are unlikely to lead to improved performance.

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## Introduction 1/

"Coordination of macroeconomic policies is certainly not easy; maybe it is impossible. But in its absence, I suspect nationalistic solutions will be sought--trade barriers, capital controls, and dual exchange-rate systems. War among nations with these weapons is likely to be mutually destructive. Eventually, they, too, would evoke agitation for international coordination."

James Tobin (1987), p.68

"... I believe that many of the claimed advantages of cooperation and coordination are wrong, that there are substantial risks and disadvantages to the types of coordination that are envisioned, and that an emphasis on international coordination can distract attention from the necessary changes in domestic policy."

Martin Feldstein (1988), p.3

This paper discusses the scope, methods, and effects of international coordination of economic policies. Coordination is defined here, following Wallich (1984, p.85), as "... a significant modification of national policies in recognition of international economic interdependence." The existence of a number of comprehensive surveys of the literature on coordination makes the task easier. 2/ This discussion can, therefore, be selective and focus on a number of key issues that impinge on the advisability and practicality of strengthening policy coordination among the larger industrial countries. The purpose is to identify and evaluate factors that merit attention in any serious examination of the subject.

The paper is organized as follows. Section I covers economic policy coordination in the widest sense and addresses various dimensions of the scope for and of coordination. The terrain covered includes the applicability of the "invisible hand" paradigm to decentralized economic policy decisions, barriers to coordination, the range and specificity of policies to be coordinated, the frequency of coordination, and the number of participants to be included in the coordination exercise. Section II narrows the discussion to monetary and fiscal policies and turns to the methods of coordination. The emphasis here is on the broad issues of rules versus discretion, single-indicator versus multiple-indicator approaches, and hegemonic versus more symmetric systems.

Section III is still more specific and confronts the problem of how to infer the effects of coordination. In an attempt to shed some light on how the world economy might be affected by different rule-based proposals for coordination, some simulations are presented of a global macroeconomic model (MULTIMOD) developed in the International Monetary Fund. The simulations considered range from "smoothing" rules for monetary and fiscal policy that imply only minimum international coordination, to more activist "target-zone" proposals that place greater restrictions on national authorities in the conduct of monetary and/or fiscal policies. The results of the simulations are compared to the actual evolution of the world economy over the 1974-87 period.

I Scope for and of Coordination

The most logical starting point is to ask why international policy coordination would be beneficial in the first place. After all, if in the domestic economy, the working of the invisible hand under pure competition translates independent decentralized decisions into a social optimum why should not the same principle apply to policy decisions by countries in the world economy?

The answer is that economic policy actions, particularly those of larger countries, create quantitatively significant spillover effects or externalities for other countries, and that a global optimum requires that such externalities be taken into account in the decision-making calculus. 3/ Coordination is then best seen as a facilitating mechanism for internalizing these externalities.

This conclusion can perhaps be better appreciated by emphasizing the departures from the competitive model in today's global economy. Cooper (1987) has identified several such departures, and his analysis merits some extension here.

Unlike the atomistic economic agents of the competitive model who base their consumption and production decisions on prices that are beyond their control, larger countries exercise a certain degree of influence over prices, including the real exchange rate. This of course raises the specter that they will manipulate such prices to their own advantage and at the expense of others. Two examples are frequently cited--one dealing with inflation, and the other with real output and employment. Under floating rates, a Mundellian (1971) policy mix of tight monetary

and loose fiscal policy allows an appreciated currency to enhance a country's disinflationary policy strategy--but at the cost of making it harder for trading partners to realize their own disinflation targets. Similarly, under conditions of high capital mobility and sticky nominal wages, a monetary expansion under floating rates leads to a real depreciation and to an expansion of output and employment at home. But the flip side of the coin is that output and employment contract abroad. 4/ Seen in this light, the role of coordination is to prevent--or to minimize--such intentional as well as unintentional "beggar-thy-neighbor" practices. Most international monetary constitutions have injunctions against "manipulating" exchange rates or international reserves.

The existence of public goods--and their role in the resolution of inconsistencies among policy targets--constitute a second important point of departure from the competitive model. When there are  $N$  currencies, there can be only  $N-1$  independent exchange rate targets. Similarly, not all countries can achieve independently set targets for current account surpluses.

Adherents of decentralized policymaking--sometimes rather inappropriately labelled the "German school"--argue that such inconsistencies provide no justification for intervention. 5/ Much as in the competitive model, the economic system will generate signals--in the form of changes in exchange rates, interest rates, prices, and incomes--that will lead to an adjustment of targets such that they eventually become consistent. If, however, the path to consistency involves large swings in real

exchange rates, or even more problematically, the imposition of restrictions on trade and capital flows, then reliance on decentralized policymaking may not be globally optimal. Implicit in this conclusion is the notion that a certain degree of stability in real exchange rates and an open international trading and financial system are valued in and of themselves, i.e., they are public goods (in contrast, the market signals that resolve supply/demand inconsistencies in the competitive model, are not regarded as public goods). If that is accepted, there is a positive role for coordination, both to identify target inconsistencies at an early stage and to resolve them in ways that do not produce too little of the public good(s). 6/ It is of course possible for groups of countries who value the public good highly to attempt to obtain more of it by setting up "regional" zones of exchange rate stability or of free trade, and some have done just that (including the establishment of the European Monetary System (EMS)). 7/ But the essence of a public good is that it will tend to be undersupplied so long as some large suppliers or users act in a decentralized fashion.

Once the realm of atomistic competitors is left and that of non-trivial spillovers of policies is entered--be it via goods, asset, or labor markets--the possibility arises that choices made independently by national governments would not be as effective in achieving their objectives as policies that are coordinated with other governments. 8/ A popular example suffices to illustrate the point. Whereas any single country acting alone may be reluctant to follow expansionary policies designed to counter a global deflationary shock for fear of unduly worsening its external balance, coordinated expansion by many countries

will loosen the external constraint and permit each country to move closer to internal balance.

All of this establishes a presumption that there can be valid reasons for deviating from the tradition of decentralized decision-making when it comes to economic policy, that is, that there is scope for coordination. This presumption is reinforced by two empirical observations. The first is that the world economy of 1988 is considerably more open and integrated than that of 1950, or 1960, or even of 1970. Not only have simple ratios of imports or exports to GNP increased but also--and probably more fundamentally--are global capital markets more integrated. 9/ With larger spillovers, there is more at stake in how one manages interdependence. Second, there is by now widespread recognition that the insulating properties of floating exchange rates are more modest than was suspected prior to their introduction in 1973. 10/

But a presumption that cooperation could be beneficial is not the same as a guarantee--nor does it preclude the existence of sometimes formidable obstacles to its implementation.

Suppose national policymakers have a predilection for inflationary policies but are restrained from implementing them by the concern that relatively expansionary monetary policy will bring on a devaluation (or depreciation). Yet, as outlined by Rogoff (1985), if all countries pursue such inflationary policies simultaneously, none has to worry about the threat of devaluation. Here, coordination may actually weaken discipline by easing the balance of payments constraint. In a

similar vein, as noted by Feldstein (1988) there is the potential risk that a coordinated attempt to stabilize a pattern of nominal or real exchange rates could take place at an inappropriately high aggregate rate of inflation. The proposals put forward by U.S. Treasury Secretary Baker and U.K. Chancellor Lawson, at the 1987 Annual Meetings of the Fund and the World Bank, for a commodity-price-basket indicator as a potential "early-warning" signal of emerging aggregate price developments, addresses just such a concern. 11/ Equally troublesome would be a coordination of fiscal policies that yielded an aggregate fiscal deficit for the larger countries that put undue upward pressure on world interest rates. The basic point is straightforward: there is nothing in the coordination process in and of itself that reduces the importance of sound macroeconomic policies. 12/ There can be coordination around good policies and coordination around bad ones--just as with the exchange rate regime, where there are good fixes and bad fixes, and good floats and bad floats. 13/ Welfare improvements are not automatic.

It is only realistic, too, to acknowledge that there are barriers to the exercise of coordination. Four of the more prominent ones are worth mentioning. 14/ First, international policy bargains that involve shared objectives can be frustrated if some policy instruments are treated as objectives in themselves. Schultze (1988), for example, offers the view that it would have been difficult to have reached a bargain on target zones for exchange rates in the early 1980s given President Reagan's twin commitments to increased defense spending and

cutting taxes. In some other countries, the constraints on policy instruments may lie in different areas--including structural policies--but the implications are the same.

Second, there can at times be sharp disagreements among countries about the effects that policy changes have on policy targets. In some cases, these differences may extend beyond the size to even the sign of various policy-impact multipliers. 15/ The harder it is to agree on how the world works, the harder it is to reach agreement on a jointly designed set of policies.

Third, while most countries have experienced a marked increase in openness over the past few decades, there remain huge cross-country differences in the degree of interdependence. Large countries--the United States being the classic case in point--are generally less affected by other countries' policies than small ones. Coordination--as Bryant (1987) has recently emphasized--is not a matter of altruism. It is rather the manifestation of mutual self interest. To the extent that large countries are less beset by spillovers and feedbacks than small ones, the former's incentive to coordinate on a continuous basis may be lower. 16/ In this regard, the high degree of trade interdependence shared by members of the European Monetary System (EMS) can be seen as a positive factor in reinforcing incentives to coordinate in that group.

Finally, as Polak (1981) has reminded us, in terms of national priorities, international bargaining typically comes after domestic bargaining. More specifically, the compromise of growth and inflation objectives at the national level may leave little room for further compromise on demand measures at the international level.

These barriers to coordination should not be overestimated: one of the clearest examples of true coordination--the Bonn Economic Summit of 1978--occurred just when domestic bargaining over the same issues was most intense; 17/ the growing integration of capital markets--of which the global stock market crash of October 1987 is but one reminder--has brought the implications of interdependence home to even large countries; and continued empirical work on multi-country models should be able progressively to whittle down the margin of disagreement on the effects of policies. Still, as readers of Sherlock Holmes will be aware, sometimes the most telling clue is that the hounds didn't bark. If the scope for coordination is to expand beyond the efforts of the past, these obstacles will need to be overcome.

Turning from the scope for to the scope of coordination, a key issue concerns the appropriate range and depth of policies to be coordinated.

The case for supporting a wide-ranging, multi-issue approach to coordination is that it increases the probability of concluding some policy bargains that benefit all parties, 18/ that favorable spillover effects are generated across negotiating issues, and that improved economic performance today depends as much on trade and structural policies as on exchange-rate and demand policies. Exhibit A is the Bonn Economic Summit of 1978 where commitments to accelerate growth by Japan and the Federal Republic of Germany were exchanged for a commitment by the United States to come to grips with its inflation and oil problems, and where agreement on macroeconomic and energy

policies has been credited with reinforcing progress on the Tokyo Round of Multilateral Trade Negotiations. 19/

The defense of a narrower approach to coordination rests on the arguments that negotiation costs rise rapidly with the spread of issues under consideration, 20/ that prospects for implementation of agreements dim as the number of jurisdictional spheres expands (i.e., Finance Ministers can negotiate agreements but fiscal policy is typically the responsibility of legislatures, while monetary policy is the province of independent central banks); and that heated disputes on some issues (such as the stance of monetary and fiscal policies) can frustrate the chance for agreements in other areas (like defense and foreign assistance) where coordination might be more fruitful. 21/ In addition, a case could be made that coordination is only likely in areas where there is a consensus about the effects of common policies. 22/

In view of these conflicting considerations, it is hard to fault present institutional practices on the range of coordination. Those practices entail high-frequency coordination on narrow issues in a multitude of fora (such as the International Monetary Fund (IMF), the Organization of Economic Cooperation and Development (OECD), the Bank of International Settlements (BIS), and the General Agreement of Tariffs and Trade (GATT); 23/ less frequent (say, biannual) and wider coordination at a higher level in more limited fora (such as the IMF's Interim Committee, or the Group of Seven major industrial countries); and even less frequent (annual), wider-yet coordination at the highest level (heads of state and of governments at the economic summits). Thus,

there are occasional opportunities for multi-issue bargaining, but without the exponential increase in negotiation costs that might ensue if this were the order of the day. All in all, probably not a bad compromise.

