

International Payments Imbalances in the 1980s

Proceedings of a Conference
Held in October 1988

Norman S. Fieleke, Editor

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*Federal Reserve Bank
of Boston*

Branson
Buire
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Dornbusch
Fieleke
Frankel
Frenkel
Krugman
Marchese
Marston
Perng
Richardson
Sachs
Schlesinger
Sundberg
Suzuki

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International Payments Imbalances in the 1980s: An Overview

*by Norman S. Fieleke**

Many observers are troubled by the persistence of large international current-account imbalances in the industrialized and newly industrialized countries. Even deeper concern exists over the continuing difficulties of numerous less developed countries in servicing their international debts. These geographic imbalances, together with large, puzzling variations in exchange rates, have stimulated questions about the role played by international capital movements, about the efficiency of the international adjustment process, and about the possible need for greater international coordination of macroeconomic policy.

To consider these issues, a group of international economists, officials, bankers, businessmen, and other interested parties convened at a conference sponsored by the Federal Reserve Bank of Boston in the autumn of 1988. Although no effort was made to reach a consensus, some points of at least partial agreement did emerge. Of the authors presenting papers, three maintained that the United States government should reduce its budget deficit in order to shrink the nation's current-account deficit, and that to offset the resulting contractionary impact on world demand, monetary policy should be eased in some other countries. Three authors agreed that the behavior of foreign-exchange rates reveals a dearth of stabilizing speculation or an excess of destabilizing speculation, and two of these authors endorsed, in principle, the imposition of a moderate tax on all foreign-exchange transactions as a means of discouraging short-term destabilizing capital movements. Finally, a panel was unanimous that international coordination of

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macroeconomic policy can yield appreciable gains and should be pursued in spite of acknowledged serious difficulties.

This article offers an overview of the conference papers and discussants' remarks. The first three papers deal with major geographic imbalances in international payments. The fourth paper inquires into the role of international capital movements in payments imbalances and exchange-rate volatility, and the fifth examines the workings of the balance-of-payments adjustment mechanism. The conference concluded with a panel discussion of the desirability of international coordination of macroeconomic policy.

Japan, Germany, and the United States

William H. Branson and Grazia Marchese note that international policymakers have been puzzled and worried by the persistence of large current-account imbalances in Japan, West Germany, and the United States, and that international policy analyses such as the *OECD Economic Outlook* and the *IMF World Economic Outlook* have focused on prescriptions to reduce the imbalances. Their paper reviews the IMF and OECD projections published in April 1988 and June 1988, respectively, and then presents a theoretical model that is used to help analyze alternative scenarios, or policy mixtures.

The IMF and OECD baseline projections, which covered the years 1988–92, assumed little or no change in real exchange rates and in current or announced policies, and also assumed specified paths for certain key international variables such as oil prices. For 1989 the projections showed a U.S. current-account deficit amounting to 2.6 percent of U.S. GNP, a Japanese surplus of virtually the same magnitude relative to Japanese GNP, and a German surplus of 3.1 to 3.3 percent of German GNP. The projected surplus of the European Community countries collectively was only 0.3 percent of their GNP, leading Branson and Marchese to observe that the German surplus would provoke much less concern if Germany were viewed as part of an integrated European Community.

More striking than the size of the imbalances projected for 1989 is the failure of projected imbalances to decline appreciably in relation to GNP after 1990. Both the IMF and the OECD expected the U.S. deficits to hover around 2 percent of GNP from 1990 through 1992. For the same years the IMF foresaw Japanese surpluses running at 2 percent and German surpluses amounting to 3 percent of GNP, while the OECD projected Japanese surpluses to be about 2.7 percent and German surpluses to be about 2.2 percent of GNP. Branson and Marchese believe that imbalances of this size would probably generate further depreciation of the U.S. dollar against the yen and the Deutschemark.

But they argue that the dollar would also depreciate if policy shifts of the kind recommended by the IMF and OECD were undertaken, since the recommended shifts would produce the desired current-account effects partly through the medium of dollar depreciation. The recommendations have been for policies to induce more rapid growth in domestic demand in Japan and Germany and slower growth in the United States. As a consequence, world demand would grow more rapidly for Japanese and German output and more slowly for U.S. output. Thus, prices would tend to rise less rapidly in the United States than in the other two nations; in other words, the dollar would depreciate in real terms against the yen and the Deutschemark.

Using the IMF Multimod model and the OECD Interlink model, Branson and Marchese then evaluate the consequences of changes in some key assumptions underlying the IMF and OECD baseline projections. The changes, considered separately, are:

- (1) A market-driven depreciation of the dollar during 1988, amounting to 15 percent against other major currencies in the simulation with Multimod, and to 15 to 20 percent against the Deutschemark and the yen in the simulation with Interlink.
- (2) Fiscal restriction in the United States. For the Multimod simulation, federal government non-interest expenditure is reduced by amounts increasing from \$42 billion in 1988 to \$91 billion in 1992 from the levels assumed in the baseline projection. For Interlink, federal expenditure is gradually reduced by about \$70 billion and income tax proceeds increased by about \$50 billion by 1992 by comparison with the baseline.
- (3) Fiscal contraction in the United States and expansion in Japan and Germany. For Multimod, the same U.S. fiscal contraction as in (2) is assumed, and in Japan and Germany fiscal stimuli (higher expenditures or lower tax revenues) amounting to about 0.5 percent of each country's GNP are introduced over 1988 to 1990 or 1991. For Interlink, the general government financial deficit is cut back in the United States by 2 percent of GNP and increased in Japan by 1 percent of GNP, by comparison with the baseline projections for 1989-92, while in Germany the same stimulative policy as in the baseline is assumed.

Results of the simulations incorporating these changes are reported in detail. They support the authors' argument that dollar depreciation would ensue from fiscal policy shifts contracting domestic demand in the United States relative to that in Japan and Germany. The role of exchange-rate change is further highlighted by the finding that the largest projected reduction—\$86 billion by 1992—in the U.S. current

account deficit (by comparison with the baseline) is generated by the assumption of a market-driven dollar depreciation (with Multimod).

The fiscal policy shifts considered by Branson and Marchese, especially restriction in the United States accompanied by expansion abroad, are found to reduce aggregate GNP for the three countries below the level projected in the baseline. On the other hand, net fiscal contraction in these countries would reduce real interest rates, to the benefit of developing country debtors. To achieve a projection with lower real interest rates but without the slowdown in aggregate GNP growth, the authors investigate with Multimod the effect of a fiscal contraction in the United States accompanied by two alternative paths of monetary expansion in Japan and Germany. The policy combinations explored (one of which the authors say resembles policy actually in effect after late 1986) have the disadvantage of stabilizing real exchange rates and thereby allowing even larger Japanese and German current-account surpluses than in the baseline projection. On the other hand, the U.S. current-account deficit would be reduced by an estimated \$36 billion to \$38 billion below the baseline projection, about the same reduction yielded by fiscal contraction in the United States and fiscal expansion in Japan and Germany, but with higher growth in the latter countries and lower world real interest rates. On balance, then, Branson and Marchese would prefer the policy shift of fiscal contraction in the United States and monetary expansion in Japan and Germany.

In commenting on Branson's and Marchese's paper, Paul Krugman focuses mainly on their theoretical model. He affirms their conclusion that both expenditure-switching and expenditure-reducing measures are required to reduce the U.S. current-account deficit; neither dollar depreciation (expenditure-switching) nor belt-tightening will be sufficient by itself. But Krugman finds their model less than adequate in two respects: its failure to allow for substantial lags in the adjustment of trade volumes to exchange-rate changes, and its assumption of rational expectations.

The treatment of expectations is the more difficult to remedy. Krugman argues that if the dollar had fallen from its 1985 peak as slowly as market variables were then forecasting, the United States would have accumulated an infinite foreign debt, and that this and other market behavior clearly contradict the assumption of rational expectations. Unfortunately, how to model an irrational market is an unsolved problem.

In his discussion, Yoshio Suzuki argues that during 1987–88 Japan and Germany were in fact already engaged in the kind of monetary expansion that Branson and Marchese prescribe, but that the United States did not reduce its budget deficit enough. As a consequence, in October 1988 the IMF revised upward its baseline projection for real GNP growth in Japan and Germany, and concern has grown about an

acceleration of inflation, while insufficient reductions have occurred in the U.S. current-account deficit and in real interest rates. Also, contrary to the theoretical model presented by Branson and Marchese, Suzuki believes that a contraction of the U.S. budget deficit could improve the U.S. current-account balance without necessarily bringing about further dollar depreciation. A cut in the budget deficit that reduced U.S. absorption would reduce U.S. imports directly, without requiring the medium of dollar depreciation; and Suzuki thinks the effect might be quite large, as final goods comprise about 50 percent of U.S. merchandise imports. In addition, Suzuki argues that the model of Branson and Marchese can be used to analyze the effects of fiscal but not of monetary policy, since the model deals with relationships between real variables but not between nominal variables.

Heavily Indebted Developing Countries

In his survey of the developing-country debt problem, Norman S. Fieleke notes that the threat to stability of the international financial system has diminished since the Mexican payments crisis of August 1982, but not because of successful adjustment or restoration of creditworthiness in heavily indebted developing countries. Rather, the threat has eased as commercial banks have sharply reduced the share of their assets and capital exposed to the troubled debtor countries. Fieleke analyzes in some detail the adjustment that occurred in the 15 heavily indebted countries between 1982 and 1987, considers some indexes of creditworthiness (a measure of progress in adjustment), and addresses the questions of why growth has not accompanied adjustment, why debts continue to be serviced in the absence of growth, and why debt forgiveness has been so rare.

Using real net exports as a gauge, Fieleke points out that the path of adjustment in the heavily indebted countries has been both suboptimal and halting. Across countries little progress in aggregate adjustment was discernible by 1987 beyond the progress attained in the first year or two following the onset of the debt crisis. This front-end loading of the aggregate adjustment suggests that, in the early stages, resources were not given enough time to shift without becoming unemployed, and that, in later years, aggregate adjustment may virtually have stalled.

Examining the anatomy of the adjustment, Fieleke reports that between 1982 and 1987 absorption decreased in 8 of the 15 countries, with the median change for all 15 amounting to -2.2 percent of 1982 GNP. The range of experience is striking, as Nigeria suffered a reduction in absorption amounting to 19 percent of 1982 GNP, while Brazil enjoyed a 21 percent increase.

The burden of restraining absorption has generally fallen primarily on gross domestic investment, so that GNP growth may be slow to recover. Nonetheless, Fieleke observes that reductions in investment may have been warranted, since before the crisis investment had become excessive. Thus, analyses of the debt problem may have placed too much emphasis on raising the supply of investable funds to the heavily indebted countries and not enough emphasis on raising the productivity of investment.

The countries with the greater GNP growth have not been more successful in enlarging their real net exports. By way of explanation, Fieleke speculates that the nations with the higher growth rates may have attained those rates precisely because they were under less pressure to adjust, perhaps benefiting from more favorable terms of trade than other debtors or from more favorable appraisals by foreign lenders. Also, the data do not support the view that a sharp recession early in the adjustment process enhances adjustment over the longer run.

Another question examined is whether the countries experiencing the greater deteriorations in their terms of trade have also recorded the greater deteriorations in the value of their net exports, as a percentage of nominal GNP. Fieleke finds a significant correlation.

Did the adjustments that were made between 1982 and 1987 improve the creditworthiness of the heavily indebted countries? Fieleke reports that commonly consulted indicators of creditworthiness present a mixed picture. Analysts with confidence in market valuations will consult first the discounts in the secondary market for the debt of the heavily indebted countries. On a weighted average basis, this discount had widened from 30 percent at the beginning of 1986 to more than 50 percent in the first quarter of 1988. It is somewhat disquieting that creditworthiness failed to show a clear improvement in spite of the presumably favorable influence of "reasonable growth" in the industrial countries.

Fieleke points out that, in principle, adjustment in the heavily indebted countries need not be inimical to their growth. Through 1987, however, adjustment with growth had failed to materialize. By way of explanation, Fieleke suggests that some past investment may have been ill-conceived, yielding little or no return; that even some well-conceived investments were rendered uneconomic by unforeseeable adverse shifts in the terms of trade and in real interest rates; that because of the rapid contraction in new lending, insufficient time was allowed for an efficient shifting of resources in the manner called for by long-term adjustment; that extreme risk aversion has come to characterize the attitude of potential lenders, who, once burned, are now twice shy; that aside from such risk aversion, the debt overhang itself discourages new foreign lending, because new loans may be lumped in with old unproductive

ones for repayment purposes; and that governments of heavily indebted countries have often discouraged investment and growth through government dissaving, overvaluation of their currencies, and uncertainty-generating policy shifts.

Even though the heavily indebted countries were unable by end-1987 to resume growth in per capita GDP, they generally continued to pay interest on their indebtedness. Fieleke presents a preliminary regression analysis to help explain the volume of these interest payments and finds, among other things, that higher exports seem to contribute to higher interest payments. Noting that only a few of the heavily indebted countries had by 1987 approached a state of confrontational default, he discusses the costs of such default for a country and concludes that they have been a significant deterrent.

In the proper circumstances and the proper dosage, debt forgiveness can make both borrowers and lenders better off. Fieleke argues that the rarity of forgiveness is attributable to the difficulty of identifying those circumstances and dosages. For example, to predict the debtor country's response to forgiveness—to ensure that forgiveness enhances rather than diminishes adjustment effort—one must estimate the country's marginal efficiency of investment and its intertemporal utility function, as well as the minimum level of absorption that it will accept.

In his discussion of Fieleke's paper, J. David Richardson emphasizes the impact on the developing debtor countries of capital losses suffered at the beginning of the 1980s and of net outward financial transfers from 1982 to 1987. Real interest rates in 1981–82 turned out much higher than had been expected, undermining the profitability of investments that had been committed earlier and inflicting substantial capital losses on the debtor countries. These losses, combined with the sizable net outward financial transfers from these countries, help to explain why their living standards declined and their trade balances improved so dramatically. Rising protectionism in creditor countries helps to explain why the trade-balance improvement was concentrated in import compression rather than export expansion.

Richardson expresses concern that the declines in investment in the heavily indebted developing countries will lead to a cycle of impoverishment, in which "aggregate poverty leads to underinvestment which leads to the perpetuation of aggregate poverty, and so on." Finally, he encourages an extension, over more years and countries, of the regression analysis undertaken by Fieleke to explain interest payments by the developing countries.

The failure to achieve adjustment with growth is attributed by Ariel Buirá primarily to the external environment faced by the debtor countries. Although economic growth in the industrial countries has been satisfactory, the debtor countries have been burdened by worsened terms of trade, by increased protectionism in the industrial countries, by

high real interest rates, and by net outward financial transfers. If government deficits in the indebted countries could be financed by capital inflows from abroad, then exchange-rate depreciation, inflation, and crowding out of private investment in these countries would be reduced, laying a basis for adjustment with growth. Buira notes that investment in the debtor countries is further discouraged by a climate of uncertainty over debtor government policies and over external economic conditions, including the availability of foreign financing.

Referring to Fieleke's observation that aggregate adjustment in the heavily indebted countries may have stalled, Buira offers the explanation that contraction of demand has a limit, at least politically. In the case of Mexico, he asserts that despite enormous adjustment efforts the nation faces low investment levels, low growth, and rising unemployment unless debt service can be reduced, and he warns that such economic problems may have unfortunate consequences, both political and economic, for the wider community of nations.

East Asian Developing Countries

Unlike many other developing countries, those in East Asia have generally escaped severe debt-repayment problems. On the contrary, some have earned such sizable trade and current-account surpluses as to provoke criticism. Moreover, although their record is not unblemished, the East Asian developing countries have generally enjoyed rapid GNP growth, rising per capita incomes, and low inflation. Jeffrey D. Sachs and Mark W. Sundberg inquire into the reasons for this superior economic performance and then examine alternative policies that some of the countries might pursue in order to reduce their trade surpluses.

It is difficult to generalize about the reasons for the success of the East Asian developing economies, as the countries differ markedly in social and economic characteristics and in the degree of government intervention. Nonetheless, Sachs and Sundberg discern six favorable factors that are fairly common to the countries in the region. First and foremost is a high rate of saving, which finances a high rate of domestic investment, not only in physical but in human capital. Second, most of the governments have avoided chronically large budget deficits and have run current-account budget surpluses, thus contributing to high national saving, low inflation, and high immunity to debt crises. A third and key factor is outward-oriented trade policy that provides incentives to export production at least as favorable as the incentives given to import-competing sectors. Accordingly, all four of the Asian newly industrializing countries—Hong Kong, Singapore, Korea, and Taiwan—have very large exports, including sizable manufactured exports, in relation to GNP.

Fourth, the East Asian countries adjusted quickly to the adverse external shocks of 1979–82 (the soaring world interest rates, falling commodity prices, and industrial country recessions), especially with exchange-rate policies that avoided currency overvaluation. Fifth, the distribution of personal income is more nearly equal in the East Asian countries than in other developing countries with comparable average per capita incomes. The lower degree of inequality probably fosters political stability and reduces demands for excessive government spending. Finally, the East Asian developing countries have had, in Japan, a close-at-hand model whose successful strategies they could emulate.

Sachs and Sundberg do not accept the argument that East Asia's success is due to *laissez-faire*, for they find government's economic involvement to be at least as extensive in East Asia as in Latin America. Nor do the authors credit East Asia's cultural background or its largely authoritarian political structure.

Because Korea and Taiwan have had easily the largest current-account surpluses among the East Asian developing countries, Sachs and Sundberg offer a more detailed analysis for those two nations. Far from suffering debt-repayment problems, Korea is becoming a net creditor, with a sizable current-account surplus. In addition, the nation enjoys rapid economic growth with virtually no inflation. By way of explanation, the authors cite the Korean government's 1979–82 austerity policies, which staved off a debt crisis, the favorable returns to investments of the late 1970s in heavy industry, and "plain old good luck."

Korea's good luck took three forms. First was the rapid growth of U.S. imports following the U.S. expansionary fiscal policy of 1983–84. Second was the combination in the mid-1980s of declining world interest rates, declining oil prices, and a declining real value of the Korean won in terms of the Japanese yen. Third was the 1987–88 boom in the Japanese economy, which—like the earlier boom in the U.S. economy and the decline in the won—served to raise the demand for Korean exports. Consequently, Korea's terms of trade improved at the same time that its debt-service costs diminished.

The net result of these favorable influences was a sharp rise in Korea's income and rate of saving and, thus, in its current-account surplus. Sachs and Sundberg argue that Korea's trade policies are not responsible for the surplus. Indeed, trade policy was being rapidly liberalized at the very time that the large current-account surpluses were developing.

With Taiwan, as with Korea, the authors attribute the country's sizable trade surpluses neither to trade policies nor to exchange-rate manipulation, but to other forces determining the flow of domestic investment relative to national saving. During 1980–85 investment spending contracted relative to GNP in Taiwan, while the saving rate remained very high and, after 1985, rose still higher. The contraction in

the domestic investment rate probably stemmed from the curtailment of government investment, from the political uncertainty generated by U.S. recognition of the People's Republic of China and severance of relations with Taiwan, from the rise in protectionist barriers to Taiwanese exports in developed countries (leading Taiwanese firms to shift investment abroad to preserve market access), and from domestic financial intermediation that failed adequately to channel the flow of national saving into private domestic investment.

Turning to macroeconomic policy for the future, Sachs and Sundberg argue that even substantial policy changes in Korea and Taiwan would have very small effects on the rest of the world, including the United States, so that macroeconomic policy in the two nations should be geared to their own domestic needs rather than to accommodating the rest of the world. The authors speculate that for Taiwan the marginal social return might be greater on domestic investment than on foreign investment, in which case the nation would benefit from an increase in the rate of domestic investment and a commensurate decrease in the current-account surplus. For Korea, however, they believe that current-account surpluses that eliminate the nation's net foreign indebtedness may be desirable, "in view of the turmoil of world financial markets." Whether or not the two nations reduce their current-account surpluses, both should generate more of their surpluses in trade with Japan and less with the United States. This shift requires little in the way of policy changes, but can emerge from market forces such as the rapid growth in Japanese domestic demand and the depreciation of the won against the yen.

In his comment, Fai-nan Perng reports that Taiwan's large current-account surpluses have generated excess liquidity and inflationary pressure within the country's economy. However, steps have been taken to reduce the surplus, which dropped by more than 50 percent between the first half of 1987 and the first half of 1988. Among the steps taken, the N.T. dollar has been allowed to appreciate by 40 percent against the U.S. dollar since September 20, 1985. Import tariffs have been lowered, and the number of import items on the prohibited and controlled list has been reduced to only 1.5 percent of all import items. Of the projected 7.2 percent real GNP growth for 1988, 12.6 percentage points should come from domestic demand and -5.4 percentage points from net exports; and government spending is projected to increase by 17 percent in fiscal year 1989, stimulating domestic demand. Perng accepts the widespread view that further reduction in the U.S. government budget deficit is preferable to U.S. protectionist measures as a means of shrinking the U.S. external deficit.

Richard C. Marston infers from exchange-rate data presented by Sachs and Sundberg that the Korean won and the Taiwanese dollar had risen enough by October 1988 to regain most if not all of their 1980-82

value in real terms relative to the U.S. dollar. This development should ease tensions between the United States and these two countries over the U.S. trade deficits with them.

Marston discerns that a "new triangular trade" has emerged: the Asian newly industrializing economies export consumer goods to the United States and import machinery and inputs from Japan, which imports securities from the United States. Such penetration of the U.S. market by the Asian countries would not have been possible if they had not rapidly changed the composition of their production for exports, shifting from traditional exports like textiles and footwear to technically more sophisticated products like electrical machinery.

Although Marston agrees with Sachs and Sundberg that lowering the trade surpluses of the newly industrializing countries would have little impact on the U.S. trade deficit, he observes that a reduction in the U.S. trade deficit could powerfully affect *those* countries. Their export growth between 1980 and 1987 was heavily oriented toward the U.S. market, and a slackening in U.S. demand for their exports would confront them with the need to find fast-growing markets in other industrial countries. The latter, Marston argues, should be receptive.

Capital Mobility and Exchange-Rate Volatility

With Jeffrey A. Frankel's paper, the focus shifts away from regional imbalances to the role of capital movements in payments imbalances, or more precisely, to the role of capital movements in exchange-rate volatility. This paper examines first the various approaches to evaluating the degree of capital mobility and then the relationship between capital mobility and exchange-rate volatility.

Frankel presents four definitions, or criteria, of perfect capital mobility that are widely used. In ascending order of rigor, they are: (1) closed interest parity: capital flows equalize interest rates across countries when contracted in a common currency; (2) uncovered interest parity: capital flows equalize expected rates of return on countries' bonds, in spite of exposure to exchange risk; (3) real interest parity: capital flows equalize real interest rates across countries; (4) Feldstein-Horioka definition: exogenous changes in national saving can be financed by borrowing from abroad and thus need not crowd out investment in the borrowing country, except to the extent that the country looms large in world financial markets.

The Feldstein-Horioka criterion requires not only real interest parity but also that all determinants of a country's rate of investment other than its real interest rate be uncorrelated with its rate of national saving. By this criterion, econometric tests have generally shown capital to be immobile internationally. The easy explanation for this finding, accord-

ing to Frankel, is that real interest parity has not held. However, another possibility he raises is that past divergences between national saving and investment may have been too small to provoke sizable international capital movements. He finds that the divergence in the United States (generated by the federal budget deficit) has recently been so sizable as to elicit large capital flows into the country, contrary to the finding of immobility in earlier econometric studies. Frankel notes that recent financial liberalization and innovation in various countries may have made some contribution to this greater degree of capital mobility.

Taking up next the real interest parity definition of capital mobility, Frankel observes that it entails not only uncovered-interest parity but also *ex ante* relative purchasing power parity (an expectation of no change in the real exchange rate). Because goods markets are not perfectly integrated, real exchange-rate change may well be expected, in which case the real interest parity condition is not satisfied, even if uncovered-interest parity prevails. Thus, it is not necessary to assume that uncovered-interest parity fails to hold—in particular, it is not necessary to assume the existence of a risk premium—in order to demonstrate violation of the real interest parity condition. But while the real exchange rate may be expected to change in the short run, Frankel asserts that less reason exists to expect it to change in the very long run. Using 119 years of data on the real exchange rate between the United States and the United Kingdom, he finds a statistically significant tendency for the rate to regress to purchasing power parity.

In Frankel's judgment, closed-interest parity is the appropriate test of capital mobility, in the sense of the degree of integration of financial markets across national borders. The covered-interest differential reflects such obstacles as capital controls, discriminatory tax laws, the risks of default and of future capital controls, and transaction and information costs. Frankel's analyses have confirmed this differential to be very small, at least for short-term capital movements, for 11 industrial countries whose capital markets he characterizes as essentially open. Using currency swap-rate data to measure covered-interest differentials for the longer term for some of these countries, he concludes that those differentials, too, are very small.

Frankel asserts that high capital mobility helps to explain the high variability of exchange rates since 1973, variability that some economists consider excessive. One school of economists argues that exchange rates are too volatile because capital moves too readily in response to minor disturbances, while a second school argues that the volatility stems from the failure of disturbances to evoke enough stabilizing capital flows. To reconcile the two, Frankel points out that the first school is concerned with destabilizing capital movements, such as those undertaken by traders with bandwagon expectations. If such movements predominate,

or if stabilizing speculation is lacking, exchange-rate volatility will be excessive.

From surveys of the forecasts of foreign-exchange market participants, Frankel concludes that those who forecast at shorter horizons tend to extrapolate recent trends, or display destabilizing expectations, while those who forecast at relatively longer horizons tend to have regressive, or stabilizing, expectations. He argues that the destabilizing short-term traders may play the larger role in the foreign-exchange market because their superiors (typically, bank executives) can assess the profitability of their trading activities over a much shorter time period than is required for longer-term, stabilizing investments. The theory of rational speculative bubbles shows how such destabilizing speculators can make money.

If destabilizing speculators are indeed short-term traders, then a small percentage tax on all foreign-exchange transactions, such as proposed by James Tobin, would discourage the volume of such short-term trading without significantly deterring longer-term stabilizing transactions. The net result could be to reduce exchange-rate volatility. However, unless all countries imposed the tax, foreign-exchange transactions would gravitate toward jurisdictions without the tax so that high volatility could persist.

In commenting on Frankel's paper, Michael Dooley stresses that real exchange rates may change predictably over substantial time periods. It is important to know the reasons for such changes. Proposals for monetary reform assume that the changes reflect destabilizing speculation or a lack of stabilizing speculation. If, on the contrary, the changes stem from changing fundamentals, they may be part of an efficient adjustment mechanism.

Dooley finds that theory provides no strong presumption on whether the real exchange rate must change as current-account balances change. However, it is instructive to note that the real exchange rate will change when investors generally seek to reduce their claims subject to taxation by a government facing insolvency, as in some heavily indebted developing countries. Residents of such countries export tradable goods in exchange for claims held in other countries, thereby raising the prices of tradable goods relative to nontradable goods within the exporting country.

The Adjustment Mechanism: Theory and Problems

Large current-account imbalances, persistent swings in real exchange rates, and high volatility of exchange rates from one month to the next are inclining policymakers toward more active management of exchange rates, according to Rudiger Dornbusch. To launch his analysis

of the adjustment mechanism, Dornbusch classifies the sources of current-account imbalance into eight categories: development deficits, which arise in countries with low saving relative to investment opportunities; deficits driven by government dissaving, as in the United States in the 1980s; deficits induced by adverse terms of trade shocks; deficits resulting from new investment opportunities, such as an oil discovery that attracts foreign capital; deficits resulting from enhanced financial intermediation, providing new borrowing opportunities; deficits engendered by structural change in the form of new foreign competition in world markets; demographic deficits resulting from aging of the population and concomitant dissaving; deficits produced by misaligned exchange rates.

In the "new classical," or "equilibrium," approach, external imbalances and exchange-rate variations are generally deemed to require no policy response, for they are seen as the outcome of optimizing decisions made under conditions of full wage and price flexibility. Consumers choose the optimum path of consumption based on current information about their future endowments, and governments select the optimum tax and spending path and structure. Trade imbalances and exchange-rate changes are thus considered to be optimizing responses to shocks in technology, endowments, or policies, and are interpreted as equilibrium phenomena, unless externalities are present. In this framework, Dornbusch observes, government generally has no role to play in regard to real exchange rates or external imbalances.

Dornbusch believes that policy activists have not met the challenge to government involvement posed by the new classical approach. He agrees with the new classical economists that government should not intervene in some cases. For example, governments should tolerate external imbalances arising from demographic change and also real exchange-rate changes associated with differentials in productivity growth between nations.

Dornbusch next considers three questions related to the adjustment mechanism: whether exchange-rate changes contribute to adjustment, whether speculation in exchange markets is stabilizing, and whether adjustment and financing of external imbalances will continue smoothly. On the first question, his answer is affirmative; nominal exchange-rate changes produce real exchange-rate changes, which alter trade volumes sufficiently to affect nominal trade balances. He adds that real exchange-rate changes entail price changes that differ widely across products and countries, sometimes altering the industrial organization landscape.

On the second question, his answer is negative. Speculation fails to keep the exchange rate on a path that minimizes excess volatility and resource misallocation. Three classes of evidence support this conclusion. The first is the poor performance of model-based estimates of the

determinants of exchange rates. The second is movement of actual exchange rates well beyond the movements that econometric models predict to occur in response to monetary and fiscal policy changes. Finally, forward rates are poor forecasters of future spot exchange rates, and the forecast errors are not even random. Dornbusch concludes that if asset markets do not work efficiently, governments should intervene, contrary to the prescription of the new classical approach. The intervention might take the form of a moderate, worldwide tax on foreign-exchange transactions, or indeed on all financial-asset transactions, with the goal of discouraging short-term, destabilizing speculation. Dornbusch recognizes, however, that the tax could easily be avoided if only a few countries levied it.

With respect to the third question—whether adjustment and financing of external imbalances will continue smoothly—Dornbusch focuses on the U.S. current-account deficit. The U.S. government must reduce its fiscal deficit in order to free resources for the expansion of net exports. To offset the effect of contractionary U.S. fiscal policy on world demand, monetary policy should foster lower worldwide real interest rates; government budget deficits are already so large in foreign industrial countries that fiscal expansion would be inappropriate. This policy mix would facilitate reduction of the U.S. current-account deficit and a timely depreciation of the dollar, obviating the need for an abrupt depreciation in the more distant future.

In his discussion of Dornbusch's paper, W. Max Corden concentrates on the question of whether current-account imbalances should be considered an adjustment problem, requiring a policy response. He contrasts three approaches to this question.

First is the traditional, still popular approach, in which policymakers do concern themselves with the current account because they have a view on what national saving should be, and saving in turn influences the current account. If private saving deviates from their perception of the optimum, policymakers strive to compensate by adjusting fiscal policy so as to attain the optimum level of national saving and the optimum current-account balance.

Second is the new classical approach, which is essentially the reverse of the traditional approach. The new classical view is that government fiscal policy may well be suboptimal, but that private saving behavior will compensate, so that optimal national saving is attained. In this case, neither the current account *nor* the budget deficit should be the object of policy.

The third approach, the one endorsed by Corden, falls between these two extremes. It asserts that the private sector does not fully compensate for nonoptimal saving or dissaving within the public sector, so that the government budget balance, but not the current-account balance *per se*, is a fit concern for policymakers.

To Coordinate or Not to Coordinate?

As the first panelist to address this question, Richard N. Cooper defines macroeconomic coordination as a strong form of international economic cooperation. Such coordination can be directed at targets of economic policy, such as exchange rates, or at the instruments, such as interest rates. It can be rule-based, meaning that countries agree upon rules of behavior (such as the General Agreement on Tariffs and Trade) within a specific area, or it can be process-oriented, meaning that countries consult closely shortly before taking action.

In Cooper's view, macroeconomic coordination likely enhances world welfare. One reason is that large nations, acting independently, can influence their own terms of trade, and if they undertake to do so, will reduce world welfare below the optimum. Another reason is that nations require current information on the probable policies of other nations in order to formulate wise policy. Finally, coordination has the potential to improve macroeconomic stabilization, an international public good.

Coordination faces substantial obstacles, including disagreements among governments on objectives, on the outlook, and on how economies respond to policy measures. And if governments did agree, their agreement might be based on a seriously flawed model of the world economy. Thus, Cooper does not foresee a lot of coordinated action, although he believes gains are possible.

Cooper then takes up the matter of "credibly fixed exchange rates," as an extreme form of rule-based coordination. The cost to a participating nation is the loss of monetary (and exchange-rate) policy as a national instrument, and the gain is a reduction in the real exchange-rate uncertainty facing the productive sectors. The gain might exceed the cost for large and diversified regions such as Western Europe, within which adjustment can be facilitated by growing factor mobility and increased use of fiscal transfers, both of which reduce the need for exchange-rate change.

Another member of the panel, Jeffrey A. Frankel, sets forth three characteristics of fruitful coordination. To be substantive, coordination agreements must entail policy changes that countries would not necessarily make independently, but that are seen as beneficial if executed jointly. To be enforceable, coordination agreements must entail commitments to performance criteria that are closely enough related to policy instruments so that policymakers can be held accountable for deviations. Finally, if welfare is to be enhanced, the performance criteria must be closely enough linked to policymakers' ultimate goals (such as output and inflation levels) that fulfilling the criteria promotes attainment of the ultimate goals.

Frankel observes that the current G-7 system of indicators lacks some of these characteristics. All of the indicators are either too far removed from the available policy instruments or from the output and inflation goals of greatest concern. Moreover, the G-7 countries do not publish the targets adopted for their indicators, and the number of indicators and targets easily exceeds the number of policy instruments available to act upon them.

To remedy these failings, Frankel proposes that the G-7 should henceforth set for each member a single target variable: the rate of growth of nominal GNP (or even better, nominal demand). This proposal assumes that the motivation for coordination is to avoid an outcome that is either too contractionary or too inflationary. By committing to a specific growth rate for a nominal magnitude such as nominal GNP, the authorities can reduce inflationary expectations and thereby, in the long run, achieve a lower level of inflation for a given level of output. And nominal GNP is superior to the other nominal variables proposed as targets in that it is more closely linked to the output and inflation goals, and is also closely enough related to policy instruments that the authorities can be held at least loosely accountable for it.

Jacob A. Frenkel, another panelist, notes that coordination can be viewed as a mechanism for internalizing the externalities that arise from the influence of one country's economy on others. The motivation to engage in coordination is national self interest—recognition by a nation that it is in the same boat with other nations. Coordination should generate somewhat better policies, but is likely to enjoy success only in crises. Thus, it is important to keep the mechanism in place—to have ongoing meetings—in order to be prepared to deal with crises.

Coordination should not focus on monetary policy, Frenkel warns, lest that policy instrument become overburdened. The peer pressure imposed by the coordination process can be beneficial, and the major industrial countries should participate. When evaluating the benefits and costs of coordination to the participants, one should do so in a broad context, including more than purely economic considerations.

Panelist Helmut Schlesinger observes that the susceptibility of national economies to external influences has increased in recent years, as world trade has grown faster than world GNP and financial markets have become more integrated internationally. Thus, policymakers must take foreign developments into account, and should also consider the effects of their actions on other nations.

In principle, coordination can reduce policy-generated disruptions of the world economy. In fact, successful coordination is difficult, depending on the fulfillment of several conditions. Policymakers must understand the economic transmission mechanism. Nations must adhere to the agreed rules of behavior. And agreed policy objectives must be attainable with the policy instruments available. In spite of these

obstacles, coordination must be pursued to avoid further disintegration in the form of nationalistic trade barriers, capital controls, and the like.

However, Schlesinger warns against overburdening the coordination process with unrealistic goals. Coordination should be confined to the broad adjustment of policies, leaving the detailed implementation to individual nations, and should be pursued when pending or actual disequilibria clearly need to be rectified, not otherwise. Fiscal as well as monetary policy must be subjected to the coordination process. Mechanistic rules should be avoided, and policy coordination should be supplemented by free market processes, which contribute to coordination through price adjustments.

Conclusion

The autumn 1988 conference sponsored by the Boston Fed grappled with some major international economic problems and policy issues: What initiatives, if any, should be taken to reduce the large and persistent current-account imbalances of some industrialized and newly industrialized countries? What progress is being made in restoring the creditworthiness of the heavily indebted developing countries? Are international capital movements insufficiently stabilizing, or perhaps even destabilizing? Does the international adjustment process work fairly well? Should macroeconomic policies be coordinated more closely across countries?

The question of coordination elicited the greatest agreement among those presenting papers, as a panel unanimously endorsed further efforts at coordination, elusive though the gains might be. Several authors also agreed that the U.S. government's budget deficit should be reduced as a means of decreasing the U.S. current-account deficit. To counteract the resulting contractionary effect on world demand, these authors proposed an easing of monetary policy in some other major countries. Finally, considerable support emerged for the view that foreign-exchange rate movements betray too little stabilizing speculation or too much destabilizing speculation. This view led some to advocate a small tax on all foreign-exchange transactions in order to discourage short-term destabilizing capital flows, although the problems of enforcing such a tax on a worldwide basis were duly noted.

International Payments Imbalances in Japan, Germany, and the United States

*William H. Branson and Grazia Marchese**

The persistent current account imbalances of the United States, Japan, and Germany have been a source of surprise, concern, and puzzlement to international policymakers since the turnaround of the dollar in 1985, and even before that. Prescriptions to reduce these imbalances have become the central point of international policy analyses, as in the International Monetary Fund's *World Economic Outlook* (1988) and the Organisation for Economic Cooperation and Development's *OECD Economic Outlook* (1988). In this paper we review the existing projections of these imbalances and present a dynamic model that can be used to analyze the sources of the imbalances and the policies to reduce them. We use the model to discuss scenarios that the international organizations have developed, and we present alternative scenarios that may be preferable.

In the opening section we review the existing projections. First, we show the projected 1989 imbalances for the three countries in the context of the world distribution of imbalances. Here, the question of European integration comes forward immediately. The German current account surplus for 1989 is projected at \$40–45 billion, while the surplus of OECD Europe is less than \$10 billion and that of the European Community, about \$15 billion. Thus, concern about the German surplus would be greatly reduced if Germany were considered to be part of an integrated Europe. Next we review the IMF and OECD reference scenarios based on current and announced future policy for the three countries. These show persistent, large imbalances out to 1992, and

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support the organizations' proposals for policy changes in the direction of an expansion of domestic demand in Japan and Germany, and contraction in the United States.

A small theoretical model is developed in the following section that is used to illustrate the sources of the current imbalances in fiscal shifts in the early 1980s and to analyze the effects of proposed shifts in policy, interpreted as fiscal adjustments. The model is a dynamic version of the "fundamentals" model in Branson (1988), which is, in turn, a two-country version of the model in Branson (1985). We interpret the position of the three countries in 1988 as a point along a dynamic adjustment path that began in the early 1980s and includes the turnaround in 1985. We then show the effects of the policy shifts from that point. This differs from earlier analyses such as that in Krugman (1987) or Branson (1988), which at least implicitly begin from points of equilibrium. The basic result is that the policy shifts would be accompanied by further real depreciation of the dollar against the DM and yen except for one case. That is the case of a large, anticipated fiscal shift where the market causes the dollar to depreciate so much in anticipation of the shift that it appreciates when the shift finally occurs. In this case, the current account imbalances would have to be anticipated to reverse under existing policies, including the anticipated fiscal shift. None of the projections includes this case, so it seems safe to rule it out.

Our versions of three alternative scenarios considered by the IMF (1988) and the OECD (1988) are then presented and discussed. These are (1) a market-driven depreciation of the dollar, (2) fiscal contraction in the United States alone, and (3) fiscal contraction in the United States and expansion in Japan and Germany. These alternatives are produced using a system operating at the Bank of Italy that compares alternative projections of the international institutions and can produce additional projections using the multipliers from the different organizations' models. The projections of the alternative scenarios are consistent with the theoretical model, with further dollar depreciation in the fiscal policy scenarios. Scenario 2, with fiscal contraction in the United States alone, produces a slowdown in growth in all areas, more marked in the OECD model. The largest projected reduction in the U.S. current account deficit, \$86 billion by 1992, comes in Scenario 1 in the IMF model.

The balanced fiscal policy scenario, with the United States contracting and the others expanding, would leave world saving and therefore average world real interest rates approximately unchanged. To reduce real interest rates and benefit the developing country debtors, the aggregate fiscal deficit would have to be reduced, as in Scenario 2. But that scenario maximizes the chance of recession. So we have developed alternative scenarios with fiscal contraction in the United States and monetary expansion in Japan and Germany. These scenarios are discussed in the final section, and they resemble the actual policy stance

since late 1986. They produce nearly as much adjustment in the U.S. current account as the balanced fiscal scenario, with more projected growth outside the United States and lower real interest rates. Thus, we conclude that these scenarios may be preferable to the others.

Current Account Projections

In recent years a number of international organizations, including the IMF and the OECD, have formulated alternative medium-term scenarios to aid in the analysis of the problems of adjustment of external imbalances of various groups of countries. The alternatives are generally built upon a baseline scenario that is a run of a simulation model, sometimes econometric, assuming existing policy, somehow defined. The alternatives then change the policy assumptions and rerun the model, taking into account to some extent the possibility that the policy changes will themselves alter the behavioral equations of the model.

The projections discussed in this section are based on the *reference scenarios* (or *baselines*) derived from the IMF Multimod and the OECD Interlink models, assuming (a) no change in current or announced policies, (b) a predicted path for key exogenous variables such as oil and other commodity prices, and (c) approximately unchanged real exchange rates over the simulation period. (The details of the assumptions are given in the notes to table 3.) The time horizon of the simulations is five years, beginning in 1988. The IMF scenario is reported in IMF (1988); the OECD scenario is in a background document for OECD (1988). Here we use the reference scenarios to discuss the distribution of current account imbalances internationally, and the projected evolution of the imbalances of the United States, Japan, and Germany.

The projected world current account balances for 1989 are shown in table 1. The first column gives the OECD projections in billions of dollars, and the second in percent of GNP, where available. The third column compares the IMF projections as a percent of GNP. The table is based on the OECD projections because they include the dollar amounts and more countries. The OECD current account deficit in 1989 is projected to be \$64 billion, with deficits of \$144 billion in North America and \$9 billion in the Antipodes, and surpluses of \$80 billion in Japan and \$9 billion in Europe. The Asian newly industrializing countries (NICs) show a surplus of \$24 billion (a range of \$22–32 billion in the IMF projections), and the rest of the world (ROW) a \$26 billion deficit.

The world deficit, or current account discrepancy, in the OECD projections of table 1 is \$66 billion. The world deficit in the IMF projections is \$60 billion. The IMF breaks this down into a trade *surplus* of \$39 billion and deficits of \$84 billion on services and \$15 billion on transfers (IMF 1988, p. 143).

Table 1
World Current Accounts, 1989

Area or Country	OECD Projections		IMF Projections
	\$ billion	% GNP	% GNP
OECD	-64	-4	-.3 ^a
North America	-144	-2.6	
United States	-132	-2.6	-2.6
Canada	-12	-2.2	-2.3
Japan	80	2.6	2.5
OECD Europe	9	.2	
Australia-New Zealand	-9	-3.0	
Asian NICs	24 (22-32) ^b		6-9 ^b
Korea	7		
Taiwan	15		
Hong Kong	2		
Singapore	0		
Rest of World (ROW)	-26		
(OPEC)	-4		
World Total	-66		

^a IMF total for industrial countries, which excludes OECD countries Greece, Portugal, and Turkey.

^b IMF estimated range for Asian NICs.

Source: OECD (1988), IMF (1988).

Aside from the world deficit, the main impression we get from table 1 is that North America (mainly, of course, the United States) and Japan have large imbalances, both in levels and as fractions of GNP, and that the NICs and the ROW also have marked imbalances. These are smaller in levels, but larger in terms of GNP, and about the same size. OECD Europe and Australia-New Zealand have imbalances that are small in levels, but large as a fraction of GNP in the latter area. Among the industrial countries, the impression is one of large imbalances in the United States, Japan, and the NICs, with much smaller ones in Europe and the Antipodes. Any problem concerning Germany disappears into the OECD Europe aggregate in table 1.

The distribution of imbalances within Europe is shown in table 2, which follows the same format as table 1. In table 2 we see the amplitude of imbalances across Europe. The biggest imbalance in levels is Germany's, while Norway's is the biggest in terms of GNP.

The data of table 2 can be looked at in several ways. Clearly there is a large offset to the \$42 billion German surplus. The surplus of the European Monetary System (EMS) countries is \$39 billion, so the rest of the EMS is roughly in balance. Thus the offset is a deficit in the non-EMS countries. The European Economic Community (EEC) has a surplus of \$16 billion, so the EEC non-EMS members have a collective deficit of \$23 billion. A non-institutional way to look at the data is suggested by the

Table 2
 OECD Europe Current Accounts, 1989

Area or Country	OECD Projections		IMF Projections % GNP
	\$ billion	% GNP	
OECD Europe	9.0	.2	
Surplus Countries	55		
Belgium-Luxembourg ^{ab}	2.0	1.2	
Germany ^{ab}	42.0	3.3	3.1
Ireland ^{ab}	.5	1.2	
Netherlands ^{ab}	4.5	1.9	1.8
Switzerland	6.25	3.1	3.2
Deficit Countries	45		
Austria	-.5	-4	
Denmark ^{ab}	-2.5	-2.2	
Finland	-3.25	-2.9	
France ^{ab}	-6.0	-.6	-3
Greece	-2.25	-4.1	
Iceland			
Italy ^{ab}	-1.0	-.1	-2
Norway	-5.75	-5.8	
Portugal ^a	-1.0	-2.2	
Spain ^a	-5.25	-1.4	
Sweden	-2.75	-1.4	
Turkey	-1.0	-1.3	
United Kingdom ^a	-14.0	-1.6	-1.1
EEC	16	.3	
EMS	39.5		

^a EEC Member

^b EMS Member

Source: OECD (1988), IMF (1988). Differences in degree of rounding are in the source tables.

separation of surplus and deficit countries in table 2. The surplus countries are a core group around Germany. Viewed from this aspect, all of the periphery except heroic Ireland is in deficit.

The extent to which we should consider the German, or the core, surplus as an independent imbalance, rather than submerge it into a European aggregate, depends on how integrated we think the aggregate is. We do not break out states or regions in the United States for purposes of this analysis because we consider that country to be definitively integrated. Suppose we considered the EMS to be integrated from the point of view of financing external imbalances. Then we would see the core EMS surplus as automatically financing the EMS deficits, and the external surplus shrinks to \$39 billion. If we accept the Single European Act as expressing a definitive decision on integrating the EEC from this point of view, then the EMS surplus is automatically available to finance EEC imbalances, and the external imbalance shrinks to \$16 billion. If we think that the non-EEC members will take the necessary

Table 3
IMF Reference Scenario (percentage growth rates, except where noted)

	1987	1988	1989	1990	1991	1992
United States						
Real GNP	2.9	2.5	2.9	2.8	2.8	2.8
GNP Deflator	3.0	3.1	3.5	3.5	3.5	3.5
Current Balance						
\$ Billions	-160.7	-138.5	-128.4	-113.0	-120.0	-128.0
Percent of GNP	-3.6	-2.9	-2.5	-2.1	-2.1	-2.1
Japan						
Real GNP	4.2	3.7	3.7	3.6	3.6	3.6
GNP Deflator	-2	1.6	1.8	1.5	1.5	1.5
Current Balance						
\$ Billions	87.0	77.1	74.6	65.0	70.0	75.0
Percent of GNP	3.6	2.7	2.4	2.0	2.0	2.0
Real Exch. Rate (Yen/\$)	179.16	160.23	160.23	160.23	160.23	160.23
Germany						
Real GNP	1.7	1.7	1.7	2.3	2.3	2.3
GNP Deflator	2.1	2.0	2.0	2.3	2.3	2.3
Current Balance						
\$ Billions	44.3	42.0	41.5	42.5	45.0	47.6
Percent of GNP	3.9	3.3	3.1	3.0	3.0	3.0
Real Exch. Rate (DM/\$)	2.00	1.86	1.86	1.86	1.86	1.86

Source: Authors' calculations on IMF data.

Table 4
OECD Reference Scenario (percentage growth rates, except where noted)

	1987	1988	1989	1990	1991	1992
United States						
Real GNP	2.9	2.4	1.7	2.1	2.2	2.2
Private Consumption Deflator	4.0	3.9	3.8	3.9	4.0	4.2
Current Balance						
\$ Billions	-160.7	-134.0	-105.0	-108.0	-113.0	-116.0
Percent of GNP	-3.6	-2.8	-2.1	-2.0	-2.0	-1.9
Japan						
Real GNP	4.2	3.4	3.0	3.2	3.2	3.3
Private Consumption Deflator	-.1	1.6	1.9	1.8	1.9	1.9
Current Balance						
\$ Billions	87.0	81.0	79.0	83.0	88.0	93.0
Percent of GNP	3.6	3.0	2.8	2.7	2.7	2.6
Real Exch. Rate (Yen/\$)	174.05	170.10	173.28	173.28	173.28	173.28
Germany						
Real GNP	1.7	1.4	1.2	2.0	2.0	2.0
Private Consumption Deflator	.5	1.7	1.6	1.6	1.5	1.4
Current Balance						
\$ Billions	44.3	41.0	32.0	31.0	32.0	34.0
Percent of GNP	3.9	3.3	2.5	2.3	2.2	2.2
Real Exch. Rate (DM/\$)	2.05	1.94	1.98	1.98	1.98	1.98

Source: Authors' calculations on OECD data.

Key Assumptions for the Reference Scenarios (Tables 3 and 4)

IMF	OECD
<i>Fiscal Policy</i>	<i>Fiscal Policy</i>
United States: The fiscal position is projected on the basis of currently legislated expenditures and the existing tax system; no allowance is made for possible fiscal measures additional to those that have already been enacted by the beginning of 1988. As a result, the general government deficit as a percent of GNP is projected to decline from 2.2 percent in 1988 to 0.9 in 1992.	United States: Fiscal policy is based on the October 1987 CBO's budgetary projections, adjusted to take account of the legislation passed on 21st December 1987 and the OECD Secretariat's estimates of slower growth and higher interest rates. In particular, the federal deficit as a percent of GNP is projected to decline from 2.4 percent in 1988 to 1.6 percent in 1992.
Japan: The general government financial balance as a percent of GNP is assumed to be roughly constant over the projection period (-0.8 percent in 1988, -0.7 thereafter).	Japan: Fiscal consolidation is assumed over the medium term with the general government balance moving from -1.1 percent of GNP in 1988 to a small surplus by the end of the projection period.
Germany: The general government financial balance as a percent of GNP is projected to reach -2.7 percent in 1988 (as against -1.7 in 1987) and to decline somewhat in 1989; it is reach set at -2.6 percent by the end of the projection period.	Germany: The fiscal package due for 1990 is assumed to be implemented as announced with income taxes cut by DM 19 billion; general government deficit as a percent of GNP is projected to increase from 2.3 percent in 1988 to 3 percent in 1992.
<i>Monetary policy</i> is assumed to be aimed at preventing any acceleration of underlying inflation.	<i>Monetary policy</i> , in general, is characterized by money growth somewhat in excess of the growth of nominal GNP; there is a slow movement in nominal short-term and long-term interest rates; real long-term interest rates also gradually decrease over the medium term.
<i>Exchange rates</i> are assumed to be constant in real effective terms at their January 1988 levels.	<i>Exchange rates</i> are stable in nominal terms from November 1987 to the end of 1989 and broadly stable in real terms thereafter.

steps to be within the single European market, we come back to the \$9 billion surplus of OECD Europe. Thus how we view the core EMS surplus in a world analysis depends on the degree of integration of the core with concentric groups of increasing economic distance, and this degree of integration itself is changing rapidly. So we are left with a range of uncertainty between inclusion of two Europes into the analysis, one with a surplus of around \$55 billion and the other with a deficit of \$45 billion, or one Europe with a surplus of \$9 billion.

This uncertainty will not be resolved in this paper, partly because it is the topic of a separate research program, but more importantly because the available simulation models have not resolved it. The models allow us to analyze adjustment among the United States, Japan, and Germany, but not to expand or contract the European aggregate easily. So for the simulation results in the rest of the paper, we will stay with this aggregation, sometimes interpreting "Germany" as approximating "Europe."

The reference scenarios of the IMF and the OECD are summarized in tables 3 and 4. Each shows the paths of real GNP, the private consumption deflator as a measure of inflation, the current account balance, and the real bilateral exchange rate for the United States, Japan, and Germany. In both scenarios Japan grows faster than the United States, which in turn grows faster than Germany. The growth rates in the IMF scenario are higher than those in the OECD scenario for all three countries, by about one-half of a percentage point. The OECD has a higher inflation path for the United States, and lower inflation in Japan and Germany.

The most striking aspect of both the scenarios is the persistence of large external imbalances over the simulation horizon, based on current policy. The United States deficit and the surpluses of Japan and Germany shrink in both scenarios out to 1990, and then stabilize as a percent of GNP. The two scenarios have similar paths for the United States deficit, with the IMF at 2.1 percent of GNP in 1992, and the OECD at 1.9 percent. The IMF projects a smaller surplus than the OECD for Japan, 2.0 percent versus 2.6 percent in 1992, and a larger surplus for Germany, 3.0 percent versus 2.2 percent in 1992. The sum of the two surpluses in 1992 is about the same in the two projections, \$122.6 billion in the IMF scenario and \$127 billion in the OECD's. It is worth noting that in the IMF scenario the intra-European imbalances are larger by 1992 than in the OECD scenario, as evidenced by the larger German surplus.

In both scenarios, the real bilateral exchange rates remain approximately constant after 1988, by assumption. The persistence of the large current account imbalances then raises the question whether the financial markets are going to be willing to continue to finance these imbalances at constant real exchange rates. The answer is, most probably no. The dollar would have to depreciate further against the DM (or ECU) and especially the yen in the absence of policy action. The secretariats use the apparent unsustainability of the reference scenarios to argue for policy change in the direction of slower growth of domestic demand in the United States and faster growth in Japan and Europe (IMF 1988, pp. 24–26 and OECD 1988, pp. xi–xiv). Both concentrate on fiscal contraction in the United States. The OECD is unclear on the choice of demand policy instrument in Japan and Germany, as is the

IMF in the case of Germany. The IMF favors monetary expansion in Japan. Both secretariats appeal to structural adjustment in Europe and Japan as policies to reduce the external imbalances.

The IMF and the OECD do not discuss explicitly the likely effect of the policy changes on real exchange rates; this is understandable. However, both treat the policy changes as substitutes for further exchange rate adjustment. It is argued by Krugman (1987) and Branson (1988), among others, that the policy changes would work to reduce the external imbalances *through* changes in real exchange rates. This view is supported both by theoretical analysis and by simulation experiments on the IMF and OECD models.

Real Exchange Rate Dynamics

A shift in domestic demand growth between two areas operating near their current levels of full-employment output will have predictable effects on real exchange rates, as noted by Krugman (1987). A slowdown in demand in the United States and an increase in Japan and Germany (Europe) will reduce world demand for U.S. output and increase it for Japanese and German output. This will tend to increase the prices of Japanese and German output relative to the U.S. This is a real depreciation of the dollar against the DM (ECU) and yen. In this section we develop a two-country model that captures analytically the dynamics of this adjustment of real exchange rates with exogenous shifts in real domestic demand. The model is useful in interpreting the simulation results that follow. It also produces the conditions under which the policy shifts *would* be accompanied by dollar appreciation, rather than depreciation, in real terms.

The model includes two countries, or areas; for concreteness we will call the home country the United States and the foreign country with starred * variables Japan. All variables in the model are real. The level of output in both countries is taken as given, in order to concentrate on real exchange rates and interest rates. This assumption can also be justified by noting that medium-term recession or inflation is not an acceptable part of an adjustment package. The policy shifts are represented as exogenous shifts in fiscal positions. Expectations of movements in the real exchange rate are rational, so the model is forward-looking and solutions proceed from the long-run equilibrium to the short. Here we present only the details needed to show the basic results; a full discussion of the model is in the appendix. The model is a two-country version of the fundamentals model in Branson (1985). It adds rational expectations and stock-adjustment dynamics to the version in Branson (1988).

The Model

The model has four equations, representing the national accounts, or IS, equilibrium in the two countries, the arbitrage equilibrium between the two financial markets, and the accumulation of their net debt position via the current account. The national income equations are

$$D = S(r) - X(e,B), \text{ and} \quad (1)$$

$$D^* = S^*(r^*) + X(e,B). \quad (2)$$

Here D, D^* are the home and foreign country's "structural" fiscal deficits, since we assume full employment; S, S^* are the excesses of private saving over investment; X is the home country's current account surplus, r, r^* are the real interest rates; e is the real exchange rate in terms of home currency per unit of foreign exchange (so an increase signifies a depreciation of the home currency); and B is the net debt of the home to the foreign country. We assume that S and S^* are increasing functions of r and r^* , and X is an increasing function of e and a decreasing function of B . Since we have only two countries, the same X enters both equations. To avoid problems in evaluation of B , we assume it is denominated in an average of the two currencies.

The arbitrage condition that links the financial markets is

$$r = r^* + \hat{e} + p(B). \quad (3)$$

Here \hat{e} is the expected rate of change of the real exchange rate, and p is a risk premium, increasing in B . This is a summary form of a portfolio model in which debt in both currencies is held in international portfolios. Equation (3) introduces real exchange rate dynamics into the picture. The other dynamic equation is the accumulation of the debt position, given by

$$\dot{B} = -X(e,B). \quad (4)$$

A home-country current account surplus reduces its debt position.

Long-Run Equilibrium

In the long-run equilibrium, the real exchange rate is expected to remain constant, or trendless in a stochastic version of the model, so \hat{e} in equation (3) would be zero. The current account would be balanced, so X in equations (1), (2), and (4) would be zero. This would be the case even if the two economies were on a balanced growth path, with each accumulating the other's debt.

The long-run solution of the model is recursive and simple. Equations (1) and (2) with $X = 0$ determine the real interest rates at which

domestic private saving finances the budget deficit in each country. An increase in D or D^* eventually requires an increase in r or r^* to finance it domestically. Then equation (3) with $\hat{e} = 0$ determines the debt position that yields the risk premium p that equals the difference between the two real interest rates. Finally, the requirement that $X = 0$ gives the value of the real exchange rate that is consistent with the debt position. This is the value of the exchange rate that gives a trade balance that just finances the debt service.

An example will illustrate the movement of long-run equilibrium. Consider an increase in D , the home (U.S.) structural deficit. From equation (1) with $X = 0$, the home r must rise to stimulate the excess saving to finance the rise in D . From (3) with $\hat{e} = 0$ and an increase in $r - r^*$, the home debt position must rise. This increases the debt service, requiring a real depreciation in the long run to generate the trade surplus to finance it. With $X = 0$ in the long run, if B increases so must e . The United States is on a path towards this equilibrium in 1988.

Short-Run Equilibrium and Dynamics

In the short run, neither $X = -\dot{B}$ nor \hat{e} need be zero, so we need the entire model to locate the dynamic path to the long-run equilibrium. To locate that path, we find the separate loci in e, B space along which alternatively $\dot{B} = 0$ and $\hat{e} = 0$. The long-run equilibrium is at their intersection. Then we study graphically the dynamics around that point to locate the unique stable saddlepath into it. This is the dynamic adjustment path of B and e . Finally, we can do comparative dynamics by seeing which locus is shifted by any given disturbance, and how the saddlepath shifts.

The $\dot{B} = 0$ line in figure 1 is the locus of points along which $X = 0$. An increase in B reduces X , and requires an increase in e to hold X to zero. So along the $\dot{B} = 0$ line the current account is in balance. Above it, the home current account is in surplus, that is $X > 0$, and B is decreasing. Above it, B is increasing. These dynamics of the debt position are given by the horizontal arrows in figure 1. Any exogenous event such as a change in tastes or technology that makes the home country more competitive, that is, would generate a current account surplus at the pre-existing equilibrium, shifts the $\dot{B} = 0$ line down. Any such event favoring the foreign country's competitiveness shifts it up.

Derivation of the $\hat{e} = 0$ line is a little more complicated. From equation (3), an increase in B with $\hat{e} = 0$ requires an increase in $r - r^*$. An increase in r increases S in equation (1), and a reduction in r^* reduces S^* in equation (2). Both require an increase in X to maintain equilibrium in (1) and (2). This requires an increase in e , and since X has increased, the rise in e is greater than along the $\dot{B} = 0$ line. So the $\hat{e} = 0$ line in figure 1 is steeper than the $\dot{B} = 0$ line.

To obtain the dynamics of e around $\hat{e} = 0$, begin with a point on the line, and then consider an increase in e for a given B . The increase in e increases X , requiring an increase in r and a decrease in r^* to maintain equilibrium in (1) and (2). This increases $r - r^*$ in equation (3), so for a given B , \hat{e} must become positive. For financial equilibrium to be maintained with the interest differential greater than the risk premium, the exchange rate must be expected to rise. Thus for financial market equilibrium, if the exchange rate is higher than is compatible with zero expected increase, it must be expected to rise even more. If expectations are rational, the exchange rate will rise. Below the $\hat{e} = 0$ line, the exchange rate falls. These unstable dynamics are shown by the vertical arrows in figure 1.

An increase in D or a decrease in D^* shifts the $\hat{e} = 0$ line down. Consider an increase in D . For a given debt position, maintaining $\hat{e} = 0$ in equation (3) requires that r and r^* rise by the same amount. In equation (2), with D^* unchanged, the rise in r^* and therefore S^* requires a fall in X and therefore e . This is consistent with an increase in S in equation (1) that is smaller than the increase in D , so X goes down. Similarly, if D^* is reduced, both interest rates fall. In equation (1), the resulting reduction in S with D unchanged requires a reduction in X and therefore a reduction in e to maintain equilibrium. So an increase in D or reduction in D^* shifts $\hat{e} = 0$ down, and a reduction in D or increase in D^* shifts it up.

Putting the dynamics of e and B together in figure 1, we see the unique stable saddlepath ss into the equilibrium, lying between the $\dot{B} = 0$ and $\hat{e} = 0$ lines. The ss path has the properties that it goes to the equilibrium E_0 , and along it expectations are realized. All the other paths are speculative bubbles, heading off toward infinity along an asymptote that is perpendicular to ss . Following a disturbance, for the existing debt

Figure 1

The Saddlepath Equilibrium

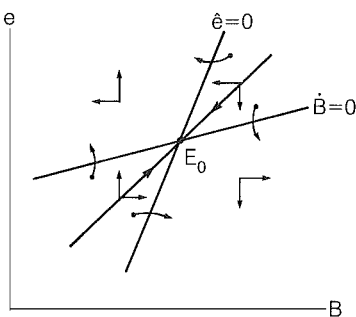
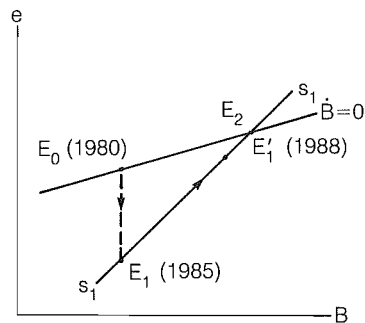


Figure 2

Unanticipated Increase in D



position B, the exchange market searches for the e value that is on the saddlepath into the new equilibrium.

We can illustrate the dynamics by returning to the example of an unanticipated increase in the home (U.S.) structural deficit D . This shifts the $\hat{e} = 0$ line down, creating a new ss path that runs into a new long-run equilibrium out along the $\hat{B} = 0$ line in figure 1. The situation is shown in figure 2. The original equilibrium from figure 1 is E_0 , and the new equilibrium is E_2 . The new adjustment path is s_1s_1 into E_2 . The real exchange rate jumps down (dollar appreciates) to E_1 at the original debt position, creating a current account deficit. This then begins the adjustment toward E_2 .

The path from E_0 to E_1 , and up towards E_2 , describes roughly the path of the dollar since 1980. The shift in the structural fiscal deficit was not sudden, unanticipated, and known fully at the time of its announcement, so the movement from E_0 to E_1 proceeded by fits and starts, ending in 1985. In addition, disturbances connected with the appearance of the debt crisis in 1982, and a possible speculative bubble in 1984-85, added to the turbulence. The point here is just that the model predicts the general outline of the movement, first appreciation then depreciation, with a current account deficit accumulating the debt position.

On this interpretation, in 1988 we are at a point such as E_1' , above the original E_0 , but well short of E_2 . The OECD competitiveness measures (OECD 1988, p. 55) show a gain of about 15 percent in 1988 over 1980, but no forecast says that at the existing exchange rates as of mid-1988, the current account deficit would shrink to zero. So in the discussion of policy alternatives to follow, we will assume that the United States, Japan, and Germany are at a point like E_1' in figure 2.

Unanticipated Shift in Fiscal Policy in 1989

In order to set the stage for the analysis below of an anticipated shift in fiscal positions, we can briefly discuss the effect of an unanticipated shift beginning from the initial position of 1988, E_1' in figure 2. We focus here on fiscal actions, but the results hold for any exogenous shift in domestic demand. Suppose that at point E_1' , the United States reduces its fiscal deficit, and Japan and Germany increase theirs, all in an unanticipated fashion. What path would we expect for the real exchange rate? The answer is illustrated in figure 3.

Let us take point E_1' as the 1989 point on the path from E_1 to E_2 from figure 2. The fiscal adjustment would shift the $\hat{e} = 0$ locus back up, giving a new long-run equilibrium along $\hat{B} = 0$ left of E_2 in figure 3. The real exchange rate would jump up (home currency depreciate) onto the new ss path into the new equilibrium.

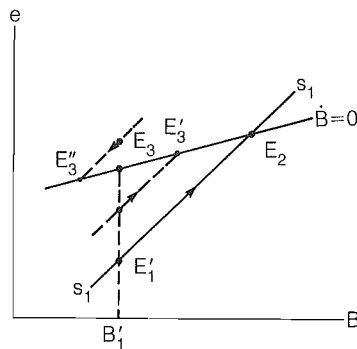
If the fiscal adjustment were small enough that the new long-run equilibrium is to the right of E_3 in figure 3, for example E'_3 , the new s path would be below $\dot{B} = 0$, and run up and right into it. Then the real exchange rate would jump up and then continue up into the new equilibrium with the current account deficit diminishing gradually to zero. The fiscal shift would reduce the eventual depreciation by speeding it up in the present. The final equilibrium would be between E_2 and E_3 .

The other alternative is a larger fiscal adjustment that moves the new equilibrium left of E_3 in figure 3, for example E''_3 . Then the new s path would be above $\dot{B} = 0$, and run left and down into the new equilibrium. In this case the exchange rate would overshoot, with the home currency depreciating so much as to generate a current account surplus, and then gradually appreciating back to equilibrium left of E_3 on $\dot{B} = 0$. If the fiscal adjustment moved the equilibrium exactly to E_3 , the exchange rate would jump there and stop.

In all of these cases, the unanticipated fiscal adjustment generates a jump real depreciation in the home currency. This speeds up adjustment of the current account balance, and is the analytical basis for the assertion that fiscal adjustment would cause a real depreciation of the dollar. To get the opposite, we have to go to an anticipated fiscal adjustment.

Figure 3

Unanticipated Fiscal Adjustment



Anticipated Shift in Fiscal Deficits

Consider the case of a fiscal adjustment that is anticipated by the markets. Then the basic result from Wilson (1979) is that the real exchange rate in the present model will jump onto an unstable bubble path relative to the existing equilibrium such that it reaches the new s saddle path at the time when the anticipated fiscal shift occurs. Again,

there are two cases, depending on the size of the correctly anticipated shift. These are shown in figures 4(a) and 4(b).

For a small anticipated fiscal shift, the path would resemble that from E_1' to a to b to E_3 in figure 4(a). The new saddle path that will be relevant when the shift occurs is below $\dot{B} = 0$, and the exchange rate jumps into an unstable path relative to E_2 that takes it to point b when the shift occurs. In this case the exchange rate shows first a jump depreciation of the home currency to point a, and then further depreciation to points b and E_3 , with the home deficit shrinking throughout.

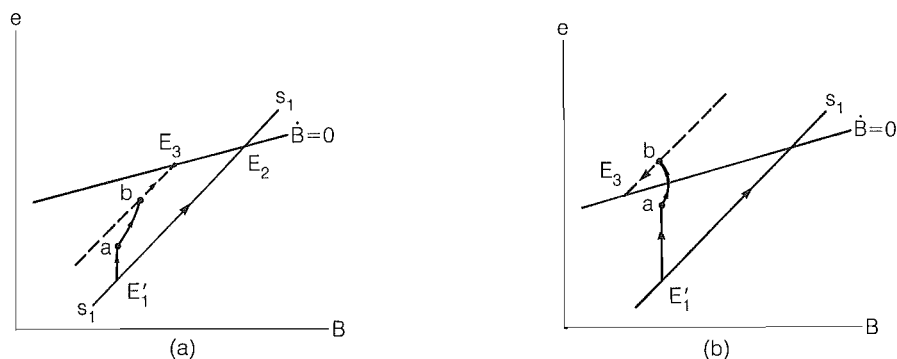
The case of a large anticipated fiscal shift is shown in figure 4(b). Here the relevant new saddle path is above $\dot{B} = 0$, running down and left to E_3 . Again, the adjustment path is $E_1' \rightarrow a \rightarrow b \rightarrow E_3$. But in this case, the trip along the unstable path from a to b carries the exchange rate above $\dot{B} = 0$, and the currency then appreciates from point b to E_3 after the actual fiscal shift occurs. This is the case in which the fiscal shift leads to an appreciation of the dollar. (It was first suggested to us in a conversation with Francois Bourguignon.)

The border line between the two cases illustrated in figures 4(a) and 4(b) would be a fiscal shift that locates E_3 on $\dot{B} = 0$ to the right of E_1' just enough that the trip along the unstable path from a to b ends at E_3 when the shift occurs, that is, a shift that makes points b and E_3 the same. In that case, no further adjustment would occur after the fiscal shift. It may be interesting to note that this anticipated shift would be smaller than the unanticipated shift that takes the equilibrium to E_3 in figure 3. This is because in the pre-announced case, the anticipatory jump in the exchange rate provides a head start on the speeded-up reduction of the current account deficit.

On the assumption that in 1988 a substantial correction in at least the U.S. fiscal deficit is expected, which case of figure 4 is applicable? One difference between the two cases would be that in case (a), at point

Figure 4

Anticipated Fiscal Adjustment



b when the fiscal shift comes, the current account of the home country is in deficit, while in case (b) it is in surplus. Given the empirical J-curve lags of adjustment of trade behind real exchange rates, this distinction could be interpreted as follows. If projections including the fiscal shift show an eventual surplus at current exchange rates after the shift, we are in case (b), and the dollar would appreciate after the shift. If the projections show an eventual deficit after the shift at current exchange rates, then we are in case (a), and the dollar would depreciate. The OECD and IMF projections show continued current-account deficits, suggesting that case (a) holds, if in fact a fiscal shift is anticipated by the markets.

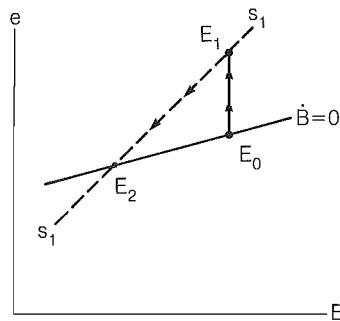
Exogenous Increase in the Risk Premium

In order to connect with the discussion of the Multimod simulations in the next section, here we briefly discuss the effect of an exogenous increase in the risk premium p in equation (3) for a given level of the debt position B , starting from the original equilibrium of figure 1. This would shift the $\hat{e} = 0$ line up, as shown in figure 5. The increase in p in equation (3) requires an increase in $r - r^*$ to maintain financial equilibrium with $\hat{e} = 0$. The rise in r and fall in r^* increase S and reduce S^* in equations (1) and (2). This requires an increase in X and therefore in e .

The upward shift of the $\hat{e} = 0$ line creates the new s_1s_1 adjustment path in figure 5. The real exchange rate jumps up to E_1 , generating a current account surplus. The exchange rate and debt position then fall towards the new equilibrium at E_2 . This is the path we see in the Multimod simulations below.

Figure 5

Exogenous Shift in the Risk Premium



Alternative Fiscal Policy Scenarios

During 1988 the IMF and the OECD have used their models to produce projections based on alternative assumptions about policies. These are generally published as changes from the current reference scenario. We have programmed these alternatives as linear multipliers to be added to the updated reference scenarios as they appear. (See Gomel, Marchese, and Martinez Oliva (1988) for details.) Three of these policy alternatives are discussed in this section. We have also included in the program the unit multipliers from each model so we can produce our own alternative projections. One of these is discussed in the next section.

The IMF Multimod is a close empirical representation of our two-country theoretical model discussed above, with variable output and prices sticky in the short run. It includes endogenous variation of exchange rates and arbitrage equations with terms for risk premia. So policy simulations with Multimod produce endogenous variations in exchange rates. In addition, simulations can be performed with exogenous variations in risk premia and endogenous variation in exchange rates. Expectations in Multimod are forward-looking, so the simulations include "model-consistent" exchange-rate expectations. A detailed description of the model, and a full set of multiplier runs, are provided in Masson et al. (1988).

The OECD Interlink model has more price stickiness and output variation than Multimod. Exchange rates are exogenous, and expectations adjust adaptively. A detailed discussion of Interlink and its multipliers is provided in Richardson (1987). In performing comparative simulations, we sometimes take the endogenous exchange rate results from Multimod and use them as exogenous input to the Interlink simulations. While the Interlink simulations and the OECD projections provide more country coverage than Multimod, the latter is a closer representation of the theoretical framework.

In this section we discuss three alternative policy scenarios over the period 1989–92 using the two models. Scenario 1 is an exogenous depreciation of the dollar in 1988. In Multimod, this is represented by a shift in the risk premium; in Interlink, it is simply exogenous. Scenario 2 is a gradual reduction in the U.S. fiscal deficit from 1988 to 1992 which is unanticipated until it is announced, with exchange rates endogenous in Multimod, and constant in nominal terms in Interlink. Scenario 3 is a gradual fiscal tightening in the United States and ease in Japan and Germany from 1988 to 1992, with exchange rates endogenous in Multimod and the dollar depreciating in nominal terms at 2 percent per year against the DM and yen in Interlink. The Multimod simulations are shown in table 5, and the Interlink simulations in table 6. To conserve

Table 5
Alternative Fiscal Scenarios in Multimod

	Scenario 1 Pure Dollar Depreciation				Scenario 2 Fiscal Restriction in United States				Scenario 3 Fiscal Restriction in U.S., Expansion in Japan, Germany, and Endogenous Dollar Depreciation			
	1989		1992		1989		1992		1989		1992	
	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
United States												
Real GNP	3.2	-1.5	2.9	-.8	3.1	-.4	2.8	-.4	3.0	-.4	2.8	-.4
GNP Deflator	3.9	.4	3.2	.2	3.5	0	3.3	-.2	3.6	.1	3.4	.1
Current Balance												
\$ Billions	-91.8	36.6	-41.9	86.1	-118.2	10.2	-91.3	36.7	-118.2	10.2	-85.2	42.8
Percent of GNP	-1.8	.7	-.7	1.4	-2.3	.2	-1.5	.6	-2.3	.2	-1.4	.7
Japan												
Real GNP	3.3	-1.6	4.1	.7	3.5	-.6	3.7	0	3.6	-.1	3.7	-.2
GNP Deflator	-.3	-2.9	.8	-6.6	1.1	-1.0	1.2	-2.3	1.2	-1.0	1.3	-2.1
Current Balance												
\$ Billions	70.2	-4.4	64.0	-11.0	68.7	-5.9	75.9	.9	67.5	-7.1	78.7	3.7
Percent of GNP	2.2	-.2	1.6	-.4	2.2	-.2	1.9	-.1	2.1	-.3	1.8	-.2
Real Exch. Rate (Yen/\$)	148.9	-7.1	155.9	-2.7	155.7	-2.8	149.6	-6.6	151.8	-5.3	139.1	-13.2
Germany												
Real GNP	.8	-2.9	2.8	.5	1.4	-.9	2.5	.1	1.8	-.2	2.5	.6
GNP Deflator	.3	-2.8	1.7	-5.3	1.4	-.9	2.1	-1.8	1.3	-1.2	2.2	2.0
Current Balance												
\$ Billions	37.5	-4.0	50.7	3.1	38.8	-2.7	50.0	2.4	37.5	-4.1	44.8	-2.8
Percent of GNP	2.7	-.4	3.0	0	2.8	-.3	2.8	-.2	2.7	-.4	2.5	-.5
Real Exch. Rate (DM/\$)	1.71	-8.0	1.78	-4.2	1.78	-4.3	1.7	-11.1	1.79	-3.9	1.66	-10.7

(A) Percentage growth rates except otherwise marked. Figures in columns (A) were obtained applying the deviations from baseline derived from the simulations carried out by the IMF in August 1987 to the reference scenario depicted in table 4.

(B) For GNP, deflator and exchange rate, percentage deviations from levels in the baseline (or reference scenario); for current account balance, absolute deviations.

Source: Authors' calculations on IMF data.

Table 6
Alternative Fiscal Scenarios in Interlink

	Scenario 1 Pure Dollar Depreciation				Scenario 2 Fiscal Restriction in United States				Scenario 3 Fiscal Restriction in United States, Expansion in Japan and Exogenous Dollar Depreciation			
	1989		1992		1989		1992		1989		1992	
	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
United States												
Real GNP	2.3	1.4	1.6	-1.0	1.1	-1.2	1.4	-3.5	1.2	-5	2.5	-6
Private Consumption Deflator	6.9	3.7	5.7	9.6	3.7	-2	3.4	-1.8	4.2	1.0	4.8	2.5
Current Balance												
\$ Billions	-101.0	4.0	-79.0	37.0	-89.0	16.0	-66.0	50.0	-85.0	20.0	-47.0	69.0
Percent of GNP	-1.9	.2	-1.2	.7	-1.8	.3	-1.1	.8	-1.7	.4	-.8	1.1
Japan												
Real GNP	1.7	-1.6	3.3	-3.8	2.7	-.4	3.0	-1.4	3.5	1.1	3.3	1.7
Private Consumption Deflator	.8	-1.4	.8	-3.8	1.8	-.1	1.6	-.8	1.8	-.4	2.1	0
Current Balance												
\$ Billions	76.0	-3.0	71.0	-22.0	75.0	-4.0	79.0	14.0	71.0	-8.0	55.0	-38.0
Percent of GNP	2.2	-.6	1.6	-1.0	2.7	-.1	2.3	-.3	2.4	-.4	1.5	-1.1
Real Exchange Rate (Yen/\$)	145.7	-15.9	145.7	-15.9	173.1	-.1	171.5	-1.0	172.2	-.6	174.2	.5
Germany												
Real GNP	1.1	0	2.4	-1.1	.9	-.4	1.9	-1.1	.9	-.5	2.0	-1.0
Private Consumption Deflator	1.3	-.5	.8	-1.8	1.5	-.1	1.1	-.6	1.4	-.3	.8	-1.8
Current Balance												
\$ Billions	37.0	5.0	30.0	-4.0	30.0	-2.0	26.0	-8.0	30.0	-2.0	26.0	-8.0
Percent of GNP	2.5	0	1.6	-.4	2.4	-.1	1.7	-.5	2.3	-.2	1.7	-.5
Real Exchange Rate (DM/\$)	1.75	-11.4	1.75	-11.4	1.98	-.1	1.95	-1.2	1.96	-.7	2.02	2.3

(A) Percentage growth rates except otherwise marked. For scenario 2, the figures in columns (A) were obtained by applying the deviations from baseline derived from the simulations carried out by the OECD in April 1987 to the reference scenario depicted in Table 4.