The "depth" of coordination covers the degree of specificity and disaggregation within a given policy area. Here, two issues arise--one dealing with fiscal policy, and the other with structural policies. A strong implication of recent research is that aggregate measures, such as the central or general-government fiscal deficit, are not likely to be a good guide to the effects of fiscal policies on macro-economic variables such as the current account, the exchange rate, and the rate of interest. <sup>24/</sup> The reason is that such effects depend on how the deficit is altered: that is, taxes versus expenditures, expenditures on tradables versus nontradables, taxes on investment versus those on saving, fiscal action by a country with a current account surplus versus a deficit, and anticipated versus unanticipated policies. This suggests that more specificity in coordination--quite apart from its positive effect on the ability to monitor the implementation of agreed-on policies--would be desirable. It is notable that the Louvre Accord of February 1987 among the Group of Seven specified not only quantitative targets for budget deficits but also some quantitative guidelines of how these overall fiscal targets were to be achieved. <sup>25/</sup>

In the area of structural policies, a good case can also be made for specificity--but on somewhat different grounds. Here, coordination may often best be interpreted not as the simultaneous application of the

same policy instrument in different doses or directions across countries, but rather as the simultaneous application of different policy instruments--26/ with each country adopting the policy best tailored to its particular structural weakness. 27/ In some cases, this may imply reducing impediments to labor mobility or to market-determined wages; in others, it may mean increasing incentives for private investment relative to those for private saving; and in still others, it may mean changes in the trade and distribution system. The simultaneous application of the policy measures across countries may be necessary to overcome the blocking tactics of domestic pressure groups and to enhance the credibility of the exercise. Again, the depth or specificity of coordination can be as relevant as the range.

Another salient issue concerns the question of when to coordinate. There has been, and continues to be, wide variation in the frequency of coordination across different fora--ranging from one-of-a-kind meetings like the 1971 Smithsonian Conference on exchange rates to the near continuous discussion and decision making at the Executive Boards of the IMF and the World Bank.

One position is that, given the constraints, true coordination cannot be expected to be more than an episodic, regime-preserving effort. Dini (1988) has recently argued that international considerations still play only a small factor in policy making, and that only at times of crisis is a common interest in coordinated action clearly recognized. 28/ Some might even go farther and argue that the reservoir of international compromise should be conserved for situations when

there is a high probability of a policy deal and when failure to reach an agreement would carry a high cost.

Our view is that both the likelihood and effectiveness of coordination will be enhanced when it is a regular, on-going process--and for at least three reasons. First, the potential for multiperiod bargaining expands the opportunities for policy bargains (by facilitating, for example, phasing of policy measures). What should count in assessing the gains to coordination is the present discounted value of welfare-improving policy agreements over an extended period--not the welfare change in a single period. Second, as suggested in the game-theoretic literature, the existence of repeated bargaining strengthens the role of reputational considerations in coordination. 29/ In contrast, when coordination is a once-and-for-all or episodic exercise, there is a higher risk that agreed policies will never be implemented because of the much-discussed problem of time-inconsistency, i.e., the temptation to renege on earlier policy commitments when it later becomes advantageous to do so. 30/ To be effective, coordination agreements need to pass through the market filter of credibility, and credibility is more likely if sticking to the agreement enhances reputation, which in turn allows profitable bargains to be struck in the future. Third, once coordination is established as a routine on-going process, there is apt to be more freedom of policy maneuver for all participants than when negotiations are conducted in a crisis atmosphere and when disagreements--which after all are inevitable--may be inappropriately seen as signaling the collapse of coordination itself. 31/

As any good newspaper reporter knows, the three W's of why, what and when are not sufficient for writing a story. One also has to bring in the fourth W, namely who should coordinate. Again, existing practice does not provide a definitive answer. Among the industrial countries, we have the Group of Seven and the Group of Ten. For the developing countries, there are the Group of Twenty-Four and the Group of Seventy Seven. And in the Executive Board of the Fund--where industrial and developing countries alike are represented--there are twenty-two representatives of various country groupings--a Group of Twenty-Two.

Among the factors that should influence the size of the coordinating group, three would seem to stand out. First, to the extent that the *raison d'etre* of coordination is the internalization of externalities, the group should include those countries whose policies generate the largest externalities. This argues for including the largest industrial countries. Second, there is the general proposition that the costs of negotiation, and conflicts that might endanger the continuity of the exercise, increase significantly with the number of players. This argues for a relatively small group. Third, and pointing in the opposite direction, a small group runs the risk of concluding policy agreements which are beneficial to the direct participants--but which are not satisfactory to those countries not sitting at the coordination table. 32/

In light of these considerations, it is worth mentioning two features of recent coordination efforts by the Group of Seven. One of them, proposed at the Venice Economic Summit in 1987 and incorporated in subsequent coordination meetings, is the addition of aggregate

indicators for the Group of Seven as a whole to the list of individual-country indicators. Aggregate indicators for the group may include such variables as the growth rate of real GNP and of domestic demand, the interest rate, the current account position, and the real exchange rate. A strong motivation for such aggregate indicators is that they can be helpful in gauging the impact of G-7 coordination agreements and actions among the Group of Seven on the rest-of-the-world, with particular reference to the developing countries. For example, it has been estimated that each 1 percent change in real GNP in the industrial countries is associated, ceteris paribus, with approximately a 3 percent change (in the same direction) of export earnings in developing countries. Similarly, a 1 percent change in "world" interest rates implies roughly a \$3-4 billion change in net interest payments by capital importing developing countries. In short, aggregate indicators can be seen as an analytical instrument for helping to evaluate whether a given policy package for the larger countries is also in the interest of others.

A second notable feature is that the Managing Director of the Fund participates in these Group of Seven coordination meetings. Since the Fund's membership includes not only the larger industrial countries but also the smaller industrial countries, as well as most of the developing countries, one rationale for the Managing Director's participation is that it provides a systemic perspective and evaluation on proposed policy agreements--while still keeping the meeting small enough for administrative efficiency.

## II Methods of Coordination

This section, shifts the focus from whether to coordinate to how to coordinate. More specifically, the advantages and disadvantages of alternative methods of coordination are discussed, with particular attention to the issues of rules versus discretion, single versus multi-indicator approaches, and hegemonic versus symmetric systems.

It is not surprising that many of the issues that emerged during the long and continuing debate on the relative merits of rules versus discretion in domestic economic policy should have resurfaced in the dialogue on international economic policy coordination. After all, the present system of managed floating, even as it has evolved since the Plaza Agreement of September 1985, is much closer to a pure discretion than to a pure rules model. In this regard, the gold standard with its automatic specie flow mechanism, the adjustable peg system with its clear implications for the subordination of domestic monetary policy to the exchange rate (except during fundamental disequilibria), the EMS with its parity grid and divergence indicator, target zone proposals with their trigger for coordination discussions whenever the actual exchange rate threatens to breach the zone, and pure floating with its complete prohibition on all official intervention in the exchange market--all can be considered less discretionary than the present exchange rate system. The debate is thus not about what is, but rather about what should be.

Those who support a more rules-based approach to international economic policy rest their case on essentially four arguments. First, the most promising route to eliminating any excess demand for coordination in the world economy is not by increasing the supply, but rather by decreasing the demand (or the need) for coordination. 33/ That decrease in demand, in turn, can best be brought about by the application of simple policy rules, such as the maintenance of a fixed exchange rate. In the process, one would eliminate--so the argument goes--most of the negotiation costs and burden-sharing conflicts that are intrinsic to more discretionary systems. Second, rules are regarded as the only viable mechanism for imposing discipline on economic policymakers who might otherwise manipulate the instruments of policy for their own objectives. 34/ Third, rules are regarded as enhancing the predictability of policy actions and thereby improving the private sector's ability to make informed resource allocation decisions. 35/ Fourth, rules are championed as providing protection against the lack of knowledge about how the economy operates by pre-empting destabilizing fine-tuning.

The main counter-arguments in favor of a discretionary approach are the following. First, rule-based adjustment systems often turn out to be less automatic in practice than in theory. For example, the automaticity of the specie-flow mechanism under the historical gold standard was often undermined by the proclivity of authorities to offset or sterilize the effect of gold flows. 36/

Second, rules will impart discipline to the conduct of macro-economic policy only to the extent that the penalties for breaking the rules are significant enough to ensure that the rules are followed. The Bretton Woods rule that countries should consult with the Fund once there was a cumulative parity change of 10 percent or more, while complied with in a technical sense, fell short in a substantive sense of its original purpose. The discussion surrounding the revision of the original Gramm-Rudman deficit-reduction targets in the United States is a more recent case in point. History could in fact be seen as just as kind to the proposition that the policy regime adjusts to the amount of discipline that countries want to have--as to the reverse. 37/ Also, care needs to be taken to separate the effects of policy rules on economic outcomes from other influences. In this connection, the oft-made argument that the EMS was a major determinant of the 1979-85 disinflation in Europe would seem to be based on shaky ground. 38/

Third, it is by no means clear that rules are necessary to obtain the benefits of greater predictability of policy. For example, the practice of pre-announcing money-supply targets--sometimes accompanied by announcements of public-sector borrowing requirements--provides the markets with information on the authorities' policy intentions, but stops well short of a rigid rule.

Finally, while rules diminish the risk emanating from fine tuning, they increase the risk stemming from lack of adaptability to changes in the operating environment. 39/ The idea of a "crawling-peg" rule

based on inflation differentials drew quite a few supporters in the 1960s as the right antidote for sticky nominal exchange rates. Yet its neglect of the need for real exchange rate changes now seems more serious in light of the real economic disturbances of the early 1970s. 40/ More recently, the crumbling of the link between narrow monetary aggregates and the ultimate targets of monetary policy in the face of large scale financial innovation and institutional change has reminded us anew of the limitations of policy rules.

In light of all this, there may not be any attractive alternative to conducting economic policy coordination in a judgmental way.

Even after the choice is made about coordinating via rules or discretion, there remains the decision of whether to coordinate around a single indicator or a set of indicators. A regime of fixed exchange rates or target zones is an example of the former approach, while the ongoing Group of Seven coordination exercise is an example of the latter.

There are two main considerations that are typically advanced to support the single-indicator approach. One is that it avoids over-coordination of policies by preserving for each country freedom of action over those policies not used to reach the single target variable. Thus, for example, if the exchange rate is the focus of coordination, monetary policy will be constrained, but other policies will be less affected. Implicit in this line of argument is the view that attempts to place many policies under international coordination

will ultimately prove self defeating and may even induce national authorities to compensate by exercising greater independence in uncoordinated policy instruments, such as trade policy. 41/

The second, and probably more important, defense of a single-indicator approach is that it sends a clear signal to markets about the course of future policy. If, for example, the monetary authorities commit themselves to maintain a fixed exchange rate within a given band, then movements of the exchange rate provide an unambiguous guide for monetary policy. A similar message would derive from a nominal income target for monetary or fiscal policy, with the exchange rate left to determination of the market. In contrast, a multi-indicator approach increases the authorities' scope for discretion since they can appeal to the conflicting messages coming from different indicators. In cases where the authorities' past record of policy performance has been weak and where a single objective of policy is predominant (such as disinflation), a single-indicator framework for coordination can carry significant advantages in the battle to restore credibility to policy.

But relying on a single policy indicator can also carry substantial risks. Perhaps the most serious one is that the single indicator can send weak--or even false--signals about the need for changes in other policies that are not being coordinated. This is perhaps best illustrated by considering the problem of errant fiscal policy under a regime of fixed exchange rates or of target zones.

First, consider fixed rates. With high capital mobility, a fiscal expansion will yield an incipient positive interest rate differential,

a capital inflow, and an overall balance of payments surplus--not a deficit. Here, exchange rate fixity helps to finance--and by no means disciplines--irresponsible fiscal policy. 42/ Only if and when the markets expect fiscal deficits to be monetized will they force the authorities to choose between fiscal policy adjustments and devaluation. 43/ The better the reputation of the authorities, the longer in coming will be the discipline of markets, i.e., the exchange rate will provide only a weak and late signal for policy adjustment. In this connection, it is worth observing that whereas the EMS has produced a notable convergence of monetary policy, convergence of fiscal policy has not taken place. 44/

Next, rerun the same fiscal expansion under a target zone regime, where the zones are to be defended by monetary policy. In such a scenario, the appreciation of the currency induced by the fiscal action will prompt a loosening of monetary policy to keep the rate from breaching the zone. Here, coordination around a single indicator, namely, the exchange rate, will have exacerbated--not corrected--the basic cause of the problems. 45/ The single indicator would have sent the wrong signal for policy adjustment.