(B) For GNP, deflator and exchange rate, percentage deviations from levels in the baseline (or reference scenario); for current account balance, absolute deviations.

Source: Authors' calculations on OECD data.

 Key Assumptions for the Scenarios with Pure Dollar Depreciation^a (Tables 5 and 6)

Multimod	Interlink
<p><i>Fiscal Policy:</i> Unchanged policy setting with respect to the reference scenario and endogenous revenues.</p>	<p><i>Fiscal Policy:</i> Unchanged policy setting with respect to the reference scenario and endogenous revenues.</p>
<p><i>Monetary Policy</i></p>	<p><i>Monetary Policy:</i> Broadly non-accomodating. In particular:</p>
<p>United States: Monetary conditions are tightened in order to avoid inflationary consequences of dollar depreciation; interest rates rise above the level in the reference scenario.</p>	<p>United States: Short-term interest rates are driven up to 9 percent as a counter to inflation and then fall to 7 percent as output weakens and inflation pressures ease; long-term interest rates rise from 9 to 11 percent over the projection period.</p>
<p>Japan and Germany: Interest rates decline somewhat with the appreciaiton of the currencies, as monetary growth rates remain unchanged.</p>	<p>Japan and Germany: Interest rates decline as inflation falls, with a floor on short-term rates at 2 percent.</p>
<p><i>Exchange Rates:</i> A constraint is imposed over the ratio of U.S. net foreign indebtedness to GNP, that it must not exceed 15 percent in 1995, as against 22 percent in the reference scenario. Therefore, the exchange value of the dollar is assumed to decline in a way consistent with the reduction of U.S. current account deficit that keeps the foreign debt ratio at the desired level in 1995: the adjustment takes place in 1988, with the U.S. dollar depreciating by 15 percent in nominal terms against the other major currencies.</p>	<p><i>Exchange Rates:</i> During 1988, the U.S. dollar depreciates by 20 percent against the yen and 15 percent against the DM in nominal terms. Then, exchange rates are constant in nominal terms in 1989, and broadly stable in real terms in the following years.</p>

^a Simulation carried out in August 1987 for Multimod and in February 1988 for Interlink.

 Key Assumptions for the Scenarios with Fiscal Restriction in United States^a (Tables 5 and 6)

Multimod	Interlink
<i>Fiscal Policy</i>	<i>Fiscal Policy</i>
United States: Federal government non-interest expenditure is reduced by amounts rising from \$42 billion in 1988 to \$91 billion in 1992 from the levels assumed in the reference scenario.	United States: Federal government expenditure is gradually reduced by about \$70 billion and proceeds from income taxes increase by about \$50 billion by the end of 1992 from the levels assumed in the reference scenario.
Japan and Germany: Unchanged policy setting with respect to the reference scenario and endogenous revenues.	Japan and Germany: Unchanged policy setting with respect to the reference scenario and endogenous revenues.
<i>Monetary Policy:</i> Interest rates decline in the United States in order to keep money growth on target; a reduction of interest rates is also projected, to a lesser extent, for Japan and Germany.	<i>Monetary Policy:</i> U.S. money supply growth decelerates broadly in line with nominal income, leaving short-term rates unchanged from the levels in the reference scenario; in Japan and Germany, interest rates also remain at the reference level.
<i>Exchange Rates:</i> Endogenous variations.	<i>Exchange Rates:</i> Nominal exchange rates unchanged from the levels in the reference scenario.

^a Simulation carried out in August 1987 for Multimod and in February 1988 for interlink.

Key Assumptions for the Scenarios with Coordinated Fiscal Action and Dollar Depreciation^a (Tables 5 and 6)

Multimod	Interlink
<p><i>Fiscal Policy</i></p> <p>United States: The same policy setting as in Scenario 2.</p> <p>Japan: Higher fiscal expenditures in 1988–1990 by an amount equal to 0.5 percent of GNP.</p> <p>Germany: Lower tax revenues by an amount growing from DM 7.6 billion in 1988 to DM 20 billion in 1991. As a ratio to GNP, the fiscal stimulus is roughly the same as in Japan.</p>	<p><i>Fiscal Policy</i></p> <p>United States: Starting from 1988, the general government financial deficit is cut back over four years by a further 2 percent of GNP, compared with the reference scenario, action being concentrated on government expenditure.</p> <p>Japan: Starting from 1988, the general government financial deficit is increased over four years by a total of 1 percent of GNP compared with the reference scenario, action being concentrated on government expenditure; housing investment is increased by 3 percent per annum compared with the reference scenario.</p> <p>Germany: The same policy setting as in the reference scenario and endogenous revenues.</p>
<p><i>Monetary Policy:</i> Interest rates decline in the United States and rise in Japan and Germany, in order to keep money growth on target.</p>	<p><i>Monetary Policy:</i> Assumed to be broadly non-accomodating. In particular:</p> <p>United States: Unchanged money growth and lower interest rates compared with the reference scenario.</p> <p>Japan: Interest rates are assumed to be initially slightly higher than in the reference scenario before falling towards the end of the project period.</p> <p>Germany: Interest rates are rather lower than in the reference scenario reflecting weaker output growth and lower inflation.</p>
<p><i>Exchange Rates:</i> Endogenous variations.</p>	<p><i>Exchange Rates:</i> Steady decline of the U.S. and the Canadian dollars against other OECD countries of 2 percent per annum in nominal terms relative to the reference scenario.</p>

^a Simulation carried out in August 1987 for Multimod and in February 1988 for Interlink.

space, we show only the first and last years of the simulations, 1989 and 1992. Details of the assumptions are given in the notes to tables 5 and 6.

In Scenario 1 in table 5 we see the movement illustrated in figure 5 earlier. In 1989 the yen appreciates against the dollar in real terms by 7.1 percent and the DM by 8.0 percent. By 1992, these numbers are down to 2.7 and 4.2 percent. This shows the upward jump in the U.S. real exchange rate in figure 5, followed by the gradual fall.

The dollar depreciation is accompanied by a rise in the interest rate in the United States, and a fall in Japan and Germany. So the effect on demand is unclear in all cases. The depreciation stimulates demand in the United States, but the increase in the interest rate depresses it, and vice versa in Japan and Germany. On balance, the interest rate effect dominates in the short run in the United States, and the exchange rate effect dominates in Japan and Germany, as the growth rate of real GNP falls in all areas. These effects diminish in the longer run, and reverse by 1992 in Japan and Germany. The relatively smaller effects on real GNP in Multimod improve its correspondence to the theoretical model.

Multimod and Interlink both include empirical lags of adjustment of trade flows behind changes in exchange rates—J-curve effects. Thus the U.S. current account deficit in Scenario 1 of table 5 falls by \$36.6 billion in 1989 and \$86.1 billion in 1992. To see the effects on the current accounts of Japan and Germany, it is better to use the local currency numbers as a percent of GNP, since the exchange rates are falling against the dollar. The Japanese current account surplus falls by 0.2 percent of GNP in 1989 and 0.4 percent in 1992. These effects are smaller than the U.S. results. The German surplus shrinks by 0.4 percent of GNP in 1989, but that effect disappears by 1992.

Scenario 2 in table 5 shows the effect of a gradual reduction in U.S. government spending by an amount that increases from \$42 billion in 1988 to \$91 billion in 1992, relative to the baseline. This has a small depressive effect on U.S. growth throughout the simulation. The reduction of output growth in Japan and Germany is a little larger in the short run, but disappears by 1992. The yen appreciates against the dollar in real terms by an amount that increases from 2.8 percent in 1989 to 6.6 percent in 1992. The corresponding numbers for the DM are 4.3 and 11.1 percent.

The fiscal shift and the dollar depreciation reduce the U.S. current account deficit by \$10.2 billion in 1989 and \$36.7 billion in 1992. The effects on the current accounts of Japan and Germany are smaller, but go in the right direction. Since only the United States takes the fiscal action in the simulation, the gain to the U.S. current account is spread across all areas of the world.

Scenario 3 in table 5 adds a gradually growing fiscal stimulus in Japan and Germany to Scenario 2. The negative effect on U.S. growth is unaffected, while the negative effects in Japan and Germany are re-

duced. The effects on the real exchange rates and on the current account balances are increased. The reduction in the U.S. current account deficit in 1992 in Scenario 3 is \$42.8 billion, compared with \$36.7 billion in Scenario 2.

Comparison of the exchange rate and U.S. current account effects in Scenarios 1 and 3 is instructive. The early depreciation in Scenario 1 results in a larger improvement in the U.S. current account in both 1989 and 1992. Presumably this difference would be reversed eventually as the fiscal shift persists, but the result illustrates the gains from early action on the exchange rate, if action is inevitable.

The Interlink simulations are shown in table 6. In Scenario 1 the dollar is depreciated in nominal terms by 20 percent against the yen and 15 percent against the DM in 1988, and held roughly constant subsequently. The result is appreciation of the yen and DM that is larger than in the Multimod simulation in 1989, and even larger in 1992. The effects on the growth rates of real GNP in Interlink are quite different from those in Multimod. The U.S. growth rate increases in the short run, but falls by 1992. The negative effect on growth in Japan is the same in 1989, but increases to 1992 in Interlink. There is no short-run effect in Germany in 1989, but a negative effect by 1992. Interlink seems to show cumulating negative effects on real GNP growth over time in all three countries from a one-time real depreciation of the dollar.

The U.S. current account deficit in Scenario 1 of table 6 is essentially unchanged in dollar terms in 1989, although the increase in the growth rate suggests significant positive quantity effects. By 1992, the gain is \$37.0 billion, less than half that of Multimod with a much larger dollar depreciation. The current account surplus of Japan is reduced in Interlink by more than in Multimod, even with the lower growth path of output. There is little effect on the German surplus in either model in Scenario 1.

The fiscal restriction in the United States in the Interlink Scenario 2 is about 30 percent larger than in Multimod. By 1992, the U.S. current account deficit is reduced by \$37 billion in the Multimod simulation and \$50 billion in Interlink. The depressive effects on real GNP growth are much larger in Interlink than in Multimod, and relatively larger in the United States than in Japan or Germany. As a result, with roughly constant real exchange rates in Interlink, the reduction in the U.S. current account deficit and the Japanese and German surpluses are larger than in the Multimod Scenario 2.

The Interlink Scenario 3 has government spending in Japan greater by 1 percent of GNP than in the reference scenario, and housing investment growing 3 percent per year faster. U.S. and German policies are the same as in Scenario 2. The result, in the last panel of table 6, is a small reduction in the growth rate in the United States, a larger increase in Japan, and a substantial decrease in Germany, relative to the

reference scenario. With real exchange rates roughly constant, this pattern of changes in demand produces a substantial reduction in the U.S. surplus, larger than in the Multimod Scenario 3, and an even larger reduction in the Japanese deficit. The effects on Germany come from the combination of the changes in growth in the United States and Japan, and on balance give a reduction of the surplus by about 0.5 percent of GNP by 1992.

From the simulation results, the Multimod seems to show current accounts more sensitive to changes in exchange rates than in Interlink. The latter has real GNP more sensitive to fiscal policy, and obtains its effects on current accounts from fiscal shifts through this channel. The Multimod simulations correspond more closely to our theoretical model described earlier, and show the effects of fiscal actions on the exchange rate. Presumably if the exchange rate were endogenized in the Interlink simulations, its movements would dampen output effects. For example, as fiscal policy tightens in the United States, the dollar depreciation contributes an expansionary force to demand. In that case, the effects of the fiscal shifts would be seen to come more through the exchange rate channel, as in Multimod.

Expansionary Monetary Policy in Japan and Germany

In this section we report the results of alternative simulations using the Multimod unit multipliers, and assuming monetary rather than fiscal expansion in Japan and Germany. We have three reasons for studying this option. First, with only fiscal contraction in the United States, the growth rate of real GNP falls in all three countries in the simulations of tables 4 and 5, and substantially so in the Interlink simulation. Second, as theory and the Multimod simulations show, the dollar will depreciate with either fiscal action in the United States alone or joint fiscal action. Using Multimod, we can find the degree of monetary expansion abroad that would prevent a jump in the dollar at the time of the fiscal shift in the United States or hold the average of the nominal exchange rates constant over the simulation period. This is how the alternative simulations are formulated. Third, a balanced joint fiscal action would leave world real interest rates high, while our alternatives would reduce them by reducing the aggregate world fiscal deficit. This can be seen by summing equations (1) and (2) to obtain the world saving-investment balance:

$$D + D^* = S(r) + S^*(r^*). \quad (5)$$

A reduction in D and equal increase in D^* would reduce r and increase r^* , leaving the average world real interest rate unchanged. But a reduction in D alone would reduce both rates in the short run, and the

U.S. rate in the long run. A reduction in average world real interest rates would benefit debtors, especially in the developing countries.

To perform the alternative simulations, we used the Multimod unit multipliers to formulate two alternative expansionary paths for monetary policy in Japan and Germany. The first is the amount of monetary expansion in 1988 in Japan and Germany that would offset the effects on their nominal exchange rates against the dollar in 1989 in the Multimod Scenario 2. These are 3.7 percent in Japan and 4.6 percent in Germany. These are the step increases in the money supply that would just offset the effects of the announcement and implementation of the fiscal program in table 5, Scenario 2, on nominal exchange rates at the time of the announcement. These were implemented in the simulation along with the Scenario 2 fiscal program. The money supplies subsequently grow at the rates in Scenario 2. The results are shown as Scenario 4 in table 7.

The policy alternatives in Scenario 4 resemble the policy actions actually in place since late 1986. Comparing M1 growth rates, in Japan M1 growth increased by 5.5 percentage points from 1985 to 1987, and in Germany it increased by 4.7 percentage points. Over the same period, the U.S. fiscal deficit was reduced by 1.9 percent of GNP. So Scenario 4 can be taken to approximate actual policy since 1986, as well as prospective policy in 1988.

The second monetary alternative was formulated as the increase in the average rate of growth of money in Japan and Germany that would offset the average effects on their nominal exchange rates in Multimod Scenario 2 over the simulation period. These are 1.7 percent in Japan and 2.3 percent in Germany. These increases in money growth rates were implemented in the simulation along with the Scenario 2 fiscal program. The results are shown as Scenario 5 in table 7.

Scenarios 4 and 5 in table 7 can be usefully compared with Scenarios 2 and 3 in table 5. A slight reduction in real growth in the United States occurs in Scenarios 4 and 5 compared to 2 and 3, but real growth increases in 1989 and 1992 in Japan and Germany. The real appreciation of both the yen and the DM is reduced in 1989 in both Scenarios 4 and 5 compared to Scenario 2. By 1992, the yen appreciates by about the same in Scenarios 4 and 2, but less in Scenario 5. The appreciation of the DM is less throughout Scenarios 4 and 5.

The reduction in the U.S. current account deficit in 1992 is \$38.3 billion in Scenario 4 and \$35.8 billion in Scenario 5, about the same as the \$36.7 billion of Scenario 2 and less than the \$42.8 billion of Scenario 3. With less appreciation of their currencies in the monetary policy simulations, the current account surpluses of Japan and Germany are not reduced in Scenarios 4 and 5 relative to the reference scenario, except for the reduction of 0.2 percent of GNP in Germany in 1992 in Scenario 4. The faster growth in Japan and Germany in Scenarios 4 and

Table 7
Alternative Monetary Scenarios in Multimod

	Scenario 4 ^a				Scenario 5 ^b			
	1989		1992		1989		1992	
	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
United States								
Real GNP	2.9	-.7	2.9	-.5	3.0	-.6	2.8	-.8
GNP Deflator	3.3	-.3	3.1	-1.0	3.4	-.2	2.9	-1.3
Current Balance								
\$ Billions	-122.3	6.1	-89.7	38.3	-119.2	9.2	-92.2	35.8
Percent of GNP	-2.4	.1	-1.5	.6	-2.4	.1	-1.5	.6
Japan								
Real GNP	3.8	.1	3.6	.6	3.8	-.1	4.0	1.4
GNP Deflator	1.8	.5	1.3	0	1.8	.1	2.3	1.8
Current Balance								
\$ Billions	77.8	3.2	81.8	6.8	75.3	.7	91.6	16.6
Percent of GNP	2.5	.1	2.1	.1	2.5	.1	2.4	.4
Real Exch. Rate (Yen/\$)	159.0	-.8	150.0	-6.4	159.9	-.2	155.0	-3.3
Germany								
Real GNP	1.6	.7	2.4	1.5	2.2	.6	3.2	4.0
GNP Deflator	1.6	-.3	2.4	-.3	1.7	-.4	2.9	.5
Current balance								
\$ Billions	41.8	.3	50.0	2.4	42.5	1.0	55.0	7.4
Percent of GNP	3.1	0	2.8	-.2	3.2	.1	3.3	.3
Real Exch. Rate (DM/\$)	1.86	.1	1.69	-9.1	1.87	.5	1.81	-2.5

^a Once-and-for-all money shock neutralizing exchange rate variations due to U.S. fiscal maneuver in 1989.

^b Sustained money shock neutralizing average exchange rate variations due to U.S. fiscal maneuver over five years.

(A) Percentage growth rate except otherwise marked.

(B) For GNP, deflator and exchange rate, percentage deviations from levels in the baseline (or reference scenario); for current account balance, absolute deviations.

5 is partially generated by less current account adjustment. So the gain in stabilization of the bilateral exchange rates comes at the cost of current account adjustment in Japan and Germany. In these cases the improvement in the U.S. current account comes from the rest of the world.

Thus the scenarios of fiscal contraction in the United States and monetary expansion abroad yield mixed results. They would give approximately the same result for the U.S. current account deficit, with better results for growth in Japan and Germany, than the balanced fiscal package. They would also increase world saving and produce a bonus for the developing country debtors in the form of lower world real interest rates. But by stabilizing real exchange rates over the simulation period, they eliminate current account adjustment in Japan and Germany. This loss may be more than balanced by the gains from growth in Japan and Germany and lower world real interest rates.

Appendix: Two-Country Fundamentals Model

This appendix sets out the algebra of the model of exchange-rate and debt dynamics in the text. This is an extension of the fundamentals model presented in Branson (1985 and 1988), to include rational expectations dynamics. It permits us to analyze the effects of anticipated shifts in fiscal policy. The model has two countries or areas, home and foreign with starred * variables. We lay out first the expressions for the loci in e, B space that control the current-account and exchange-rate dynamics, and study their movements. Then we lay out the long-run equilibrium solution.

Current Account and Debt Dynamics

The current account surplus of the home country (X), and the deficit of the foreign country ($-X$), give the rate of change of net debt (B) of the home country. We assume the current account itself depends on the real exchange rate (e) and the debt position:

$$X(e, B) = -\dot{B}. \quad (\text{A.1})$$

Here the partial derivative $X_e > 0$ gives the effect of the real exchange rate on the trade balance, and $X_b < 0$ gives the effect of the debt position on the flow of debt service. The $\dot{B} = 0$ locus in figure 1 comes from equation (A.1). Its slope is given by $-(X_b/X_e) > 0$. Above the $\dot{B} = 0$ locus $X > 0$, and B is decreasing. Below it, B increases. Anything that shifts the current account balance for given values of e and B shifts the $\dot{B} = 0$ locus.

Exchange Rate Dynamics

Exchange rate dynamics and interest rates are determined by the two national income equilibrium conditions and the open interest parity condition that links the two financial markets. The national income equilibrium conditions are:

$$D = S(r) - X(e, B), \text{ and} \quad (\text{A.2})$$

$$D^* = S^*(r^*) + X(e, B). \quad (\text{A.3})$$

Here D and D^* are the home and foreign fiscal deficits, S and S^* are the excess of private saving over investment, and r and r^* are the real interest rates. We assume $S', S'^* > 0$. Financial market equilibrium is characterized by the open interest parity condition on real interest rates:

$$r = r^* + \hat{e} + p(B). \quad (\text{A.4})$$

Here \hat{e} is the rationally expected rate of change of the real exchange rate, and p is the risk premium on home currency assets, with $p' > 0$.

The characteristics of the equilibrium locus along which $\hat{e} = 0$ in figure 1 can be obtained by setting $\hat{e} = 0$ in equation (A.4), and then totally differentiating (A.2) – (A.4) to solve for e , r , and r^* as functions of D , D^* , and B . The total differential, in matrix form, is equation (A.5):

$$\begin{array}{l}
 \text{A.2} \\
 \text{A.3} \\
 \text{A.4}
 \end{array}
 \begin{array}{c}
 \text{A} \\
 \left[\begin{array}{ccc}
 S' & 0 & -X_e \\
 0 & S^{*'} & X_e \\
 1 & -1 & 0
 \end{array} \right]
 \end{array}
 \begin{array}{c}
 \left[\begin{array}{c}
 dr \\
 dr^* \\
 de
 \end{array} \right]
 \end{array}
 =
 \begin{array}{c}
 \text{B} \\
 \left[\begin{array}{ccc}
 X_b & 1 & 0 \\
 -X_b & 0 & 1 \\
 p' & 0 & 0
 \end{array} \right]
 \end{array}
 \begin{array}{c}
 \left[\begin{array}{c}
 dB \\
 dD \\
 dD^*
 \end{array} \right]
 \end{array}
 \quad (\text{A.5})$$

The determinant of the A matrix is given by

$$|A| = X_e(S' + S^{*'}) > 0.$$

The solutions from (A.5) are given in table A.1. The term in de/dB is the slope of $\hat{e} = 0$, and the terms in de/dD and de/dD^* give the vertical shift in $\hat{e} = 0$ with a change in one of the fiscal positions. The terms in the dr and dr^* columns give the impact effect of a change in the debt position or in either fiscal position on the two interest rates. The slope term de/dB is larger than $-(X_b/X_e)$, the slope of $\hat{B} = 0$. The two shift terms de/dD and de/dD^* show that an increase in the home budget deficit shifts $\hat{e} = 0$ down, and an increase in the foreign deficit shifts it up.

The dynamics of \hat{e} are given by the vertical arrows in figure 1. If e is above the $\hat{e} = 0$ locus, then X in equations (A.2) and (A.3) is larger than the value consistent with $\hat{e} = 0$ for given B , D , D^* . This means that r must be larger than consistent with $\hat{e} = 0$ for (A.2) to hold, and r^*

Table A.1
Short-run Comparative Statics of $\hat{e} = 0$

Exogenous Variables	Endogenous Variables		
	dr	dr^*	de
dB	$\frac{p'S^{*'}X_e}{ A } > 0$	$-\frac{p'S^{*'}X_e}{ A } < 0$	$\frac{S'S^{*'}p' - X_b}{ A } \frac{X_e}{X_e} > 0$
dD	$\frac{X_e}{ A } > 0$	$\frac{X_e}{ A } > 0$	$\frac{-S^{*'}}{ A } < 0$
dD^*	$\frac{X_e}{ A } > 0$	$\frac{X_e}{ A } > 0$	$\frac{S'}{ A } > 0$

smaller for (A.3) to hold. With $r - r^*$ larger than consistent with $\hat{e} = 0$, from (A.4) \hat{e} must be positive. If the exchange rate is expected to rise, under rational expectations it does rise. So for a point above the $\hat{e} = 0$ locus to be consistent with equilibrium, e must be rising, and below it, falling.

Equilibrium Dynamics

Dynamic adjustment to the long-run equilibrium proceeds along the *ss* saddle path in figure 1. This is the unique path that has the two essential properties that (a) it leads to the equilibrium, and (b) along it expectations of \hat{e} are realized. All other paths are unstable "bubbles" that diverge to an asymptote normal to the *ss* path. Following a disturbance that shifts either the $\hat{e} = 0$ or the $\dot{B} = 0$ locus, for a given existing debt position the real exchange rate jumps onto the new *ss* path, and then the debt position and the exchange rate follow the *ss* path to the new equilibrium.

The comparative status of the long-run equilibrium can be obtained from equations (A.1) – (A.4) with X and \hat{e} set to zero. From (A.2) and (A.3) with $X = 0$, we get in the long-run equilibrium,

$$dr = \frac{1}{S'} dD, \text{ and } dr^* = \frac{1}{S^{*'}} dD^*. \quad (\text{A.6})$$

From the arbitrage equation (A.4) and (A.6) we obtain

$$dB = \frac{1}{p'} \left[\frac{1}{S'} dD - \frac{1}{S^{*'}} dD^* \right]. \quad (\text{A.7})$$

Finally, from (A.1) with $X = 0$ and (A.7) we obtain

$$de = - \frac{X_b}{p' X_e} \left[\frac{1}{S'} dD - \frac{1}{S^{*'}} dD^* \right]. \quad (\text{A.8})$$

The long-run solution is recursive.

As an illustration of the adjustment process, consider the effect of an unanticipated increase in the home fiscal deficit D (or decrease in D^*), shown in figure 2. The initial equilibrium is E_0 , from the previous figure. The increase in D shifts the $\hat{e} = 0$ locus down, according to the sign of de/dD in table A.1. This shifts the adjustment path *ss* down to s_1s_1 in figure 2, running into the long-run equilibrium E_2 , where the new $\hat{e} = 0$ locus (not shown) intersects the unshifted $\dot{B} = 0$ locus.

The real exchange rate jumps down to point E_1 , through a nominal appreciation of the home currency if price levels are slow to adjust. At

point E_1 , the real exchange rate is expected to rise along s_1s_1 . The appreciation generates a current account deficit that contributes to the finance of the budget deficit. The home interest rate exceeds $r^* + p(B_0)$ by the expected rate of increase of e .

The model exhibits an overshooting of the real exchange rate in response to a fiscal disturbance, in that the initial real appreciation is reversed in the increment to E_2 . In order to service the increase in debt from B_0 to B_2 , the home currency must eventually depreciate relative to E_0 . But to accumulate the increase in debt, it must first appreciate to E_1 .

The path from E_0 to E_1 , and back toward E_2 describes roughly the adjustment process of the U.S. real exchange rate and current account since 1980, with the 1988 point somewhat higher than E_0 , but not yet at E_2 . It is higher than E_0 because the real exchange rate has depreciated a bit relative to 1980, at least by the OECD's (1988) competitiveness measure. The contention that it has not yet reached E_2 follows from the hypothesis that at the existing level of e , the current account deficit would not go to zero. This implies further depreciation, in the absence of any further fiscal adjustment.

The main problem with this explanation of the path of the dollar since 1980 is that in fact the dollar appreciated in a series of irregular jumps from 1980 to 1985, rather than one single jump early in the period. The single jump from E_0 to E_1 would occur if the budget shifts had occurred fully when announced. In fact, the deficit in the United States emerged gradually, following a path that must have seemed uncertain from the point of view of the foreign exchange market. This could account for the irregular path to 1985. In addition, the 1985 peak could well have resulted from a temporary divergence onto a bubble path, as was argued by Krugman (1985).

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Discussion

*Paul R. Krugman**

This paper by William Branson and Grazia Marchese operates on two levels. At one level it presents a set of simulation results from major econometric models of the international economy, analyzing projections and alternative policy experiments. At the same time, the paper analyzes the same issues in terms of a small-scale theoretical model, in effect using it to model not only the world but also the bigger models. The result is an interesting mix, in which the sometimes obscure channels of influence in big models are illumined by the little model, while the little model gains in apparent relevance by the numerical results afforded by the bigger systems. In my comments I want to focus primarily on the small model, and on some aspects of the world that is being modeled.

On the whole I am highly sympathetic to the approach taken here. The small model embodies a basic point about international adjustments that ought to be universally accepted, but still is not. In mapping from the model to reality, however, there are some problems for which I have no good solution, but that I wish the authors had made more of.

What is important and right about the approach taken here is the emphasis on the complementarity of expenditure-switching and expenditure-reducing policies in any reduction of the U.S. external deficit. The current account balance is $S-I$; it cannot be narrowed unless the savings-investment gap is closed. But the current account is also $X-M$; the United States must sell more goods abroad or buy fewer foreign goods as part of the process of deficit reduction, which can only be accomplished by making U.S. goods and services relatively cheaper.

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Thus, reducing the deficit requires both a reduction in domestic demand and a depreciation of the dollar.

This should be an obvious point, yet it is one that policymakers seem oddly reluctant to accept. On the one side, some politicians, especially in the United States, seem to believe that currency depreciation can somehow solve the trade deficit all by itself, without any need for a domestic belt-tightening. On the other side, many central banks seem to believe that a lower U.S. budget deficit will somehow translate directly into a lower trade deficit, without any need for a lower dollar (and perhaps can even strengthen the dollar). The virtue of a model like this one is that it makes clear why exchange rate and expenditure adjustment are not alternatives, but necessarily go together.

While the model is useful for making this point, I am less convinced that a model like this one is adequate for understanding the economics of the dollar. There are two key problems. The minor one is the handling of lags, the major one the handling of expectations.

The point about lags should be apparent. While the econometric models used in the paper allow for slow trade adjustment, the theoretical model does not—and for that matter, even the econometric models almost surely understate the long-run effects of exchange rate changes. U.S. experience since the dollar began declining has demonstrated that the long lags in trade adjustment are surely as crucial a part of exchange rate dynamics as price adjustment or growing international indebtedness, which are the usual focus of dynamic exchange rate models. I think that the J-curve should be placed at the center of the story, not simply be given an occasional mention.

The other problem, which is harder to solve, is that of expectations. To close their model, the authors assume rational expectations—the device we all use, because of the lack of any good alternative. They then go on to suggest that the predictions of the model using this assumption track more or less the rise and fall of the dollar as it actually happened. Unfortunately, that just is not true.

The problem is that rational expectations, however persuasive as a modeling device, is an assumption that has no backing in the observed behavior of exchange markets, or indeed of financial markets in general. To take the simplest kind of test, forward rates not only are inefficient predictors of future spot rates, they are worse predictors than current spot rates; indeed, for many samples, forward premia are actually negatively correlated with subsequent exchange rate changes. Attempts to explain these results by invoking shifting risk premia look more and more like Ptolemaic epicycles, and the historical patterns of supposed risk premia do not make sense (a high risk premium on dollar assets when the dollar was rising, a negative premium when it was falling). Furthermore, it is by now a familiar point that the dollar's strength at its peak made no sense at all—had the dollar fallen as slowly as the market

apparently believed possible, the United States would have accumulated an infinite foreign debt.

No good answer exists to the question of how to model an irrational market. Ad hoc formulations of expectations formation are sometimes better metaphors for historical experience than rational expectations, but are subject to the Lucas critique. Models in which apparent irrationality is the result of a learning process when agents do not initially know the model are interesting but not really usable at this point. So I have no good alternative suggestion. All that I can advocate is caution: readers should be warned that our models do not account for history very well at all.

Discussion

Yoshio Suzuki*

I found the paper by Professor Branson and Ms. Marchese extremely stimulating, because it dealt explicitly with the question of adjustment of external imbalances between the United States, Japan and West Germany, a matter of great concern for both policymakers and academics in each country. Since the paper is made up of a theoretical model and policy simulations, I take them up in turn. With respect to the theoretical model, I basically agree with the analytical framework.

The paper tries to explain the relationship between expansionary fiscal policy in the United States and the movements of the dollar exchange rate in the 1980s using a simple theoretical model. In this model, the exchange risk premium is one of the primary determinants of the real exchange rate, together with real-interest-rate differentials. Since it is difficult to explain the sharp depreciation of the dollar after 1985 without taking into account the effect of the risk premium that emerged from the massive current account imbalances, I agree to their emphasis on the risk premium factor.

However, this theoretical model is in some respects not necessarily relevant to the policy simulations and proposals discussed in the latter part of the paper. For instance, it is applicable only to the analysis of the effects of fiscal policy, not those of monetary policy, since it deals exclusively with the relationships among real variables, not nominal variables. However, the policy actions that the authors most strongly recommend in the latter half of the paper involve an expansionary *monetary* policy in Japan and in West Germany.

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I have another reservation with respect to the specification of the current account balance in this theoretical model. It is assumed that the current balance, excluding the investment income balance, depends solely on the real exchange rate. This assumption seems to come from the underlying model, in which the trade balance is determined by the real exchange rate and domestic and foreign gross national products. The cyclical movements in GNP's are then abstracted. This assumption is justifiable if the dominant portion of imports consists of intermediate goods and raw materials. In this case, the level of imports is essentially determined by the GNP. However, the ratio of imports of final goods to total imports is relatively high in the United States, and this ratio has been on an upward trend in Japan. Therefore, in both countries, imports depend not only on *production* but also on *absorption*. This implies that even if the real exchange rate and domestic and foreign GNP's are stable, the U.S. current imbalances can still be improved if the domestic absorption of the U.S. is suppressed, for instance by cutting the U.S. budget deficits. According to the model adopted here, the current account deficit of the United States cannot be eliminated without a further depreciation of the dollar, since the role of absorption in the current balance is ignored in the model. I am rather skeptical about this view.

Now, let me turn my attention to the simulation results and policy implications. The paper provides several possible scenarios of the future adjustment process.

- (1) In Scenario 2, only the United States takes policy action and cuts its budget deficit. The merit of this scenario is a decline in the world real interest rate, while the demerit is a decline in the world growth rate.
- (2) So, in Scenario 3, expansionary fiscal policy in Japan and West Germany is added to Scenario 2. The gain is a speed-up of the current account adjustment process due to a further depreciation of the dollar, and an increase in the growth rate, while the loss is that the world interest rate, on average, does not fall as compared to Scenario 2.
- (3) In the last two scenarios, 4 and 5, which are preferred by Branson and Marchese, Japan and West Germany follow an expansionary monetary policy instead of a fiscal one, while the United States adopts the same contractionary fiscal policy as is the case in Scenario 3. In these scenarios, the world economy can maintain a high growth rate; thus, Scenarios 4 and 5 are better than Scenario 2. The world real interest rate falls; and so Scenarios 4 and 5 are better than Scenario 3. The major loss with these scenarios is the relatively slow adjustment of external

imbalances, in comparison with the other scenarios. But the authors conclude that two gains are superior to one loss.

I appreciate the clear-cut discussion presented here, and I would have agreed to the proposals of Scenarios 4 and 5 if the time had been 1986. However, the serious problem of this simulation today is the large difference between the assumed baseline forecasts for 1988 and the most recent actual data. Regarding Japan, the real growth rate in the first half of 1988 was 6 percent over the same period of the previous year, and the real growth rate for 1988 is now expected to be almost 6 percent. This growth rate is much higher than the IMF baseline of 3.7 percent or the OECD baseline of 3.4 percent. The IMF itself has already revised its estimate upward to 5.8 percent for 1988 and from 3.7 percent to 4.2 percent for 1989, in the latest *World Economic Outlook*. Also, the ratio of current account surplus to GNP in Japan has already fallen to 2.5 percent in the second quarter of 1988; this level is projected for 1989 in Scenarios 4 and 5. It has already been achieved a year in advance without any new policy.

Although these forecast errors by the IMF and the OECD are not the fault of these authors, they represent a serious problem with their simulation exercises. This rapid expansion of the Japanese economy is largely due to five successive cuts in the official discount rate in 1986 and 1987 to 2.5 percent, the lowest level in the history of the Bank of Japan. We also allowed a significant acceleration in the rate of monetary growth (in terms of M2 + CDs), which reached 12 percent at the end of 1987 compared with the appropriate long-run trend of 8 percent. Germany also has permitted an overshooting of its monetary target in recent years. However, the paper does not mention this expansionary monetary policy stance that has already been taken by Japan and Germany since 1986, and its results. Actually, a part of the policy recommendation of this paper, namely expansionary monetary policy in Japan and Germany, has already been implemented. The part that has not been implemented yet is the reduction of the U.S. budget deficits. The world is now worrying about a possible acceleration of inflation as a result of expansionary monetary policy in 1986 and 1987 in Japan and Germany without the promised cut in the U.S. budget deficits.

Taking account of these factors, this policy proposal should have been presented in 1986. In 1986 and through 1987, Japan has conducted an expansionary monetary policy in line with this proposal, while the United States has not cut its budget deficits enough. On the one hand, this has led to the expansion of the Japanese economy, one of the gains of this proposed scenario; but on the other hand, slow improvements in the U.S. current-account deficits and insufficient reductions in real interest rates continue, corresponding to the other, unrealized gains of the proposed scenario.

A rapid reduction of U.S. budget deficits is urgently needed. Even if the yen is forced to appreciate to some extent as a consequence, it would be desirable for the Japanese economy because it would reduce the possibility of excessive economic expansion and acceleration of the inflation rate. If the deflationary effects of the reduction of the U.S. budget deficits are much larger than expected, and if the Japanese economy threatens to go into a recession, Japan can take expansionary fiscal policy action without a large increase in its real interest rate, since the economy already has enough liquidity as a result of the past monetary expansion.

Lastly, the suggested loss in this proposed scenario, namely the possible delay in the external-imbalance adjustment, might not be as serious as predicted in the paper, when we consider the role of absorption, through which the cut in U.S. budget deficit affects the demand side. According to the empirical investigation by Hooper and Mann (1987) at the Federal Reserve Board, the increase in the U.S. current account deficits in the 1980s is largely attributable to the change in the real exchange rate when GNPs are used as explanatory variables. However, the role of the real exchange rate is significantly lessened and the role of the demand factor turns out to be more important, when absorption levels are used instead of GNPs. Considering the fact that the ratio of final goods imports to the total is about 50 percent in the United States, the effect of the cut in the U.S. budget deficits on its current account deficits may be quite large even if there is no further depreciation of the dollar.

Reference

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International Payments Imbalances in Heavily Indebted Developing Countries

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For combined threat and tenacity, few economic problems compare with the developing-country debt problem. When the Mexican payments crisis erupted in August 1982, it was the immediate threat to the stability of the international financial system that concentrated the minds of policymakers, at least in the creditor countries. However, the general hope, if not the expectation, was that the severity of the threat would diminish fairly quickly as the developing countries "adjusted" their economies, with the assistance of debt rescheduling and some new lending, so as to restore their creditworthiness and economic growth.

Indeed, the threat has diminished, but not because of successful adjustment or restoration of creditworthiness in heavily indebted developing countries. The threat to the financial system has eased as commercial banks have sharply reduced the share of their assets and capital exposed to the troubled debtor countries. The countries themselves are no better off, however.

The difficulty of the adjustment confronting the 15 heavily indebted countries—the tenacity of the debt problem—was generally underestimated.¹ This paper analyzes the nature of the adjustment that has taken place between 1982 and 1987, and, after considering some indexes

* Vice President and Economist, Federal Reserve Bank of Boston. Helpful comments were received from Michael Dooley, Steven Kamin, and Henry Terrell, but the author remains responsible for the deficiencies in this paper. Valerie Hausman provided competent research assistance.

¹ U.S. Treasury Department staff report that the "Baker 15" were selected as the 15 countries with the largest external debts, with debt owed primarily to commercial banks and also requiring rescheduling. They are listed in table 3.

of creditworthiness, raises the question of why growth has not accompanied adjustment.

Despite the lack of economic growth, the heavily indebted countries generally continue to service their debts, a phenomenon that is explored in a later section. Also addressed is the issue of debt relief.

The Balance-of-Payments Adjustment Process

In terms of the balance-of-payments accounts, the heavily indebted countries were confronted at the onset of the crisis with the challenge of financing a huge increase in interest payments, an increase stemming from marked rises in both their indebtedness and world interest rates. The \$28 billion surge in these payments from 1979 to 1982 more than "explains" the accompanying increase in the current account deficit (table 1). Since capital inflows to finance these interest payments were not forthcoming, trade balances had to be wrenched into sizable surplus. Remarkably, the surpluses were generated even though exports made almost no contribution, being of virtually the same value in 1987 as in 1982, and even smaller than in 1981. The improvement in the nominal trade balance was entirely accounted for by import reductions.