In contrast, a multi-indicator approach to coordination--assuming that the list of indicators included monetary and fiscal policy variables--would not be susceptible to this weak or false-signal problem. 46/ This is because such an approach goes directly to the basic stance of fiscal and monetary policies, rather than passing

through the medium of the exchange rate. If, for example, the impetus for coordination was a misalignment of exchange rates, and if the root cause of the misalignment was an inappropriate stance and/or mix of monetary and fiscal policies, the multi-indicator approach would be appealing.

But all is not a bed of roses here either. While all effective approaches to coordination require a consistency of policy instruments and targets within and across countries, this requirement of consistency or compatibility can take an added prominence when authorities make public a set of targets and intended courses for policy instruments. 47/

Two aspects merit explicit mention. One is that exchange rate targets--or even concerted views on the existing pattern of exchange rates--must be consistent with the announced course of monetary and fiscal policies. Without that consistency, attempts to provide the market with an anchor for medium-term exchange rate expectations are likely to prove fruitless.

The second point is that the credibility of multiple policy targets also hinges on the constraints on policy instruments. Two such constraints are the striking inflexibility of fiscal policy in almost all industrial countries, 48/ and the limited ability of sterilized exchange market intervention to affect the level of the exchange rate over the medium-term (unless of course it provides a signal about the future course of policies). 49/ A relevant concern is that limitations on other policy instruments may wind up with monetary policy being asked to carry too

heavy a burden--with primary responsibility for maintaining internal and external balance. In such a case, any contribution that a multi-indicator approach to coordination could make to enhancing the predictability of policies would also be diminished. This is so because a shock to the system--such as the October 1987 global stock market crash---might raise the question in minds of market participants of whether monetary policy would serve its internal or external master.

Yet another key methodological issue associated with coordination--particularly when it involves joint decision making--is whether one country should, by common consent, have a predominant voice on the course of policies, or alternatively, whether that influence should be shared more equally. In this respect, the historical gold standard, the Bretton Woods system, and the EMS are all often regarded as hegemonic systems, while the ongoing Group of Seven coordination process would qualify as a more symmetric exercise. 50/

Hegemonic exchange rate systems have typically operated under what might be called an "implicit contract" between the leader and the satellite countries. 51/ Under Bretton Woods, the leader (that is, the United States) carried the obligation to conduct prudent macroeconomic policies--perhaps best summarized by a steady, low rate of inflation. This obligation was reinforced by the leader's commitment to peg some nominal price--in that case, the price of gold. Since there can be only N-1 exchange rates among N countries, the leader was passive about its exchange rate. The satellite countries committed to peg

their exchange rates within agreed margins to the leader. As a reaction to the competitive depreciation of the 1930s, cumulative exchange rate adjustments greater than 10 percent were to be placed under international supervision and were to be taken only under conditions of "fundamental disequilibrium." By virtue of their exchange rate obligations, the satellites sacrificed independence in their monetary policies but expected to import stability from the leader.

With the benefit of hindsight, that this implicit contract came under strain from two main directions (in addition to Triffin's (1960) well-known "confidence problem.") One was the breakdown (after the mid-1960s) of discipline by the leader such that the satellites came to see it as exporting inflation rather than stability. The response was for the satellites to sever their formal links with the leader (in the early 1970s) and thereafter to seek stability via other mechanisms, including national money-supply targeting and regional exchange rate arrangements. The second strain was an excessive rigidity of nominal exchange rates in the face of fundamental disequilibrium that produced a misalignment of the leader's real exchange rate in the late 1960s. The leader then abandoned the commitment to be passive about its exchange rate.

The implicit contract in the EMS is similar in many ways to that under Bretton Woods. While there is no formal leader, most observers regard the Federal Republic of Germany (and its Bundesbank) as the de facto or acknowledged leader. 52/ Germany follows macroeconomic policies that export price stability and anti-inflationary

credibility to the others. It is noteworthy that while there have to date been 11 realignments in the EMS, none of them has resulted in a revaluation relative to the deutsche mark, thus leaving Germany's reputation as an exporter of stability intact. Other members of the exchange rate mechanism of the EMS can be characterized as "tying their hands" on domestic monetary policy so as to make credible both their exchange rate obligations and their inflation objectives. 53/ Exchange rate adjustments are placed under common supervision. When realignments do take place, they do not always provide full compensation for past inflation differentials. In this way, the resulting real appreciation for high-inflation countries can act as a disincentive to inflation (by penalizing exports, output, and employment), while the leader receives a gain in competitiveness that provides some quid-pro-quo for its export of anti-inflationary credibility. 54/ Monetary policy in Germany is typically regarded as the anchor and is considered so disciplined as to do away with the need to peg to some "outside" nominal price.

While there have clearly been periods when large countries have exerted a stabilizing influence on the system, it is hard to accept that hegemony is a necessary characteristic of a well-functioning system of international economic policy coordination. There are several reasons. First, careful study of alleged hegemonic systems, including the gold standard, reveals that the amount of coordination needed for smooth functioning was substantial. 55/ The coordinated interest rate actions

of September 1987 in the EMS when Germany and the Netherlands lowered their rates, and France raised its rate, are a recent example of such cooperation. Second, much of what passes for the stabilizing influence of hegemony can also reflect common objectives. Again, the EMS serves as a useful laboratory. In the early 1980s, disinflation was the top priority in virtually all EMS countries. Since Germany had the best reputation for price stability, there was a commonality of interests in trying to converge to the German inflation rate. Now, however, some observers argue that given both the progress already made with inflation and the high unemployment rates prevailing in some EMS (and potential EMS) countries, it is time to give greater weight to objectives other than inflation. 56/ If such a decision were taken, it would probably result in a more symmetric EMS--and this quite apart from shifts among members in relative economic size or reputation. 57/ Third, attempts to reinstate a hegemonic approach to coordination when economic realities no longer support it could be counterproductive. In the present context, there appears to be no obvious candidate that combines an unblemished record for economic stability, a dominant position in international trade and finance (relative to other members of the coordination group), and a willingness to accept the requisite responsibilities.

### III The Effects of Coordination

Identifying key issues related to the scope and methods of economic policy coordination is one thing; attempting to infer its effects is quite another. The latter is obviously an empirical question that requires for analysis some type of quantitative economic model.

Earlier efforts to gauge the effects of international economic policy coordination or of alternative international monetary arrangements fall into two categories. One strand of the literature compares the value of a welfare function where each country maximizes welfare independently with that where the countries maximize a joint welfare function. Two controversial findings are that the gains from coordination are likely to be "small" for the largest countries and that the gains can even be negative if countries coordinate using the "wrong" model of the world economy. 58/

These findings should not be used as an indictment of coordination-- for at least five reasons. First, a comparison of optimal uncoordinated with optimal coordinated policies may not be generalizable to the more relevant comparison of suboptimal uncoordinated with suboptimal coordinated policies. In particular, the link between pressures for protectionism on the one hand, and recession and exchange rates on the other, could result in quite a different "counterfactual" (i.e., what would happen in the absence of coordination) than that assumed in these studies. 59/ Second, some of the gains from coordination may be unobservable (unwritten pledges to alter policies in the future), or difficult to separate from

less ambitious forms of cooperation (exchange of information across countries), or extend beyond the realm of macroeconomic policy (joint measures to combat terrorism, to harmonize international fare schedules for air travel, and so on). Third, a judgment that gains from coordination are small presupposes some standard of comparison. Would the gains from international coordination be small relative to the gains from coordination of policies across different economic agencies within a national government? Fourth, empirical estimates of gains from coordination have typically compared policies that do not exploit the incentive governments have to adhere to agreements in order to enhance their reputation for consistency. Currie, Levine and Vidalis (1987) argue, in contrast, that comparison of "reputational" policies shows large gains. Fifth, the danger that coordination may reduce welfare because policymakers use the wrong model(s) is greatest if they ignore model uncertainty. If, however, policymakers recognize that they do not know the true model and take this uncertainty into account, policy may be set in a more cautious fashion, with positive effects on the gains from coordination. 60/

The second strain of the empirical literature attempts to quantify the effects of specific policy proposals (such as the introduction of target zones) by comparing them either with a baseline that describes the current policy stance, or with historical values for the macroeconomic variables of interest. This typically involves the simulation of a global econometric model. Such an application of models is still in its infancy. To date, most attention has been paid to rule-based proposals

for policy coordination that focus on real effective exchange rates. Two examples of such studies are Edison, Miller, and Williamson (1987) and Currie and Wren-Lewis (1987). They compare simulated outcomes of cooperative policy rules to recent historical experience. Both of these studies, however, are open to the classic Lucas (1976) critique that, due to the endogeneity of expectations of economic agents, estimates of "structural parameters" will differ under different policy regimes; in these studies, expectations are formed in a mechanistic fashion-- independent of the policy regime.

This chapter reports some initial rule-based simulations from a global macroeconomic model developed in the Research Department of the Fund, called MULTIMOD. Two questions are addressed: first, would a smoother path of monetary and fiscal policies have produced a smoother path for real exchange rates, real output, and inflation than that observed historically; and second, what would be the variability of policy instruments under a simple or extended "target zone" scheme where the real effective exchange rate is treated as an intermediate target? 61/ The "effects" of coordination are generated by comparing the counterfactual simulations to a baseline simulation where MULTIMOD is constrained to replicate the historical data over 1974-87 by including the appropriate residuals in each equation. These same residuals are also used in the counterfactual simulations, each of which postulates that policy would have been different in some way from its historical stance.

By virtue of using MULTIMOD for the simulations, this approach differs from earlier work in two important respects. One is that expectations are forward-looking and reflect the stance of policy. This permits expectations to differ across different policy regimes. <sup>62/</sup> For instance, if it is known that the monetary authorities will resist movements away from an "equilibrium" level for the exchange rate, then this will condition the value expected for the exchange rate in the future. In this sense, the results are less subject to the Lucas critique than previous work. <sup>63/</sup> In a related vein, the model attributes complete credibility to the government's policy stance and assumes that the private sector forms its expectations in a fashion that turns out to be correct ex post. Thus, it gives a potentially powerful influence to changes in present and future policies. Second, although this section concentrates on the larger industrial countries, MULTIMOD contains a fully specified developing-country block.

Before proceeding to a capsule summary of MULTIMOD and to the simulations themselves, it is worth emphasizing a caveat. This paper is the first attempt to apply MULTIMOD to policy coordination issues. The results should, therefore, be considered tentative, preliminary, and relevant only to a few rule-based proposals. Much more will need to be learned over time about which aspects of the simulation are quite model specific, about the sensitivity of the conclusions to particular parameter

values and historical periods, and about the effects of alternative coordination proposals--including those that rely on judgmental or discretionary application of policies.

MULTIMOD is documented fully elsewhere and we will therefore limit ourselves here to describing its main features. 64/ The model contains submodels for the three largest industrial countries separately--that is, for the United States, Japan and the Federal Republic of Germany--for the remaining four Group of Seven countries as a group (France, the United Kingdom, Italy and Canada), and for the remaining smaller industrial countries as a group. Developing countries (excluding the high-income oil exporters) are modeled as one region, but with some industrial disaggregation. Each of the country or regional submodels has equations explaining the components of aggregate demand as well as the supply of the various goods produced. The submodels are linked through trade and financial flows. The parameters of the behavioral equations are in most part estimated using annual data available since the early 1960s.

In the case of industrial countries, financial markets are assumed to exhibit both perfect capital mobility and perfect substitutability between assets denominated in different currencies. 65/ Consequently, arbitrage conditions link the returns on long- and short-term bonds and on domestic and foreign bonds. Moreover, as suggested earlier, expectations are assumed to be forward-looking, and to be consistent with the model's solution in future periods. Thus interest parity holds both ex ante and ex post in model simulations where future variables are correctly anticipated--that is, where there are no "surprises." 66/ As a result, the

change in the exchange rate between two currencies from one period to the next is determined by their interest differential prevailing in the first period.