If exports of the 15 countries failed to increase in value, it was not for lack of increase in volume. The volume of exports grew by 23 percent from 1982 through 1987, but a decline in unit value was fully offsetting. On the other hand, the price paid by the 15 for imports rose by 3 percent over this period (IMF October 1988, pp. 84-85).

Whether the 23 percent growth in export volume should be viewed as a major adjustment effort is questionable. Over the same five-year period, the volume of world trade grew by 27 percent (IMF October 1988, p. 79). Thus, the 15 lost market share in real terms.

The massive import reductions of 1981-87 could not be effected without suppressing domestic growth. In no year between 1981 and 1987 did real GDP growth in the 15 countries even approach the average for 1970-79, and in 1987 per capita GDP was nearly 6 percent below the level of 1980 (table 2). To be sure, some of this decline represented a correction of the earlier economic boom, but some also resulted from the obstacles, internal and external, that these countries encountered in enlarging their exports.

The decline in economic growth was associated with a decline in gross investment. Between 1981 and 1987, gross capital formation fell from 24 percent to 17 percent of GDP in the heavily indebted countries (IMF October 1988, p. 66). Whether or not such a decline was warranted on efficiency grounds, the intermediate term prospects for economic growth seem diminished.

Table 1
 Current Account Transactions of 15 Heavily Indebted Developing Countries, 1979–87
 Billions of U.S. Dollars

Category	1979	1980	1981	1982	1983	1984	1985	1986	1987
Exports (f.o.b.)	94.2	127.9	127.0	112.2	111.1	123.4	118.8	99.4	112.5
Imports (f.o.b.)	96.1	122.4	133.6	108.2	82.8	80.4	78.2	78.7	86.1
Trade Balance	-1.9	5.5	-6.5	4.0	28.3	43.0	40.6	20.7	26.4
Services, Net	-25.8	-36.8	-46.9	-56.9	-46.8	-48.2	-45.1	-41.1	-40.1
Interest Payments Portion ^a	-17.1	-25.5	-37.8	-45.5	-41.3	-46.6	-44.3	-39.7	-37.5
Goods and Services Balance	-27.7	-31.3	-53.5	-52.9	-18.6	-5.2	-4.5	-20.4	-13.7
Unrequited Transfers	3.1	2.2	3.2	2.2	3.2	3.6	4.2	5.2	4.8
Current Account Balance	-24.6	-29.1	-50.3	-50.8	-15.3	-1.5	-.3	-15.3	-8.7

Note: Detail may not add to totals shown because of rounding.

^a Including dividends and other investment income payments not related to foreign direct investment.

Source: International Monetary Fund, *World Economic Outlook*, April 1988, pp. 156–57; October 1987, p. 85 and October 1988, p. 104.

Table 2
 Real GDP and Real GDP Per Capita in 15 Heavily Indebted Developing
 Countries, 1980–87
 Annual Percentage Change

Year	Real GDP	Real GDP per Capita
Average, 1970–79 ^a	5.9	3.3
1980	5.4	2.2
1981	.1	-1.9
1982	-5	-2.8
1983	-2.7	-4.9
1984	2.3	.1
1985	3.8	1.7
1986	3.8	1.5
1987	2.5	.1

^a Compound annual rates of change.

Source: International Monetary Fund, *World Economic Outlook*, October 1988, pp. 64–65.

With the aid of data kindly supplied by the World Bank, the anatomy of the adjustment in real terms can be examined in greater detail. For our base year, we select 1982, when the debt crisis erupted and the need for adjustment became widely perceived, and to facilitate comparisons we generally use 1982 GNP as a common denominator.² Our primary focus is on the contributions made to changes in the volume of net exports by various key components of the national accounts.

To begin with net exports themselves, we see in table 3 that all but one of the countries raised its real net exports between 1982 and 1987. The median change was 5.9 percent of 1982 GNP. The range of experience was wide, however, extending from -3.9 percent (Bolivia) to 12.7 percent (Venezuela).

The time path of the adjustment seems both suboptimal and halting. Only four countries—Chile, Colombia, Mexico, and Nigeria—have recorded noteworthy increases in net exports beyond the increases already reported by 1983 or 1984. And appreciable declines from the 1983 or 1984 levels are evident for three countries—Bolivia, Ecuador, and Uruguay. Thus, across countries little progress in aggregate adjustment is discernible beyond the progress attained in the first year or two following the onset of the debt crisis. The front-end loading of the

² As the pre-crisis peak year, 1981 might have been selected as the base, but GDP data for that year were highly bloated by the boom. Also, 1982 was the peak year for the current account deficit.

Table 3
Changes in Net Exports of Goods and Services, in Constant Prices, as
Percentage of 1982 GNP, For Heavily Indebted Developing Countries

Country	1982-83	1982-84	1982-85	1982-86	1982-87
Argentina	1.1	0	6.5	4.3	2.2
Bolivia	.3	2.3	-3.5	-3.5	-3.9
Brazil	3.0	5.6	6.7	3.8	5.9
Chile	4.2	-.5	6.4	6.7	7.3
Colombia	1.4	2.5	5.6	6.0	7.2
Côte d'Ivoire	-.4	8.3	7.2	7.9	7.3
Ecuador	8.2	9.1	10.4	13.3	5.7
Mexico	4.5	4.7	4.7	5.3	10.7
Morocco	3.1	2.5	1.2	1.5	3.4
Nigeria	2.8	6.7	9.3	13.0	12.6
Peru	4.7	10.1	12.7	7.8	9.2
Philippines	-.5	3.8	6.8	7.8	3.4
Uruguay	4.8	6.3	7.3	9.0	4.9
Venezuela	10.6	7.5	9.4	8.1	12.7
Yugoslavia	.1	1.0	1.8	1.1	1.0
Median	3.0	4.7	6.7	6.7	5.9

n.a.: not available.

Source: World Bank staff.

aggregate adjustment suggests that, in the early stages, resources were not given enough time to shift without becoming unemployed, and that, more recently, aggregate adjustment may virtually have stalled.

Table 4 reveals that the volume of imported goods and nonfactor services actually shrank in 11 countries between 1982 and 1987. The typical (median) change with respect to 1982 GNP was a decline of 2.0 percent, although declines of 11 or 12 percent were experienced by Côte d'Ivoire and Nigeria. In four countries, the decline was large enough to account for nearly all, or more than all, of their increase in real net exports.

While import reductions often are an essential ingredient of balance-of-payments adjustment, they do not necessarily generate equivalent improvements in net exports. Many imports become components of exports, and domestic substitutes for those imports may not be readily available. A reduction in such imports, especially if accomplished through controls, can force fairly direct reductions in associated exports (Khan and Knight 1988). Nonetheless, decreases in import volume over 1982-87 have typically been accompanied by increases in export volume. Moreover, the reductions in import volume, measured from 1982, have generally diminished in recent years.

For another perspective on the adjustment process, recall that a nation can enlarge its net exports only by expanding its output by more

Table 4
Changes in Imports of Goods and Nonfactor Services, in Constant Prices, as Percentage of 1982 GNP, for Heavily Indebted Developing Countries

Country	1982-83	1982-84	1982-85	1982-86	1982-87
Argentina	-1.1	0	-2.2	0	1.1
Bolivia	.7	-1.4	.7	4.1	4.6
Brazil	-1.7	-2.0	-2.0	0.1	-1.8
Chile	-4.0	-.3	-3.2	-.9	3.4
Colombia	-2.0	-2.7	-4.0	-3.5	-2.6
Côte d'Ivoire	-4.0	-7.8	-10.3	-10.6	-11.3
Ecuador	-7.6	-8.1	-6.5	-6.7	-3.9
Mexico	-3.1	-2.1	-1.1	-2.3	-2.0
Morocco	-2.4	-1.6	-1.6	-.1	-.5
Nigeria	-3.8	-6.5	-7.4	-10.3	-11.9
Peru	-8.3	-11.9	-13.3	-9.5	-8.8
Philippines	2.4	-1.3	-5.6	-2.0	2.5
Uruguay	-4.6	-7.3	-7.1	-3.4	-1.4
Venezuela	-11.8	-5.9	-7.6	-4.6	-6.7
Yugoslavia	-1.3	-1.4	-1.5	-.7	-2.0
Median	-3.1	-2.1	-4.0	-2.3	-2.0

Source: World Bank staff.

than its domestic absorption of goods and services, or by shrinking its absorption by more than its output. Thus, the changes shown for GNP and absorption for each country in table 5 yield the net change in the country's net exports reported in table 3 (except for rounding errors). For most people, the preferred way to expand net exports would be to expand GNP, but both economic advisers and markets are more effective at restraining absorption, especially in the short run.

In fact, between 1982 and 1987 absorption decreased in 8 of the 15 countries with the median change for all 15 amounting to -2.2 percent of 1982 GNP. Nonetheless, in none of the countries was absorption in 1987 below that in 1983 or 1984, again indicating that the adjustment "crunch" came several years ago. The range of experience is striking. While Nigeria suffered a reduction in absorption amounting in 1987 to 19 percent of 1982 GNP, Brazil enjoyed a 21 percent increase. Of course, unchanged aggregate absorption implies a substantial per capita reduction for the typical country.

Far from achieving adjustment with growth, three countries—Bolivia, Nigeria, and the Philippines—recorded reductions in real GNP between 1982 and 1987. Bolivia was the only one whose output fell even more than absorption, producing a decline in net exports. Although a few countries attained significant GNP growth over the five years, the median change was only 3.6 percent.

Table 5
Changes in Output (GNP) and Absorption (A) as Percentage of 1982 GNP for Heavily Indebted Developing Countries

Country	1982-83		1982-84		1982-85		1982-86		1982-87	
	GNP	A	GNP	A	GNP	A	GNP	A	GNP	A
Argentina	2.2	1.1	4.3	4.3	1.1	-4.3	8.6	5.4	9.7	8.6
Bolivia	-6.0	-5.9	-5.9	-8.1	-7.5	-4.0	-9.2	-5.8	-6.2	-2.4
Brazil	-3.3	-6.2	2.3	-3.3	11.4	4.8	21.7	17.9	26.6	20.8
Chile	-7	-5.0	3.2	3.7	8.0	1.6	14.2	7.5	23.2	15.9
Colombia	1.2	-2	3.6	1.1	6.5	1.0	10.6	4.6	16.6	9.3
Côte d'Ivoire	-3.4	3.0	-5.0	-13.2	-2.7	-9.9	3.5	-4.4	1.9	-5.4
Ecuador	-2.9	-11.1	-.9	-10.0	3.8	-6.6	7.5	-5.7	1.7	-3.9
Mexico	-5.0	-9.5	-1.0	-5.7	3.4	-1.3	-1.7	-7.0	3.4	-7.3
Morocco	1.9	-1.2	3.9	1.5	6.8	5.6	14.9	13.3	16.1	12.7
Nigeria	-5.4	-8.2	-13.0	-19.6	-5.2	-14.5	-.8	-13.8	-6.2	-18.8
Peru	-13.9	-18.6	-9.8	-19.8	-7.3	-20.0	4.0	-3.8	12.9	3.7
Philippines	1.2	1.7	-6.1	-9.8	-9.9	-16.7	-8.1	-15.9	-2.9	-6.3
Uruguay	-8.7	-13.5	-11.5	-17.8	-11.1	-18.3	-2.7	-11.7	2.7	-2.2
Venezuela	-4.4	-14.9	-6.4	-13.9	-5.2	-14.6	1.8	-6.3	5.2	-7.5
Yugoslavia	-1.2	-1.4	.4	-.6	.9	-1.0	5.2	4.1	3.6	2.6
Median	-3.3	-5.9	-1.0	-8.1	.9	-4.3	4.0	-4.4	3.6	-2.2

Source: World Bank staff.

Have the countries with the greater GNP or GDP growth been more successful in adjusting (enlarging) their real net exports (in relation to 1982 GNP or GDP)? The answer is negative; the correlation between growth and adjustment over the five years is virtually zero. Perhaps this finding should not be surprising. The nations with the higher growth rates may have attained those rates precisely because they were under less pressure to adjust, perhaps benefiting from more favorable terms of trade than other debtors or from more favorable appraisals by foreign lenders.

Is a sharp recession early in the adjustment process a good purgative, promoting external adjustment? Not obviously so; among this group of countries, no significant correlation obtains between the rate of real GNP change from 1982-83 and the change in net exports (as percent of 1982 GNP) from 1982-87.

As already noted, the typical heavily indebted country has been obliged to exercise severe restraint over its domestic absorption of goods and services. Now, not only the level but the composition of absorption is of considerable interest. Reductions in consumption may be more painful in the short run, but less painful in the long run, than investment reductions that lower future growth rates.

In table 6 we observe that the burden of restraining absorption has generally fallen primarily on gross domestic investment and secondarily on government consumption. Private consumption, with a median change of 5.8 percent of 1982 GNP, has grown in all but two of the 15 countries. The two, Mexico and Nigeria, suffered cuts in private consumption of 2.2 percent and 8.3 percent, respectively. (Because of the statistical discrepancy, PC, GC, and GDI in table 6 may not add to A in table 5.)

Gross domestic investment diminished in the typical country by 5.2 percent of 1982 GNP over the five-year period. In 12 countries investment declined. Even in Brazil, where GNP grew by nearly 27 percent, gross domestic investment increased by only 1.3 percent of 1982 GNP. The only country where investment increased notably in relation to 1982 GNP was Chile, with a remarkable gain of more than 11 percent.

Substantial restraint has been imposed on government consumption. The median experience from 1982-87 for the 12 countries reported was almost no change, and the largest increase was only 4.8 percent of 1982 GNP (Morocco).

Because absorption restraint has fallen so heavily on investment, GNP growth may be slow to recover. This is not to say that reductions in investment were unwarranted. During the pre-crisis boom, investment surely became excessive, yielding at the margin less than the socially relevant rate of interest. Thus, analyses of the debt problem may have placed too much emphasis on raising the supply of investable

Table 6
Changes in Real Consumption and Gross Domestic Investment as Percentage of 1982 GNP
for Heavily Indebted Developing Countries

Country	1982-83			1982-84			1982-85			1982-86			1982-87		
	PC	GC	GDI	PC	GC	GDI	PC	GC	GDI	PC	GC	GDI	PC	GC	GDI
Argentina	3.2	0	-1.1	8.6	1.1	-3.2	-2.2	1.1	-6.5	8.6	1.1	-4.3	8.6	3.2	-2.2
Bolivia	.2	-1.3	-5.3	1.0	-2.2	-6.9	6.3	-3.8	-6.4	9.1	-6.5	-8.4	9.0	-3.8	-7.6
Brazil	-3	-1.4	-4.6	1.4	-2.2	-2.5	5.1	.2	-.5	12.5	1.9	3.5	19.0	.5	1.3
Chile	-2.8	-1	-2.1	-1.8	.1	5.4	-2.7	.1	4.2	1.2	-2	6.5	5.1	-5	11.3
Colombia	.3	-1	-.5	2.5	.4	-1.8	4.0	.9	-3.9	6.4	1.1	-2.9	9.5	1.6	-1.8
Côte d'Ivoire	-.1	-.6	-2.3	4.7	-3.5	-14.4	6.0	-6.9	-9.1	13.7	5.7	-12.4	5.8	.1	-11.2
Ecuador	-1.8	-1.0	-8.3	.1	1.6	-8.6	2.8	-2.2	-7.1	3.4	-2.3	-6.8	5.3	2.6	-6.6
Mexico	-3.6	.3	-6.3	-1.5	1.1	-5.2	.6	1.2	-3.1	-1.3	1.4	-7.2	-2.2	1.3	-6.4
Morocco	.8	-.7	-2.1	3.3	-.7	-1.9	4.3	.9	-.8	11.4	3.7	-1.9	10.2	4.8	-2.2
Nigeria	-4.0	-.5	-3.7	-7.5	-3.4	-8.8	-1.7	-5.5	-7.3	-1.7	-4.4	-7.7	-8.3	-2.9	-7.5
Peru	-5.7	-1.0	-11.9	-4.6	-1.0	-13.8	-3.3	-1.1	-15.6	4.9	-.7	-8.1	9.4	-.5	-5.2
Philippines	1.9	-.4	-1.3	2.6	-.8	-12.4	2.5	-.9	-15.6	3.2	-.9	-16.5	6.9	-.3	-14.5
Uruguay	-7.4	-.4	-5.6	-12.0	-.3	-5.4	-11.1	.1	-7.3	-4.9	.6	-7.3	2.1	1.1	-5.3
Venezuela	2.7	-.3	-13.3	.5	-.2	-11.0	-1.0	-.3	-10.1	5.6	.4	-8.6	.4	.4	-5.0
Yugoslavia	-1.0	-.3	-.2	-1.5	-.2	.6	-1.5	0	.1	2.5	.7	-.5	1.8	1.1	.6
Median	-.3	-.4	-3.7	.1	-.2	-5.4	.6	0	-6.5	4.9	.6	-7.2	5.8	.5	-5.2

PC: Private consumption.

GC: Government consumption.

GDI: Gross domestic investment.

Source: World Bank staff.

funds to the heavily indebted countries and not enough emphasis on raising the productivity of investment.³

The importance of raising the efficiency of investment in problem debtor countries is suggested by recent estimates of total factor productivity for the period 1982–87. For countries with recent debt servicing problems, total factor productivity growth was estimated to be negative, subtracting three-quarters of 1 percent per annum from the growth of potential output. By contrast, in developing countries without debt servicing problems, growth in total factor productivity contributed an estimated 1.25 percent per year to potential output (IMF 1988, p. 31).

Finally, in this brief empirical survey of the adjustment process, we turn our attention to the commodity terms of trade, and we pose the following counterfactual: If export prices received by the heavily indebted countries could have been adjusted each year so as to bear the same ratio to import prices as in 1982, with other things equal, how would those countries' trade balances have been changed? The answer is presented in table 7, which reports, for the end year of each period, the amount by which actual net exports exceed or fall short of net exports valued at the 1982 terms of trade, as a percentage of nominal GNP. For 8 of the 15 countries, actual net exports in 1987 fell short of what they would have been if the 1982 terms of trade had prevailed. The median was a shortfall of 1.5 percent of 1987 GNP. For Nigeria, this loss amounted to a startling 38 percent of 1987 GNP.

With respect to the terms of trade, another relevant question is whether the countries experiencing the greater deteriorations in their commodity terms of trade have also recorded the greater deteriorations (or the smaller improvements) in the value of net exports as a percentage of nominal GNP, as reported in table 8. The correlation coefficient is 0.59 and is significant at the 0.05 level under a two-tail test. A stringent two-tail test is appropriate, because theory offers no strong presumption as to the direction of the effect of terms-of-trade changes on the current account balance (Sen and Turnovsky 1988). The relationship suggested by the correlation analysis should, of course, be subjected to more rigorous econometric testing than is feasible in this survey.

Is Creditworthiness Being Restored?

After six years of struggling, are the heavily indebted countries in better position to service their debts, and to assume new debt? Indicators of creditworthiness commonly consulted by lenders to these nations present a mixed picture (table 9). While ratios of debt to exports and to

³ Vito Tanzi argues along these lines (Tanzi 1988, p. iii).

Table 7
Hypothetical Changes in Value of Net Exports of Goods and Nonfactor Services Attributable to Changes in Terms of Trade, as Percent of End of Period Nominal GNP, for Heavily Indebted Developing Countries

Country	1982-83	1982-84	1982-85	1982-86	1982-87
Argentina	.3	1.0	-.9	-2.0	-2.6
Bolivia	-.5	-.8	1.4	-7.2	-9.2
Brazil	-.1	.9	.1	1.3	.8
Chile	1.1	-.9	-2.5	-2.2	1.1
Colombia	.1	.7	1.3	4.1	3.1
Côte d'Ivoire	.7	6.9	6.5	7.3	1.3
Ecuador	-.5	-1.7	-4.4	-15.3	-14.0
Mexico	-5.3	-4.7	-5.2	-12.2	-6.0
Morocco	.4	.2	.7	3.0	2.7
Nigeria	-.9	-.9	1.8	-16.8	-37.5
Peru	.2	.1	-1.9	-2.1	-1.5
Philippines	1.4	2.2	1.6	5.4	4.7
Uruguay	-2.5	-4.3	-5.3	-1.0	.1
Venezuela	-.8	5.3	1.0	-7.2	-13.4
Yugoslavia	-.3	-2.3	-3.0	.3	-2.3
Median	-.1	.1	.1	-2.0	-1.5

Source: World Bank staff.

GDP were much higher in 1987 than when the crisis erupted, debt service ratios were much lower.

These indicators resemble the leading economic indicators used to forecast business cycles, in that they constitute measurement without much underlying theory, and their movements can mislead the unwary. For example, a country in outright default and paying no debt service would have the lowest possible ratio of service paid. More generally, all such ratios provide very little information about the capacity of a nation to service additional debt. That capacity depends on the ability both to employ capital productively and, when necessary, to tap the proceeds, an ability that could differ sharply among nations having the same debt service ratios.

In the present instance, the sharp decline in the debt service ratio in 1987 was associated with debt relief amounting to some 9 percent of exports—a record high—rather than with marked favorable changes in fundamentals such as market interest rates or export demand (IMF 1988, p. 19). Such a development hardly testifies to the ability of the heavily indebted countries to service still more debt—although it is possible that they could do so, if sound investment projects were waiting in the wings.

Another index of creditworthiness is capital flight. Flight capital may be defined as capital withdrawn out of fear of large losses, so that

Table 8
 Net Exports of Goods and Services as Percentage of Nominal GNP, for Heavily Indebted Developing Countries

Country	1982	1987	Change 1982-87
Argentina	-5.8	-6.6	-.8
Bolivia	-3.5	-16.3	-12.8
Brazil	-6.3	-.5	5.8
Chile	-9.9	-4.6	5.3
Colombia	-5.9	.3	6.2
Côte d'Ivoire	-10.3	-1.7	8.6
Ecuador	-10.5	-16.4	-5.9
Mexico	-.7	.1	.8
Morocco	-20.2	-10.0	10.2
Nigeria	-7.7	-1.7	6.0
Peru	-9.9	-3.0	6.9
Philippines	-8.4	.1	8.5
Uruguay	-5.3	-1.8	3.5
Venezuela	-4.6	-2.0	2.6
Yugoslavia	-2.5	-2.3	.2
Median	-6.3	-2.0	5.3

Source: World Bank staff.

massive flight signifies a sharp loss of confidence by many investors in the creditworthiness of the afflicted nation. Because one cannot know what portion of a capital outflow is provoked by fear of large losses rather than by less dramatic investment motivations, capital flight cannot be measured directly. Indeed, the flight may go altogether unrecorded, since the withdrawals are often made through channels that evade both normal reporting requirements and governmental restraint. Ironically, this very evasiveness has provided the basis for some measures of capital flight, the quintessential example being the "errors and omissions" item in the balance-of-payments accounts. Large swings in errors and omissions have long been attributed chiefly to unreported capital movements, and these swings may offer a crude barometer of capital flight.⁴

The barometric readings in table 9 suggest that the storm has subsided considerably from the peak intensity of 1982. It is not so easy as it was some years ago to make the case that funds loaned to the heavily indebted countries are used merely to finance capital flight. Even more encouraging, of course, would be some sizable positive

⁴ For a comparison of alternative measures of capital flight, see Cumby and Levich (1987).

Table 9
Debt Indicators and Balance-of-Payments Errors and Omissions for Heavily Indebted Developing Countries, 1980–87

	1980	1981	1982	1983	1984	1985	1986	1987
External Debt ^a as Percent of:								
Exports of Goods and Services	168	202	268	291	272	290	348	337
Gross Domestic Product	33	38	42	47	46	46	47	50
Debt Service ^b as Percent of								
Exports of Goods and Services								
Total	29	39	50	40	40	39	43	35
Interest Portion	16	23	31	29	29	29	28	22
Balance-of-Payments								
Errors and Omissions								
(Billions of U.S. Dollars)	-8.1	-15.4	-17.0	-10.0	-1.8	-4.4	-.4	-2.9

^a Long-term and short-term debt at end of year, but excluding debt owed to IMF.

^b Interest payments on total debt plus amortization payments on long-term debt only, excluding payments to IMF.

Source: International Monetary Fund, *World Economic Outlook*, October 1988, pp. 115, 128–31.

entries for errors and omissions, suggesting the repatriation of capital that had flown and a concomitant surge in confidence.

Those with strong confidence in market valuations will form their impressions of creditworthiness not so much from the data in table 9 as from the data plotted in the figure. As shown, the weighted average secondary market discount for the debt of the 15 heavily indebted countries widened from 30 percent at the beginning of 1986 to more than 50 percent in the first half of 1988, even though interest rates in the industrial countries were generally no higher at the end of this period than at the outset. To be sure, the market for less developed country debt is itself less developed, so that quoted prices may sometimes be misleading; but as the market has become more mature the discount has hardly diminished. Moreover, according to a recent study by Sachs and Huizinga, the market values of commercial bank stocks have been in line with the market valuations of developing country debt held by the banks (Sachs and Huizinga 1987, pp. 559, 576–87). Thus, the discounts depicted in the figure may be a fairly good index of the creditworthiness of the heavily indebted countries.

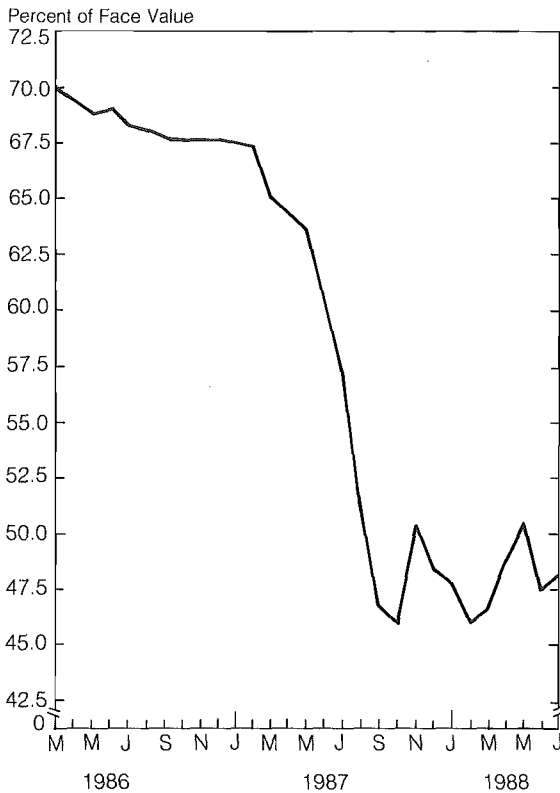
Rather than examining only the actual changes in such indexes of creditworthiness, one can compare those changes with earlier projections. One then obtains a measure of progress against expectations. If the progress diverges widely from the expectations, investigation of the reasons may yield helpful insights, leading to improved modeling of the relevant economic structure.

A preeminent source of forecasts relating to creditworthiness is the International Monetary Fund. In 1987 the Fund favored us with a frank analysis of the reasons that one of its earlier projections went awry. This analysis is summarized in table 10.

Focusing on the non-oil developing countries, the IMF projected in April 1984 that their external debt would be 132 percent of their exports of goods and services at the end of 1987. This projection contemplated a significant improvement from the figure of some 150 percent that had been published for 1983 (IMF 1984, p. 219). But by October 1987, the Fund had come to expect a ratio of 170, a number 38 points higher than the original forecast.

Of this net error, 14 percentage points were attributable to inadequate data on external debt, or in more positive phraseology, to progress in collecting data on debt that had been unknown to the Fund in April 1984. Another contributor to the error, accounting for 13 percentage points, was unexpected dollar depreciation, which boosted the dollar value of debt denominated in foreign currencies. Still another positive contribution, amounting to 19 percentage points, was made by a large, unforeseen decline in the prices these countries received for their export goods. Smaller, offsetting errors were generated by greater export

Secondary Market Prices for Developing Country Loans, March 1986 to July 1988^a



^a Weighted average prices for 15 heavily indebted countries, where weights are staff estimates of unguaranteed outstanding commercial bank debt at end-1986, adjusted for maturing short-term debt.
Source: International Monetary Fund.

volume and lower borrowing than had been expected for these countries.

What did not contribute to the forecast error is at least as noteworthy as what did. In particular, none of the error stemmed from a failure of gross output to grow as rapidly as projected in 1984. For the industrial countries, the output projections for 1987 made in 1984 and 1987 were identical; for the non-oil developing countries, the level of the 1987 projection was 1.75 percent higher than the 1984 projection. This fact is somewhat disquieting, as it raises doubt about the feasibility of adjustment *with growth* in the developing countries, a matter taken up in the next section. At a minimum, it is clear that "reasonable growth" in the industrial countries was not sufficient to improve the debt-to-export ratio, even with lower borrowing by the non-oil developing countries than the Fund had projected.

Table 10
Revision in IMF Projection of 1987 Debt Ratio for
Non-Oil Developing Countries^a

Description	Percentage Points
April 1984 Projection	132
October 1987 Projection	170
"Error" in Projection	38
Projection Error due to:	
Data Revisions ^b	14
Underlying Forecast Error	24
Forecast Error due to:	
Valuation of Debt ^c	13
New Borrowing	-5
Price of Exports	19
Volume of Exports	-3

^a The debt ratio is defined here as external debt outstanding as a percentage of exports of goods and services.

^b Reflects primarily the improved accounting of external debt statistics.

^c Reflects primarily the effects of exchange-rate changes.

Source: International Monetary Fund, *World Economic Outlook*, October 1987, p. 25.

Is Adjustment Compatible with Growth?

In principle, adjustment, or measures to restore creditworthiness, need not be the nemesis of growth. On the contrary, with effective expenditure-switching mechanisms that channel output growth into traded goods, growth should contribute to, rather than interfere with, balance-of-payments adjustment. The chief issue between "debt optimists" and "debt pessimists" is whether such an outcome is really attainable for the heavily indebted countries.

Optimists believe that heavily indebted countries will soon begin to "outgrow" their debts, lowering debt-to-GNP ratios largely through productivity gains partially financed by new loans from the rest of the world. For example, in a widely read article in *The Economist*, Martin Feldstein showed how Brazil might reduce the ratio of its external debt to its GNP by 18 percent between 1987 and 1992, "under relatively conservative assumptions" (including the assumption that Brazil's net debt service was limited to 2.5 percent of GNP). Such analysis led him to conclude that "muddling-through via modest increases in debt and equity" was the best approach to restoring growth and creditworthiness (Feldstein 1987). Pessimists doubt that even modest new lending to the heavily indebted countries is in prospect; or they doubt that new

lending, even if forthcoming, would be very effective in raising output, especially in relation to absorption.

Through 1987, the weight of the evidence favors the pessimists. Net lending to the heavily indebted countries remains very low, as indicated by their small current account deficit. Moreover, GDP growth rates also remain depressed, especially in per capita terms.

Why has adjustment with growth failed to materialize? Accurate quantitative answers to this question probably are not possible, but a number of hypotheses are deserving of serious consideration, including the following:

- (1) Past investments may have been ill-conceived, yielding little or no return;
- (2) Even well-conceived investments have been rendered uneconomic by unforeseeable adverse shifts in the terms of trade and in real interest rates;
- (3) Because of the rapid contraction in new lending, insufficient time was allowed for an efficient shifting of resources in the manner called for by long-term adjustment;
- (4) Extreme risk aversion has come to characterize the attitude of potential lenders, who, once burned in lending to heavily indebted countries, are now twice shy;
- (5) Aside from such risk aversion, the debt overhang itself discourages new foreign lending, because new loans, no matter how productive, may be lumped in with old unproductive loans for repayment purposes;
- (6) Governments of heavily indebted countries have often discouraged investment and growth through government dissaving, overvaluation of their currencies, and uncertainty-generating policy shifts.

Of course, these hypotheses are not mutually exclusive, but mutually reinforcing.

With regard to the first hypothesis, anecdotes are legion of hasty loan commitments to developing countries in the years immediately preceding the onset of the debt crisis. Many of the investments financed by these loans seem to have been selected in equal haste. One indication is the relatively high incremental capital-to-output ratios observed in a number of countries in the years surrounding the onset of the crisis; another is very low financial rates of return to public sector investments;

still another is estimated negative total factor productivity change in countries with debt-servicing problems.⁵

Bad judgment was compounded by bad luck, as the terms of trade turned sharply adverse for the 15 heavily indebted countries. Between 1982 and 1987, the prices of their exports fell by 20 percent in relation to the prices of their imports (IMF October 1988, p. 88). Moreover, the real interest rates paid by the developing countries, which had generally been negative from 1976 to 1980, soared in 1981 and 1982 and hovered around 13 percent through 1986, before plunging in 1987.⁶

The third hypothesis recognizes that dramatic changes in fundamental economic conditions, such as the changes of the early 1980s, call for extensive shifts in resource allocation. Developing country resources previously devoted to the production of nontraded goods had to be redirected to the production of exportables and import-competing goods. Some resource adjustments can be made quickly; others require more time. The more abruptly a current account deficit must be eliminated, the more expansion or contraction will occur in those activities that can respond relatively quickly and easily; and some of this short-run shifting will have to be reversed eventually as other adaptations, more suitable in the long run, become feasible. Thus, in the short run the country may expand its output and export of apparel, because it has the factories and marketing facilities in place. But from the standpoint of long-run adjustment the workers added to the apparel industry should perhaps be constructing buildings to house electronic assembly operations.

No elaboration is probably needed of points 4 and 5. As for the sixth, private investment is likely to have been diminished by governmental deficits in many heavily indebted countries. As one crude index of the problem, between 1982 and 1987 central government deficits ranged from 3.4 to 6.5 percent of GDP for these countries as a group (IMF October 1988, p. 78). Where the deficits have been to some degree financed by domestic market borrowings, private investment may have been crowded out. Commonly, the deficits have been largely financed, directly or indirectly, by domestic central banks, contributing to intense inflationary pressure that has also discouraged private investment. Another deterrent to private investors is the prospect of tax increases,

⁵ On incremental capital/output ratios, see Bianchi (1987, p. 214) and Tanzi (1988, p. 13). On rates of return, see Tanzi (1988, pp. 11–14). Total factor productivity is discussed in IMF (1988, p. 31).

⁶ The real interest rate is here defined as the six-month dollar LIBOR divided by the change in the price of exports of the developing countries (The World Bank 1988a, p. xv).

Table 11
Real Effective Exchange Rates for Selected Developing Countries, 1981–87
1980–82 = 100

Year	Argentina	Mexico	Korea
1981	107.7	114.1	101.2
1982	76.5	81.9	102.9
1983	71.6	79.0	97.6
1984	80.2	91.9	96.5
1985	71.0	90.4	88.7
1986	60.8	65.0	82.1
1987	53.4	66.7	84.0

Note: Where the exchange-rate system entailed multiple rates, the official rate was used in the calculations.

Source: *World Financial Markets*, 1988 Issue 7, p. 15, and February 1986, p. 11.

whose nature is uncertain, for the purpose of reducing the deficit in the future. Indeed, among analysts a clear consensus now exists that the heavily indebted countries cannot resume sustained, significant growth in per capita GNP without appreciable reductions in their governmental deficits.⁷

Although “overvaluation” is difficult to define operationally, the sharp depreciations of some developing country currencies during the 1980s at least raise the question whether those currencies had become severely overvalued, partly in response to excessive government borrowing from abroad. For example, the data in table 11 are consistent with the proposition that the Argentine and Mexican currencies were severely overvalued in 1981, and Korea’s currency much less so, if at all. This interpretation is supported by estimates showing massive capital flight from Argentina and Mexico, but not from Korea, during the early 1980s.⁸ Moreover, the wider fluctuations in the Argentine and Mexican exchange rates surely generated greater uncertainty among potential investors in those countries. Such fluctuations in exchange rates for developing country currencies were sometimes associated with abrupt changes in government policies.

These six hypotheses are hardly the full explanation of why growth-cum-adjustment has failed to materialize in the heavily indebted countries, but we doubt that any full explanation could omit them.

⁷ See, for example, The World Bank (1988b, p. 78); Sachs (1987); and Balassa et al. (1986, pp 13–14).

⁸ For estimates that probably are upper bounds, see The World Bank (1985, p. 64).

Why Is Debt Being Serviced?

Even though the heavily indebted countries have not been able to resume growth in per capita GDP, they generally continue to pay interest on their indebtedness. What determines the interest that the developing countries pay? The answer may require a dynamic, general equilibrium model of the world polity and economy. Here we present only a preliminary regression analysis that may offer some insights for more comprehensive modelling.

To begin with, if a country were both willing and able to meet its obligations, its interest payments would simply be a function of its outstanding indebtedness. Different classes of debt would, of course, entail different rates of interest. But the record is clear that countries differ in both ability and willingness to pay. An obvious index of ability to pay is per capita income. Another such index may be export receipts, since such receipts provide foreign exchange with which to service debt in the absence of net capital inflows (provided, of course, that the country economizes on imports).

What determines willingness to pay is more conjectural; change in per capita income seems a logical economic determinant. In addition, countries with large export receipts would generally be more vulnerable to trade sanctions or interruptions of trade credit, and on this count would have greater incentive to service their foreign debt. Thus, the volume of export receipts may affect willingness as well as ability to pay.

These considerations lead to the following model:

$$(I/Y)_i = a + b_1(LGD/Y)_i + b_2(C/Y)_i + b_3(LPD/Y)_i + b_4(P/Y)_i \\ + b_5(X/Y)_i + b_6\Delta(P/Y)_i + e_i,$$

- where I = total interest payments on long-term external debt, public and private,
 Y = GNP,
 LGD = long-term public (and publicly guaranteed) external debt, excluding debt on concessional terms,
 C = long-term public external debt on concessional terms,
 LPD = long-term private (nonguaranteed) external debt,
 P = population,
 X = exports of goods and services,
 e = the error term,
 and the subscript, i , represents the country.

The parameters were estimated by ordinary least squares. Available data permitted 79 developing countries to be included in the sample. All debt is the average for the year-ends 1981–86. Other variables are averages for 1982–86, with two exceptions: (P/Y) , which is the average of

population for 1982 and 1986 divided by the average GNP for 1982–86, and $\Delta(P/Y)$, which is the percentage change in population per unit of GNP between 1982 and 1986. Population data are in millions, and other underlying data are in millions of U.S. dollars.⁹

The estimated equation is as follows, with *t* statistics in parentheses:

$$(I/Y)_i = 0.003 + 0.056(LGD/Y)_i - 0.110(C/Y)_i + 0.138(LPD/Y)_i \\ (0.92) \quad (9.26) \quad (-0.68) \quad (8.21) \\ -0.776(P/Y)_i + 0.014(X/Y)_i - 0.00004\Delta(P/Y)_i. \quad \bar{R}^2 = 0.79. \\ (-1.09) \quad (2.76) \quad (-1.23)$$

The data are long-period averages, and it would be gratifying to believe that the explanatory variables were fully exogenous, reflecting basic structural differences among countries but not phenomena affecting the explanatory and dependent variables jointly. We refrain from such wishful thinking, and take the results as suggestive only.

What is suggested, then, is that—at the margin and other things equal—the developing countries have been paying on their long-term private debt a rate of interest more than twice that on their long-term government debt (excluding concessional debt). Concessional debt increments seem to have been truly concessional, yielding no interest. As expected, higher exports may contribute to higher interest payments. Although the remaining parameters bear the expected signs, they are not significantly different from zero.

The ultimate test of creditworthiness, of course, is not how much interest is paid but whether debt is serviced on schedule. Thus, a number of studies have sought to identify the factors that determine whether developing country debt is rescheduled. One very recent and imaginative analysis concludes that a country is more likely to undergo rescheduling, and to experience deep secondary market discounts on its debt, if it has a highly unequal income distribution, a low share of agriculture in GNP, a low per capita income, and an inward-oriented trade policy (Berg and Sachs 1988). The first two of these explanatory variables are presumed to make for political instability and poor government management of fiscal policy.