Similarly, expected long-term bond rates and rates of inflation are also consistent with the model's solutions for future periods in the absence of further shocks. The rate of inflation--unlike prices in financial markets--is not assumed perfectly flexible. Instead, rigidities in wage and product markets make for persistent effects on output as a result of purely monetary shocks; only in the medium- to long-run will full employment result. 67/ Thus, both monetary and fiscal policies of the industrial countries have significant and persistent effects on real variables, both in the country undertaking the policy change and in other countries.

In order to provide some feel for the properties of MULTIMOD, Table 1 shows the effects of monetary and fiscal policies in each of the three major countries on itself, on the other three major countries, and on the remaining Group of Seven countries. These policy changes are assumed to be unanticipated at the time of initiation. Two comments are in order about the results. First, and not surprisingly, policy actions taken by the United States have much larger spillover effects than those undertaken in Japan or in the Federal Republic of Germany. This reflects the large size of the U.S. economy and the fact that, while a relatively closed economy to imports, a relatively large share of its imports come from other Group of Seven countries. Japan is only roughly half as

large (in terms of GNP) and obtains more of its imports from outside the Group sources. Germany is the most open but is smaller than Japan; the spillovers of its actions primarily affect other European countries. Second, while both monetary and fiscal policies have strong effects on domestic real output over the medium-term, fiscal policy has a much larger own-effect on the current account than does monetary policy. 68/ This is because the output and relative-price effects go in the same direction for a fiscal policy change, whereas they offset each other in the case of monetary policy. A fiscal expansion, for example, induces an appreciation of the real exchange rate and an increase in domestic demand--both of which lead to a fall in net exports. 69/ In contrast, a monetary expansion yields a depreciation of the real exchange rate--which promotes net exports--and an increase in domestic demand--which penalizes them; because the relative-price effect dominates--at least in the case of the United States and Japan--the result is a small improvement in the current account.

One rather minimalist interpretation of coordination is that large countries should use their monetary and fiscal policies in a largely independent decentralized way but should avoid sharp changes in policy stance that would, in turn, generate sharp changes in real exchange rates. Such a concession to internalizing externalities would not affect the ultimate size of the stock adjustment of actual to desired policies but would constrain the speed of adjustment--much in the same spirit that speed limits in boat marinas discourage large boats from producing wakes

that would topple smaller boats. One exponent of "smoothing" guidelines is Corden (1986, p. 431), who states: 70/

"If we accept that the spillover effects of a foreign fiscal policy change can be defined as the adverse effects of the destabilization of the real exchange rate, two implications follow.

The most important implication is that each country benefits the other by maintaining relatively stable policies, meaning policies which will minimize real exchange-rate changes in either direction. Coordination consists essentially of a reciprocal agreement to modify policies that generate real exchange-rate instability."

Charts 1 to 3 summarize developments for some indicators of policy stance since the first full year of generalized floating (1974), while Chart 4 gives a measure of real effective exchange rates for the Group of Seven countries. 71/ There are well-known difficulties in getting good policy indicators, including the problem that each of the series-- money growth, the share of government purchases on goods and services in GNP, and the ratio of tax receipts less non-interest transfer payments to net national product and interest receipts--are all endogenous to some extent. It should also be emphasized that this historical period contains several different policy regimes, ranging from targeting of monetary aggregates over much of the earlier part of the period, to the strengthening of international economic policy coordination since the Plaza Agreement of September 1985.

Nevertheless, some useful stylized facts emerge from an examination of historical data. First, money growth rates are quite volatile and appear to be positively correlated across economies. Second, taxes net of transfers seem to exhibit more variation than government spending;

CHART 1. ACTUAL MONEY GROWTH RATES  
(in percentage changes)

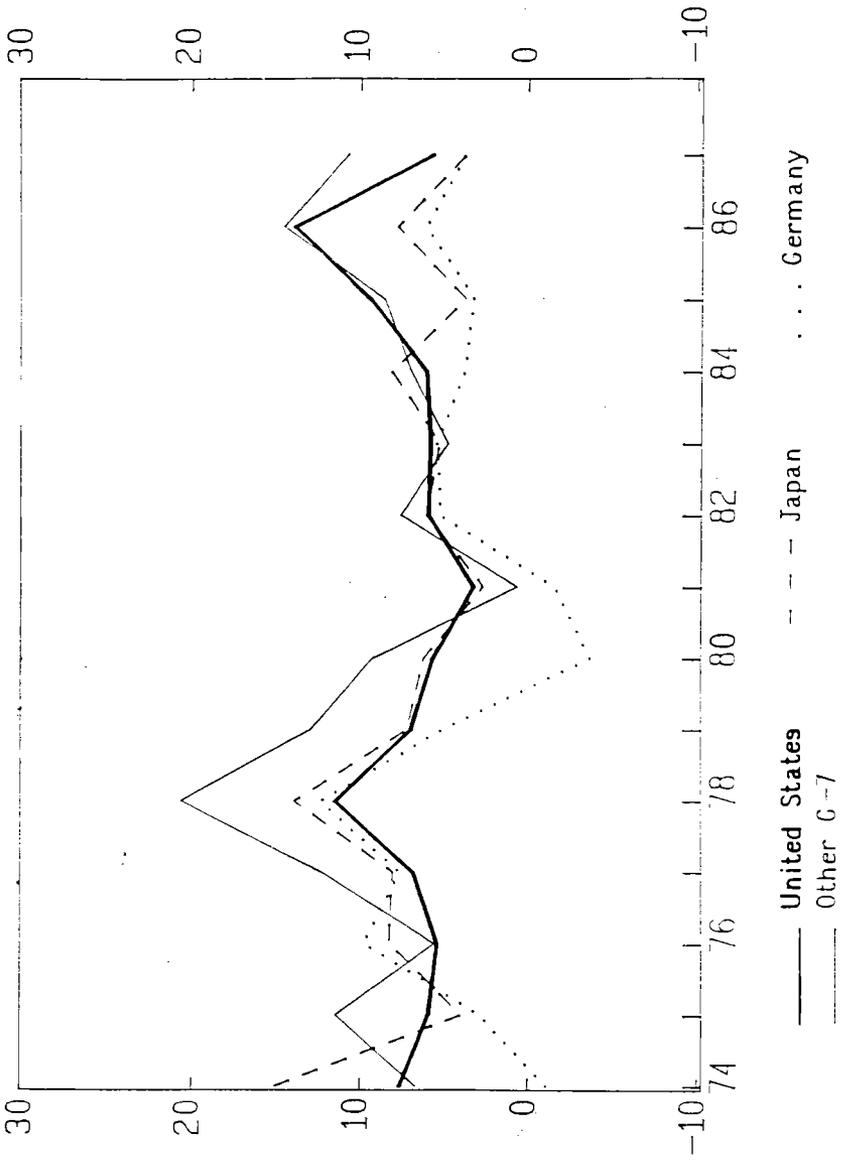


CHART 2. ACTUAL GOVERNMENT SPENDING SHARE IN GNP  
(In percentage changes)

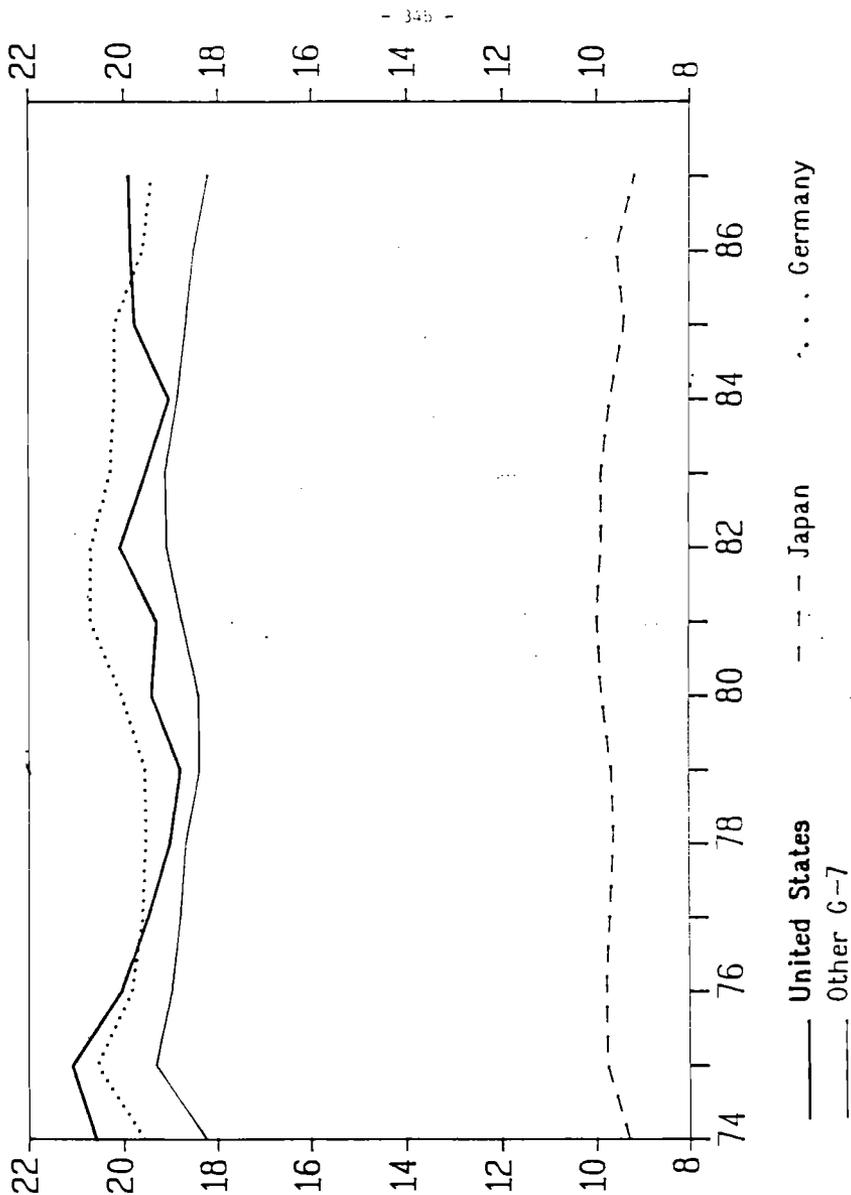


CHART 3. ACTUAL TAX RATES

(In percent)