Rescheduling, while a nuisance, nonetheless evidences that a debtor country has at least worked out an agreement with its creditors, so that debt servicing remains on schedule, albeit a more relaxed schedule. By contrast, arrears signify an inability or unwillingness to service debt on any mutually acceptable schedule.¹⁰ As table 12 shows,

⁹ Population data are from IMF (1987). Other data are from The World Bank (1988c).

¹⁰ Arrears are simply payments that a country owes but fails to make on schedule (or to reschedule by agreement with creditors).

Table 12
 Payments Arrears by Heavily Indebted Developing Countries, 1982-87
 Millions of U.S. Dollars

	1982	1983	1984	1985	1986	1987	Total 1982-87
Argentina	2,654	304	910	-2,393	-991	415	899
Bolivia	76	32	545	353	334	272	1,612
Brazil	0	2,192	-2,231	0	0	n.a.	n.a.
Chile	0	0	0	0	0	0	0
Colombia	0	0	0	0	0	0	0
Côte d'Ivoire	0	0	0	0	0	0	0
Ecuador	191	-46	118	-279	-15	0	-31
Mexico	0	0	0	0	0	0	0
Morocco	0	0	0	0	0	0	0
Nigeria	3,216	1,966	1,023	460	387	1,079	8,131
Peru	0	0	1,284	1,282	1,541	1,603	5,710
Philippines	0	1,095	628	-1,096	0	0	627
Uruguay	0	0	0	0	0	0	0
Venezuela	0	0	0	0	0	0	0
Yugoslavia	0	0	0	0	0	0	0

Note: Data show arrears incurred or discharged (-) each year.

Source: International Monetary Fund, *Balance of Payments Statistics* 39: Yearbook, Part 1, 1988.

five of the heavily indebted countries reportedly accumulated net arrears over the period 1982-87. At least for Nigeria and Peru, the sums were sizable. Ecuador, on the other hand, discharged arrearages over these years, as did Brazil for the period 1982-86.

The curiosity is that arrears have not been greater. The customary explanation is that countries service their debts for fear of being cut off from new loans. However, for several years the net new lending extended to the heavily indebted countries (their current account deficit) has been dwarfed by their interest payments (table 1). Indeed, net outward financial transfers from Latin America, whether measured as a percent of GDP or as a percent of exports, reportedly have exceeded the famous war reparations payments by Germany and rival the payments made by France following the Franco-Prussian War. If the trade surplus is a reliable index, Latin American real transfers clearly exceed those associated with the French and German reparations, according to the data in table 13.

Even if the heavily indebted countries could reasonably expect substantial net loans, recent theorizing indicates that the threat of denial of such future credit is not necessarily sufficient to deter default in the present (Eaton, Gersovitz, and Stiglitz 1986). The cost of being denied credit is having to endure wider fluctuations in consumption, or having to stockpile foreign-exchange reserves with which to smooth consump-

Table 13
 War Reparations, Net Outward Financial Transfers, and Trade Surpluses for
 France, Germany, and Latin America, for Selected Periods

Country and Period	Reparations (France, Germany) or Net Transfers (Latin America) ^a		Trade Surplus	
	Percent of GDP ^b	Percent of Exports ^c	Percent of GDP ^b	Percent of Goods Exports
France, 1872–75	5.6	30.0	2.3	12.3
Germany, 1925–32	2.5	13.4		
1929–32			2.5	13.8
Latin America, 1982–85	4.2	25.7	4.3	31.1
Argentina	6.0	41.4	5.9	48.0
Brazil	2.9	24.2	3.7	34.6
Colombia	–.3	–2.8	–2.8	–25.0
Costa Rica	–.3	–1.2	–.4	–1.5
Chile	3.3	14.2	2.6	14.3
Ecuador	4.5	19.6	6.6	32.2
Mexico	7.9	42.1	7.0	46.8
Peru	.8	4.6	2.3	15.8
Uruguay	5.3	20.8	4.6	23.7
Venezuela	9.3	33.6	11.2	43.3

Note: All data should be treated as estimates.

^a For France, reparations of F 5,000 million under 1871 peace treaty of Frankfurt ending Franco-Prussian War; for Germany, reparations of RM 10,720 million in currency and payments in kind as prescribed in 1919 Treaty of Versailles; for Latin America, net inflow of capital minus net payments of interest and profits.

^b National income rather than GDP for France and Germany.

^c Assumed to be goods, for France and Germany, and goods and services, for Latin America.

Source: Andres Bianchi, "Adjustment in Latin America, 1981–86." In *Growth-Oriented Adjustment Programs*, Vittorio Corbo et al., eds. 1987. pp. 206–207.

tion. Unless the borrowing country is extremely risk averse or faces a highly uncertain income stream, this cost may not seem high compared to the cost of repaying outstanding loans.

Thus, the economic incentive to service outstanding debt may arise mainly from considerations other than the net benefit of future net borrowing. One such consideration is the benefit of future *gross* borrowing, especially the borrowing that finances international trade. Even though a country may be a net creditor, its trade can be unsettled by a trade credit embargo.

The legal remedies available to the creditors of a defaulting sovereign government are limited, but not inconsequential, and have been

significantly expanded since World War II.¹¹ Before 1945 foreign governments were virtually immune from suit in the courts of the United States or the United Kingdom, the two major creditor countries. But as governments began to participate more fully in activities that previously had been the domain of private commerce, sovereign international borrowing came to be construed as a commercial activity. Today, therefore, courts within the United States and the United Kingdom will hear the requests of private creditors for sanctions against defaulting sovereign borrowers. And assets of the borrower that are used or held outside its territory for commercial purposes may be seized or attached, in most Western countries, especially if the loan contract contains the customary waiver of sovereign immunity with respect to the attachment of assets. Especially relevant is the right of banks to set off deposits owned by a defaulting borrower against unpaid loans.

Of course, a sovereign borrower planning to default might well take pains to shift its assets beyond the jurisdiction of courts that might seize them. Nonetheless, creditors could obtain orders of attachment for any future assets (including exports) of the debtor government or its instrumentalities that might come within the jurisdiction of the creditors' courts. Such action would give priority within that jurisdiction to the claims of these creditors over any new obligations incurred by the debtor. Thus, the debtor government would have difficulty in arranging new purchases, unless it could persuade suppliers to accept promised payments in jurisdictions other than those protective of creditors.

Defaulting governments may also face other costs. For example, under the Sovereign Immunities Act of 1976, countries defaulting on debts to U.S. citizens are to be denied trade preferences; and if claims are outstanding against a country in U.S. courts, U.S. representatives to the multilateral lending institutions are to vote against loans to that country.

Thus, the costs that may be incurred by defaulting are not limited to the curtailment of credit *per se*. The total costs seem to have been a significant deterrent. Among the heavily indebted countries, only a few have approached a state of "confrontational default." Peru is one. Having declared in July 1985 that its debt-service payments would be limited to 10 percent of its export earnings, Peru proceeded to amass arrears and showed little willingness to compromise with its creditors.

Peru's experience is instructive. In order to reduce the nation's vulnerability to legal sanctions that might be sought by creditors, the government shifted most of its foreign-exchange reserves into accounts that would be less open to seizure. In particular, the country's entire gold reserves, some 70 tons, were recalled from Zurich to Lima in

¹¹ See Alexander (1987, ch. II) and Kaletsky (1985).

February 1986. Since that date, however, reserves have dwindled. Peru also formulated contingency plans to circumvent any efforts to disrupt its merchandise trade. To thwart such efforts, the country would seek to channel its trade transactions so as to avoid holding title to goods within court jurisdictions friendly to creditors. According to estimates by Peruvian officials themselves, the cost of circumventing trade sanctions imposed after an outright default would range from 10 to 15 percent of the value of commodity trade (Alexander 1987, p. 46). On September 28, 1988, the Government relaxed its confrontational posture, announcing its intent to clear its arrears with the IMF and World Bank.¹²

Brazil, too, has been confrontational. On February 20, 1987, the Brazilian government announced an indefinite suspension of interest payments on most of its debt to foreign commercial banks. In February of the following year, however, Brazil indicated its readiness to resume those interest payments in conjunction with a debt rescheduling and new loans on terms more favorable to creditors than the nation had earlier been willing to accept. At the time, President Sarney conceded, "The fact is that we can't destroy the international financial system. We can scratch it, but it can destroy us."¹³ And Jose Luis Machinea, president of Argentina's central bank, concluded, "It has been demonstrated that the costs of a moratorium, such as cuts in credit lines and other losses, are greater than the benefits."¹⁴

The costs of a moratorium are not limited to those imposed by a government's external creditors. If a government refuses to service its external debt, doubts surely arise as to whether it will service its internal debt. A government that does not honor its obligations abroad may encounter greater difficulty in marketing them at home, and the interest it saves from nonpayment to external creditors may be partly offset by higher risk premiums demanded by resident creditors. More generally, all investors, especially foreigners, may become more fearful that the government will take additional measures to raise its revenues or foreign-exchange holdings at their expense. Thus, aggregate investment in the nation's economy may be suppressed.¹⁵

In sum, both logic and recent history suggest that unilaterally "laying down the law" toward creditors is unprofitable for a debtor, or

¹² "World Bank Appears Eager to Return Peru to Fold," *Journal of Commerce*, September 30, 1988.

¹³ Alan Riding, "Brazil Seeks to Mend Ties with Lenders," *The New York Times*, February 15, 1988.

¹⁴ Alan Riding, "Brazil's Reversal of Debt Strategy," *The New York Times*, February 22, 1988.

¹⁵ Lawrence J. Brainard argues that Brazil's moratorium had this effect (1988, pp. 41-42).

at least less profitable than genuine bargaining.¹⁶ For creditors, too, compromise is generally preferable to declarations of default. The willingness of creditors to bargain is clear; they have not declared defaults even for borrowers with substantial arrears and confrontational postures.

The bargaining position of U.S. commercial banks has strengthened since the onset of the debt crisis, in that much smaller percentages of their assets and capital are accounted for by loans to heavily indebted developing countries. Loans to these countries from all U.S. banks amounted to 129 percent of bank capital at the end of 1982, but had been reduced to 54 percent of bank capital by September 1988. For the nine money center banks, the corresponding percentages were 193 and 96 (table 14). As a consequence, the banks were under less pressure to "throw good money after bad," a matter taken up in the next section.

The Issue of Debt Relief

While the commercial banks have not issued declarations of default, neither have they announced forgiveness of outstanding debts. Yet some measure of forgiveness might be in their own self-interest.

It is well known that at times it can be in the interest of a creditor to "throw good money after bad." Suppose a new firm borrows \$500,000 to finance the purchase of machinery with which to manufacture an established product.¹⁷ Suppose that a new health or safety standard is then promulgated, rendering the output of the machinery unsalable and confronting the new firm with bankruptcy. Assume that for \$100,000 the machinery could be modified to manufacture a product that satisfied the new health or safety standard, and that the return would not only repay the added \$100,000 with interest, but nearly all of the original \$500,000 investment. In this case, the lender would be foolhardy not to throw good money after bad, especially since the firm, if surviving, might manage eventually to repay all funds borrowed.

This kind of thinking played an important role in the immediate aftermath of the 1982 Mexican debt crisis. Developing countries that could not meet their interest payments received new loans from their creditor banks in the hope that adjustment programs facilitated by the new loans would enable the repayment of most, if not all, of the outstanding debt. In Cline's terminology, rational creditors "will provide additional new loans as long as (a) the reduction in the probability

¹⁶ Bolivia may be an exception. See Sachs (1988b, pp. 29-32).

¹⁷ To keep things (overly) simple, assume that \$500,000 is the full cost of the machinery. (History suggests that lenders can sometimes be imprudent.)

Table 14
U.S. Bank Claims on Developing Countries, 1980–88

End of Period	All U.S. Banks with Significant Foreign Banking Operations						Nine Money Center Banks					
	Billions of Dollars		As Percent of				Billions of Dollars		As Percent of			
			Total Bank Assets		Total Bank Capital ^a				Total Bank Assets		Total Bank Capital ^a	
	All Developing Countries	Heavily Indebted Countries	All Developing Countries	Heavily Indebted Countries	All Developing Countries	Heavily Indebted Countries	All Developing Countries	Heavily Indebted Countries	All Developing Countries	Heavily Indebted Countries		
1980	96.8	67.5	9.1	n.a.	169.8	n.a.	63.5	n.a.	12.0	n.a.	264.6	n.a.
1981	115.8	81.5	9.9	n.a.	184.7	n.a.	74.0	n.a.	13.1	n.a.	283.5	n.a.
1982	128.3	91.1	10.2	7.2	181.7	129.0	82.0	55.9	13.9	9.5	282.8	192.8
1983	132.9	94.2	9.9	7.1	167.6	118.8	84.7	57.8	14.6	9.9	268.9	183.5
1984	129.9	95.4	9.2	6.8	140.9	103.5	83.8	60.0	14.2	10.2	228.3	163.5
1985	119.0	90.5	7.8	5.9	112.9	85.9	78.3	58.9	12.6	9.5	185.1	139.2
1986	108.6	86.2	6.7	5.3	93.5	74.2	71.7	56.4	11.2	8.8	153.5	120.8
1987	100.2	81.7	6.1	5.0	77.6	63.2	67.1	54.6	10.7	8.7	130.3	106.0
Sept. 1988	88.9	73.6	5.3	4.4	65.4	54.2	61.9	51.8	9.9	8.3	114.2	95.6

Note: Data are for domestic and foreign offices of the banking organizations and cover only cross-border and nonlocal currency lending.

^a Capital includes equity, debentures, and reserves for loan losses.

n.a.: not available.

Source: Board of Governors of the Federal Reserve System, "Country Exposure Lending Survey," Statistical Release E.16 (126), various issues.

of country default thereby achieved, *multiplied by* previously outstanding loans, *exceeds* (b) the terminal probability of default (after the new loans) as *multiplied by* the amount of the new loans" (Cline 1984, p. 72). Lending motivated by such a calculus was "forced," or "involuntary," or "defensive," in the sense that it would not have occurred if the lenders had held no previously outstanding claims on the debtors.

The volume of new lending to the heavily indebted countries was not sustained for long, however. The Baker Plan called for \$20 billion in new loans from commercial banks over the three years ending with 1988, a target that is not being attained. Apparently, additional lending, as evaluated by the banks, did not satisfy Cline's criterion. The figure suggests the reason; deepening and then large discounts in the secondary market implied that new loans had failed to raise the value of those previously outstanding, and banks no doubt assumed that additional new loans would have a market value well below their book value.

It is a short step to ask whether it could be in the interest of creditors not to extend additional loans but to forgive some of the loans outstanding, or to extend equivalent concessions. The step is short because defensive lending itself contains a concessionary element, namely, the expected loss on the new lending (element (b) in Cline's formula). The case for partial forgiveness, then, is an elaboration of the case for defensive lending.

In the machinery example, the firm might be reluctant to modify and operate the equipment in exchange merely for the additional \$100,000 loan, perhaps preferring termination to the prospect of operation with no net profit. But if the lender were willing to share the gain from the additional loan and modifications, the firm might respond positively. Forgiving part of the loans would be one form of sharing by the lender. Having shared in the borrower's current ill-fortune, however, the lender might insist on sharing in any future good fortune, such as a *cost-reducing* change in regulatory standards. Thus, pure loan forgiveness would not be so attractive from the lender's standpoint as making repayment of part of the loan contingent upon future good fortune.

This crude example introduces the key issues raised by recent theorizing concerning the effects of debt forgiveness on the incentives for borrowers to repay.¹⁸ In general, a debtor country can, through adjustment effort in the present (such as curtailing consumption in favor of investment), augment its output that will be available in the future for debt service or for domestic absorption. As Corden has elegantly demonstrated, debt forgiveness, in the proper circumstances and the proper dosage, can make both borrowers and lenders better off (Corden

¹⁸ See especially Corden (1988), Krugman (1988), and Sachs (1988a).

1988). For this result to hold, so large a share of any future increase in the debtor's output—an increase gained from reducing current consumption—must be destined for debt service (in the absence of forgiveness) as to discourage the borrower from cutting back further on current consumption. In these circumstances, a measure of forgiveness, allowing the country to retain more of future output increases, could provide the requisite incentive for an adjustment effort that would generate extra output sufficient to meet much of the original debt-service obligation.

Once forgiveness had been declared, it could be rendered unnecessary by a favorable change in the debtor's environment, such as a reduction in world interest rates or an improvement in the debtor's terms of trade. In principle, then, forgiveness should be linked to the nonoccurrence of such favorable developments, and withheld if they occur. To grant this point, however, is to compromise the case for forgiveness. Reschedulings—or at least retention of the original claims—seem preferable as long as any prospective change in the debtor's circumstances might allow eventual repayment in full. The problem, as always, is foretelling the future.

Moreover, as a general rule, commercial banks have shown little inclination to bear the risks of changes in the environment. Exhibit A is their growing reliance over the years on variable rather than fixed rates on their loans to developing countries.¹⁹ Clearly, the banks have preferred that the borrowers bear the risks of changes in interest rates.

How to deal with such environmental changes is not the only obstacle to implementing forgiveness in an efficient way, so as to improve the welfare of both lenders and borrowers. To predict the debtor country's response to forgiveness—to ensure that forgiveness enhances rather than diminishes adjustment effort—one must estimate the country's marginal efficiency of investment (or, more broadly, the marginal efficiency of adjustment effort) and the country's intertemporal utility function, as well as the minimum level of absorption that the country will accept (given its range of prospective output). Preparing accurate estimates of these parameters would require a certain sagacity. To be sure, essentially the same parameters had to be evaluated, at least implicitly, by creditors at the time the currently outstanding loans were committed, but the current status of the loans forcefully testifies to the difficulty of the undertaking.

Given the difficulties of ensuring that forgiveness will be efficient, it is not surprising that forgiveness thus far has been reserved for the "basket cases," for cases where it is generally agreed that per capita income is extraordinarily low, the marginal efficiency of investment is

¹⁹ The World Bank (1988a, p. 3), presents data on the rising share of variable rate debt in public debt of the developing countries.

negligible, and nonpayment of debt service is fully attributable to “inability” rather than “unwillingness” to pay.²⁰ Thus, in practice, whether to forgive becomes more nearly a structural than a marginal calculation.

The Puzzle of Pre-Crisis Lending

One of the puzzles about lending to the heavily indebted countries is why such a large volume of loans was extended in the first place. At the time—before 1982—the lending was justified, or at least rationalized, on several plausible grounds. The losses experienced by banks on international loans had been proportionately lower than on domestic loans. Many developing countries had compiled much better economic growth records than the industrial countries had, and the officially published indicators of developing country creditworthiness had not been flashing red, at least not for long and not uniformly.

What is puzzling is that these favorable considerations should have so heavily outweighed the costs and risks peculiar to international lending. Among the deterrents are the difficulty and expense of acquiring information about proposed foreign investments, and also varied political risks, such as the relatively high uncertainty of recovering on defaulted foreign obligations through legal proceedings. As pointed out by this writer as early as 1971, these deterrents imply that international capital flows should fall short of, rather than exceed, the optimal levels (Fieleke 1971, pp. 18–20).

One way to discourage excessive bank exposure in the future is to raise bank capital requirements, an action in fact recently taken. Another precautionary measure would be to promote the use of seniority clauses in future loan contracts. Fewer loans might have been made to the developing countries during the years immediately preceding the debt crisis had those loans been subordinated to ones already outstanding.²¹

Conclusion

The debt crisis has elicited a sizable balance-of-payments adjustment in the 15 heavily indebted developing countries. The adjustment, however, was concentrated—at least in quantitative terms—in the years

²⁰ Not all the impediments to efficient forgiveness are reviewed here. Others include the problems of moral hazard and free riders.

²¹ To give practical force to seniority might be difficult; see Bulow and Rogoff (1988, p. 16).

immediately following the onset of the crisis, and might have been more efficient if executed more gradually. Associated with the adjustment were reductions in import volumes and absorption in most countries. GNP growth has typically been minimal, and GNP growth rates across countries are uncorrelated with balance-of-payments adjustment in real terms. The burden of restraining absorption has fallen primarily on gross domestic investment; this is not to say that greater investment would necessarily have been productive. For about half of the countries, the difficulty of the adjustment has been compounded by an adverse shift in the terms of trade.

In spite of the adjustment that has occurred, the creditworthiness of the heavily indebted countries, as evaluated by conventional indexes, has not improved. Nor has economic growth per capita been resumed. Several hypotheses for the failure of growth to accompany adjustment have been set forth in this paper.

Notwithstanding their economic straits, the heavily indebted countries generally continue to pay interest on their indebtedness. A regression analysis suggests that these interest payments are positively related to export receipts (as a fraction of GNP). Debtors continue to service their debts not only for the sake of future creditworthiness, but to avoid disruption of trade and other penalties.

In theory, partial forgiveness of indebtedness can sometimes be in the interest of the lender as well as the borrower. In practice, it is hard to know when the conditions for this mutually rewarding outcome are satisfied. Thus, forgiveness is rare.

Theory also suggests that international capital movements should generally fall short of, rather than exceed, the optimum, yet the opposite seems to have been true for the heavily indebted countries before 1982. Perhaps greater use of seniority clauses in loan contracts could help to dampen herd instincts in the future.

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Discussion

*Ariel Buira**

Norman Fieleke has provided us with a rich and thoughtful study as well as a wealth of important statistical analyses of the adjustment process in heavily indebted developing countries over the past six years. While I find myself in agreement with the thrust of his paper, a number of points merit some discussion from a debtor's perspective.

I would like to center my comments on four broad areas dealt with in the paper:

- (1) why growth has not accompanied adjustment in heavily indebted countries;
- (2) the characteristics of the adjustment process in these countries;
- (3) the issue of their creditworthiness; and
- (4) future economic growth, debt service and debt relief.

Fieleke puts forward several hypotheses to explain why growth-cum-adjustment has failed to materialize. I would view the failure of the strategy of adjustment with growth in a broad perspective: the conditions considered essential to make this strategy viable have not been fulfilled.

As was widely publicized following the statement of Secretary Baker before the Annual Meetings of the International Monetary Fund (IMF) and the World Bank in Seoul in October 1985, the attainment of adjustment with growth in heavily indebted countries rested on four assumptions:

- (1) economic adjustment and structural change in debtor nations;

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- (2) healthy growth of the world economy;
- (3) adequate banking flows to the debtor countries; and
- (4) greater involvement of multilateral institutions in financing and structural change in these nations.

A number of debtor countries have fulfilled the role they were supposed to play in the strategy of adjustment with growth. The ratio of the government budget deficit to GNP in many highly indebted countries has fallen significantly.¹ Important progress has also been made in the process of structural change through trade liberalization, the removal of price controls, and streamlining and privatization of public enterprises. Another indicator of the magnitude of efforts made is the sharp depreciation of these countries' real effective exchange rates and the reduction of their consumption and import levels.

Nevertheless, it is now apparent that adjustment with growth cannot be attained in the absence of the other elements of the strategy. Both the evolution of the world economy and the volume of financial flows have shown a behavior inconsistent with adjustment with growth in debtor nations. Although economic growth in the industrial countries has been satisfactory, the terms of trade of heavily indebted countries have fallen to unprecedented levels and, for many, continue to decline. This point bears some elaboration, since on the basis of statistics in the IMF's latest *World Economic Outlook*, the loss of purchasing power of the exports of the 15 highly indebted countries can be estimated at \$120 billion over the period 1981–87, an amount equivalent to 25 percent of their external debt. In addition, protectionism has increased, real interest rates continue to be high and show an upward trend, and the net transfer of resources from the commercial banks and multilateral institutions as a group to the heavily indebted countries remains negative.

Given the unfavorable external environment, adjustment in these nations has relied excessively on the contraction of domestic spending, adversely affecting investment levels and development potential. Thus, instead of adjustment with growth, debtor nations have followed an arduous path of adjustment with recession.

The results of the policies adopted have been mixed. On the one hand, a collapse of the international financial system has been avoided and commercial banks have gained time to strengthen their capital base.

¹ For instance, a recent IMF study reports that between 1981 and 1987 the fiscal deficit of Argentina fell from 16.4 percent of GDP to 9 percent; that of the Ivory Coast from 11.6 percent to 7.5 percent, and that of the Philippines from 5.5 percent to 3.2 percent. In addition, the operational balance in Mexico recorded a surplus of 2 percent of GDP in 1987 after having shown a deficit of more than 10 percent of GDP in 1981, while that of Brazil fell from 5.9 percent to 5.5 percent of GDP in the same period. See International Monetary Fund, *Issues in Managing the Debt Situation*, EBS/88/159, August 1988.

But, on the other, debtor countries have not been able either to restore creditworthiness or to resume economic growth.

Let me now briefly turn to the characteristics of the adjustment process in the heavily indebted countries. Fieleke notes that the dynamics of adjustment in these nations seem both suboptimal and halting, and he concludes that aggregate adjustment may virtually have stalled. To me this seems the natural result of the transfer problem, given the low ratio of imports to total demand, coupled with adjustment without financing. Adjustment through the contraction of demand has a limit, at least politically, especially if you take into account the adverse evolution of the terms of trade, adjusted for interest rates, which have largely offset the adjustment efforts of many debtor countries and obstructed the structural transformation of their economies. As a result, for many countries the 1980s are the lost decade, in which they lost the gains achieved in two previous decades of development. The presence of debt fatigue under these circumstances should not be surprising.

One cannot but agree with Fieleke that economic adjustment might have been more efficient if executed more gradually. However, when liquidity dries up there is no choice. The adjustment process was often abrupt, not because of an unconstrained choice by the debtor countries, but as a result of the unavailability of net financing. From this perspective, Fieleke's search for ways to diminish bank exposure to debtor nations in the future would seem far from what is required.

I cannot help feeling that the difficulties of the task of adjustment for heavily indebted countries were underestimated in 1982 and 1985. One simply has to pay regard to the limitations imposed by the external debt itself on the adjustment process and to the inherent conflict that exists between depreciation and stabilization. Recall that in a number of countries, interest payments on the external debt account for a large share of domestic savings and of the public deficit. Thus, stabilization policies often fail, as the sharp depreciation of the real exchange rate that is required to generate trade balance surpluses in order to service the external debt also accelerates inflation: this forces domestic interest rates up, thereby further increasing pressures on the fiscal deficit.

It took time for us to recognize the heavy fiscal burden that external debt obligations represent for debtor countries. Since most of the debt is public, governments of debtor countries face the problem of extracting resources from the private sector in order to effect the transfer abroad implied by debt service. The difficulties of this process often lead to high rates of inflation. Also, the crowding out of private investment by government deficits is closely linked to the need to comply with external debt service. Indeed, with adequate flows from abroad to finance fiscal deficits, such crowding out need not take place and adjustment with growth becomes possible.

With respect to exports, Fieleke raises the question whether the export effort has been sufficient. Whatever the answer, allow me to make some observations. If exports are to be more than the mere sale of domestic surplus production or of the use of spare capacity because the domestic market is depressed, new investment is needed to shift resources towards the production of tradeables. However, the investment required for this reallocation of resources is not likely to be forthcoming in a situation of crisis and instability, where perceived uncertainties and risks are large and call for high risk premiums.

Several components contribute to the atmosphere of uncertainty. On the domestic side, these relate to questions such as the *credibility* of government policies and their *permanence*—not just fiscal policy, but also policies such as trade liberalization and real exchange rates. Doubts often reflect past responses to balance of payments crises. Political considerations such as the approach of elections and their results also give rise to uncertainty. The high level and variability of real interest rates, often in excess of 20 percent per annum, discourage investment.

On the external side, the persistent atmosphere of crisis arises from the “short leash” and “muddling through” approach to the debt problem on the part of creditors. For years, protracted program negotiations with the Fund, the World Bank and with commercial banks have taken place annually, with questions as to whether the next quarterly targets will be met. These make for an atmosphere of “wait and see.”

Additional uncertainties relate not only to terms of trade, interest rates and exchange rates but, more importantly, to protectionism. The latest World Bank *President's Report to the Development Committee* is particularly clarifying in this connection.² It states that protectionism has increased in coverage and intensity in developed countries during the 1980s, particularly through nontariff barriers; these, according to the report, cover roughly one-third of developed country imports of manufactures from major developing country exporters. The report stresses that protectionism in the industrial countries has been chiefly aimed at the industrially more advanced LDCs. Thus, an expansion of the volume of exports by heavily indebted countries that is slightly below that recorded by world trade can hardly be surprising. Allow me to recall: OECD subsidies to agriculture amount to \$185 billion per year. Secondly, note that measured in value terms, Mexico's exports increased 33 percent over the period 1980–87; however, in volume terms, the increase was a staggering 108 percent, which speaks of the effort made. The terms of trade loss for Mexico is estimated at \$57 billion over this period (or \$30 billion in the period 1982–87).

² See International Bank for Reconstruction and Development, *President's Report to the Development Committee*, August 4, 1988.

Let us now turn to the issue of creditworthiness. Fieleke's warnings on the usefulness of certain debt indicators in order to measure creditworthiness are well taken. It is to be hoped that commercial bankers will be aware of these caveats when the recent improvement in debt service ratios of LDCs is incorrectly used as an argument to claim an increase in their capacity to service the external debt.

Among the range of indicators available to try to assess a debtor country's creditworthiness, two are stressed in Fieleke's paper: capital flight and the secondary market valuation of developing country debt. I would like to stress that even if the government of an indebted country follows "correct" macroeconomic policies, capital flight might take place, since investors recognize that, given the existence of a debt overhang, financial assets remain vulnerable to taxation through inflation and through the depreciation of the exchange rate. Thus, the public's perception of the ability of the government to service the external debt in the face of adverse developments in, say, external interest rates, oil export prices and prospects for economic activity in the United States may be an important determinant of capital flight. Alternatively, the retention of savings may require extremely high real rates of interest with adverse consequences for government finances. In other words, capital flight in some countries may in fact be a result of the uncertainties associated with the external environment and the debt burden.

Consider now the secondary market price of developing country loans. While it must be recognized that the evolution of prices in the secondary markets reflects to some extent the market's perception of creditworthiness of debtor countries, other factors enter into play. For instance, during 1987 the prices on claims of most major debtors dropped sharply after the decision taken by major U.S. banks to set aside reserves against potential loan losses, despite the fact that underlying economic conditions and therefore creditworthiness were improving in several of these nations. The reasoning behind this behavior seems to lie in the fact that the increase in banks' reserves was perceived as a signal of a greater bank reluctance to lend new money to debtor countries. Since bank loans had been used to cover debt service in the past, when it was feared that no new funds would be forthcoming, the price of LDCs' debt in the secondary market immediately fell.

Consider next a major question the paper does not raise directly: Is it possible, in the current economic environment, for the heavily indebted countries to grow at adequate levels and at the same time pay full debt service? I would like to probe deeper into this question by assessing the prospects faced by Mexico, a country that has been praised by the international community as a "model" of economic adjustment.

Indeed, over the past six years Mexico has made impressive progress in both adjustment and structural change. Particularly impor-

tant has been the strengthening of public finances. The primary fiscal deficit, which computes the difference between public sector revenues and expenditures excluding interest payments, turned from a deficit of 8 percent of GDP in 1981 to a surplus of 4.9 percent in 1987. An even greater surplus (7 percent of GDP) is expected for 1988, an adjustment of 15 percent of GDP. Accordingly, the current account switched from a deficit of 6.5 percent of GDP in 1981 to a surplus of 2.7 percent in 1987.

Substantial advances have been achieved in other areas as well. Thus, inflation, as measured by the consumer price index, decreased from an annualized rate of 424 percent in December 1987 to under 10 percent in September 1988. The economy has gone through an unprecedented process of import liberalization, whereby most quantitative restrictions have been eliminated and the average tariff has been reduced to only 6.5 percent. Exports have been diversified: while in 1982 oil accounted for nearly 80 percent of merchandise exports, as of June 1988 the share of non-oil exports in the total reached 68 percent. Moreover, the number of public enterprises has been more than halved, from 1,155 at the end of 1982 to 449 by mid-1988.

Economic adjustment in Mexico has coexisted with a huge net transfer of resources abroad, equivalent to more than 6 percent of GDP over the period 1982–87. Partly due to this situation, the measures adopted have emphasized the contraction of domestic expenditure (which necessarily exceeds the transfer itself) and in particular of investment. Over the past six years public investment fell from 10.2 percent of GDP in 1982 to 5.5 percent in 1987.

In this context, annual GDP growth in Mexico, which had averaged close to 7 percent in the 1960s and 1970s, decreased to -0.2 percent in the period 1982–87. In the 10-year period from 1977 to 1987, real average wages in the manufacturing sector dropped by some 30 percent in real terms and minimum wages by nearly 50 percent. The real levels of per capita imports and investment in Mexico in 1987 were as low as those prevailing in the seventies, while real per capita consumption decreased to the levels of a decade ago. These are all major adjustments greater than seemed possible six years ago.

Nevertheless, the efforts carried out have not been enough to restore creditworthiness. Negotiations with foreign creditors have allowed an extension of maturities and a decrease in margins over base rates. Partly as a result of this, the debt service ratio diminished from 62 percent in 1982 to 42 percent in 1987. But, during the same period, the ratio of external debt to exports rose from 310 percent to 340 percent, while the size of the debt in relation to GDP increased from 51 percent to 74 percent despite no net use of foreign credit.

Although adjustment and structural change have taken place, the prospects for resuming adequate and sustained rates of economic growth are uncertain. In particular, it is doubtful that the net transfer of

resources implicit in the present levels of debt service will allow the financing of a needed expansion of investment.

Exploring the viability of combining adequate rates of growth with full debt service payments is not an easy endeavor. However, the comparison of the investment requirements for resuming growth with the availability of domestic and external resources for this purpose provides some useful insights.

Mexico's labor force will grow at a rate of about 3.2 percent a year during the next five to six years. With an income elasticity of the demand for labor of around 0.6, the minimum GDP growth required to absorb the yearly increase in the labor force would be slightly over 5 percent. Assuming that the structural changes mentioned above will increase considerably the efficiency of investment compared to the historical standards of the last decade, the economy will need an investment/GDP ratio of at least 19.5 percent to sustain a 5 percent GDP growth rate. It must be noted that during the 1960s and 1970s the investment share of GDP amounted to an average of 23.6 percent.

Currently, despite the fall in real per capita incomes, domestic savings stand at around 16 percent of GDP. This leaves little leeway for a rapid mobilization of internal resources. Consequently, to finance an I/GDP ratio of 19.5 percent, external savings would have to amount to some 3.5 percent of GDP if economic growth is to attain an annual rate of 5 percent.

Under optimistic assumptions for the behavior of domestic and external variables, Mexico would require five to six billion dollars in new financing from the commercial banks to meet external debt service and balance the external accounts in this scenario, in addition to all other financing from direct foreign investment and multilateral and bilateral sources. This figure evidently does not mesh with the lending plans of commercial banks. It would be farfetched to think that Mexico could raise the above-mentioned amount year after year in the voluntary credit markets.

Consequently, despite enormous adjustment efforts and the structural change undergone, Mexico's medium-term prospects remain poor. Unless debt service can be reduced, with limited new financing forthcoming the debt burden will translate into low investment levels, low growth, rising unemployment and speculative capital movements for the coming years.

Obviously, the situation is even more somber in most other heavily indebted countries. Under such circumstances, the limitations of the present debt strategy seem evident and the need for debt relief acquires crucial importance. Creditor governments and international organizations must support market-oriented debt reduction schemes linked to programs of economic reform in debtor nations, if the debt problem is to be overcome.

We must all understand that this problem goes beyond the economic and financial areas. Without tangible benefits, the persistence of adjustment efforts in debtor countries faces mounting political resistance. Debtor country governments may be tempted or compelled to turn to populist policies in response to the population's frustration with lower living standards, unemployment and stagnation. In that event, the adverse implications of the debt crisis for debtors, creditors and in general for the world economy will be substantially accentuated.

Discussion

J. David Richardson*

Norman Fieleke presents an attractive summary of the macroeconomic adjustment experience of the "Baker 15" countries since 1982. It is especially attractive in the cross-country comparisons that highlight several important generalizations. (1) The first two years' adjustment by these 15 countries accounted for nearly all of their increases in net exports. In only a few cases do we see further success beyond that of the first two years. (2) Those countries with the fastest rates of GNP growth among the 15 were no more successful at increasing net exports than others. (3) Nor were countries that early swallowed the bitter pill of abnormally deep recession any more successful. (4) Investment spending bore the heaviest downward adjustment among the Baker 15, consumption spending the lightest, with government spending in between.

I will focus my comments on the macroeconomic adjustment questions that occupy the greatest part of Fieleke's paper. I was surprised and instructed by several of his conclusions, but felt the author could have instructed me even more. For example, the perspective of the traditional transfer problem appears relevant here. The most recent World Bank *World Development Report* reveals that middle-income debtor countries transferred nearly 100 billion real dollars' worth of capital back to creditor countries between 1982 and 1987. In 1982, sizable inward transfers to the Baker 15 did not merely dry up, they were reversed. The transfer perspective helps, then, to explain why the macroeconomic impetus was recessionary in debtor countries, and why however much income might decline, aggregate purchasing power—the

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standard of living—had to decline *more* in order to transform trade-deficit transferees into trade-surplus transferors. Since real depreciation of its currency is an expected (albeit not necessary) part of the adjustment of a transferor, the decline of the Baker 15's terms of trade between 1982 and 1987 is not simply more bad luck, but an essentially endogenous adjustment mechanism.¹ It too reduces aggregate purchasing power.

Moreover, I have always been surprised that commentators underplay the very sizable real capital loss that debtor countries bore at the beginning of the 1980s, a balance-sheet loss of real national wealth that independently compressed purchasing power and precipitated the 1982 crisis and ensuing adjustment. The source of the real capital loss is simple and familiar: capital formation that appeared profitable at the *expected* real interest rates of the early 1980s turned out to be quite unprofitable at the *realized* real interest rates. The realized real interest rate over the period 1981–82 was fully 10 percentage points higher than the expected real interest rate, if we use the inflation forecast of the January 1981 *Economic Report of the President* to calculate “expected,” and the actual inflation rate to calculate “realized”: 23 percent inflation expected over the two-year span versus 13 percent actual.

The real capital loss and transfer perspective help explain both the dramatic improvement in the trade balance of the Baker 15 and the equally dramatic decline in their standards of living and terms of trade. But they do not explain the peculiar mix of trade-balance improvement; much more import compression occurred than had been expected, and much less export expansion (zero in value terms, as the paper shows).

I believe that the growth of protectionism in creditor countries is the key to this puzzle. Not that the Baker 15 were unfairly singled out to bear the protectionist burden—table 1 suggests that export growth rates of many developing countries, including Asian exporters, dropped nearly 10 percentage points below the 1970–87 trend in the sub-period from 1982 to 1987. For the fastest growing exporters, however, this meant a decline from extraordinary to high export growth (20 percent per year to 10 percent); for the Baker 15 it meant the extinction of high export growth (12 percent to 2). Table 2 tries to document further that the Baker 15 were victimized by indiscriminate protectionism in the face of their commendable but less-than-stellar export growth to start with, and not by any vendetta of protectionism against them alone. Unfair trade orders and initiatives increased in the United States more than threefold between 1983 and 1987 against *both* the Baker 15 and the fastest-growing developing-country exporters.

¹ This is one reason why I don't find very revealing the author's counterfactual simulations at fixed terms of trade toward the end of the first part of his paper.

Table 1
Average Annual Change in f.o.b. Exports, Selected Debtor and Developing Countries
Percent

	(1) 1970-87	(2) 1982-87	(3) Percentage Point Difference (2)-(1)
Nine Problem Debtors from "Baker 15"^a			
Mexico	17.2	-3	-17.5
Ecuador	14.9	-1.0	-15.9
Brazil	14.2	5.4	-8.8
Yugoslavia	11.9	2.1	-9.8
Colombia	11.5	8.7	-2.8
Nigeria	10.7	-10.5	-21.2
Morocco	10.6	5.5	-5.1
Philippines	10.4	2.5	-7.9
Uruguay	10.1	3.1	-7.0
Unweighted Average	12.4	1.7	-10.7
Comparison Group of Nine Fastest-Growing Developing-Country Exporters^b			
Korea	26.8	16.7	-10.1
Taiwan	23.5	19.2	-4.3
Hong Kong	19.0	18.2	-8
Singapore	18.7	6.7	-12.0
Turkey	18.3	12.1	-6.2
China	18.2	12.6	-5.6
Thailand	17.9	10.9	-7.0
Indonesia	17.2	-5.8	-23.0
Tunisia	15.6	1.5	-14.1
Unweighted Average	19.5	10.2	-9.3

^a Only these nine "Baker 15" countries were tabulated in the source below.

^b The nine developing countries with fastest growing exports from 1970 to 1987, as tabulated in the source below.

Source: General Agreement on Tariffs and Trade, *International Trade 1987/88*, Table 13.

The author might also have expanded on the foreboding dynamics of the incidence of decreased living standards. The Baker 15 are collectively eating their seed corn, as shown by the particularly large declines in investment and in government spending (at least some of which is for maintenance and expansion of productive infrastructure). Spending on education and on structural adaptation (retooling, retraining, and the like) might show the same depressing decline if such data could be distilled from the more familiar aggregates. This is takeoff in reverse, a crash in a no-growth (negative in per capita terms) valley in which aggregate poverty leads to underinvestment which leads to the

Table 2
Unfair Trade Initiatives in the United States, 1983 and 1987

	Anti-Dumping Cases at End of Year ^a	Countervailing Duty Cases at End of Year ^b	Section 301 Cases during Year ^c
Nine Problem Debtors from "Baker 15" ^d			
1983	6	4	2
1987	23	15	4
Comparison Group of Nine Fastest-Growing Developing-Country Exporters ^d			
1983	0	8	4
1987	10	34	0

^a Anti-dumping orders and findings in effect as of December 31, 1983 or 1987, without regard to effective date of original action.

^b Countervailing duty orders and findings in effect as of December 31, 1983 or 1987, without regard to effective date of original action.

^c Section 301 petitions filed during 1983 or 1987.

^d Same nine countries as in table 1.

Source: U.S. International Trade Commission, *Operation of the Trade Agreements Program, 35th Report, 1983* (June 1984), pp. 350-51, 358-59, 367-72, and *39th Report, 1987* (July 1988), pp. 5-8 and 5-9, B-27 and B-28, and B-31 and B-32.

perpetuation of aggregate poverty, and so on—the damning dynamics of the “underclass” writ large.

The heavy decline in government spending and in elements of investment, such as construction and imports of capital goods, is due in part to natural movements in relative prices in the adjustment process. Tradables prices almost certainly must rise relative to nontradables, because output must be squeezed out of government and other nontradables sectors and into exports and import substitutes. I find it insightful to remember that the most natural adjustment process for the Baker 15 establishes a new price hierarchy. It leaves nontradables prices, including most wages and salaries, lower than normal and lower than tradables prices within the Baker 15. But tradables prices within the Baker 15 must end up lower than world tradables prices in order to generate the needed improvement in the trade balance. The first and last elements in the hierarchy joined together show once again why standards of living (the command of Baker 15 incomes over the world's goods) must fall if capital is being transferred back to creditor countries, and must certainly fall relative to the heady days of inward transfer.

As a final point I would like to commend the author for his regression approach to the experience of the Baker 15. For purposes of generalizing and making comparisons across countries, a regression is a useful tool, more akin to a multi-dimensional cross-tabulation than a

causal analysis. It allows estimates of correlations between pairs of variables (for example, rates of GNP growth and improvement in the trade balance) conditional on the correlations between other variables that have interest and influence. The author gives us the beginnings of a very nice potential longitudinal study of the Baker 15—to be supplemented, I would suggest, by a sample of more successful debtors (Colombia, Indonesia, Korea, Thailand, Turkey?) to alleviate sampling biases. Fifteen to 20 countries tracked over roughly 20 years is a reasonably rich panel of data from which to begin drawing quantitative inferences and generalizations. I hope the author proceeds to do so, and I will look forward to the result.

International Payments Imbalances of the East Asian Developing Economies

*Jeffrey D. Sachs and Mark W. Sundberg**

The recent economic performance of the East Asian economies ranks among the most remarkable in world history. For the past 15 years, the four Asian newly industrializing economies (South Korea, Taiwan, Singapore, and Hong Kong), have each averaged output growth of more than 7 percent per year, and per capita output growth of more than 6 percent per year. The growth in the major ASEAN countries (Malaysia, Thailand, Indonesia, and the Philippines), with the conspicuous exception of the Philippines, has been almost as remarkable, with growth above 5.5 percent per year. The performance of the East Asian economies is all the more spectacular in comparison with the developing countries of Latin America and Africa, where the past decade has been one of deep crisis and a decline of living standards. A comparison of growth rates in East Asia and Latin America is shown in table 1.

The extent of social and economic transformation in East Asia in the past couple of decades is overwhelming. Consider the case of Korea, for example. In 1960, Korea had a per capita income of \$157 (\$610 in 1988 dollars), and total merchandise exports of \$33 million. By 1988, per capita income stood at about \$3300, with exports of \$51 billion, making Korea the tenth largest merchandise exporter in the world. In 1960, over 70 percent of the Korean population lived in the rural sector, and 58 percent of the work force was in agriculture. In less than 30 years, the rural population has declined to only 35 percent of the total, and agriculture now accounts for an estimated 30 percent of the work force.

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Table 1
Comparative Income Statistics for the Asian Newly Industrializing Economies
and Latin America
Percent

Country	Period	Average Annual Growth of Real GDP (1980 prices)	Average Annual Growth of Real Per Capita GDP
Korea	1965-80	9.5	6.4
	1980-86	8.2	5.1
Taiwan	1965-80	9.1	7.2
	1980-86	10.7	9.3
Singapore	1965-80	10.4	8.8
	1980-86	5.3	4.2
Hong Kong	1965-80	8.5	6.4
	1980-86	6.0	4.8
Indonesia	1965-80	7.9	5.6
	1980-86	3.4	1.2
Thailand	1965-80	7.4	4.7
	1980-86	4.8	2.8
Malaysia	1965-80	7.4	4.9
	1980-86	4.8	2.1
Philippines	1965-80	5.9	3.0
	1980-86	-1.0	-3.5
Argentina	1965-80	3.4	1.8
	1980-86	-8	-2.4
Brazil	1965-80	9.0	6.6
	1980-86	2.7	.5
Chile	1965-80	1.9	.1
	1980-86	0	-1.7
Mexico	1965-80	6.5	3.4
	1980-86	.4	-1.8

Source: IMF, *International Financial Statistics, The Statistical Yearbook of the R.O.C.*, 1987, and the World Bank, *World Development Report*.

In addition to the high average growth, the East Asian countries (again, the Philippines excepted) have shown an amazing ability to shrug off the external shocks of the 1980s. Korea started the decade with a deep recession and in 1982 had a debt-GNP ratio that was higher than Brazil's.¹ It is ending the decade with booming growth (13 percent in 1988), stable prices, a current account surplus of \$12 billion, and most remarkably, the likelihood of becoming a net *creditor* government by the end of 1989 or early 1990! Similarly, Taiwan and Hong Kong have maintained rapid growth and large trade surpluses in recent years. Even

¹ According to the *World Debt Tables* of the World Bank, 1987-88 edition, the end-1982 total debt was 54.4 percent of GNP in Korea and 36.1 percent of GNP in Brazil.

the commodity exporters in the region, Thailand, Malaysia, and Indonesia, which suffered large terms of trade declines in the 1980s, have escaped the shocks of the 1980s without an external debt crisis, with their creditworthiness intact, and with sustained growth and price stability.

Ironically, while East Asia has escaped the debt crisis that has crippled Latin America, it is now facing a potential "credit crisis," especially in its economic relations with the United States. In the view of the U.S. government in the past couple of years, the successful adjustments of the East Asian countries have been too successful. The large trade surpluses in East Asia are now seen as a major source of America's large trade deficits. These surpluses, and their rapid increase in recent years, may be seen in table 2. As can be seen by the comparison with Latin America, the East Asian trade surpluses have emerged through a surge in exports, while the Latin American surpluses have been achieved by a compression of imports. In October 1988, the U.S. Treasury charged that Korea and Taiwan were artificially manipulating their exchange rates in order to gain an unfair trade advantage (presumably vis-à-vis the United States), thereby hindering the U.S. adjustment process.²

Whereas the U.S. government now urges real exchange rate depreciations and fiscal austerity in Latin America, it is urging real exchange rate appreciations and fiscal expansion in East Asia, as a way to reduce the large trade surpluses of the region. The U.S. government has also charged that discriminatory trade policies, including merchandise import quotas, violations of intellectual property rights, and protectionist policies regarding international trade in financial services, have contributed unfairly to the successes of the East Asian economies.

The goal of this paper is to put the East Asian economic performance into an international and historical perspective, and to better understand the role of economic policies in the outstanding economic performance of the countries in the region. Since so much policy attention is now focussed on Korea and Taiwan, where the trade surpluses are largest, we also pay special attention to these cases. In order to explore the policy options open to Korea and Taiwan for moderating their trade surpluses, we introduce a global simulation model (still in the developmental stage) to give an idea of the quantitative aspects of macroeconomic interdependence between the four Asian newly industrializing economies (ANIEs) and the U.S. economy.

In the next section, we review some of the key structural factors in East Asia's exceptional macroeconomic performance, and then illustrate

² The charges are spelled out in U.S. Treasury Department, "Report to the Congress on International Economic and Exchange Rate Policy," October 15, 1988.

Table 2
Trade Balance Data for the Asian NIEs and Selected Latin American Countries,
1980–87
Billions of U.S. Dollars

	1980	1981	1982	1983	1984	1985	1986	1987
<u>Korea</u>								
Exports	17.5	21.3	21.9	24.4	29.2	30.3	34.7	47.3
(as % GNP)	28.0	30.8	30.2	31.1	34.2	34.9	35.3	39.0
Imports	20.4	24.4	22.7	24.6	28.8	29.5	29.9	38.8
(as % GNP)	32.7	35.4	31.3	31.3	33.7	34.0	30.4	32.0
Trade Balance	-2.9	-3.2	-.8	-.2	.4	.8	4.8	8.4
(as % GNP)	-4.6	-4.6	-1.1	-.2	.5	.9	4.9	7.0
<u>Taiwan</u>								
Exports	21.6	24.6	23.9	27.4	32.8	33.1	43.9	58.9
(as % GNP)	52.9	52.2	50.6	54.0	57.6	56.1	60.6	60.7
Imports	22.1	23.6	21.4	22.8	26.2	24.5	28.8	40.3
(as % GNP)	54.1	50.1	45.4	45.0	46.0	41.7	39.8	41.5
Trade Balance	-.5	1.0	2.5	4.6	6.6	8.5	15.1	18.6
(as % GNP)	-1.2	2.1	5.3	9.0	11.6	14.5	10.8	19.2
<u>Singapore</u>								
Exports	19.4	21.0	20.8	21.8	24.1	22.8	22.5	28.6
(as % GNP)	165.2	151.0	136.1	125.6	128.2	128.9	128.4	143.9
Imports	22.6	26.1	26.5	26.6	27.0	24.8	24.1	30.6
(as % GNP)	193.2	187.8	173.4	152.8	144.0	140.1	137.3	154.0
Trade Balance	-3.3	-5.1	-5.7	-4.7	-3.0	-2.0	-1.6	-2.0
(as % GNP)	-28.0	-36.8	-37.2	-27.1	-15.8	-11.2	-8.9	-10.2
<u>Hong Kong</u>								
Exports	24.2	26.7	26.0	27.2	33.9	36.1	42.3	48.5
(as % GNP)	87.8	90.5	84.8	95.2	106.7	107.6	110.1	104.9
Imports	25.5	28.4	27.1	27.8	32.6	34.2	40.6	43.6
(as % GNP)	92.4	96.1	88.4	97.2	102.5	101.9	105.6	94.4
Trade Balance	-1.3	-1.7	-1.1	-.6	1.3	1.9	1.8	4.9
(as % GNP)	-4.6	-5.6	-3.6	-2.0	4.2	5.7	4.6	10.5
<u>Indonesia</u>								
Exports	34.9	35.2	33.7	23.3	21.3	16.7	11.6	na
(as % GNP)	48.2	38.3	35.7	28.7	25.2	19.7	15.4	na
Imports	15.4	18.8	22.8	16.1	12.1	8.2	7.5	na
(as % GNP)	21.3	20.4	24.1	19.8	14.2	9.7	9.9	na
Trade Balance	19.5	16.5	10.9	7.2	9.3	8.5	4.1	na
(as % GNP)	26.9	17.9	11.6	8.9	10.9	10.0	5.4	na

Table 2 (continued)
 Trade Balance Data for the Asian NIEs and Selected Latin American Countries,
 1980-87
 Billions of U.S. Dollars

	1980	1981	1982	1983	1984	1985	1986	1987
<u>Thailand</u>								
Exports	6.5	7.0	6.9	6.4	7.4	7.1	8.8	11.7
(as % GNP)	19.4	19.5	18.9	15.8	17.7	18.6	21.1	24.9
Imports	8.3	8.9	7.7	9.3	9.3	8.3	8.3	11.7
(as % GNP)	24.8	24.8	21.0	23.0	22.3	21.8	19.8	24.8
Trade Balance	-1.8	-1.9	-.8	-2.9	-1.9	-1.2	.5	0
(as % GNP)	-5.3	-5.4	-2.1	-7.2	-4.6	-3.2	1.2	.1
<u>Malaysia</u>								
Exports	12.9	11.8	12.0	14.1	16.5	15.4	13.9	17.7
(as % GNP)	52.8	47.1	44.9	47.1	48.6	49.4	49.9	59.2
Imports	9.7	10.4	11.3	12.0	12.7	11.2	9.8	11.8
(as % GNP)	39.7	41.7	42.0	40.0	37.4	35.7	35.3	39.5
Trade Balance	3.2	1.3	.8	2.1	3.8	4.3	4.1	5.9
(as % GNP)	13.2	5.4	2.9	7.1	11.2	13.7	14.6	19.7
<u>Philippines</u>								
Exports	5.7	5.6	5.0	4.9	5.3	4.6	4.8	5.7
(as % GNP)	16.3	14.6	12.5	14.2	16.3	13.9	15.4	16.3
Imports	7.7	7.9	7.7	7.5	5.9	5.0	4.9	6.7
(as % GNP)	21.9	20.6	19.2	21.7	18.4	15.2	15.9	19.5
Trade Balance	-2.0	-2.3	-2.7	-2.6	-.7	-.4	-.1	-1.1
(as % GNP)	-5.6	-5.9	-6.8	-7.4	-2.0	-1.3	-.5	-3.1
<u>Argentina^a</u>								
Exports	8.0	9.1	7.6	7.8	8.1	8.4	6.9	6.4
(as % GNP)	5.1	7.3	13.4	12.1	10.4	12.8	8.7	na
Imports	9.4	8.4	4.9	4.1	4.1	3.5	4.4	5.4
(as % GNP)	6.0	6.8	8.5	6.4	5.4	5.3	5.5	na
Trade Balance	-1.4	.7	2.7	3.7	4.0	4.9	2.5	1.0
(as % GNP)	-.9	.5	4.9	5.7	5.0	7.5	3.2	na
<u>Brazil</u>								
Exports	20.1	23.3	20.2	21.9	27.0	25.6	22.3	26.2
(as % GNP)	8.0	8.5	7.5	10.8	12.9	11.3	8.3	na
Imports	23.0	22.1	19.4	15.4	13.9	13.2	14.0	15.1
(as % GNP)	9.1	8.0	7.3	7.6	6.6	5.8	5.2	na
Trade Balance	-2.9	1.2	.8	6.5	13.1	12.4	8.3	11.1
(as % GNP)	-1.1	.5	.2	3.2	6.3	5.5	3.1	na

Table 2 (continued)
Trade Balance Data for the Asian NIEs and Selected Latin American Countries,
1980–87
Billions of U.S. Dollars

	1980	1981	1982	1983	1984	1985	1986	1987
<u>Chile</u>								
Exports	4.7	3.9	3.7	3.8	3.7	3.8	4.2	5.1
(as % GNP)	16.9	12.0	15.2	19.4	19.1	23.9	25.0	na
Imports	4.5	5.6	3.1	2.5	2.8	2.4	2.6	3.4
(as % GNP)	16.4	17.3	12.8	12.4	14.8	15.3	15.4	na
Trade Balance	.2	-1.7	.6	1.3	.9	1.4	1.6	1.8
(as % GNP)	.5	-5.3	2.4	7.0	4.3	8.6	9.6	na
<u>Mexico</u>								
Exports	16.1	19.9	21.2	22.3	24.2	21.7	16.0	20.7
(as % GNP)	8.4	8.2	13.1	15.4	14.2	12.5	13.0	na
Imports	18.9	24.0	14.4	8.6	11.3	13.2	11.4	12.2
(as % GNP)	10.5	10.0	8.2	5.7	7.0	7.9	9.3	na
Trade Balance	-2.8	-4.1	6.8	13.7	12.9	8.5	4.6	8.5
(as % GNP)	-2.1	-1.8	4.9	9.7	7.2	4.6	3.7	na

^a GNP shares based on converting \$US trade values into Australes at the period average implicit rate to market rate (rf).

Source: IMF, *Direction of Trade Statistics, International Financial Statistics* and the national accounts of various countries.

the importance of these factors in a comparison of Korea's economic success and Brazil's economic failure in the 1980s. Then, we look more in depth at the balance of payments performance of the East Asian economies in the 1980s, with a special focus on Korea and Taiwan. We go on to examine some of the policy options open to these economies using a global simulation model that we introduce in this paper (the model is described in a brief Appendix at the end of the paper).³ Finally, we offer some concluding observations and thoughts about future research.

Successful Economic Adjustment in the East Asian Economies

The ANIEs and the ASEAN countries have had several interrelated successes in macroeconomic adjustment in the past two decades: rapid GNP growth, low inflation, rising per capita income levels, and an

³ A more detailed description of the model is available in Sundberg (1989).

avoidance of the debt crisis of the 1980s. Although performance of the ANIEs is the more exceptional in absolute terms, performance of the ASEAN countries is perhaps more remarkable in that they suffered more severely from the commodity price declines of the 1980s, and faced the difficulties of the 1980s with much lower per capita income levels than in the ANIEs.

The experiences of these countries are not, of course, without blemishes. Indonesia faced a serious external financial crisis in 1975 after the overborrowing of the huge state enterprise Pertamina. Korea came close to a debt crisis in the early 1980s, as did Malaysia during 1982–85. Today, Indonesia still skates perilously close to a debt rescheduling, especially since the fall of oil prices and the appreciation of the yen, which has pushed up the burden of Indonesia's yen-denominated foreign debt in terms of domestic output. Even high-flying Singapore suffered a decline in aggregate GNP in 1985. And, of course, one country in the region, the Philippines, succumbed to a deep financial and economic crisis in the 1980s.

Nevertheless, the most striking fact is the consistency of economic successes. That consistency has by now generated an enormous literature accounting for the success and speculating on how it may be transferred to other developing countries. This literature is far too vast to treat in detail in this paper, and to do so would take us rather far afield from our main task, which is to analyze the current balance of payments situation of these countries.⁴ Nevertheless, it is worthwhile for our later discussion to understand what are, and what are not, the major factors that have brought the East Asian economies to their current situation.

To some extent, the East Asian successes are a kind of Rorschach test for economists: the causes of the region's success are sufficiently complex that each economist can see his favorite hypothesis in the record. Milton Friedman, for example, has declared that the region is a triumph of *laissez-faire*, while most political scientists and many economists see Korea, Taiwan, and Singapore as the triumph, instead, of highly intrusive but highly effective governments that have taken a

⁴ For an up-to-date, outstanding collection of survey articles, see "Why Does Overcrowded, Resource-poor East Asia Succeed—Lessons for the LDCs?," a special supplement issue of *Economic Development and Cultural Change*, vol. 36, no. 3, Supplement, April 1988. Other attempts at synthesis include the excellent book by Oshima (1987), the NBER Conference Volume edited by Bradford and Branson (1987), and articles by Sachs (1985) and (1987), and Krueger (1985) among many others. Sachs (1989) contains a series of essays by various authors on country experiences in East Asia and Latin America in the period of the debt crisis, and offers insights into why Latin America succumbed to crisis while East Asia did not. A recent survey of issues by James, Naya, and Meier (1987) also offers a solid discussion and an extensive bibliography.

strong hand in guiding development.⁵ Even the Prime Minister of Singapore since its independence, Dr. Lee Kuan Yew, describes Singapore as a case of "socialism that works."

Adding to the complexity, the economies in the region differ markedly among themselves in their historical, cultural, social, and economic characteristics, as well as in the strategy of development pursued by the governments. Korea, for example, has followed a development strategy modelled in important ways after the Japanese example, with heavy government involvement in foreign trade, a strategy of infant-industry protection, a reliance on large enterprises, and a resistance to foreign direct investment in strategic sectors. Hong Kong, on the other hand, has come as close as any economy to practicing free international trade, with virtually no trade barriers and free access of foreign firms to direct investment in Hong Kong.

Given these complexities, it is a bit hazardous to commit to particular explanations of the region's successes. Nonetheless, there are certain factors that seem to be common to the various countries in the region. At the same time, enough evidence exists to allow us to reject many of the most common hypotheses about the economic performance of the region. We will proceed by describing some of the explanations that we view as most convincing, and then proceed to mention and cast doubt on some of the other common ideas about the region.

Factors Contributing to the Macroeconomic Success of East Asia

High and rising savings rates. At the core of the high growth in the region is the high rate of savings, which finances an extraordinarily high rate of capital formation. The high rate of capital formation adds directly to the growth of per capita income through capital deepening, and indirectly through a high rate of technical change embodied in the

⁵ Friedman has written, for example, "Every successful country [Taiwan, South Korea, Singapore, Hong Kong, Japan] has relied primarily on private enterprise and free markets to achieve economic development. Every country in trouble has relied primarily on government to guide and direct its economic development" (" 'No' to More Money for the IMF," *Newsweek*, November 14, 1983, p. 96). Friedman's vision of laissez-faire as the key to East Asia's triumphs brings to mind a story that Friedman himself told, at a conference several years ago, of a man who is examined by a psychiatrist. The doctor shows the man a picture with two vertical lines and asks the patient to describe the picture. The man responds that the picture shows two people, standing up and making love. Then the doctor shows a picture with two horizontal lines, which the patient describes as two people lying down and making love. The doctor, growing exasperated, says to the patient, "Can't you think of anything but sex?" to which the patient responds, "But doctor, you're the one showing me all the dirty pictures." Most political scientists would say the same to Friedman: "Can't you think of anything but laissez-faire?" The most important recent treatment of East Asian governments as major promoters of growth is Chalmers Johnson, *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*, Stanford: Stanford University Press, 1982.

Table 3
Regional Savings, Investment and Current Account Figures for the Asian NIEs
and Selected Latin American Countries, 1980-87

	1980	1981	1982	1983	1984	1985	1986	1987
<u>Korea</u>								
Savings/GNP (%)	20.8	20.5	20.9	25.3	27.9	28.6	32.6	35.6
Investment/GNP (%)	20.5	28.7	30.5	31.3	31.3	30.8	31.4	31.4
Current Account (\$Bn)	-5.3	-4.7	-2.7	-1.6	-1.4	-.9	4.6	9.9
Current Account/GNP (%)	-8.8	-7.0	-3.8	-2.1	-1.7	-1.1	4.8	8.3
<u>Singapore</u>								
Savings/GNP (%)	36.5	39.3	40.7	44.8	46.3	42.7	41.1	42.4
Investment/GNP (%)	39.3	45.4	48.8	47.8	46.9	40.7	36.4	35.1
Current Account (\$Bn)	-1.6	-1.5	-1.3	-.6	-.4	0	.5	.5
Current Account/GNP (%)	-13.8	-13.8	-8.7	-3.5	-2.0	0	3.0	2.6
<u>Taiwan</u>								
Savings/GNP (%)	33.0	32.0	30.4	32.1	33.7	33.5	38.7	40.4
Investment/GNP (%)	31.1	28.4	26.3	23.1	21.3	18.7	18.1	19.3
Current Account (\$Bn)	-.9	.5	2.2	4.4	7.0	9.2	16.2	18.1
Current Account/GNP (%)	-2.3	-2.3	4.8	8.7	12.1	15.3	21.8	18.1
<u>Hong Kong</u>								
Savings/GNP (%)	31.4	31.4	28.2	25.1	28.9	27.3	27.9	30.7
Investment/GNP (%)	33.2	31.4	31.4	25.0	22.3	21.1	22.3	24.1
Current Account (\$Bn)	na	na	na	na	na	na	1.5	na
Current Account/GNP (%)	na	na	na	na	na	na	4.0	na
<u>Thailand</u>								
Savings/GNP (%)	22.7	20.6	18.8	17.8	20.6	17.2	18.7	20.9
Investment/GNP (%)	26.3	24.7	21.9	22.9	18.8	21.9	22.1	21.4
Current Account (\$Bn)	-2.1	-2.6	-1.0	-2.9	-2.1	-1.5	.3	-.5
Current Account/GNP (%)	-6.3	-7.3	-2.8	-7.3	-5.2	-4.2	.6	-1.2
<u>Malaysia</u>								
Savings/GNP (%)	30.4	26.2	25.1	26.1	30.8	27.3	28.1	33.4
Investment/GNP (%)	31.6	36.3	39.1	38.5	36.0	29.7	27.1	25.7
Current Account (\$Bn)	-0.3	-2.5	-3.6	-3.5	-1.7	-.7	0	2.3
Current Account/GNP (%)	-1.2	-10.3	-14.1	-12.5	-5.3	-2.4	.1	8.1
<u>Indonesia</u>								
Savings/GNP (%)	25.9	31.1	25.4	24.9	27.0	25.2	21.6	25.2
Investment/GNP (%)	21.8	30.8	28.8	30.8	26.8	27.5	27.4	27.8
Current Account (\$Bn)	2.9	-.6	-5.3	-6.3	-1.9	-1.9	-3.9	-1.7
Current Account/GNP (%)	4.1	-.6	-5.8	-8.2	-2.3	-2.4	-5.4	-2.7

capital investment. The savings and investment rates of the ANIEs and the ASEAN countries, together with the savings and investment rates for some Latin American countries, are shown in table 3. In most of the countries in East Asia, the savings rate has been rising secularly throughout the past 25 years. By 1986, national savings exceeded 30 percent of GNP in all four ANIEs, a rate that is virtually unmatched in the rest of

Table 3 (continued)
Regional Savings, Investment and Current Account Figures for the Asian NIEs
and Selected Latin American Countries, 1980-87

	1980	1981	1982	1983	1984	1985	1986	1987
<u>Philippines</u>								
Savings/GNP (%)	24.7	23.7	21.4	21.4	16.8	14.1	15.5	17.9
Investment/GNP (%)	25.7	26.1	17.9	25.1	19.0	15.1	13.0	14.0
Current Account (\$Bn)	-1.9	-2.1	-3.2	-2.7	-1.3	..	1.0	-0.5
Current Account/GNP (%)	-5.4	-5.5	-8.2	-8.1	-4.0	-1	3.3	-1.6
<u>Argentina</u>								
Savings/GNP (%)	20.5	17.9	21.3	22.8	na	na	na	na
Investment/GNP (%)	22.3	18.6	16.5	17.8	na	na	na	na
Current Account (\$Bn)	-4.8	-4.7	-2.4	-2.4	-2.5	-1.0	-2.9	-4.3
Current Account/GNP (%)	-3.0	-3.8	-4.1	-3.8	-3.2	-1.4	-3.7	na
<u>Brazil</u>								
Savings/GNP (%)	15.9	16.9	15.5	13.6	16.3	16.1	na	na
Investment/GNP (%)	21.1	21.2	21.2	16.9	16.4	16.3	na	na
Current Account (\$Bn)	-12.8	-11.8	-16.3	-6.8	0	-3	-4.5	na
Current Account/GNP (%)	-5.1	-4.3	-6.1	-3.4	0	-1	-1.7	na
<u>Chile</u>								
Savings/GNP (%)	16.8	12.4	9.4	12.5	12.5	16.5	18.7	na
Investment/GNP (%)	16.7	18.6	14.6	12.0	12.4	14.2	14.5	na
Current Account (\$Bn)	-2.0	-4.7	-2.3	-1.1	-2.1	-1.3	-1.1	-8
Current Account/GNP (%)	-7.2	-14.5	-9.5	-5.7	-10.7	-8.3	-6.7	na
<u>Mexico</u>								
Savings/GNP (%)	27.2	27.3	27.4	30.3	29.7	na	na	na
Investment/GNP (%)	24.2	25.7	22.3	17.3	18.0	na	na	na
Current Account (\$Bn)	-8.2	-13.9	-6.2	5.4	4.2	1.2	-1.7	3.9
Current Account/GNP (%)	-4.4	-5.8	-3.7	-3.8	2.5	.7	-1.3	na

Note: The current account shown does not necessarily equal savings less investment since investment shown here does not include changes in stocks and due to discrepancies between the national income accounts and balance of payments accounts shown in the International Financial Statistics.

Source: IMF, *International Financial Statistics*, World Bank, *Indonesia Report*, 1988.

the world. Savings were considerably lower in the ASEAN countries, but still well above the averages of Latin America, where savings rates have been lower and falling in the 1980s.⁶

The high savings rates have supported investments not only of private physical capital, but also of public-sector infrastructure (for example, extensive irrigation projects in agricultural areas), and even

⁶ Indonesia's savings rate dipped in 1986 to unusually low levels because of the enormous income loss from the decline in oil prices. The Philippines is the exception that proves the rule. Alone of the ASEAN countries, the Philippines experienced a significant decline in savings rates throughout the 1980s, a decline which is both a cause and reflection of the economic crisis in that country.

Table 4
 Manufactured Exports for the Asian NIES and Selected Latin American Countries, 1987

Latin America			Asian NIEs		
	Manuf. Exports (\$billion)	Percent of Total Exports		Manuf. Exports (\$billion)	Percent of Total Exports
Argentina	1.4	22	Hong Kong	44.6	92
Brazil	10.6	41	Korea	43.0	91
Chile	.5	9	Singapore	19.5	68
Colombia	.9	18	Taiwan	48.9	92
Mexico	8.0	30	Indonesia	3.6	22
Uruguay	.5	42	Malaysia	6.4	36
Venezuela	1.0	9	Philippines	3.5	61
			Thailand	4.9	42
Total	22.9		Total	174.5	

Note: Manufactured exports calculated from share of manufactures in 1986, times total exports in 1987.
 Source: World Bank, *World Development Report*, and IMF, *Direction of Trade Statistics Yearbook* (1988).

more importantly, of human capital. The population in most of East Asia is more literate and more skilled than in other countries with similar per capita income levels.

Conservative fiscal policies. In almost all the countries under consideration, governments have managed fiscal policy in a conservative manner, avoiding chronically large deficits and generating surpluses on the current account of the budget. These tight fiscal policies have contributed to high national savings (by raising the public-sector savings rate), low inflation, and the avoidance of serious financial crises from excessive borrowing. Again, there have been exceptions to this general statement (the Philippines and Malaysia in the early 1980s and Indonesia in 1974–75 are clear exceptions).

Outward-oriented trade policies. There is widespread assent in the economics literature that a key, or even *the* key factor in East Asia's successful economic growth has been the heavy emphasis on export growth and diversification. All of the ANIE economies are booming manufacturing exporters. Indeed, in 1987, *the four ANIE economies combined exported over six times as much in manufactured goods as did all of Latin America!* Individually, Hong Kong, Korea, and Taiwan exported much more than the total for Latin America (table 4). Also, the share of total exports in GNP, and the share of manufacturing exports in GNP, have risen sharply in each of these countries during the past 20 years. In Korea, for example, the share of exports in GNP has risen from 3 percent in 1960 to 39 percent in 1987.

ASEAN countries are less oriented towards manufacturing exports and somewhat less outward-oriented overall. This is primarily a reflec-

tion of factor endowments. With large endowments of raw materials, ASEAN countries are naturally more directed towards primary goods exports, and perhaps more susceptible to import-protection arguments on behalf of domestic industry.⁷ Nonetheless, the ASEAN countries have all been successful in spurring nontraditional manufacturing exports alongside their raw materials exports.⁸ Overall, when one adds both the primary exports and the manufacturing exports, the share of exports in GNP is quite high in ASEAN economies, with the exception of the Philippines, which has been more inward-oriented than the rest of the region.

There is considerable agreement about one basic aspect of the policies underlying outward-oriented growth: the net incentives given to exportables (including the effects of tariffs, subsidies, financial and tax incentives, and the like) are on balance at least as favorable as (and in some cases much more favorable than) the incentives given to import-competing sectors. Beyond that, however, there is a lively debate among economists on the extent to which export orientation actually is, and should be, based on free trade versus infant industry protection, foreign direct investment versus indigenous entrepreneurship, and state enterprise versus private sector firms.⁹

Flexible and rapid response to external shocks. Much of what went wrong in the developing world in the past decade has its origins in a four-year period: 1979 through 1982. It was in those years that world interest rates shot up to unprecedented levels, that commodities prices collapsed, and that the industrial world went into a sharp recession. Latin America responded slowly to these shocks; the East Asian economies, by and large, responded with alacrity. The pace of recovery to those shocks was a decisive factor in avoiding or succumbing to the debt crisis of the 1980s. Slow response led to a remarkable buildup of debt in

⁷ The large natural resource endowments tend to raise the internal real exchange rate (that is, the price of nontradeables relative to non-primary-good tradeables), thereby squeezing out manufacturing tradeables à la the Dutch disease. This has led in many countries to political support for import protection for the manufacturing sector, as the way to spur industrialization, in view of the fact that free trade would tend to leave the manufacturing sector quite small. The link between resource endowments and import protection is nicely spelled out in A. Bianchi and T. Nohara (1988).

⁸ Despite starting from a smaller industrial export base in 1965, the ASEAN countries had far surpassed most Latin American countries in share of manufactured exports by 1986. Between 1965 and 1986 the share of manufactured exports in the four ASEAN countries rose from 5 to 40 percent while in the major Latin American countries the shift was from 9 to 26 percent. One striking example is Malaysia, which has become one of the world's leading exporters of electronics components, despite its heavy export dependence on raw materials.

⁹ It is sometimes overlooked, for example, that state enterprises, especially in basic industry, have played a very large role in the development of Korea and Taiwan, and that many of Korea's major exporting firms (especially the giant chaebol) are privately owned, but have in fact been carefully and generously fostered with public money.

the period 1980–82, just before the commercial banks stopped lending. As we have pointed out elsewhere, the Latin net debt to the international commercial banks approximately doubled in this short period, but grew much more slowly in most Asian economies.

The behavior of debtor governments in the period 1979–82 has remarkable predictability for the depth of the crisis in the various debtor countries after 1982. In Brazil, for example, a fiscally conservative finance minister was sacked in 1979 in favor of an expansionist minister, who tried to accelerate Brazilian growth with increased foreign borrowing. Of course, Brazil soon hit a brick wall in the world financial markets, finding itself cut off from new loans, and thence fell into a deep financial crisis. In contrast, in 1979 the Korean government embarked on a stabilization program upon early signs of turbulence in the world's financial markets. The won was devalued, fiscal policy tightened, real wages were squeezed in order to improve international competitiveness, and in general the economy was prepared to weather the shocks of the early 1980s.

This pattern of early adjustment in Korea versus delayed adjustment in Brazil shows up in a country-by-country comparison of East Asia and Latin America.¹⁰ The difference shows up most markedly in exchange rate policy. Argentina experienced extensive capital flight and a highly overvalued currency during 1979–82; Mexico went on a fiscal binge with a growing overvaluation of the peso, based on expectations of \$50 per barrel oil by the mid 1980s; Venezuela allowed the exchange rate to become increasingly overvalued until a depletion of foreign exchange reserves forced a grudging devaluation in 1983. By contrast, Indonesia devalued in 1978, to prevent exchange rate overvaluation; Korea devalued in 1980; and almost all of the other East Asian countries took actions to maintain real exchange rate stability throughout the period.¹¹

High degree of income equality. One of the remarkable features of the East Asian countries is the high degree of income equality compared with other developed countries at a comparable level of per capita income.¹² The comparison of several East Asian economies with several

¹⁰ See Sachs (1989) for a series of country studies that make that point.

¹¹ The Philippines, in contrast to most of the other countries in the region, allowed the Philippine peso to become overvalued in the early 1980s. Similarly, Malaysia undertook an excessive fiscal expansion, with an overvalued exchange rate, in the early 1980s, but then engaged in a dramatic fiscal contraction after 1982, when the country came close to falling into a debt crisis.

¹² It is an open research question to explain the greater-than-average income equality in East Asia. It seems to be linked to several factors, including: the characteristics of land-poor monsoon economies (see Oshima 1987 on this point), the post-World War II land reforms in several countries, the labor-intensive export-led growth policies, the

Table 5
Income Distribution in East Asia and Latin America
Percent

	Percent of Total Income Held by		Ratio of Highest to Lowest
	Lowest Income Quintile	Highest Income Quintile	
Latin America			
Argentina	4.4	50.3	11.4
Brazil	2.0	66.6	33.3
Chile	4.5	51.3	11.4
Colombia	2.8	59.4	21.2
Costa Rica	3.3	54.8	16.6
Ecuador	1.8	72.0	40.0
Mexico	4.2	63.2	15.0
Panama	2.0	61.8	30.9
Peru	1.9	61.0	32.1
Uruguay	4.4	47.5	10.8
Venezuela	3.0	54.0	18.0
Average	3.1	58.4	18.7
East Asia			
Hong Kong	6.0	49.0	8.2
Korea	6.5	45.2	7.0
Singapore	6.5	49.2	7.6
Taiwan	8.8	37.2	4.2
Indonesia	6.6	49.4	7.5
Malaysia	3.5	56.0	16.0
Philippines	3.9	53.0	13.6
Thailand	5.6	49.8	8.9
Average	5.9	48.6	8.2

Source: Sachs and Berg (1988), table 2; World Bank, *World Development Report* (1988).

Latin American economies is shown in table 5. In earlier work, Sachs and Berg (1988) showed that countries with higher income inequality were more likely than others to have succumbed to a debt crisis in the 1980s. They speculate that high income inequality contributes to political instability and social pressures for excessive fiscal spending, and thereby contributes to poor economic performance. The fact that the Philippines is an outlier with respect to income inequality, political instability, and severity of the economic crisis in the 1980s, lends

greater importance of a rural political base in domestic politics, and the extensive literacy and widespread distribution of education in these countries.

support to these arguments.¹³ Williamson and Balassa (1987) have similarly speculated that low income inequality has contributed to a better trend growth rate of the East Asian economies, through various political and economic channels that they identify.