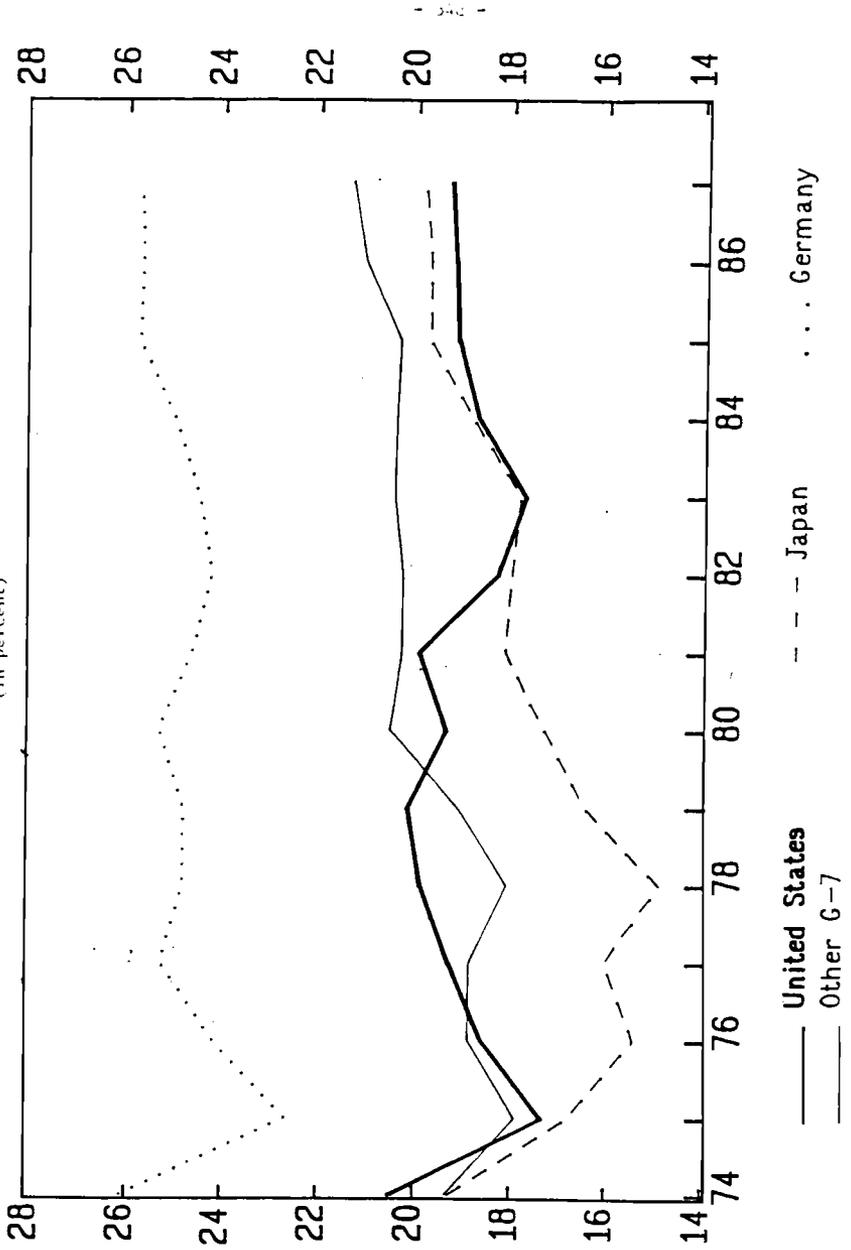
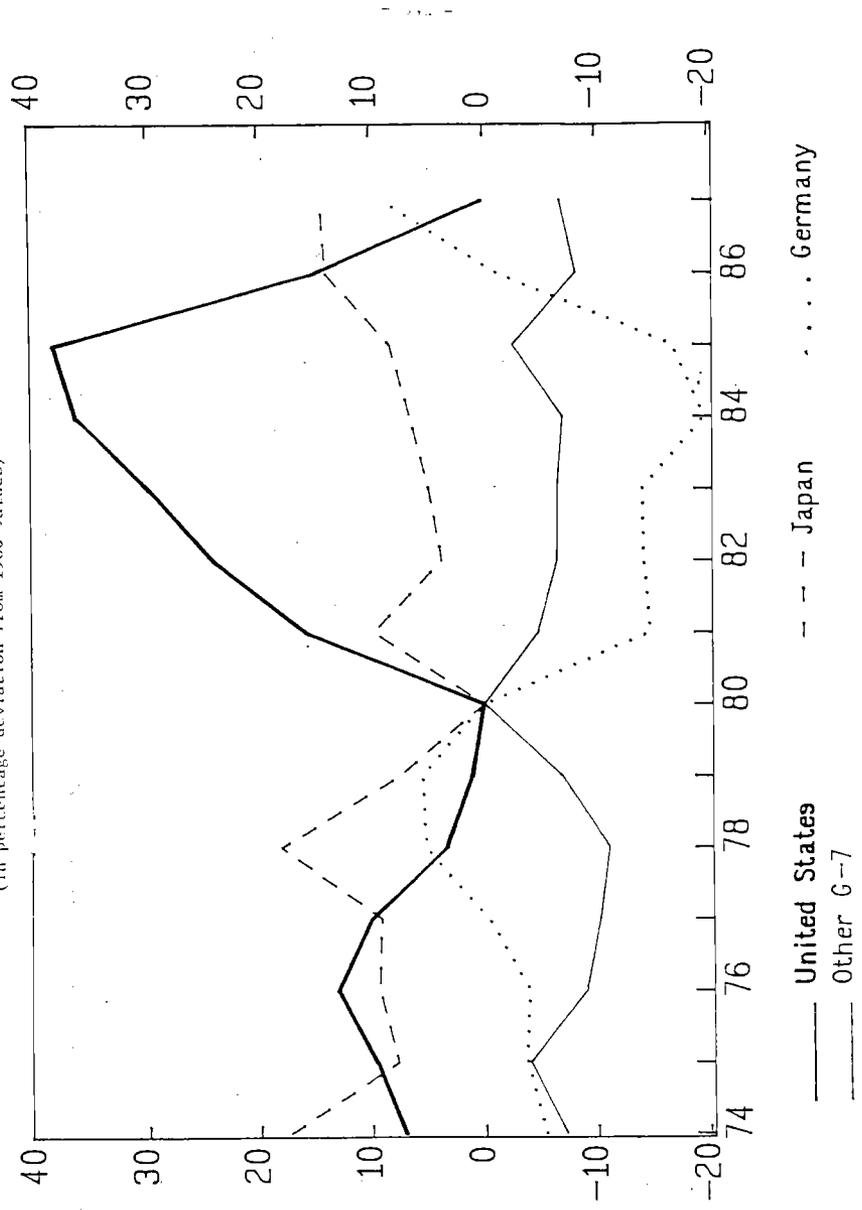


CHART 4. ACTUAL REAL EFFECTIVE EXCHANGE RATES  
 (In percentage deviation from 1980 values)



United States  
 Japan  
 Germany  
 Other G-7

evidence of fiscal stimulus in the United States in 1983 is clear.

Finally, real exchange rates exhibit large fluctuations, especially for the United States.

To estimate the effects of "smoother" policies, each of the variables in Charts 1 to 3 was replaced by its five-year moving average. Those values then were input as exogenous variables into MULTIMOD and the values of endogenous variables were calculated.

Table 2 presents the mean and standard deviation of several macroeconomic indicators, comparing their historical values with those resulting from a simulation of smoother policies. Interestingly enough, smoothing of policy variables is nowhere near sufficient to produce smooth values for major macroeconomic variables. On the contrary, such a simple smoothing rule tends to accentuate some of the fluctuations in the historical data. For example, though the average growth of real gross domestic product is about the same as in the historical data, its standard deviation is higher in the policy smoothing simulation. Real effective exchange rates are somewhat less variable with smoothing, but real short-term interest rates are considerably more variable.

This simulation illustrates that smoothing policy instruments may lead to less, not more, smoothness in target variables. Other variables exogenous to the model are also a source of variation in output and exchange rates. The model simulation suggests that the random shocks over the historical period, including changes in non-policy variables such as oil production, have had a greater influence in producing swings

Table 1. Spillovers from Changes in Fiscal and Monetary Policies in MULTITHOOD  
(First and third year domestic and foreign effects)

Country Taking Action	Government Spending Increase of 1 Percent of GNP in 1988 (Technology: each successive year is 70 percent of previous year's)												
	Real GNP in: 1/			Current balance of: 2/			Real effective exchange rate: 1/			Other G-7			
	United States	Japan	Germany	United States	Japan	Germany	United States	Japan	Germany	United States	Japan	Germany	
United States	(1)	1.2	0.5	-0.1	0.2	-13	3	-1	3	1.5	-0.3	-0.1	-0.5
	(3)	0.6	0.6	0.1	0.6	-18	6	--	7	1.8	-0.2	-0.4	-0.6
Japan	(1)	--	1.5	-0.1	0.1	1	-5	--	2	0.1	0.5	0.1	-0.3
	(3)	0.1	0.6	--	0.3	1	-8	1	4	-0.1	0.9	--	-0.4
Germany, Fed. Rep. of	(1)	0.1	0.1	0.8	0.2	1	1	-6	2	-0.3	-0.2	0.7	-0.2
	(3)	0.1	0.2	0.3	0.2	--	2	-5	3	-0.4	-0.3	0.9	-0.2
Increase in Money Supply Target by 5 Percent Relative to Baseline													
Country Taking Action	Real GNP in: 1/												
	Current balance of: 2/			Real effective exchange rate: 1/			Other G-7						
	United States	Japan	Germany	United States	Japan	Germany	United States	Japan	Germany	United States	Japan	Germany	
United States	(1)	1.2	-0.5	-0.3	-0.1	6	5	5	--	-3.8	0.6	1.4	0.6
	(3)	0.8	-0.2	-0.1	-0.1	6	5	6	-1	-2.1	0.3	1.0	0.3
Japan	(1)	-0.1	1.1	--	--	-1	3	--	-1	0.4	-2.2	0.3	0.6
	(3)	-0.1	1.0	-0.1	-0.3	-1	6	-1	-4	0.3	-1.2	--	0.4
Germany, Fed. Rep. of	(1)	-0.1	--	2.1	--	-1	--	--	-1	1.2	0.8	-3.5	1.0
	(3)	--	-0.1	1.1	-0.2	--	-1	-1	-1	0.7	0.5	-1.8	0.5

1/ Percentage deviation from baseline.

2/ Deviation from baseline, billions of dollars.

Table 2. MULTIMOD Simulations: Comparisons of Historical Policy Stance with Values of Endogenous Variables when Money Growth, Tax Rates, and the Stance of Government Spending in GDP are Smoothed

Variable	Mean Values, 1974-87		Standard Deviations 1974-87	
	Historical Values	Simulated Values under Smoothing	Historical Values	Simulated Values under Smoothing
<b>Growth rate of real GDP</b>				
United States	2.5	2.6	2.8	4.6
Japan	3.7	3.8	1.8	2.9
Germany	1.9	2.0	1.9	3.6
Other Group of Seven	2.2	2.4	1.4	3.0
<b>Rate of inflation</b>				
United States	6.5	7.4	3.0	3.0
Japan	5.0	6.5	6.0	5.9
Germany	3.9	4.5	2.1	1.9
Other Group of Seven	10.2	11.4	5.4	6.1
<b>Real effective exchange rate (1980=0)</b>				
United States	14.6	16.3	12.9	11.7
Japan	9.4	9.3	5.2	5.1
Germany	-5.4	-5.1	9.1	8.9
Other Group of Seven	-6.6	-8.6	3.0	3.1
<b>Real short-term interest rate</b>				
United States	2.1	2.5	3.6	4.4
Japan	2.7	2.5	3.5	4.6
Germany	2.9	2.7	2.4	3.1
Other Group of Seven	2.3	2.4	5.7	6.8

in exchange rates and in economic activity than economic policy variables. The role of policy has been to accommodate partially those shocks. For instance, money growth rates were increased initially after the first and second oil price shocks, but a permanent increase was resisted. The basic point is that the variability of policy instruments has to a large degree been a response to shocks, rather than an exogenous source of instability; 72/ put in other words, the historical period already contains considerable smoothing--albeit of a discretionary rather than rule-based variety--and therefore attempts to impose additional smoothing on top of it do not produce salutary effects.

Note also that real effective exchange rates take on values in this simulation that are very similar to the historical data, though they are somewhat less volatile when policy is smoothed. There seems to be little support here for the notion that exchange rate stability can be achieved solely through the application of simple mechanical of smoothing rules. Recall, however, that the smoothing simulation has only considered a change in the path of policy variables--leaving their end points unchanged--rather than a permanent changes in those variables. A permanent increase in the rate of money growth or in the shares of taxes or government spending in output might have more powerful effects.

A more activist approach to the coordination of economic policies would go beyond smoothing. One such approach would be to postulate that monetary authorities resist movements of an intermediate variable--in particular the real effective exchange rate--from their long-run equilibrium levels. A system of target zones for exchange rates has been proposed

by Williamson (1983 and 1985), and extended by Williamson and Miller (1987). The original proposal calculated "fundamental equilibrium exchange rates," and advocated the use of monetary policies to resist movements away from those rates. As explained by Williamson (1983):

"The basic focus of exchange rate management should be on estimating an appropriate value for the exchange rate and seeking to limit deviations from that value beyond a reasonable range (p. 47)... While other techniques, like sterilized intervention, may be able to give limited assistance, a serious commitment to exchange rate management leaves no realistic alternative to a willingness to direct monetary policy at least in part toward an exchange rate target." (p. 56)

More recently, Williamson and Miller (1987, p. 7) supplement the prescription that monetary policies be used to target real effective exchange rates with the assignment of fiscal policies to targets for the growth in domestic demand for the Group of Seven countries:

"The basic argument is that a nominal income target fulfills the same function as a money supply rule, providing a "nominal anchor" to prevent inflation from taking off and a guide to expectations, while avoiding the shocks to demand that come from variations in velocity..."