Japan as a role model. It is likely, though hard to prove, that Japan's economic success had important spillovers in the region. At a basic level, Japan has served as an idea and a challenge for the rest of the region, for Japan proved for the first time that an Asian country could emerge as a developed, manufacturing exporter on a par with Western nations. On the level of ideas, Japan proved (as no country ever has for Latin America), that active promotion of manufacturing trade with the advanced countries could be a source of growth rather than a source of dependency. Japan also provided specific ideas of how to foster development (industrial policy, high savings, manufacturing export promotion); specific institutions for development, in the cases of Japan's former colonies, Korea and Taiwan; and appropriate labor-intensive production technologies for the rest of the region, which arrived via foreign direct investment by Japanese firms. Moreover, by spurring growth in Korea and Taiwan, Japan's lesson was then transmitted through the ASEAN region by the emergence of several good examples of successful growth.¹⁴ Unfortunately, despite the likely importance of Japan's role for economic development in the rest of Asia, the story of Japan's influence is yet to be told with care.¹⁵

In addition to these six factors, economists and commentators have offered several others to explain East Asia's extraordinary economic accomplishments in recent years. In our view, most of these additional

¹³ Also Malaysia is notable for greater inequality of income, and for having come closer to crisis in the early 1980s than other countries in the region. Indeed, it is possible to link Malaysia's inequalities, which reflect income differences between ethnic groups (especially the ethnic Malays versus the Chinese community), and the pressures for large government spending on behalf of the poorer Malay population.

¹⁴ These spillover effects are of course hard to quantify. Yet these authors have been repeatedly impressed in trips to the region by the extent to which policymakers in each country are acutely aware of, and reactive to, the policy actions in the neighboring countries, usually to beneficial effect. There has been an active competition among the ASEAN countries, for example, to make each country especially hospitable for foreign direct investment, by maintaining an efficient tax system, competitive exchange rates, etc., thereby enforcing good behavior in each of the countries. In Latin America by contrast, the overwhelming sense that one gets is that not even one success story exists that can serve as a role model, and that the spillovers, to the extent that they exist, are of a negative variety. The biggest countries, Argentina, Brazil, and Mexico, are all in profound crisis. Chile's recent successes are discounted in other countries as the result, in part, of a repressive authoritarian government. And Asia's successes are poorly understood, and simply too distant to be felt as a useful object lesson by most observers in Latin America.

¹⁵ We are only aware of one brief discussion of this theme, but it comes from an authoritative source, Professor Ezra Vogel of Harvard University, who is one of the leading interpreter's of Japan's economic development and its effects on the rest of the world. See Vogel (1987), especially Chapter 2.

arguments carry less weight, since they are called into question by important contradictory evidence. We have already noted one common view of economists—and almost nobody else—that the East Asian economies are exemplars of free enterprise. Evidence cited elsewhere, for example, in Sachs (1985, 1987), suggests that the role of the government is at least as extensive, and in some ways more extensive, in the East Asian economies than in others.¹⁶ The role seems to differ in kind, rather than in extent.

Another interpretation has looked to cultural factors (for example, the Confucian tradition) as a fundamental explanation. Ironically, such cultural factors were widely viewed in the 1950s as reasons why the East Asian economies would have a very difficult time in sustaining modern economic growth. Nor is the view that credits the stability achieved by Asia's authoritarian political structure very credible: Africa and Latin America have also had extensive periods of authoritarian rule, without the benefits of successful economic accomplishment.

An Example of Divergent Economic Performance: Brazil and Korea

Many of the dramatic differences between East Asia and Latin America can be vividly captured by a comparison of the economic performance of Brazil and Korea in the past 20 years. In some ways, Brazil came closest in Latin America in the early 1970s to achieving East Asian-style growth, based importantly on manufacturing export promotion and an active industrial policy. An authoritarian government which took power in a coup in 1964 appeared to put the country on a high growth path for at least a decade after the coup, achieving growth rates of around 10 percent per year for several years, comparable to Korea's and Japan's. As a continental power with an enormous population, Brazil could afford to mimic Japan's policies of import protection as a form of export promotion, using the domestic market to build up infant industries which then emerged as internationally competitive. Yet, Brazil succumbed to the external shocks of higher oil prices and higher interest rates at the end of the 1970s, even though both Brazil and Korea were about as dependent on oil imports and external borrowing at the end of the 1970s. While Korea has enjoyed strong growth, stable prices, and falling debt in the second half of the 1980s, Brazil has fallen into economic stagnation and an explosive inflationary spiral.

¹⁶ The role and size of government seem to be as extensive as in Latin America in many key dimensions, including: the share of government spending in GNP; the role of state enterprises in aggregate investment; and the extent of government intervention in trade (though in East Asia, the intervention is export-promoting, and infant-industry oriented).

The following diagrams help to shed light on this divergent pattern. The main points of divergence follow the points stressed earlier, including differences in the paths of savings rates, fiscal policy, adjustment to external shocks, and trade orientation. Indirectly, the differences in income distribution in the two regions have also played a clear role.

Figure 1 shows the growth of per capita income in the two countries, showing that from 1970 until the mid-1970s, Brazil and Korea shared a common trajectory, but that Brazil then stagnated (especially after 1980), while Korea continued to boom. Figure 2 shows similarly that while both countries had moderate inflation in the mid-1970s (with Brazil's inflation somewhat higher on average, but still not increasing), Brazil started to diverge by the late 1970s onto a path of sharply higher inflation rates.

Figures 3 and 4 point towards an explanation of these patterns. In the first half of the 1970s, Brazil and Korea were investing and saving a comparable fraction of GNP (indeed, Brazil had somewhat higher savings rates in the early 1970s), but by the mid-1970s, both savings and investment rates in Brazil began to drop off steadily, and eventually very sharply. *The capital accumulation that was the basis of Brazil's rapid growth dropped off by the late 1970s.* In Korea, by contrast, savings and investment rates rose sharply in the second half of the 1970s, and remained high in the 1980s.

This difference in savings and investment cannot easily be explained by external shocks. Indeed, as shown in figure 5, the terms of trade fell by *less* in Brazil than in Korea throughout the 1970s (though

Figure 1

GDP Per Capita, Brazil and Korea

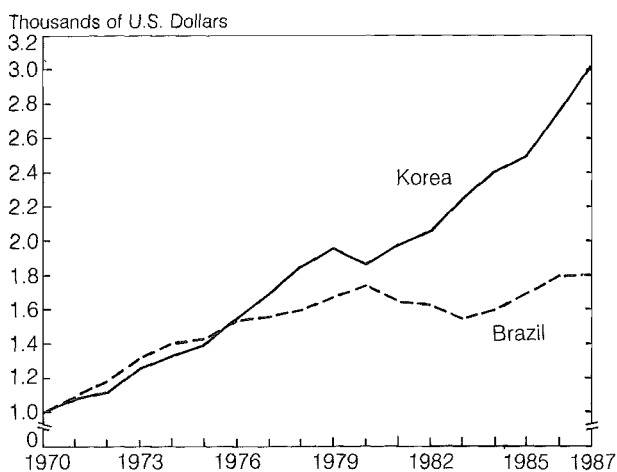
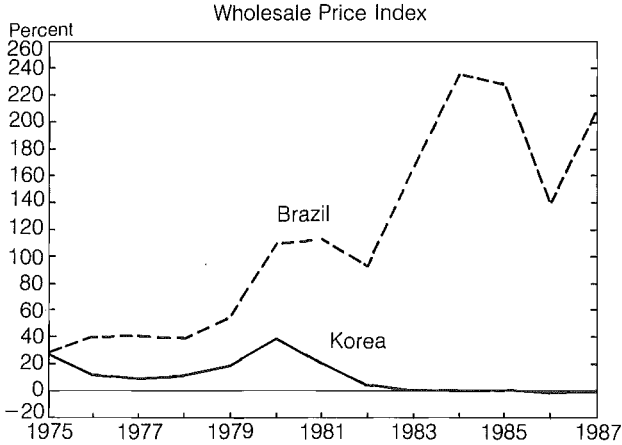


Figure 2

Annual Inflation Rate in Brazil and Korea



Korea's terms of trade are somewhat stronger in the 1980s). The big difference in savings lies in the fiscal area. In Brazil, the government postponed the economy's adjustment to the two oil shocks through various fiscal measures that attempted to insulate the private sector from the higher oil prices. Domestic energy prices were kept low with large and expensive government subsidies that contributed to rising budget deficits and thereby to falling national savings rates. In effect, the higher oil prices were paid for through international borrowing rather than

Figure 3

Share of Gross Fixed Investment in GNP, Brazil and Korea.

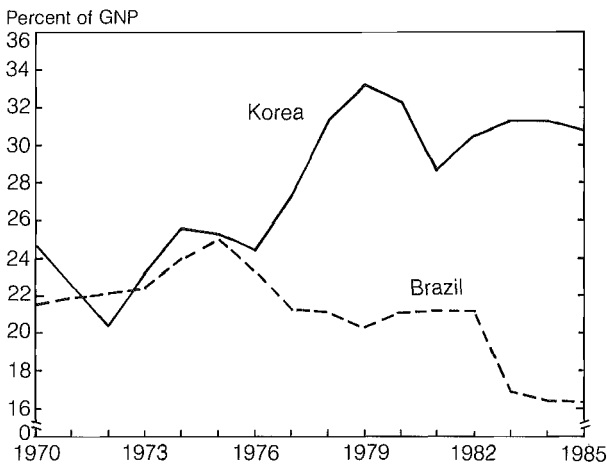
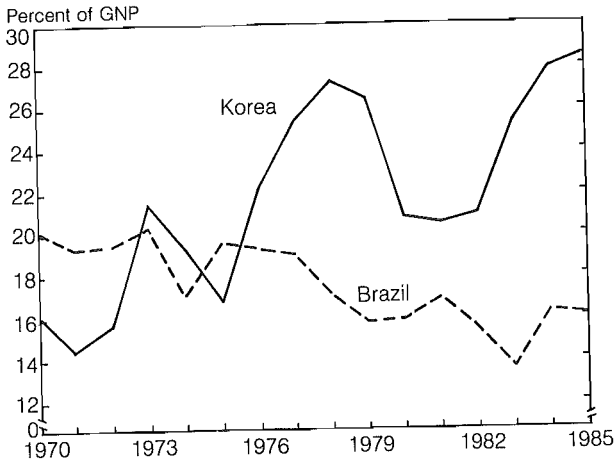


Figure 4

National Savings Rates in Brazil and Korea



reduced consumption spending. Though both Brazil and Korea borrowed heavily in international markets in the 1970s, Brazil is a quintessential case of a country that borrowed to maintain consumption spending, while Korea borrowed to augment the aggregate investment rate. In addition to the differences in fiscal policy, *private* savings rates in

Figure 5

Terms of Trade in Brazil and Korea

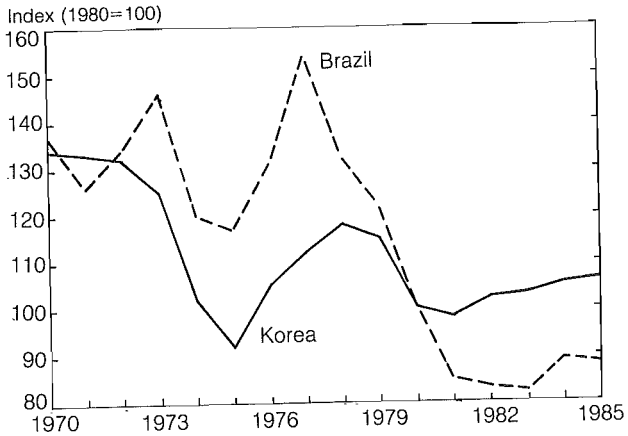
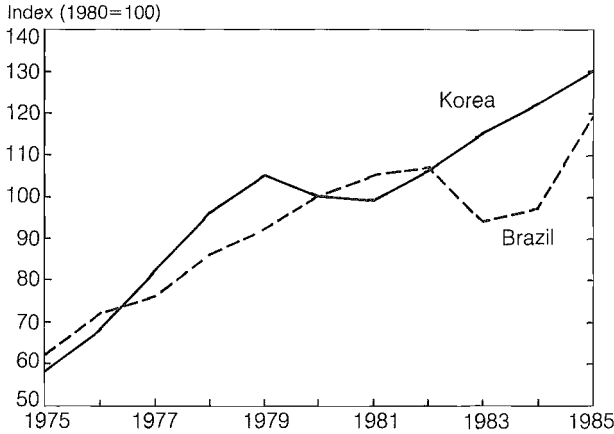


Figure 6

Real Wages in Brazil and Korea



Korea rose steadily throughout the 1970s, while private savings rates in Brazil stagnated after the mid-1970s.¹⁷

The differing reactions of the two countries to the external shocks at the end of the 1970s has already been noted in the previous section. In Brazil, a finance minister who wanted to exercise financial restraint in 1979 was fired in favor of an advocate of greater budget deficits and more international borrowing. At the same time Korea embarked on an ambitious multi-year stabilization effort. As with the oil shocks of the mid-1970s, the higher oil prices and higher interest rates on public debt after 1979 were paid for in Brazil through new borrowing (that is, lower savings rates), rather than by internal adjustment. As Brazil's capacity to borrow from international markets dried up in the early 1980s, the combination of lower savings rates and sharply lower external borrowing produced a decisive drop in the national investment rate.

The absence of appropriate adjustments in Brazil to the external shocks shows up as well in a comparison of labor market performance, shown in figure 6. Korean real wages stopped rising between 1979 and 1982, as part of the adjustment to the terms of trade deterioration. In Brazil, on the other hand, real wage growth continued unabated until

¹⁷ There is no easy explanation of the difference in *private* savings behavior. It appears to us, however, that the private savings in Korea continued to rise because of the high and stable growth rates, while the private savings in Brazil fell because of the reaction to increasingly erratic and unstable government policies. This is simply a conjecture, however, that has not been verified by more detailed analysis.

1982, when the country finally fell into deep crisis, and real wages thereafter stagnated.¹⁸

Why were the policy adjustments in Brazil so bad, and in Korea so strong, at the decisive moments at the end of the 1970s? Here we can only speculate. It seems, for one thing, that the extreme income inequalities of Brazil have played a subtle though important role in the political process. Governments in Brazil are chronically afraid to impose austerity conditions on the general public, for fear of a political revolt among the lower classes, or for fear of allowing a political opening for populist challengers to power. The authoritarian regime that came to power after 1964 sought its legitimacy in high growth rather than in social equity or political legitimacy. As such, it felt too weak to demand sacrifices from the population when external shocks hit the country at the end of the 1970s.

Also, as stressed by Bresser Pereira (1988), there is the role of ideas. Without the good examples of Japan and other successful adjusters as an encouragement, Brazilian policymakers and intellectuals have consistently rejected the very idea of "adjustment" to external shocks (that is, belt-tightening after a terms of trade deterioration), as something imposed from hostile outside forces, such as the IMF or the creditor world in general.

Balance of Payments Trends in the 1980s

In 1987, Asian NIEs collectively ran a trade surplus of \$25.9 billion, large enough to attract considerable attention and even consternation in the rest of the world. The U.S. Treasury began to pressure these countries to take measures to counteract the growing surpluses, including fiscal expansion, exchange rate appreciation, and trade liberalization. Some independent commentators, such as Balassa and Williamson (1987), similarly called for these countries to make adjustments to reduce their trade surpluses.

In 1988, a new Omnibus Trade Act was passed into law, containing a provision calling on the U.S. Treasury Department to analyze the exchange rate policies of other countries to determine whether they

¹⁸ As is well understood, a terms of trade deterioration generally requires a real wage decline in order to maintain full employment. (See Bruno and Sachs (1985) for a formal demonstration of this argument in the case of a country facing a rise in the world price of oil.) This may be brought about through nominal wage restraint, or through a policy of exchange rate depreciation. In Korea, both mechanisms were used to keep real wage growth nearly zero for several years after 1979. In Brazil, on the other hand, nominal wages were tightly indexed to past changes in consumer prices, and the exchange rate was not decisively devalued until well after the onset of the external shocks. As a result, real wage growth remained strong until 1982.

"manipulate the rate of exchange between their currency and the United States dollar for purposes of preventing effective balance of payments adjustments or gaining unfair competitive advantage in international trade." If the Treasury determines that such manipulation is in fact occurring, it is to enter into bilateral negotiations with the offending countries in order to rectify the situation.¹⁹ In October 1988, the Treasury issued its first report under the act, declaring that Korea and Taiwan were indeed manipulating their currencies for unfair advantage, within the meaning of the act, and that they would therefore be targeted for bilateral negotiations.²⁰

Our purpose in this section and the next is to analyze the appropriateness of the Treasury's conclusions, and to consider possible policy responses for Korea and Taiwan. To put the balance of payments patterns in some perspective, the following points about the East Asian countries should be noted. First, the large surpluses in the region are of very recent vintage. Korea, Hong Kong, and Singapore in fact ran external *deficits* rather than surpluses for most of their recent history.²¹ In Hong Kong, they date from 1985,²² while from Korea and Singapore, they date from 1986. Only in Taiwan have the current account surpluses been persistent, with only one year (1980) in deficit since 1975. The surpluses in the ASEAN countries are much smaller and came later. Malaysia went into a significant current account surplus in 1987, after many years of deep deficits. In Thailand, Indonesia, and the Philippines, the economy remains in current account deficit.

This dating is significant, since the current account surpluses are sometimes wrongly attributed to protectionist trade policies in the Asian countries. But contrary to a simplistic hypothesis which holds that the East Asian economies run current account surpluses because they keep imports out, the fact is that during the 1980s, *trade policies have been liberalized in most of these countries at the same time that current accounts have moved from deficits to surpluses.*²³ Thus, any links between restrictive trade

¹⁹ The provision is in Section 3004 (International Negotiations on Exchange Rate and Economic Policies) of the 1988 Omnibus Trade Act. If the Treasury determines that the exchange rate is indeed being manipulated, it is to initiate negotiations with the foreign government, "for the purpose of ensuring that such countries regularly and promptly adjust the rate of exchange between their currencies and the United States dollar to permit effective balance of payments adjustments and to eliminate the unfair advantage" (part b, Section 3004).

²⁰ See U.S. Department of the Treasury (1988).

²¹ Hong Kong does not publish current account data. On the merchandise trade balance, however, Hong Kong was in deficit in the 1980s until 1984.

²² Trade surpluses, in the case of Hong Kong.

²³ Partly in response to U.S. pressures, Taiwan has undertaken significant trade liberalization measures in recent years, including substantial cuts in tariffs and relaxation of nontariff barriers. For a description of the tariff measures in 1987, see "Tariff Cuts in the Republic of China on Taiwan," Taipei, Republic of China: Board of Foreign Trade,

policies and current account surpluses, to the extent that such links exist, would have to be much more complex than is commonly perceived. It is probably safer to assert that the links between trade policies and the balance of payments simply are not that strong. There is little doubt that Latin America is on balance more protectionist than East Asia, yet the Latin American current account balances have chronically been in deficit. Hong Kong, on the other hand, with nearly free trade, has generated large trade and current account surpluses in recent years.

A better starting point for understanding the current account patterns is to look at the savings and investment rates of the various countries in the region. The current account is, by identity, equal to the excess of national savings over national investment. As such, it is determined more by *intertemporal* considerations that affect savings and investment decisions than by static characteristics of the economy such as the trade regime.²⁴

When we examine the trends in savings and investment rates in the ANIE economies, a number of distinct trends are seen to be at work. In Taiwan, which has the largest current account surpluses in the region, both in absolute terms and relative to GNP, the notable phenomena are a rise of savings rates to extraordinary levels (over 40 percent of GNP in 1987), combined with a sharp drop in investment rates throughout the 1980s. The same trend is apparent, though in much smaller magnitude, in Singapore. In Korea, the savings rates have also risen, but with no drop in investment rates. And in Hong Kong, the investment rates came down rather sharply after the early 1980s, thereby leading to a widening gap of domestic savings over domestic investment.

The patterns in the ASEAN countries are equally diverse. In Indonesia, there seems to be little decisive trend either in savings or investment rates, except for the sharp drop in savings rates in 1986 upon the collapse of oil prices.²⁵ In Thailand, investment spending was tapered back throughout the 1980s, most likely in response to tightening credit conditions in world markets, thereby leading to an improvement

Ministry of Economic Affairs, May 31, 1987. Korea, similarly, has undertaken extensive import liberalization measures since the early 1980s. The timetable adopted by the government for a phased reduction or elimination of existing import tariffs through 1988 is also seen as accommodating, in part, U.S. pressures for liberalization. See Kim (1986) and the World Bank (1987) for a description of these measures.

²⁴ This point should not be overstated, however. In principle, trade policies could affect the savings and investment rates through various channels. For example, temporary trade policies can clearly alter intertemporal choices, by making households and firms speed up or slow down the acquisition of foreign goods. More subtly, trade policies can affect the distribution of income, and thereby affect the national savings and investment rates, as shown theoretically by Matsuyama (1987).

²⁵ We should expect that the drop in savings rates would be mostly temporary, in view of the fact that the decline in oil prices seems to be a persistent rather than transitory phenomenon. Unfortunately, we do not have yet have data for the post-1986 period.

in the current account balance in the course of the 1980s. In the Philippines, the combination of the economic crisis and terms of trade decline in the 1980s contributed to a fall in domestic savings which, due to the country's external borrowing constraint, also led to a sharp decline in the investment rate. In Malaysia, there was a sharp cycle over the course of the 1980s: a huge government investment boom led to large budget and current account deficits in the early 1980s; a subsequent sharp cutback in the deficit and in government investment spending led to a sharp improvement of the current account, eventually with a shift into surplus by 1987.

In absolute dollar terms, the surpluses in Korea and Taiwan are by far the most important in the region. The eight countries as a group had a combined 1987 current account balance of about \$31.1 billion, with Taiwan and Korea together accounting for \$27.9 billion of the surplus. It is of course these two countries that have been the major focus of U.S. economic policy attention. For this reason, we will now turn to a more in-depth focus on the current account developments in these two countries.

Korean Balance of Payments in the 1980s

In the early 1980s, Korea appeared to be on the brink of a debt crisis. Korea had borrowed heavily at the end of the 1970s, as part of a drive towards heavy industrialization. As we noted earlier, the authorities sensed trouble in 1979, with the chill winds of higher oil prices and sharply rising international interest rates, and therefore put in place an austerity-cum-export-promotion program.

The year 1980 was a disaster, on all accounts. President Park was assassinated at the end of 1979, and in the following year the country was in political turmoil as a new military regime under General Chun Doo Hwan attempted to consolidate power. The agricultural crop failed because of adverse weather conditions, contributing to a 5 percent drop in GNP. The terms of trade and interest shocks helped to push the debt-service ratios to new highs. Additionally, the investment program of the late 1970s looked like a terrible mistake, with the investment too much skewed to internationally uncompetitive heavy industries, such as steel and petrochemicals. Moreover, it looked like more trouble was brewing, with the collapse of Korea's market for overseas construction projects in the Middle East, and the potential for financial distress in these mammoth construction firms.

Six years later, the concerns of the early 1980s seem hard to imagine. Korea is now booming, with a net debt that is fast approaching zero, a large current account surplus, and virtually zero inflation. The explanation of the remarkable transformation seems to lie in a combination of good policies (particularly the timely shift towards stabiliza-

tion, and the reinforcement of stabilization measures in 1981 and 1982), the returns to earlier investments combined with an opportunity to export to a booming U.S. market, and plain old good luck.

Perhaps the biggest mistake in misjudging Korea's prospects in the early 1980s came in underestimating the incipient returns to the investments of the late 1970s. Until 1985 or 1986, it was an article of faith among many trade specialists that Korea had gone to the edge of crisis in the early 1980s because it had tried to rush the process of industrialization by making an *artificial* jump from labor-intensive manufactures to heavy industry through a foreign-financed investment binge.²⁶ In retrospect, it appears that those investments, in fact, have paid off handsomely, since it is the new heavy industries that are the major contributors to Korea's export boom to the U.S. market of the past few years. This feature is evident in table 6, which shows how the structure of Korean exports has shifted markedly towards heavy industry and transport equipment, precisely the industries that were built up at the end of the 1970s.

The good luck for Korea came in three steps: first, an import surge in the United States, following the expansion of U.S. fiscal policy in 1983-84; second, three "lows" that simultaneously benefitted the Korean economy after 1985—low interest rates, low oil prices, and a low value of the dollar;²⁷ and third, the extraordinary boom of the Japanese economy in 1987-88, which is providing a new engine for export growth of the Korean economy. The benefits to Korea of lower oil prices and interest rates are obvious, while the benefits of a lower dollar need some explanation. At a superficial level, the benefits of a lower dollar seem clear. With the won effectively pegged to the dollar, the dollar depreciation vis-à-vis the yen allowed the authorities in Korea to undertake an *effective* depreciation of the won (mainly against the yen) without the need for an overt, and possibly controversial, explicit devaluation. Thus, even as the won strengthened slightly against the dollar after 1985, the trade-weighted real exchange rate depreciated by about 15 percent

²⁶ See for example, D. Cole and Y.J. Cho (1986), "The Role of the Financial Sector in Korea's Structural Adjustment," mimeo, Harvard University. Korea was in fact not alone in trying to push towards heavy industry at the end of the 1970s. Singapore pursued a policy of intentionally pushing up wages in order to force producers into shifting to higher value-added-per-worker products. See Pang (1985) and Lim and Pang (1986). In the more normal process, and in the pattern pursued by Korea, workers are bid away from low-wage sectors through a process of capital deepening in heavy industry. The wage-push policy in Singapore proved to be a failure, as it led to a profit squeeze and employment decline, rather than to a restructuring of industry.

²⁷ Nominal short-term interest rates (LIBOR) fell from 12 percent per year in 1984 to less than 8 percent per year in 1986, and real rates also fell, though not as strongly. Real oil prices fell by over 50 percent between the end of 1984 and the end of 1986. And the real dollar exchange rate depreciated sharply, relative to the yen (which is of most importance to Korea, as we will note), by 35 percent between the end of 1984 and the end of 1986.

Table 6
Composition of Korean Exports to the United States and to Japan, 1980–87
Percent

	1980	1981	1982	1983	1984	1985	1986	1987
To the United States:								
Food and animals	2.2	1.9	1.7	1.6	1.3	1.3	1.4	1.7
Beverages and tobacco	.7	.9	.5	.3	.3	.2	.1	.1
Crude materials except fuels	.1	.2	.1	.1	.1	.1	.1	.1
Mineral fuels and materials	0	.2	.8	.1	.1	.8	.3	.2
Animal and vegetable oils	0	0	0	0	0	0	0	0
Chemicals	.8	.9	1.3	.9	.9	.9	1.1	.9
Manufactured materials	26.1	27.2	22.2	20.9	21.3	20.2	14.8	12.2
Machinery and transport equip.	19.4	18.9	20.7	27.7	27.5	25.4	31.9	38.1
Miscellaneous manufactures	50.3	48.8	52.2	47.8	48.0	50.4	49.7	46.2
Others not classified by kind	.5	.9	.5	.6	.5	.7	.6	.6
To Japan:								
Food and animals	19.4	19.6	20.5	20.8	19.8	19.0	21.7	18.2
Beverages and tobacco	.1	.2	.2	.2	.2	.2	.1	.1
Crude materials except fuels	6.3	3.3	3.5	4.1	3.0	3.5	3.1	2.6
Mineral fuels and materials	.1	2.8	2.0	9.6	11.3	12.9	5.6	4.9
Animal and vegetable oils	0	0	.1	0	0	0	.1	0
Chemicals	7.9	7.8	7.1	6.9	6.1	4.9	6.1	4.7
Manufactured materials	30.1	28.2	30.0	25.5	23.9	23.1	22.0	22.1
Machinery and transport equip.	10.1	9.5	8.2	8.6	9.3	9.4	9.7	10.5
Miscellaneous manufactures	24.8	27.6	27.4	20.9	23.9	25.4	30.1	35.6
Others not classified by kind	1.3	1.0	1.2	3.4	2.5	1.6	1.4	1.3

Source: OECD, *International Trade Statistics*.

between 1984 and 1986.²⁸ Thus, the authorities “got away” with an effective won depreciation that they might have been hard-pressed to pursue in a more open and explicit manner.

But the benefits of the weak dollar and strong yen go beyond this opportunity for a hidden exchange rate change. Because Korean goods compete directly with Japanese goods in U.S. markets, the strengthening of the yen vis-à-vis the dollar had the effect of shifting out the demand for Korean goods in the U.S. market, thereby leading to a terms-of-trade improvement for Korea, and a real income gain. In other words, the appreciation of the yen led to a rise in demand for Korean goods in U.S. markets, and thereby to a rise in the dollar price of Korean exports. To the extent that Korean imports, on the other hand, are fixed

²⁸ The Morgan Guaranty Trust Co., *World Financial Markets*, presents a trade-weighted real exchange rate for Korea. With 1980 = 100, the exchange rate depreciated from an average 1984 value of 95.6 to an average 1986 value of 82.0. Since 1986, the won has appreciated sharply in real terms, to a value of 95.0 in October 1988.

in dollar terms, the overall effect is a rise in the ratio of export prices to import prices, that is, a terms-of-trade improvement, and a consequent gain in real income. A straight won devaluation, at a given dollar-yen rate, would not result in a comparable terms-of-trade improvement, since the dollar price of import goods would rise along with a rise in export prices.

The overall effect of lower oil prices, lower interest rates, and a stronger yen, was to improve Korea's terms of trade while reducing the interest costs of debt servicing. We can make some very rough calculations of the income savings for Korea from these two developments. The terms of trade improved by 12 percent between 1984 and 1987; with an import share of 34 percent of GNP in 1984, the income savings are on the order of 4 percent of GNP. Similarly, the fall in interest rates after 1984 amounted to a reduction of real interest costs of about 3 percentage points, multiplied by a net debt to GNP ratio on the order of 0.40, suggesting income savings of 1.2 percent of GNP. In total, the favorable shocks contributed to an income improvement per year of approximately 5.2 percent of GNP. These income gains, combined with the surge in exports to the U.S. markets, resulted in a sharp rise in Korea's real income, and a sharp rise in savings rates, which in turn account for Korea's remarkable shift to external surpluses.

Of course, with alternative policies, the macroeconomic authorities in Korea could have encouraged a rise in domestic demand to match the rise in domestic income, so that the favorable shocks would have led to greater investment and consumption, rather than larger external trade surpluses. Some of these policy alternatives (for example, larger budget deficits, exchange rate appreciation, and the like) are considered in the next section. It is clear that the policymakers chose a conservative response for the favorable shocks, that is, to reduce the external debt stock, because of their close encounter with the international debt crisis in the early 1980s. It is hardly credible for U.S. policy authorities to urge a slower decline of Korea's foreign debt at a time when most other highly indebted countries remain trapped in a deep financial crisis.

During the period since 1985, Korea has been engaged in a significant liberalization of the trade account, partly under U.S. pressure, but partly under the natural evolution of Korea's development strategy.²⁹ The simultaneous emergence of large trade surpluses at the time that trade liberalization was proceeding at unprecedented rates

²⁹ A discussion of the liberalization measures undertaken during this period is available in the 1987 World Bank report *Korea: Managing the Industrial Transition*. A description of the schedule for import liberalization between 1984 and 1988 and discussion of its relevance to U.S. Korean trade is available in Kim (1986).

suggests that indeed the surpluses result from important macroeconomic phenomena rather than from the trade regime itself.

Taiwan's Balance of Payments Performance

Taiwan, unlike Korea, did not rely on foreign savings to finance domestic investment in the 1960s and 1970s. Debt was kept low, and the current account was approximately balanced or in small surplus until the early 1980s, when the economy shifted to enormous trade surpluses. Since 1980, the cumulative surpluses have led to the accumulation of international reserves of no less than 80 percent of GNP, the largest reserve holding in the world in both absolute and relative terms.³⁰ Of course, large current account surpluses result in an increase in net foreign asset holdings (or a reduction of net foreign debt). The fact that in Taiwan they resulted in such a large accumulation of *short-term, highly liquid foreign exchange reserves*, results mainly from Taiwan's extensive capital controls, which have prevented the private sector from accumulating other forms of financial assets.³¹

We have already noted that the emergence of the surpluses during 1980–85 occurred through a sharp contraction of investment spending relative to GNP, while savings rates remained very high. Then, after 1985, savings rates rose while investment rates remained at their "depressed" levels.³² Table 7 helps us to identify some of the factors in the decline in investment rates, by breaking the overall investment spending into levels for the private sector, government enterprises, and the central government. It is clear from the table that the largest cutback in spending was undertaken by the state enterprises, but that private sector investment also declined sharply.

Many possible explanations exist for the sharp drop-off in investment rates, though few if any careful studies.³³ One likely factor is the rise in political uncertainty about Taiwan's future following the U.S. recognition of the People's Republic of China, and the breaking of

³⁰ By contrast, German foreign exchange reserves at the end of 1987 were valued at 6.9 percent of GNP and Japanese only at 3.4 percent of GNP.

³¹ These capital controls are now being liberalized, in part to facilitate the diversification of foreign assets, and in part because the very large stock of foreign exchange reserves is the focus of considerable political pressure from abroad for Taiwan to expand domestic demand. For details of Taiwan's capital controls and their implications for the accumulation of foreign exchange reserves, up through mid-1987, see Seth, Rama and Robert N. McCauley, "Financial Consequences of New Asian Surpluses," Federal Reserve Bank of New York *Quarterly Review*, vol. 12, no. 2, Summer 1987, pp. 32–44.

³² Of course, the term "depressed" is relative to 1980 levels, and not relative to the rates of other countries. With an investment rate of over 19 percent of GNP, investment is still higher than the average of Latin American countries, for example.

³³ We have not been able to locate any detailed, English-language statistical analyses of investment spending in Taiwan.

Table 7
Taiwan National Income and Investment, 1980–87
NT\$ Billion

	GDP	Gross Fixed Capital Formation	Source of Investment Spending		
			Government	Public Enterprises	Private
1980	1407	456	66.9	155.9	233.6
1981	1749	494	75.5	161.0	257.0
1982	1860	488	84.3	165.6	238.7
1983	2041	472	78.2	148.8	245.3
1984	2255	484	81.9	125.9	276.5
1985	2357	449	85.8	112.0	251.0
1986	2701	500	98.6	121.9	280.3
1987	3013	597	112.3	133.6	350.7
As Shares of GDP (percent):					
1980		32.4	4.8	11.1	16.6
1981		28.2	4.3	9.2	14.7
1982		26.2	4.5	8.9	12.8
1983		23.1	3.8	7.3	12.0
1984		21.5	3.6	5.6	12.3
1985		19.0	3.6	4.8	10.6
1986		18.5	3.7	4.5	10.4
1987		19.8	3.7	4.4	11.6

Source: *Statistical Yearbook of the Republic of China*, 1988.

relations with Taiwan. A second factor is the external shocks of the late 1970s and early 1980s. The rise in oil prices and world interest rates led the conservative, inflation-averse government of Taiwan to cut back sharply in government investment projects. A third factor was the rise in protectionist barriers to Taiwanese exports in the developed economies, leading many Taiwanese firms to shift investments to overseas markets in order to protect market access.³⁴ Finally, it has been suggested that inadequate domestic financial intermediation has led to difficulties in channeling private domestic savings to domestic investment, with the result that a rise in private savings is channelled not into private domestic investment, but into government bonds that are the

³⁴ In the textile sector, for example, which accounted for 23 percent of Taiwan's exports in 1980, an estimated 90.9 percent of Taiwan's textile exports to the U.S. market were subject to quota restrictions. See Table A5, in Kuo-shu Liang and Ching-ing Hou Liang, "Development Policy Formation and Future Policy Priorities in the Republic of China," *Economic Development and Cultural Change*, vol. 36, no. 3, Supplement, April 1988, pp. S67–S102.

counterpart of the government's accumulation of foreign exchange reserves.³⁵

As in Korea, Taiwan benefitted substantially from the favorable oil and exchange rate shocks of the mid-1980s,³⁶ though the interest rate shocks would appear to have been detrimental rather than beneficial, in view of Taiwan's net creditor status. Also, like Korea, Taiwan has engaged in substantial trade liberalization in recent years, putting into severe doubt the suggestion that Taiwan's growing trade surpluses in the mid-1980s are somehow importantly related to its trade policies.

Korea and Taiwan in the Global Adjustment Process

In response to the large trade surpluses of Taiwan and Korea, and the rapid growth of these economies, U.S. government officials and many economists insist that these countries should participate more actively in international policy coordination to help resolve the large financial imbalances in the world economy. Two kinds of arguments are typically given. First, it is argued that these economies can play a major role in resolving the U.S. external deficit by undertaking policies to reduce their own large surpluses. Second, it is argued that as the U.S. economy shifts its policies towards fiscal contraction, along Gramm-Rudman-Hollings lines, it will be necessary for Korea and Taiwan to move to domestic demand-led growth to compensate for the fall in demand from the United States.

³⁵ Specifically, suppose that savers choose government securities as their only financial investment instrument, because of the poor quality of domestic financial intermediaries. A rise in the household propensity to save leads in the first instance to a fall in yields on government securities, with no reduction in the cost of borrowing for domestic firms (who lack access to the increased household savings). The rise in savings (and equivalent fall in domestic spending) also leads to a fall in imports and a rise in exports. Given the existence of international capital controls in Taiwan, exporters must sell their foreign exchange to the central bank in return for domestic currency, while importers must buy the foreign exchange from the central bank using domestic currency. The result of the widening of the trade surplus is therefore a greater net flow of foreign exchange sold to the central bank, and a more rapid flow increase of the money supply held by the private sector. In practice, the central bank sterilizes the monetary consequences of the trade surplus by selling government bonds to the private sector in return for their increased money holdings. The result, therefore, of the increased savings rate in this scenario is: a more rapid accumulation of government bonds by the private sector; a larger trade surplus; a more rapid accumulation of foreign exchange reserves at the central bank; and little, if any, increase in the domestic investment rate.

³⁶ As with Korea, the Taiwanese dollar depreciated sharply vis-à-vis the yen. Overall, Taiwan depreciated by 9.0 percent between 1984 and 1986, according to the Morgan Guaranty Index, but it appreciated sharply between 1986 and 1988, reversing the earlier real depreciation.

A typical expression along these lines was found in a widely circulated statement of 33 economists issued in December 1987 (pp. 11–12):³⁷

We believe that the NICs, notably Taiwan and to a lesser degree Korea, should aim to greatly reduce their current account surpluses over the next three to five years. These countries have achieved the most enviable development records in the world over the past twenty years, and there is no reason why they cannot continue expanding their exports rapidly. However, in light of their relatively low levels of per capita income, the impressive rates of return on domestic investment and the threats posed to their monetary stability by continued large surpluses, it would be economically and politically unwise for them to continue running such large surpluses—which now exceed 20 percent of GNP for Taiwan and 8 percent of GNP for Korea. Thus, they need sharp increases in imports and some diversion of productive output to the domestic market.

Three sets of measures would seem appropriate for these countries. First, for Taiwan and Korea, there remains considerable scope to extend the program of trade liberalization. . . . Second, all these countries have enormous opportunities for further increases in domestic investment and thus in internal demand. . . . Third, some further currency appreciation will undoubtedly be needed for the NICs to complete these adjustments.

These arguments may be correct in part, but we suggest that they are improperly motivated. To the extent that the ANIE policies should be changed, they should be changed as a response to the domestic needs of those economies, not according to the perceived needs of the global economy or the U.S. economy. *The effect on the rest of the world of the recommended changes in Korea and Taiwan are simply too small to justify a major change in their policies on the behalf of other countries.*

The motivation for the recommended changes becomes even worse when Korean and Taiwanese surpluses are attributed to unfair currency manipulation. We have already seen that the trade surpluses emerged not from currency manipulation per se, but from a variety of more basic macroeconomic factors. These include rising savings rates; a sharp fall in Taiwanese investment rates starting in the early 1980s; the high productivity of investments in Korea and Taiwan that led to a spurt of real output in the mid-1980s; and favorable terms of trade shocks in the mid-1980s. It is striking that the United States accuses these countries of unfair exchange rate manipulation despite the fact that their currencies have actually *appreciated* against the dollar during the 1980s, and during

³⁷ See "Resolving the Global Economic Crisis: After Wall Street: A Statement by Thirty-three Economists from Thirteen Countries," Institute for International Economics, Special Report No. 6, December 1987.

the past three years. If these countries are guilty of unfair currency manipulation, what about the United States itself?³⁸

The charge that currency manipulation (as opposed to other kinds of macroeconomic shocks) can explain the large Korean and Taiwanese surpluses can also be evaluated by examining the overall effective exchange rate movements of Korea and Taiwan. Interestingly, according to the Morgan Guaranty index, the real effective exchange rates for Korea and Taiwan in October 1988 are very close to their 1980–82 averages. They have not sharply depreciated, as is sometimes thought. With 1980–82 = 100, the index for Korea in October 1988 stood at 95.0 (that is, a 5 percent real depreciation during the 1980s), and the index for Taiwan stood at 99.8.³⁹

Some of the widely recommended policy changes such as further sharp currency appreciation could do real harm to these economies, while yielding little if any benefit for the rest of the world. Nor should these countries necessarily boost internal demand to counteract a future slowdown in export growth to the U.S. market. A more reasonable strategy for these countries, and one that can emerge largely from market forces, is for Korea and Taiwan to reorient their trade to the Japanese market as the U.S. trade deficit shrinks. As we shall indicate, this process of shifting from the U.S. market to the Japanese market has already begun.