In addition, the proposal, or "blueprint," specifies (p. 2) that:

"the average level of world (real) short-term interest rates should be revised up (down) if aggregated growth of nominal income is threatening to exceed (fall short of) the sum of the target growth of nominal demand for the participating countries."

Earlier simulation studies of target zones have been undertaken by Williamson and Miller (1987, Appendix C), based on Edison and others (1987). Those studies employed the Federal Reserve Board's multicountry model (MCM), which is characterized by adaptive expectations. As emphasized earlier, in simulation MULTIMOD uses model-consistent forward-looking expectations--a

looking expectations--a difference that should produce different--and we would argue, more firmly grounded--answers.

Two simulations were performed--one for the original target zone proposal (labeled "target zones"), and one for target zones augmented by a rule for fiscal policy (labeled "blueprint"). The attempt was made to stay close to the spirit of the original proposals while still making a few minor modifications.

Much of the action in a target zone scheme centers around the monetary reaction function since it is monetary policy that is typically assigned to the exchange rate. In the standard version of MULTIMOD, the reaction function for short-term interest rates involves resisting movements away from an exogenous target for base money. The demand for base money, in turn, is assumed to depend on real GNP and on its deflator with elasticities close to unity. When the effects of target zones are simulated, this term is retained but with a much lower weight than normal. <sup>73/</sup> The "target-zone" element in the reaction function is represented by the assumption that the short-term interest rate deviates from the baseline depending on the cube of the deviation of the real effective exchange rate from its target value. <sup>74/</sup> Thus, the monetary policy rule used in both the target-zone and blueprint simulations takes the following algebraic form:

$$(1) \quad r - r^b = [(c - \bar{c})/n]^3 + a [\bar{m} - m],$$

where, as in Edison and others (1987),  $r$  is the short-term rate,  $r^b$  is its baseline value,  $c$  is the log of the real effective exchange rate,  $\bar{c}$  its target value, and  $n$  is half the width of the target zone, (namely, 10

percent);  $\bar{m}$  is the target for the monetary base,  $m$  the long-run demand for the monetary base with baseline interest rates but simulated output and prices, and  $a$  is a negative constant. 75/

Targets for the real effective rate were taken from Williamson (1985). 76/ As in Edison and others (1987), an adjustment to the level of the target real effective rate is made to keep it compatible with the definition used in the model, but the constraint is imposed that the translated target exchange rate variable follow the same path as in Williamson (1985). 77/

As mentioned earlier, the "blueprint" proposes that fiscal policy follow a rule targeted on nominal domestic demand growth. As such, the equations in MULTIMOD for real government spending on goods and services had to be endogenized along such lines. The target paths for nominal domestic demand growth were taken from Williamson and Miller (1987) for the period 1980-87; outside that period, we used their formula to calculate targets.

The main results of interest are portrayed in Charts 5 to 8, where actual (historical) values are compared to simulated values for the target-zone proposal and for the Blueprint proposal. The charts cover real effective exchange rates, real GNP growth rates, rates of inflation, and current account balances. Bands 10 percent each side of Williamson's fundamental equilibrium exchange rates have been drawn on Chart 5.

Several interesting--albeit tentative--conclusions emerge from the simulations.

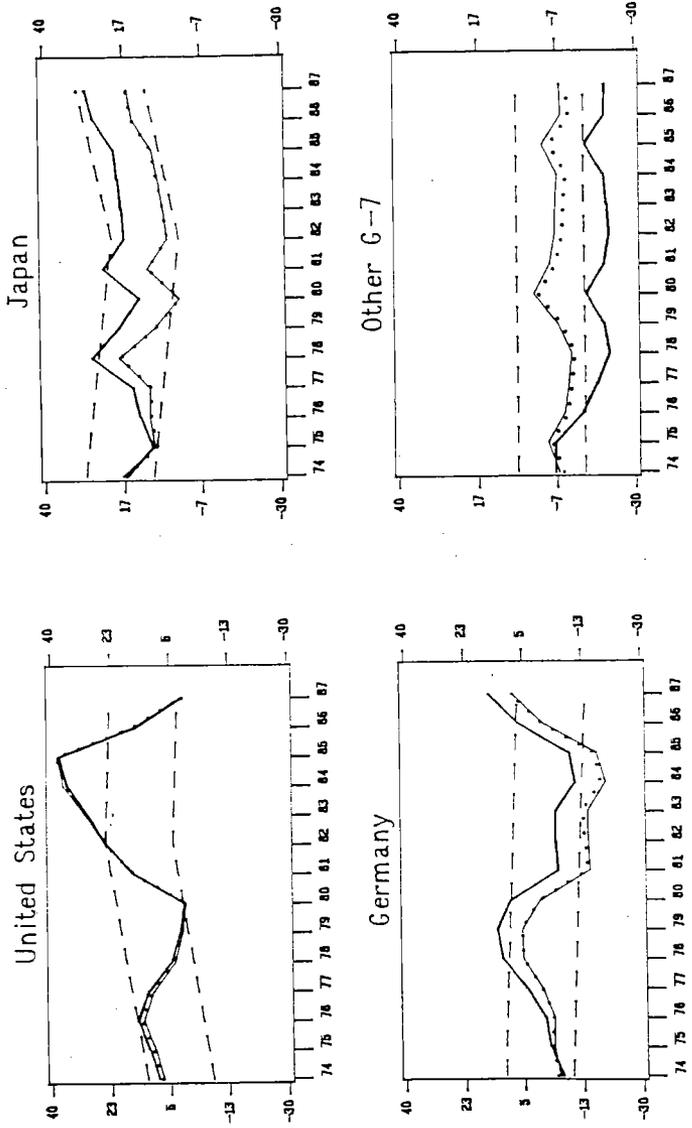
First, there is surprisingly little success in limiting real exchange rate movements away from their targets, especially for the United States. 78/ This is apparent for both the more limited assignment of monetary policy to target exchange rates and the case where fiscal policy is made endogenous, though not specifically for exchange rate targeting. Also, the cost of resisting exchange rate in terms of greater variability of nominal interest rates appears to be quite high in the model. In 1985, the short-term rate in the United States is 370 basis points below its baseline value in the target zones simulation, and 260 basis points above in Germany. An attempt to increase the feedback onto interest rates of real exchange rates produced explosive behavior in the model, and negative nominal interest rates. Why is the movement in real effective exchange rates so small? In the model, this is the result of the long-run neutrality of real variables with respect to monetary policy, and of the fact that monetary policy changes are anticipated in advance. A nominal depreciation resulting from anticipated monetary expansion leads quite soon to increases in import prices and domestic inflation, reducing the amount of real depreciation. Such a scenario has been discussed by Feldstein (1987, pp. 11-12) in the following terms:

" ... if the United States had agreed in 1983 to the demands of the French and others who wanted us to stop the dollar's rise ... [it would have come about through] easier monetary policy [which] would have produced inflation and the inflation would have caused the dollar's nominal value to decline. In the end, there would have been no change in the real exchange rate or the trade deficit but a higher price level and a higher rate of inflation."

With perfect foresight of policy changes, the required movements in monetary policy may be quite large for even small, and transitory, real exchange rate changes. It can be seen from Chart 5 that the dollar's real effective exchange rate is judged by Williamson and Miller (1987) to be undervalued in 1978-80, but overvalued from 1982-85. Thus, interest rates have to rise in the earlier period but fall in the latter (relative to baseline). With perfect foresight, the amount they must rise in the earlier period is amplified because it is known that they will be lower later. <sup>79/</sup> Note that monetary policy is effective in the model in the short run, provided that the money supply change is unanticipated. Table 1 indicates that an increase in the money supply of 5 percent causes a real effective depreciation in the first year ranging from 2 percent in the case of Germany to 4 percent in the United States; by the second-year, the depreciation has been reduced to 1 to 2 percent. If anticipated beforehand, the extent of the depreciation is further reduced.

In future work, we intend to relax the assumption that the shocks of the 1980s--as well as the policy reactions--are correctly anticipated when the simulation begins. Specifically, we plan to do an experiment where the values of exogenous variables are projected using information then available, and where in each period a drawing is made from the random errors in both policy reaction functions and in relationships describing private behavior. Expectations of future variables would thus be successively updated. This alternative method of simulation is discussed more fully below. It will be interesting to see whether

CHART 5. ACTUAL AND SIMULATED REAL EFFECTIVE EXCHANGE RATES  
 (in percentage deviations from 1980 values)



Actual  
 . . . Target Zones  
 — Blueprint  
 . . . . . Williamson's target bands

this alternative expectations structure, which provides market participants with less information than assumed here, produces a significantly different outcome for exchange rate behavior under target zone proposals.

A second conclusion is that the use of monetary policy alone to maintain target zones--keeping the same stance of fiscal policy as in the baseline--seems to exacerbate the inflationary pressures of the late 1970s and early 1980s, and to lead to more variable inflation rates; see Chart 7. In this simulation, the United States eases monetary policy to prevent the dollar's appreciation in the 1980-85 period; with perfect foresight of such a policy stance, inflation rises somewhat in the late 1970s in anticipation. Conversely, the dollar's undervaluation in 1987 (according to the calculated fundamental equilibrium exchange rate) requires a tightening of policy, which tends to lower inflation rates in the mid-1980s below baseline levels.

The substantial effects on real variables in the blueprint simulation appear to be the result mainly of the fiscal rule. In the blueprint simulation, GNP growth is smoothed considerably in the United States and the Federal Republic of Germany; see Chart 6. The recession of 1982 and the high growth of domestic demand in the United States in 1984 are both smoothed out; U.S. GNP growth in 1984 is only 2.7 percent, compared to 7.2 percent historically, while the United States no longer experiences a recession in 1982. Moderation of sharp GNP movements is however not so evident for Japan and the other Group of Seven countries. Indeed, the non-U.S. Group of Seven countries experience large output variations in 1975-76 in the blueprint simulations. This may be a result of a

CHART 6. ACTUAL AND SIMULATED RATE OF GROWTH OF GNP  
(In percentage changes)

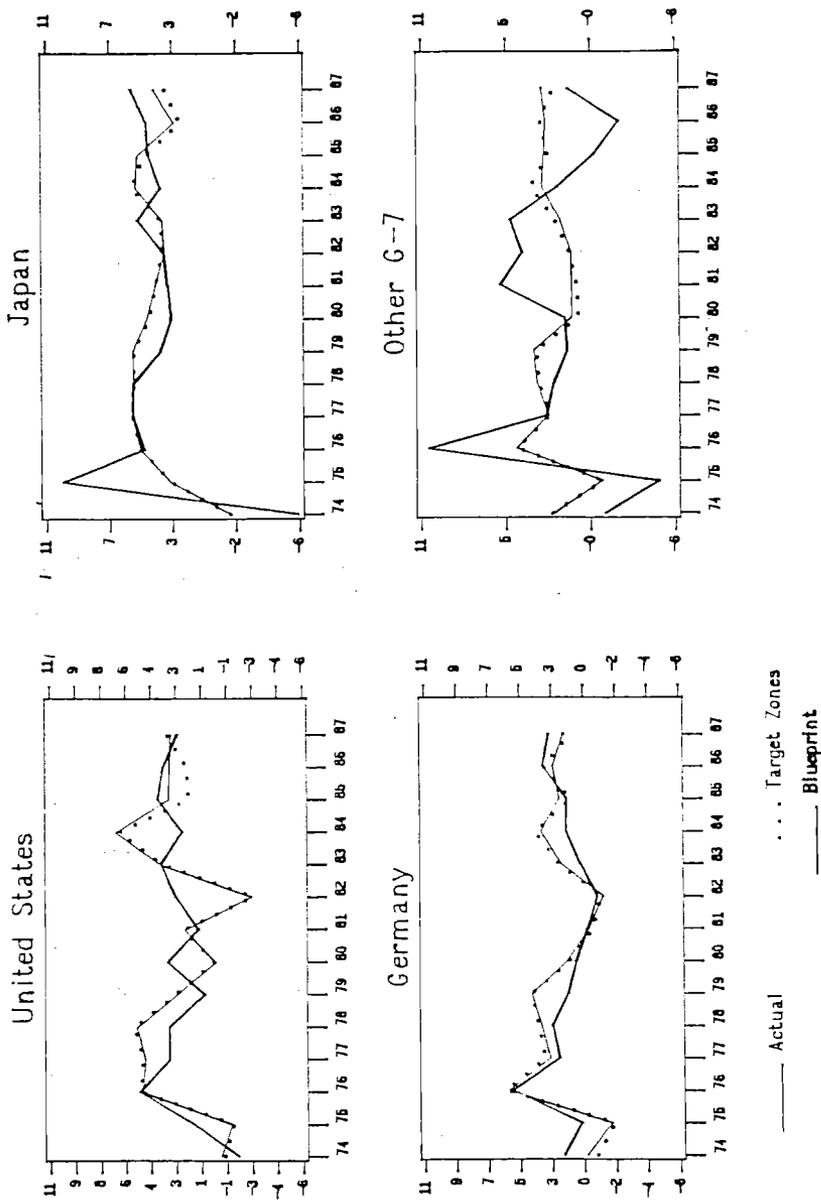


CHART 7. ACTUAL AND SIMULATED RATE OF INFLATION  
(In percentage changes)

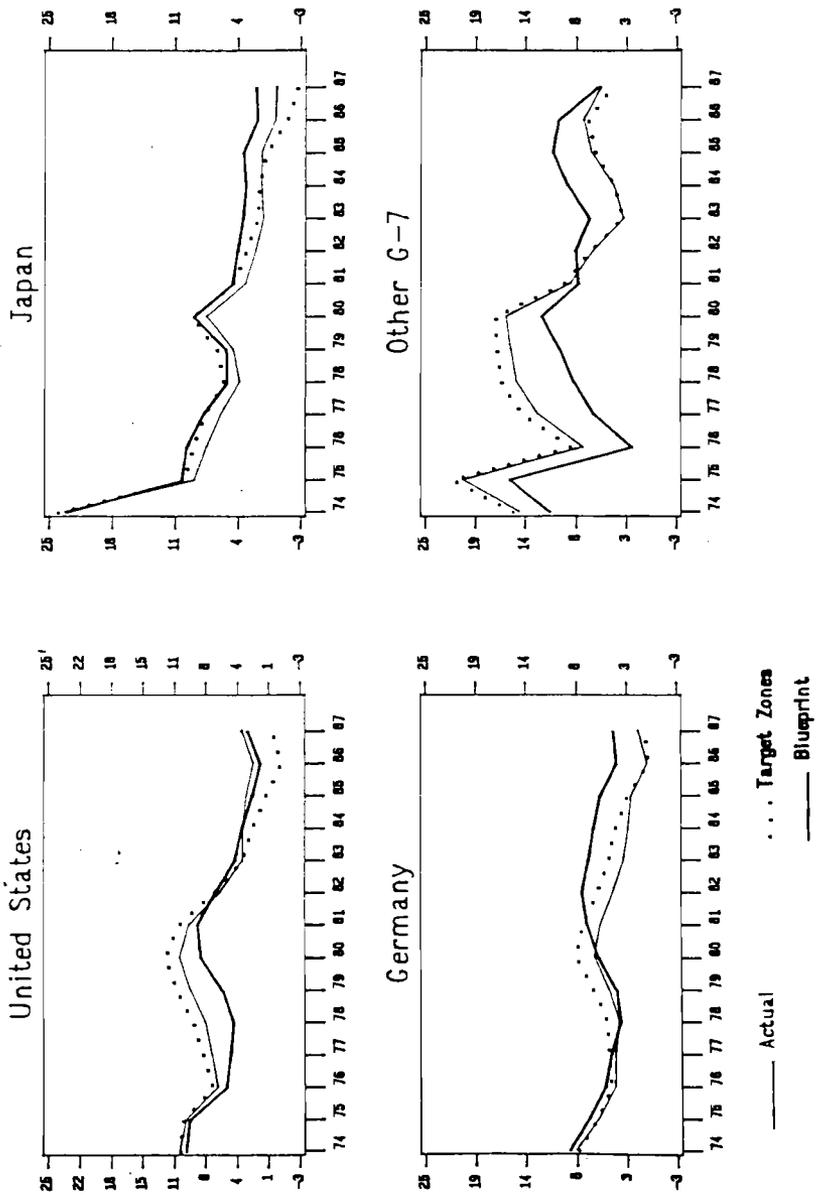
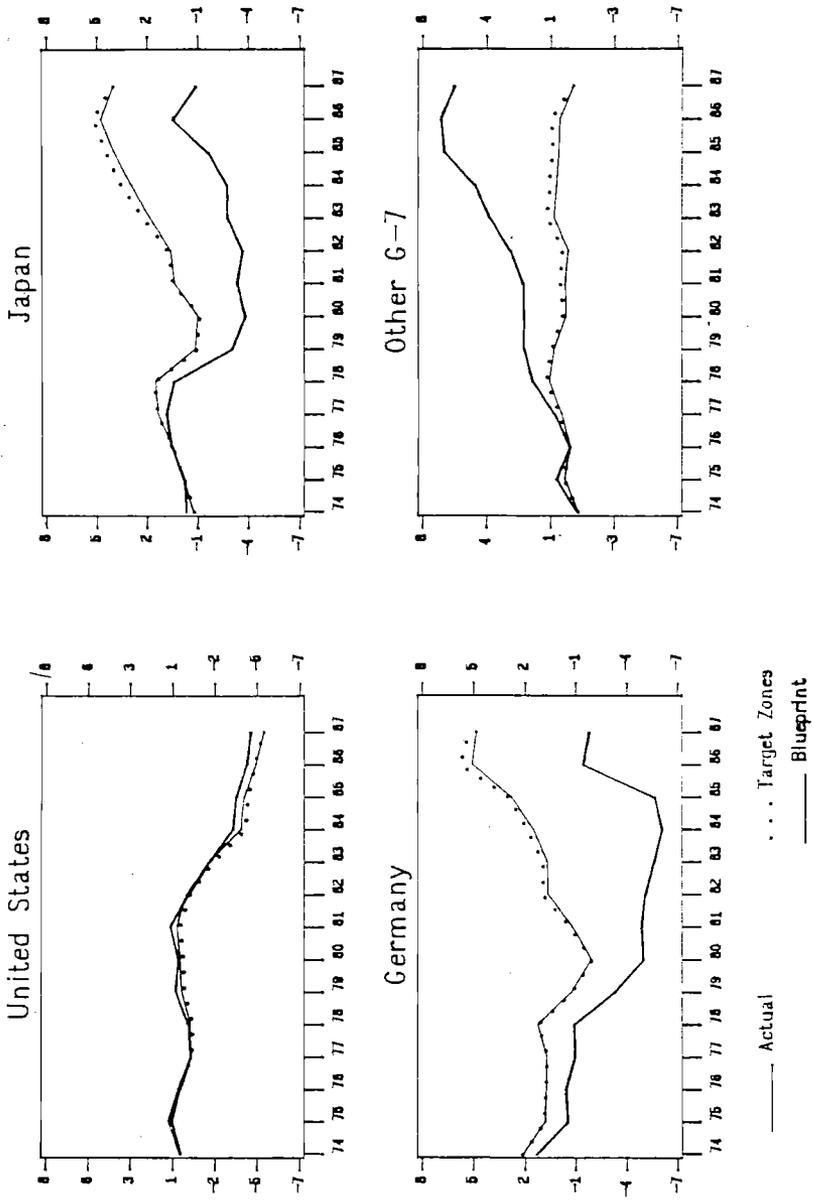


CHART 8. ACTUAL AND SIMULATED CURRENT BALANCE AS RATIO TO GNP  
(in percentage changes)



mechanical application of the Williamson-Miller formula for calculating nominal demand targets; if adjusted in an ad hoc fashion (as is done in Williamson and Miller (1987) for the second oil shock), a more reasonable path might result.

Third, current account imbalances are reduced for the major three countries in the blueprint simulation, in the sense of being closer to zero; see Chart 8. Most of the effects again come as a result of the changes in fiscal stance. In particular, targets for domestic demand growth in Germany and Japan are consistently above the historical values, and this leads to a much more stimulative fiscal policy in these countries (see Williamson and Miller (1987), Charts 4 and 5). But again, there is a cost. General government fiscal deficits reach 10 percent of GNP in Germany and 8 percent in Japan in the early 1980s! By the same token, it is the fiscal stimulus--rather than the monetary policy change--that is the cause of the sizable appreciation of the yen and deutsche mark in the 1980s relative to baseline. Clearly, such large deficits would not be tolerable politically. It is also noteworthy that the counterpart to the smaller current account surpluses in Germany and Japan is larger surpluses in the other Group of Seven countries, rather than a reduction of U.S. deficits. This occurs because a weighted average of domestic demand targets for France, the United Kingdom, Italy and Canada in Williamson and Miller (1987) is consistently lower than actual demand over the period 1974-87.

In concluding this discussion, we reiterate that it is important not to read too much into these preliminary simulation results--for at least three reasons.

To begin with, and harking back to our earlier discussion about the quality of coordination, it would be inappropriate to generalize about the effects of more judgmental discretionary approaches to coordination from simulations of more mechanical rule-based coordination proposals.

Second, we need to obtain more information on the robustness of our preliminary findings with respect to alternative assumptions about the relationship between interest rates and exchange rates, and to alternative targets for real effective exchange rates and nominal domestic demand growth. In a similar vein, it would be useful to employ MULTIMOD to draw out the implications of alternative coordination proposals for the developing countries.

Finally, the method of simulating alternative policies itself requires further study. It is sufficient here to note just two of the avenues that might be explored in further work.

Instead of recreating history by using the same residuals as in the historical data, it could be revealing to do many simulations based on different drawings from the distribution of the error terms present in the historical data. Such repeated stochastic simulations avoid the criticism that a policy rule may be appropriate only to a particular historical episode, rather than to fundamental features of the economy.

A second avenue is to delve more deeply into the nature of policy guidelines and rules, and how these relate to historical experience. One way to tackle this problem would be to assume that actual policy over the

historical period could be described by an estimated reaction function, with a systematic part (that is a function of observable variables) and a random part. In one set of simulations, the systematic part of the policy rule (i.e., the "feedback rule" including the variables targeted and their coefficients) would be changed but the random part would be left unchanged. The argument here would be that the random part represents either a component of discretionary behavior or errors in implementing policy, and that this random element would remain under all policy regimes. In a second set of simulations, one would alternatively assume that any new policy rule would be implemented without error so that the random part is identically zero. The latter set of simulations could be viewed as too favorable to a new policy rule, while the first set would perhaps not be favorable enough. The two alternative may therefore give reasonable bounds to the effects of new policies and may help us distinguish expectational errors from shocks to structural equations.

Footnotes

1/ This paper was presented at a conference organized by the IMF and HWWA-Institut für Wirtschaftsforschung on "National Economic Policies and Their Impact on the World Economy" held in Hamburg on May 5-7, 1988. In addition to colleagues in the Research Department, the authors are indebted to Hali Edison, Martin Feldstein, Pieter Korteweg, and Jacques Melitz for helpful comments on an earlier draft.

2/ See the surveys by Artis and Ostry (1986), Cooper (1985), Fischer (1987), Hamada (1979), Horne and Masson (1988), Kenen (1987), Polak (1981) and Wallich (1984).

3/ Evidence on the size of spillover effects from policy actions by the major industrial countries is discussed in the latter part of this section and in Table 1 of Section IV.

4/ The conclusion that a monetary expansion under floating rates affects real output in opposite directions at home and abroad is associated with the Mundell (1971)-Fleming (1962) model. For a recent evaluation of this model, see Frenkel and Razin (1987a); a broader survey of the international transmission mechanism can be found in Frenkel and Mussa (1985). Econometric models are more divided on whether a monetary expansion under floating rates has negative transmission effects on real output abroad; see Helliwell and Padmore (1985) and Bryant and others (1988).

5/ We regard the label as inappropriate, both because the proponents of decentralized macroeconomic policy-making--including Corden (1983), (1986), Feldstein (1987), Niehans (1988), Stein (1987), and Vaubel (1985)--are geographically quite diverse, and because some prominent German economists, such as Poehl (1987), have stressed the importance of coordination.

6/ Corden (1986) has recently argued that there may be a case for asking large countries to slow their speed of adjustment to desired policy targets so as to dampen movements in real exchange rates that could cause difficulties for others (see Section IV).

7/ Another constraint on regional attempts to create more of the public good is that they may divert or discourage its production outside the region; the argument here is analogous to the concepts of "trade creation" and "trade diversion" in the customs-union literature.

8/ To reach this conclusion, it is necessary to assume that each player does not have sufficient policy instruments to achieve all its policy targets simultaneously, and that coordination alters the trade-offs among policy targets; see Gavin (1986). Without those assump-

9/ See Fischer (1987) and Frenkel (1983, 1986).

10/ See Goldstein (1984). This is not to say that the insulating properties of floating rates are inferior to those of alternative regimes. Indeed, it is hard to see any other exchange rate regime surviving the shocks of the 1970s without widespread controls on trade and capital.

11/ On the possible use of commodity-price indicators in the conduct of monetary policy, see Heller (1987).

12/ See Bocklemann (1988) for a similar conclusion.

13/ See Frenkel (1985).

14/ Another barrier is disagreement over forecasts for key economic variables over the medium-term; on this point, see Tanzi (1988).

15/ See Bryant and others (1988) and Helliwell and Padmore (1985) for a comparison of open-economy multipliers from different global econometric models. Frankel and Rockett (1986) illustrate the sensitivity of welfare effects of coordination to the selection of the "right" versus the "wrong" economic model.

16/ See Fischer (1987). Dini (1988) goes further to argue that when the incentives to coordinate differ widely among group members, there may be a tendency for bilateral bargains to take place among those who have the most to trade.

17/ See Putnam and Bayne (1984). At the same time, the Bonn Summit is regarded in some quarters as illustrative of the pitfalls of coordinating macroeconomic policies when the economic outlook is changing rapidly.

18/ See Putnam and Bayne (1984).

19/ Putnam and Henning (1986).

20/ Artis and Ostry (1986).

21/ Feldstein (1988).

22/ Cooper (1988).

23/ Another example of high-frequency coordination is that among central banks of the largest countries on exchange-market intervention tactics.

24/ See Frenkel and Razin (1987b).

25/ For example, the Louvre Communiqué states that: "The United States Government will pursue policies with a view to reducing the fiscal 1988 deficit to 2.3 percent of GNP from its estimated level of 3.9 percent in fiscal 1987. For this purpose, the growth in government expenditures will be held to less than 1 percent in fiscal 1988 as part of the continuing program to reduce the share of government in GNP from its current level of 23 percent;" see International Monetary Fund (1987).

26/ Because coordination of structural policies typically involves different policy instruments, individual country actions cannot--unlike coordination of fiscal policies--be evaluated with reference to an aggregate policy indicator that would be desirable from a global perspective.

27/ This is not to deny the helpful role that harmonization of structural policies--ranging from adopting similar tax provisions to implementing common regulations concerning movements of goods, labor, and capital--could play in certain circumstances.

28/ Those who hold the view that international factors have minimal influence on policy-making, sometimes also argue that countries' policy commitments in coordination agreements represent policies that would have occurred even in the absence of such agreements. Under this view, coordination affects only the timing of policy announcements with countries delaying such announcements until coordination meetings so that they can present a dowry to the others.

29/ See the papers in Buiter and Marston (1985).

30/ The classic references to what is called the "time inconsistency" of policies are Kydland and Prescott (1977) and Calvo (1978).

31/ As Poehl (1987, pp. 19-20) notes: "... international cooperation does not necessarily imply that all parties must agree on all details at all times. It is important that we regard it as a process of maintaining stability in our increasingly interrelated world economy... The process of international cooperation may be difficult and burdensome, even frustrating at times, but there is no alternative to it."

32/ It is precisely because of the risk of "collusion" among the coordinating countries that Vaubel (1985) favors decentralized decision making.

33/ See Polak (1981) and Kenen (1987).

34/ It is in this context that the problems of time-inconsistency and moral hazard often surface.

35/ Advocates of rules also argue that once the public knows better what the authorities will do, markets will demand less of a risk-premium to hold the authorities' financial obligations.

36/ See Cooper (1982) and U.S. Congress (1982).

37/ Goldstein (1980), (1984), Frenkel (1982), Frenkel and Goldstein (1986).

38/ Kenen (1987) cites a regression of the change in the inflation rate between 1979 and 1985 on the level of the inflation rate in 1979 and a zero-one dummy variable denoting participation in the exchange rate mechanism of the EMS. The sample was comprised of 22 industrial countries. The EMS dummy variable was not statistically significant, whereas the level of the inflation rate in 1979 was. Note that this finding does not preclude a helpful role of the EMS in disinflation since participation could still have reduced the output cost of disinflation (see, for example, Giavazzi and Giovannini (1988)); but this is a different story.

39/ As developed in Polak (1988), the need for rules to guard against the dangers of fine tuning has receded in any case since economic policy in most industrial countries is now oriented much more toward the medium-term. Fischer (1987) makes the complementary point that the state of our knowledge about the effects of monetary and fiscal policy is too rudimentary to justify policy rules. Niehans (1988) expresses doubts that rules could be relied upon to reduce international disturbances.

40/ On the limitations of purchasing-power parity rules, see Frenkel (1981).

41/ See Frenkel (1975).

42/ Frenkel and Goldstein (1988).

43/ The literature on "speculative attacks" deals with just this phenomenon; see, for example, Flood and Garber (1980).

44/ Tanzi and Ter-Minassian (1987) and Holtham and others (1987).

45/ See Frenkel and Goldstein (1986). This missing link between exchange rate movements and fiscal policy under target zones is being increasingly recognized. Whereas first-generation target zone proposals spoke only of monetary policy, second-generation proposals have added a policy rule or guideline for fiscal policy; contrast Williamson (1985) with Williamson and Miller (1987).

46/ The list of indicators noted in the Communiqué of the Tokyo Economic Summit included growth rates of gross national product, interest rates, inflation rates, unemployment rates, ratios of fiscal deficits to GNP, current account and trade balances, money growth rates, international reserve holdings, and exchange rates.

47/ There is also the question of the proper assignment of policy instruments to policy targets. This issue is touched on in the next section.

48/ See Tanzi (1988).

49/ See Mussa (1981) and the Jurgensen Report (1983).

50/ This characterization is not universally shared. Williamson and Miller (1987), for example, regard the gold standard and Bretton Woods as more symmetric systems.

51/ See Frenkel and Goldstein (1988).

52/ See Giavazzi and Giovannini (1986).

53/ In practice, high-inflation countries have sometimes resorted to capital controls during exchange rate crises so as to avoid the choice of having to give up either monetary independence or the exchange rate target.

54/ To the extent that the EMS produces greater stability and predictability of exchange rates, all members also share any efficiency gains associated with moving closer to a single currency.

55/ Eichengreen (1987).

56/ See Dornbusch (1988).

57/ Holtham and others (1987). See the proposals on the EMS put forward to the European Community Monetary Committee last Fall by Minister Balladur of France as prefacing such a symmetric development of the EMS.

58/ See Oudiz and Sachs (1984), McKibbin and Sachs (1988), and Taylor (1985) for evidence on the size of the gains and Frankel and Rockett (1986) for the effects of using the "wrong" model.

59/ See Schultze (1987) and Bryant and others (1988). As an example of the difficulties associated with identifying the "counterfactual" contrasts Feldstein's (1987) appraisal of the likely evaluation of exchange rates in the absence of the Plaza Agreement with that of Lamfalussy (1987).

60/ See Ghosh and Masson (1988).

61/ See Williamson (1985) and Williamson and Miller (1987).

62/ Another recent paper, Taylor (1986), considers different exchange rate arrangements in a rational expectations model; however, only completely fixed and freely floating exchange rates are compared, and the model is limited to the seven major industrial countries.

63/ The model simulations do not, however, allow for two other ways in which private sector behavior may be affected by changes in policy regimes. First, the variance of output, prices, or exchange rates may be different, leading to different degrees of substitutability among goods or assets. For example, it has been argued that the greater variability of exchange rates has led to a lower level of international trade than would have prevailed under fixed rates. Second, expectations may contain "speculative bubbles" in some circumstances, and hence may not solely reflect economic fundamentals. For example, the rise of the U.S. dollar early in 1985 despite declining interest rate differentials in favor of dollar-denominated assets is hard to explain.

64/ See Masson and others (1988).

65/ In contrast to the industrial countries, developing countries are not assumed to face perfect capital markets. Instead, the availability of financing reflects their ability to service debt, as measured by a ratio of their inflation-adjusted interest payments to the value of their exports. It is assumed that there is an upper limit to this ratio, beyond which the risk of nonrepayment becomes high, and consequently creditors would refuse to grant further new lending. As a result of the financing constraint, imports by developing countries are also constrained, tending to reduce both consumption and investment. The constraint on financing is, however, not solely based on current developments, but also reflects an assessment of future export prospects of developing countries; expected future exports are made to be consistent with the model's solution for those future exports.

66/ This is a feature that will be relaxed in future work--in particular, by imposing shocks to residuals in successive periods.

67/ Labor markets do not appear explicitly in the model, but features of wage bargaining, such as those due to overlapping multiperiod contracts, are reflected in the equation estimated for inflation.

68/ One strong implication of this empirical regularity is that any "assignment rule" that assigns monetary policy to the current account--for example, Williamson and Miller's (1987) Blueprint--is going to face problems; on this point, see Genberg and Swoboda (1987) and Boughton (1988).

69/ It is assumed here that fiscal expansion is not accommodated by an increase in money growth. Current account effects also reflect the impact of interest rate changes on net investment income.

70/ Niehans (1988, p. 215) also stresses the importance of steady policies: "The first, and most promising, step to reducing international disturbances must surely be the avoidance of the policy shifts that produce them. Especially for the dominant economy, the United States, the most important part of cooperation is steadiness."

71/ The measure of real effective exchange rate is the country's manufactured export price, divided by a weighted average export price of its competitors, including developing countries. Thus, an increase indicates appreciation.

72/ Corden (1986, p. 431) recognizes this to some extent: "[Coordination] means, incidentally, that if private investment in a country declines there should be some compensating increase in its fiscal deficit to modify the current account effect. It does not necessarily mean that a fiscal policy stance should be stable."

73/ The role of this variable is to give a nominal anchor to the system. The inclusion of this term is also consistent with the intent of the blueprint proposal to make the level of interest rates depend (in an unspecified fashion) on the growth of aggregate GNP.

74/ Edison and others (1987, p. 97).

75/ In implementing the rule, the value given by Edison and others (1987) to  $n$ , 10 percent, was initially tried, but the model either would not solve or gave negative nominal interest rates. Consequently a higher value, 20 percent, was used, implying a lower feedback of exchange rate misalignments on interest rates.

76/ Again, we adopt Williamson's (1985) estimates of target or equilibrium real effective exchange rates merely to stay as close as possible to the original proposals. There should be no implication that we agree or disagree with those estimates.

77/ It should also be noted that MULTIMOD's definition of real effective exchange rates is wider than most measures, since it allows for competition from manufactures produced in developing countries.

78/ It is also the case in Edison and others (1987), that real exchange rates under a target zone regime differ little from their historical values.

79/ Suppose there are three time periods, and that interest parity relates interest rates and exchange rates. Suppose also that the exchange rate is unchanged in the third period. In each period, the interest rate differential is equal to the appreciation that is expected (and actually occurs) next period. Thus, in terms of deviations from baseline,  $d_t = e_{t+1} - e_t$ , where  $e_3 = 0$ . Then in the second period, the interest differential will have to be equal to the desired change in the exchange rate; if it is overvalued by 5 percent, interest rates will have to be 5 percentage points lower. If in the first period the exchange rate is undervalued by 5 percent, then interest rates will have to be not 5, but 10 percentage points, higher.

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