Our doubts about the wisdom of currency appreciation and fiscal expansion for Korea and Taiwan *for the sake of the U.S. trade balance* will first be made on purely theoretical grounds, and then on quantitative grounds using a global macroeconomic simulation model, which allows us to study the macroeconomic links between the Asian NIEs and the rest of the world. The theoretical doubts follow mainly from the small size of the Asian economies, from the difficulty of adjusting current account deficits and surpluses via exchange rate realignments alone, and from the inadvisability of running large budget deficits as a response to current account surpluses.

In 1987, the combined GNP of Taiwan and Korea was \$220 billion, or about *one-twentieth* of U.S. GNP, and *one-sixtieth* of OECD GNP. This means that enormous changes in Taiwan and Korea, relative to the size of these two economies, will be very small changes for the rest of the

³⁸ The U.S. position seems problematic for other reasons as well. On the one hand, the United States is accusing other countries of currency manipulation for merely pegging closely to the dollar itself over some periods, but on the other hand, the United States is resisting the growing use of the yen as a reserve currency. But to the extent that countries find themselves attacked merely for linking to the dollar, they surely will begin pegging other currencies, such as the yen, in basic political self-defense.

³⁹ See Morgan Guaranty Trust Company of New York, *World Financial Markets*, no. 6, November 29, 1988, p. 13.

world. Moreover, since the U.S. economy only accounts for about 30 percent of the production of the rest of the world, any changes in Korea and Taiwan will not fall mainly on the United States in any case, but instead will be spread out among the entire industrial world (and even beyond).

Suppose, for example, that Korea and Taiwan increase the government budget deficit enough to reduce their combined trade surplus by \$10 billion. The necessary budget deficit would be at least \$10 billion, or over 4 percent of GNP.⁴⁰ The rest of the world will experience this budgetary shift as a rise of world interest rates, which will lead to a reduction of investment and rise in savings in other parts of the world, and a consequent \$10 billion improvement in the current account of the rest of the world. Since the U.S. economy constitutes about one-third of the rest of the world, a very rough measure would suggest that the U.S. current account deficit would fall by about \$3 billion, or 0.06 percent of U.S. GNP. The tradeoff looks pretty meager: a 4 percent of GNP budget deficit in Korea and Taiwan to spur a \$3 billion improvement in the U.S. external account. Nor would this small improvement tend to be permanent, since the budget deficit would probably have to be reduced eventually in Korea and Taiwan.

As a first approximation, the distribution of the current account improvement in the rest of the world will depend on the levels of investment and savings in other parts of the world, and not importantly on the trade patterns of Korea and Taiwan.⁴¹ Even if in the first instance *all* of the increased net imports of Korea and Taiwan fell on U.S. products, the U.S. current account would still rise by much less than \$10 billion. The net shift of demand towards U.S. goods would lead to an appreciation of the dollar, and a redistribution of the rise in net imports to other parts of the world. As a result, the *bilateral* trade balance between the U.S. and the ANIEs would improve, but the U.S. deficit with other parts of the world would tend to worsen. As long as savings and investment rates in the United States and abroad do not depend overwhelmingly on the real exchange rate of the dollar and other currencies (an assumption that will be approximately true for *permanent*

⁴⁰ This is because a given shift in the budget balance tends to have less than a one-for-one effect on the current account balance.

⁴¹ In general, the response of the trade balance in any particular region will depend on the share of that region in total world absorption (consumption plus investment), and on the elasticity of absorption with respect to the world interest rate in that region compared to the interest elasticity for the rest of the world. Countries with free international capital mobility will tend to have a larger interest elasticity of absorption with respect to world interest rates (since in the case of capital controls, the links between world interest rates and domestic absorption are weakened). Therefore, after a fiscal expansion in Korea or Taiwan, countries in the rest of the world with free international capital mobility will tend to experience the largest rise in their external balance.

changes in exchange rates), but depend instead on the levels of real interest rates, the eventual distribution of current account surpluses outside Korea and Taiwan will be little affected by the direction of real trade.

The benefits for the United States of an exchange rate appreciation in Korea and Taiwan are likely to be even more modest. In fact, a significant exchange rate appreciation in Korea or Taiwan could damage those economies without improving the U.S. external balance in a sustained manner. An appreciation in Korea or Taiwan would tend to raise the real product wage and squeeze profitability in tradeables production. Demand for nontradeable goods in Korea and Taiwan would rise following an appreciation, raising employment in nontradeables sectors, but employment in the tradeables sectors would tend to fall by even more, and unemployment would likely ensue in the short run.⁴² Thus, any reduction in the ANIE trade surplus would also be accompanied by rising unemployment.

Trade liberalization is often mentioned as a possible response to the trade surpluses in Korea and Taiwan, but as we have already pointed out several times, the relationship between trade policies and the external balance is very weak. Remember that Latin America, with highly restrictive trade policies, has run chronic trade deficits except in the periods of extreme debt crisis (during which they could not get credits to finance an external deficit). In general, *temporary* trade liberalizations tend to lead to a reduction of trade surpluses, as firms increase their purchases of imports during the period of temporary liberalizations. *Permanent* liberalizations, on the other hand, are likely to stimulate exports and imports about equally, with little net effect on the trade balance.

A final policy option for reducing the trade surplus is the elimination of capital controls. This was pushed by the U.S. government in bilateral negotiations with Japan in the mid-1980s, but with the opposite results from those intended.⁴³ With free international capital mobility, savings will flow from low-interest-rate regions to high-interest-rate regions. Thus, the direction of capital flows after liberalization will depend on the direction of the initial interest rate differentials before

⁴² This discussion assumes that the appreciation is carried out with exchange rate and monetary policy alone, and is not accompanied by a fiscal expansion. An exchange rate appreciation cum fiscal expansion might avoid the unemployment effect, but would generate the other problems associated with increased fiscal deficits.

⁴³ For a historical and analytical discussion of this episode in United States-Japan bilateral negotiations, and especially the unintended consequences of the U.S. negotiating position, see Jeffrey Frankel, "The Yen/Dollar Agreement: Liberalizing Japanese Capital Markets," *Policy Analyses in International Economics*, no. 9, Institute of International Economics, Washington, D.C., December 1984.

liberalization. In the case of Japan, the Japanese capital controls were bottling up Japanese savings in the domestic economy, and keeping Japanese interest rates lower than those in the rest of the world. Thus, when the capital flows were liberalized, Japanese savings flowed out, the yen depreciated, and the Japanese external surplus was *enlarged*.⁴⁴

In the case of Korea and Taiwan, it is not exactly clear in which way the current capital control regime is now working. It appears that the capital controls are acting to prevent an *inflow* of capital that would help to finance a greater rate of domestic investment spending. In that case, capital market liberalization would indeed tend to reduce the current account surplus, and such a policy move might be advisable.⁴⁵ It is possible, however, (mainly in the case of Taiwan) that the capital controls are restricting the *outflow* rather than the *inflow* of capital. In that case, freer international capital movements could actually enlarge the trade surplus.

Liberalization of international capital movements would have one more important effect in Taiwan. Taiwanese current account surpluses would be reflected in the accumulation of a wider range of foreign assets, and not simply an accumulation of short-term, dollar-denominated, foreign exchange reserves of the central bank. The mountain of foreign exchange reserves now exposes Taiwan to political problems abroad and to extreme foreign exchange risk (from which Taiwan is already estimated to have lost \$12 billion U.S.). Liberalization would result in a much sounder and better diversified portfolio.

Welfare Considerations of Policy Moves in Korea and Taiwan

The analysis so far suggests that the effects of actions in Korea and Taiwan on the United States are likely to be very small relative to their effects on the own economies. Thus, on purely economic terms, the decision of whether to reduce the trade surpluses should depend on tradeoffs mainly within the ANIE economies.⁴⁶ Here, the first fundamental question is whether the marginal social returns to domestic

⁴⁴ In savings-investment terms, the liberalization caused Japanese interest rates to rise, thereby causing savings to rise and investment to fall, with a net effect of raising the current account surplus (equal to savings minus investment).

⁴⁵ It is still worth emphasizing, however, that policymakers in Korea are rightly worried about free capital mobility, and the costs of heavy foreign indebtedness, in view of the bad experience with foreign borrowing of most of the heavily indebted countries in the 1980s.

⁴⁶ Of course, the ANIEs have to calculate the costs and benefits of responding to various kinds of political pressures from the United States and other industrial countries. And those political pressures might have important economic consequences, such as the imposition of trade restrictions, or in the case of Korea, various pressures to assume some of the costs of military security that are now borne by the United States.

investment are higher than on foreign investment (in which case the domestic investment rate should be raised, and the current account commensurately reduced); and the second is whether the marginal social utility of current consumption is higher than the marginal social utility of wealth (in which case savings should be reduced by an incremental rise in current consumption spending).

These are very tricky questions, that cannot in general be determined by "market forces" alone. The course of economic development requires infrastructural investments and thus public-sector spending and non-market decisions. Indeed, it is a drop in public investment spending in Taiwan that accounts for a large proportion of the increase in the external surplus in the 1980s. It seems plausible, though far from proved, that Taiwan could usefully devote more domestic savings to public infrastructure and R&D investment rather than to an incremental accumulation of financial wealth.⁴⁷

With respect to the savings-consumption decision, the marginal social utility of current consumption versus future consumption is even harder to gauge. In view of the turmoil of world financial markets, there may well be a social premium to eliminating external debt. Korea might thus be correct in trying to eliminate its net debtor status even if unrestricted private capital flows would lead to a net inflow of capital, and a smaller net surplus on the current account.

A Simulation Approach to U.S.-ANIE Macroeconomic Interactions

In the final section of the paper, we attempt to document some of our skepticism about the usefulness of ANIE currency appreciations in overcoming the U.S. external deficits. For this purpose, we employ an extended version of the McKibbin-Sachs Global model (the APMSG model) which has been developed to model linkages between East Asia and the industrialized economies. The new ANIE and ASEAN sub-blocks of the model are multi-sector, computable general equilibrium sub-blocks, parameterized on the composite trade and output structure of the two East Asian regions. The work is preliminary and still in progress, but the results are promising enough to present some early results. A summary of the structure of the ANIE and ASEAN blocks is presented in the appendix.

The following points about the ANIE sub-block can be highlighted here. The ANIE economy is modelled as a four-sector economy: primary

⁴⁷ The government of Taiwan has indeed been taking steps in this direction with its 14 major projects' that are being implemented. This is expected to significantly raise government investment expenditures during 1989-90.

commodities, light industry, heavy industry, and services. We assume capital controls on private inflows and outflows of capital (correct for the larger economies, Korea and Taiwan, but not for Singapore and Hong Kong). Trade is parameterized according to the 1986 direction of trade for the four countries. We assume, without econometric verification at this point, that the ANIE goods are highly substitutable for Japanese goods in the import demands of U.S. final demanders. Thus, an appreciation of the yen vis-à-vis the Asian currencies (denominated as the Asian Currency Unit, ACU, in the model), leads to a strong shift in demand from Japanese goods to ANIE goods.

We consider two main experiments using the model. First, we study the effects on the NIEs and on Japan and the United States of a 10 percent sustained nominal appreciation of the ACU. We assume that the monetary consequences of the appreciation are sterilized within the ANIEs, in the sense that the money supply remains constant after the appreciation.⁴⁸ Next, we study the effects on the ANIEs of implementing Gramm-Rudman-Hollings budgetary measures in the U.S. economy.

Appreciation of the ACU

The results of the 10 percent further appreciation of the ACU are presented in table 8, where we report results for the ANIEs, the United States, and Japan (results for the other regions are not shown). The key points are as follows. The appreciation of the ACU leads to an initial decline in output of tradeables, as output prices fall relative to wages (thereby leading to a profit squeeze, and a reduction in employment), and to a rise in nontradeables output and employment. The rise in nontradeables demand comes essentially from a real balance effect: with a given nominal supply of money, the appreciation of the currency reduces domestic prices and raises the real money stock, which in turn depresses real interest rates and raises internal demand.⁴⁹ In the simulation model, employment in the three tradeables sectors (primary, light industry, and heavy industry) falls by 0.08 percent, 0.69 percent, and 0.26 percent, respectively, while service sector employment is

⁴⁸ Specifically, the appreciation of the ACU leads to a reduction of the trade surplus in the ANIE region. With capital controls, and without sterilization, the reduced trade surplus would lead to a fall in the money supply relative to the baseline. This fall in the money supply is sterilized in the model by assuming that the central bank undertakes open market purchases of government bonds in order to offset the decline in the money supply.

⁴⁹ In an economy with high international capital mobility, the reduction in domestic interest rates would lead to a capital outflow, which in turn would reduce the domestic stock of nominal money balances, thereby causing domestic interest rates to rise quickly back to world levels. With capital immobility, domestic interest rates can remain lower than world interest rates without generating an immediate capital outflow.

Table 8
Results of a 10 Percent Permanent Appreciation of the Asian Currency Unit (ACU)^a

		1989	1990	1991	1992	1993
<u>Asian NIEs:</u>						
Value Added by Sector:						
Light Mfg. (X)	%GDP	-.69	.65	-.61	-.56	-.51
Heavy Mfg. (M)	%GDP	-.26	-.20	-.13	-.05	.02
Agric. & Mining (R)	%GDP	-.08	-.04	-.01	.03	.06
Services (S)	%GDP	-.01	.14	.29	.45	.60
Employment:						
labor in X	%	-.69	-.73	-.76	-.78	-.79
labor in M	%	-.26	-.33	-.39	-.42	-.45
labor in R	%	-.08	-.08	-.09	-.09	-.10
labor in S	%	-.01	-.14	-.24	-.32	-.37
Total	%	-1.03	-1.29	-1.48	-1.62	-1.71
Trade Balance in						
Constant ACU	%GDP	-3.86	-3.83	-3.79	-3.73	-3.70
Domestic Price	%	-4.38	-4.62	-4.86	-5.12	-5.38
Exch Rate (\$/ACU)	%	10.00	10.00	10.00	10.00	10.00
Exports (volumes)						
to the US	%GDP	-1.65	-1.60	-1.53	-1.46	1.38
to Japan	%GDP	-.21	-.20	-.19	-.18	-.17
to the ROECD	%GDP	-.40	-.39	-.37	-.34	-.33
<u>U.S. Economy:</u>						
Trade Balance	%GDP	.04	.05	.05	.05	.05
Output	%	-.02	-.07	-.11	-.14	-.18
Domestic price	%	.02	.07	.13	.18	.23
<u>Japanese Economy:</u>						
Trade Balance	%GDP	.10	.10	.11	.11	.11
Output	%	.04	-.01	-.03	-.04	-.05
Domestic price	%	.01	.05	.09	.12	.14

% = percent deviation from base year value

%GDP = Change as a percent of GDP from base year value (1986)

^aSee the appendix for a description of the model.

unaffected in the first period, and then rises rapidly. Overall, total employment falls on impact of the devaluation by 1.0 percent. This fall in employment would presumably show up partly as open unemployment, partly as a reduction of working hours, and partly as a decline in the labor force.

The decline in production of tradeables combined with the internal demand increase causes the trade balance and current account to deteriorate. The trade balance falls by 3.9 percent of GNP on impact, or by approximately \$8 billion. As already discussed, this decline in the trade surplus is matched by an identical rise in the trade surplus in the rest of the world. In Japan, the trade surplus rises by 0.1 percent of

Japanese GNP, and in the United States, the trade surplus rises by 0.04 percent of GNP, or by approximately \$1.8 billion. Note that U.S. imports from the ANIEs fall by roughly twice this amount. However, the decline in imports from the ANIEs is balanced by an increase in imports from Japan and other parts of the world.

Thus, a sizable, 10 percent appreciation of the ACU has the effect of substantially reducing ANIE employment on impact, by 1 percent of labor input, while at the same time improving the U.S. trade balance by a mere \$1.8 billion. Assuming that the monetary effects of the trade balance reduction are fully sterilized, the appreciation has a persisting effect on the trade balance.

Gramm-Rudman-Hollings Budgetary Policies in the United States

Recently, some advocates of fiscal expansion in the ANIEs have urged domestic demand expansion as a counterweight to declining U.S. demand for ANIE exports. The argument goes, correctly in part, that the United States cannot be an engine of growth for the ANIE economies in the next few years, since budgetary austerity (not to mention protectionist sentiment) is sure to slow the increases in U.S. demand for imports from the ANIEs. The argument is that fiscal expansion in the ANIEs will be necessary to counteract the contractionary effects of U.S. policy changes.

There are two important points in response to this argument. First, alternative policy responses are available to the ANIE economies. One of the simplest is to reduce internal interest rates through a *monetary* (rather than fiscal) expansion, in step with the reduction in international interest rates that will come from a tighter budget in the United States. If the ANIEs match the reduction in interest rates that will be experienced in world markets if the United States adheres to Gramm-Rudman-Hollings, then internal demand might expand adequately to counteract any contraction coming from U.S. fiscal austerity.

Second, and equally important, the decline in U.S. demand will tend to be matched by a rise in demand in other parts of the world, thereby compensating Korea and Taiwan partly or wholly for the decline in the growth of the U.S. market. Note that this effect will be fairly automatic. As the U.S. budget deficit is reduced, world interest rates will fall. For other regions in the world with high capital mobility between local and world markets (especially Japan and the European Community), interest rates will tend to decline in step with those in the United States. This fall in interest rates in Japan and Europe will tend to contribute to a rise in internal demand in these economies, which will fuel a higher demand for imports from the ANIEs.

Thus, an important part of the adjustment to a falling U.S. budget deficit will be a *shift in ANIE exports* from the U.S. market to Japan and Europe. In fact, this shift is already occurring in 1987–88, especially towards Japan, given the strong internal demand in Japan and Europe. Korean exports to Japan, for example, have leaped by 50 percent in dollar terms comparing the first eight months of 1988 with the same period in 1987. This shift is naturally facilitated by the fact that the won is tied closely to the dollar, so the dollar-yen depreciation that accompanies the U.S. retrenchment leads to a won-yen depreciation. The cheaper won has allowed Korea to penetrate deeply into Japanese markets. The same phenomenon of growing exports to Japan is also visible with the Taiwan economy.

The simulation results shown in table 9 for a Gramm-Rudman-Hollings budgetary policy bear out these arguments. The simulation traces out the effects of a permanent cut in U.S. government spending of 3 percent of GNP, spaced out over five years with a cut of 0.6 percent of GNP each year. As the U.S. fiscal deficit is reduced, the Federal Reserve is assumed to expand the money supply sufficiently to stabilize U.S. employment levels. As expected, the reduction of the budget deficit has a significant effect on the U.S. external balance, reducing the trade deficit by about 0.9 percent of GNP in the fifth year. On impact the dollar depreciates in real terms against the major currencies, by 4.8 percent against the ECU and 7.1 percent against the yen.

As a result of these policy changes, ANIE exports to the United States decline, more for final goods than for intermediate goods.⁵⁰ At the same time, however, exports to Japan and to Europe rise markedly, since the ACU depreciates against the yen and the ECU (by 8.4 percent vis-à-vis the yen by the third year), and since domestic absorption in Japan and Europe is increased by the decline in world interest rates following the U.S. budget cut. On balance, interestingly, the trade balance and overall employment are estimated to *increase* after the U.S. policy shift, despite the loss of market growth in the United States.

This exercise points up a valid policy concern for the United States: the openness of the *Japanese* market for East Asian export goods (particularly finished goods). A natural part of the adjustment process in future years will be a shift in ANIE export markets from the United States to Japan. This, we have already seen, has been occurring in the past 18 months. Perhaps not surprisingly, many Japanese producers are starting to resist the inflow of manufactured goods from the East Asian

⁵⁰ The U.S. demand for *final* goods imports from the ANIE bloc is related to U.S. absorption, which falls with the cutback in the budget deficit. The U.S. demand for *intermediate* goods from ANIE, on the other hand, is related to U.S. GDP, which does not fall when the budget is contracted. Thus, the decline in demand for intermediate goods is less than the decline in demand for final goods.

Table 9
Gramm-Rudman-Hollings Phased Reduction in the U.S. Deficit

		1989	1990	1991	1992	1993
<u>Asian NIEs:</u>						
Value Added by Sector:						
Light Mfg. (X),	%GDP	.01	.05	.11	.17	.24
Heavy Mfg. (M)	%GFP	.02	.07	.12	.17	.22
Agric. & Mining (R)	%GDP	.04	.06	.07	.09	.10
Service(s) (S)	%GDP	.06	.12	.19	.27	.34
Employment:						
labor in X	%	.01	.06	.12	.18	.25
labor in M	%	.02	.07	.13	.19	.24
labor in R	%	.04	.05	.07	.08	.10
labor in S	%	.06	.13	.21	.29	.38
Total	%	.14	.32	.52	.75	.97
Trade Balance in						
Constant ACU	%GDP	-.01	.09	.20	.31	.43
Domestic Price	%	.78	1.15	1.57	2.01	2.38
Exchange Rate (\$/ACU)	%	2.40	3.28	4.12	4.89	5.41
Exports (volumes)						
to the US	%GDP	-.54	-.70	-.82	-.93	-.97
to Japan	%GDP	.39	.50	.60	.67	.72
to the ROECD	%GDP	.29	.41	.52	.59	.63
<u>U.S. Economy</u>						
Trade Balance	%GDP	.49	.63	.75	.84	.89
Output	%	-.36	-.42	-.42	-.37	-.26
Domestic Price	%	.12	.61	1.14	1.66	2.07
<u>Japanese Economy:</u>						
Trade Balance	%GDP	-.65	-.79	-.90	-.99	-1.05
Output	%	.04	.40	.58	.76	.93
Domestic Price	%	-.31	-.84	-1.31	-1.72	-2.06

% = percent deviation from base year value

%GDP = Change as a percent of GDP from base year value (1986)

economies, and there are legitimate fears of a protectionist backlash from Japanese producers. Certainly, an important part of Japan's global responsibilities in the future adjustment process is to maintain open markets for its East Asian neighbors.

Conclusions

Balassa and Williamson's 1987 study of the ANIEs is aptly titled, "Adjusting to Success: Balance of Payments Policy in the East Asian NICs." Indeed, as we have shown at considerable length, the story of the East Asian economies (not only the ANIEs, but also the ASEAN

countries) is one of remarkable success. And almost all of it was earned. The evidence suggests strongly that the fruits of success came despite adverse external shocks for much of the period, and emerged through a long process of heavy investment, responsible macroeconomic policy, and an appropriate trade regime.

Our concern is that the ANIEs may now become a scapegoat for the failure of U.S. macroeconomic policy to display the same farsightedness. The U.S. Treasury Department report to Congress of October 1988 attributes much of the ANIE success to unfair trade and exchange rate practices, rather than to deeper macroeconomic forces that are clearly at play. Ironically, the charge of exchange rate manipulation comes despite the fact that these currencies are actually appreciating against the dollar (quite sharply in the case of Taiwan). Moreover, contrary to a common theme that unfair trade practices explain the large surpluses of this part of the world, stands the evidence that the rise in trade surpluses has occurred during a period of vigorous trade liberalization.

As we suggest in the final section, it may be wise for the East Asian economies to expand internal demand on their own behalf, especially if there are infrastructural investments that can be undertaken with a high social rate of return. It is clear, however, that even significant actions by Taiwan and Korea on their fiscal or exchange rate policies would do little to help restore external balance for the United States, and any attempt to guide the policies of these countries according to the perceived needs of the U.S. economy could do significant harm to their economies. Perhaps as important as internal demand expansion is a shift of ANIE export growth from the U.S. market to Japan. U.S. diplomacy will be useful in this regard in stressing to Japan the importance of absorbing a much larger volume of finished-good imports from the East Asian countries.

Appendix: Outline of the Asia-Pacific MSG Model

This appendix provides a brief description of the key behavioral equations underlying the Asia-Pacific MSG model discussed in the text. A detailed discussion of features pertinent to the Asian region is available in Sundberg (1989). A complete description of the developed country blocs of the model and the solution techniques it employs is available in McKibbin and Sachs (1989) and McKibbin (1986).

The APMSG model is a dynamic general equilibrium model of a seven-region world economy. There are three developed country blocs: the United States, Japan and the rest of the OECD countries (ROECD). Developing countries have been divided into three regions comprising the export-led high growth economies of East Asia (the Asian NIES), the middle-income developing countries of ASEAN (Indonesia, Malaysia, the Philippines and Thailand), and the rest of the developing world (ROW). The member countries of OPEC are also treated as a separate bloc (excluding Indonesia).

The behavioral structure of the developed country blocs in the model are characterized by i) efficient asset markets in which asset prices are determined assuming rational expectations, risk neutrality, and intertemporal arbitrage conditions; ii) intertemporally profit-maximizing firms in which capital stocks adjust according to a "Tobin's q" model of investment; and iii) different wage-price dynamics in the United States (nominal rigidities), Japan (market clearing with a one-period lag), and the ROECD (more forward-looking, slow market clearing behavior).

The model solves for a full intertemporal equilibrium in a linearized form. Both the developing and developed regions carefully observe the key stock-flow relationships in the world economy. Government and current account deficits accumulate into public debt or changes in the net foreign asset position, serviced at variable rates of interest, and physical investment accumulates into capital stocks.

The Asian NIEs and ASEAN blocs are similarly specified. There are four productive sectors, comprising light manufacturing (X), heavy manufacturing (M), agriculture and mining (R), and services (S). For the purposes of trade classification these may be thought of as i) consumer manufactures and industrial intermediates, ii) capital goods, iii) primary commodities and minerals, and iv) non-tradeables, respectively. Output from the first three of these sectors is traded. In addition, oil is treated as a separate traded commodity.

Production

The basis for aggregate supply in the economy is the representative firm in each sector which maximizes revenues. Production is specified using a nested, multi-input CES production function of value-added

inputs and an intermediate input bundle (see Bruno and Sachs (1985) for a careful discussion of this production specification).

$$Q_i = [\beta_{1i}(V_i)^{\rho_{1i}} + (1 - \beta_{1i})(N_i)^{\rho_{1i}}]^{1/\rho_{1i}} \quad (1)$$

$$V_i = [\beta_{2i}K_i^{\rho_{2i}} + (1 - \beta_{2i})L_i^{\rho_{2i}}]^{(1/\rho_{2i})} \quad \beta_{2i} = \frac{1}{1 + \left(\frac{\mu_{2i}}{1 - \mu_{2i}}\right)^{(1-\rho)/1}} \quad (2)$$

$$N_i = [\beta_{3i}(X_i)^{\rho_{3i}} + \beta_{4i}(M_i)^{\rho_{3i}} + \beta_{5i}(R_i)^{\rho_{3i}} + \beta_{6i}(S_i)^{\rho_{3i}} + \beta_{7i}(IM)^{\rho_{3i}} + (1 - \beta_{3i} - \beta_{4i} - \beta_{5i} - \beta_{6i} - \beta_{7i})(E_i)^{\rho_{3i}}]^{(1/\rho_{3i})} \quad (3)$$

where V_i = value added in sector i

K_i = capital stock of sector i

X_i = X input to the i th sector

IM_i = imported inputs to sector i

E_i = oil input to sector i

N_i = intermediate bundle in sector i

Solution of this yields the familiar derived demand for labor and intermediate inputs equating the marginal product of each input to its marginal cost. Total labor demand (L^D) is the sum of the sectoral demands. Imported inputs are a composite made up of inputs from the three developed country blocs. Imports are treated as imperfect substitutes in production, and hence enter as a separate, non-competing input. This is the familiar Armington assumption.

Investment

The capital stock in each industry is a function of the current period level of physical investment and the rate of depreciation. A composite 'investment good' is specified with inputs from each sector as well as imported capital goods.

$$K_{i(t+1)} = J_{i(t)} + K_{i(t)}(1 - \delta - \vartheta) \quad \forall i, \quad i = X, M, R, S. \quad (4)$$

$$I_i = (I_{i(x)})^{\phi_1} (I_{i(m)})^{\phi_2} (I_{i(s)})^{\phi_3} (I_{i(im)})^{(1 - \phi_1 - \phi_2 - \phi_3)} \quad (5)$$

$$I_{i(im)} = (I_{i(us)})^{\phi_4} (I_{i(j)})^{\phi_5} (I_{i(o)})^{(1 - \phi_4 - \phi_5)} \quad (6)$$

Gross fixed capital formation is determined by two terms, a simple static expectations version of Tobin's 'marginal q ' and a term representing cash flow constraints on firms. Weights on these terms (α and γ) need not sum to unity.

$$q_{ti} = (MPK_{ti} \cdot P_{ti}^I) / (P_t^I \cdot r_t) \quad \text{and} \quad MPK_{ti} = \frac{\partial Q_t^i}{\partial V_{ti}} \cdot \frac{\partial V_t^i}{\partial K_{ti}} \quad (7)$$

$$I_i = \alpha_i \cdot [(q_i - 1) / \phi_o] \cdot K_i + \gamma_i \cdot (Q^i - L^i \cdot W - P_n^i \cdot N^i) / P^I \quad (8)$$

$$P^I \cdot I^i = [1 + (\phi_o / 2)(J^i / K^i)] \cdot P^J \cdot J^i \quad (9)$$

where J_i = gross investment in sector i (less adjustment costs)

I_i = gross investment in sector i

I_{im} = imported inputs in the investment good

P_i = log price of the investment good

δ = the rate of capital depreciation (equal in all i)

ϑ = the rate of population growth

Gross investment (I_i) includes adjustment costs, and P_i is the log price of the investment good using a simple weighted average of its log input prices. Gross investment differs from net investment by adjustment costs. A rising marginal cost of investment, due to installation costs, is a linear function of the rate of investment.

Consumption and Savings

Consumption is specified as disposable income less savings. Time separability and intertemporally optimizing agents are not assumed as in the OECD regions, since neither human nor financial wealth are currently arguments of consumption demand. This does not, however, change our basic results. Savings are a fixed portion of disposable income plus a term allowing for savings response to the real interest rate.

$$S_t^P = (\alpha^s + \alpha^r r_t) \cdot (Y_t - T_t) \quad (10)$$

$$C_t = Y_t - T_t - S_t^P \quad (11)$$

where S_t^P = private savings

T_t = total taxes

Consumption is divided between output in each sector according to the usual consumer's maximization problem with log utility. Total consumption (C) is expressed as a nested CES function similar to (2), (3) and (4) above, divided between domestic (C_d) and imported (C_{im}) final consumption goods. All goods are normal, and utility functions are continuous and concave. Imported consumption goods are from each other world region except OPEC.

Prices

Prices are derived from the dual to the CES functions or in the case of Cobb-Douglas demand they are share-weighted indices of the constituent prices. For example:

$$P^c = (\beta_j^{\sigma_i} \cdot P^{d(1-\sigma_i)} + (1-\beta_j)^{\sigma_i} \cdot P^{im(1-\sigma_i)})^{1/(1-\sigma_i)} \quad (12)$$

and

$$P_{im} = \alpha_u P_u + \alpha_j P_j E_j^u + \alpha_o P_o E_o^u \quad \sum_i \alpha_i = 1 \quad (13)$$

Wages adjust according to an augmented Phillips curve. Nominal wages respond to domestic price inflation (Π), the terms of trade (P_{ex}/P_{im}) and the level of domestic employment.

$$W_{t+1} = W_t + \left(\frac{L_t^d}{L_t^s}\right)^{\lambda_1} (\Pi_t)^{\lambda_2} \left(\frac{P_{ex}}{P_{im}}\right)^{\lambda_3} \quad (14)$$

Government and Monetary Accounts

Only the government undertakes external borrowing, and there is zero private capital mobility. Government revenues are derived from 1) lump sum taxes out of labor and capital income of the private sector, 2) interest earnings on the stock of net foreign assets of the central bank, and 3) seigniorage taxes arising from the issue of currency. Government expenditures fall on the domestic service sector and taxes are set to balance the government budget at all times. External debt (or foreign assets) are consolidated for the government and central bank. Government spending is set as a share of GNP, and varies only with changes in debt service or investment income.

$$G_t = \bar{g} + r_t^i \cdot (B_t - R_t) = \bar{g} + r_t^i \cdot (D_t) = T_t \quad (15)$$

where D_t = net national debt (external debt minus reserves)
 T_t = tax revenues

The government pegs the exchange rate to a currency basket (.65 on the \$US, .25 on the yen, and .10 on the ECU). Money supply thus adjusts endogenously to changes in foreign assets of the central bank and a standard Goldfeld-type money demand specification is used.

Model Calibration and Specification of Trade Flows

One of the model's main attractions is its ability to handle different categories of traded commodities within the dynamic, intertemporally optimizing MSG framework. Four product categories are exported by

developing countries: 1) primary goods (agriculture and mining), 2) consumer manufactures and manufactured industrial intermediates, 3) capital goods, and 4) petroleum. Demand for imported primary goods and industrial intermediates is derived from the firm's optimization problem in the importing country, demand for imported consumer goods is derived from utility maximization, and capital goods are derived from the firm's intertemporal investment decision. Oil exports from the ASEAN countries have been handled separately from these categories and are priced according to the OPEC oil price. Disaggregation of goods to match these commodity characteristics was done following the U.S. Bureau of the Census end-user classification system. A mapping was then made to the SITC classification (at the 2-digit level) as reported in the United Nations trade data.

The model has been initialized around 1986 and trade flows reproduce the actual levels and direction of trade between regions in that year. For example, the pattern of trade between Japan, the United States and the Asian NIEs reflects the prevalence of imported capital goods and industrial intermediates by the ANIEs and exports of consumer manufactures to the US market. The ASEAN countries similarly export mainly raw materials to Japan and light manufactured goods to the United States. Shown below is the 1986 trade matrix used for initializing the model.

1986 Regional Trade Matrix (in US\$ millions)

Importer:	U.S.	Japan	ROECD	ASEAN	ANIEs	OPEC	ROW
Exporter:							
U.S.	*	22631	107017	5319	18743	10877	23464
Japan	66684	*	35356	8231	31370	11253	21698
ROECD	145238	21228	*	7496	18347	37062	113680
ASEAN	9230	12462	8097	*	8280	1100	2900
ANIEs	49279	13530	19821	8534	*	4588	17600
OPEC	14610	25830	23467	2300	7457	*	5275
ROW	37861	14628	106138	4000	20939	9413	*

These aggregate trade flows are disaggregated into the corresponding sectoral outputs and demand categories mentioned above. The 1986 exports and imports of the Asian NIEs are shown below.

Structure of ANIE Exports 1986

	United States	Japan	ROECD
<i>Exports</i>			
Food & intermediates	2.3%	33.6%	29.1%
Light manufactures	56.7	41.9	42.3
Capital goods	41.0	24.5	28.6

The Asian NIE imports are disaggregated into: fuels, 4 percent (from ASEAN and OPEC); other raw materials, 6.8 percent (from ASEAN and ROW); machinery and transport equipment, 30.4 percent; and other manufactured goods, 58.5 percent. Of total imports, 6.3 percent are consumer goods, 9.8 percent are investment goods (used in production of investment goods), and 84 percent are intermediate manufactured and raw inputs to production. This last category is very sizable since it includes, amongst other things, imported components used by assembly industries, often for re-export.

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Discussion

Richard C. Marston*

Sachs and Sundberg have written a wide-ranging, insightful analysis of balance of payments performance in the East Asian countries. They trace the success of the Asian newly industrializing economies (ANIEs) and ASEAN countries to a variety of factors, but emphasize three in particular: high savings rates, conservative fiscal policies, and outward-oriented trade policies. They show how these factors combined to produce growth and trade performance far beyond that achieved in other developing economies.

Sachs and Sundberg focus much of their attention on the two largest ANIEs, Korea and Taiwan. Of all the countries in the region (leaving aside Japan), these two have had the largest trade surpluses as well as the largest bilateral surpluses with the United States. The surpluses have drawn the attention of U.S. policymakers, who have accused the ANIEs of manipulating their currencies to prevent them from appreciating relative to the dollar. Sachs and Sundberg point out that the Korean won and Taiwanese dollar have recently appreciated significantly in real terms, so this complaint by the United States may no longer be justified. They cite figures for real effective exchange rates published in Morgan Guaranty Trust's *World Financial Markets*, which show that the won reached a value of 95.0 in October 1988 on a base of 100 for the 1980–82 period, while the Taiwanese dollar reached a value of 98.8. Since the won and Taiwanese dollar have depreciated significantly relative to the yen, these figures for real *effective* exchange rates suggest that both currencies must have regained most if not all of their

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value in real terms relative to the dollar. This is an important development which should help to ease tensions between these countries and the United States.

Sachs and Sundberg argue that the source of large trade or current account surpluses in this region does not lie in manipulated exchange rates. Large surpluses are instead due to more fundamental factors involving intertemporal savings and investment behavior. High savings relative to investment, with savings rates as high as 30 to 30 percent in the four Asian NIEs, make possible the large current account surpluses. This emphasis on intertemporal factors is certainly justified, but it is also important to remember that current account surpluses require access to foreign markets. In the case of the Asian NIEs, access to the U.S. consumer market has been crucial to their success. In all four Asian NIEs, in fact, the *share* of exports going to the United States rose from 1980 to 1987. This was during a period when the total value (in dollars) of exports from these countries was more than doubling.

Increasing dependence on the U.S. market for exports coincided with increasing dependence on Japan for imports. These changes reinforced what I would like to term the *new triangular trade*: The Asian NIEs export consumer goods to the United States, while importing machinery and inputs from Japan. (The third side of the triangle is completed by the United States selling securities to Japanese investors, a phenomenon that is hardly sustainable in the long run.) Table 1 below reports trade between the NIEs, on the one hand, and the United States

Table 1
Trade Pattern of Asian NIEs with the United States and with Japan, 1980 and 1987
Percent of Total Exports or Imports

	Exports		Imports	
	1980	1987	1980	1987
Hong Kong Trade:				
United States	26.1	27.9	11.8	8.5
Japan	4.6	5.1	23.0	19.0
Korean Trade:				
United States	26.3	38.7	21.9	21.4
Japan	17.4	17.8	26.3	33.3
Singapore Trade:				
United States	12.5	24.4	14.1	14.4
Japan	8.1	9.1	18.0	20.4
Taiwan Trade:				
United States	34.1	44.1	23.7	22.1
Japan	11.0	13.0	27.1	34.3

Source: International Monetary Fund, *Direction of Trade Statistics*; Bank of Korea, *Economic Statistics Yearbook*, 1988; Council for Economic Planning and Development, Republic of China, *Taiwan Statistical Data Book*, 1988.

Table 2
Export Patterns in the Manufacturing Sectors of Korea and Taiwan, Selected Years

Korean Exports by Sector as a Percentage of Total Exports			
	1970	1980	1987
Textiles	15.3	10.2	7.2
Clothing and Footwear	27.7	21.8	21.8
Metals and Metal Products	3.7	11.9	7.0
Transport Equipment	1.1	5.1	9.1
Electrical Machinery and Appliances	5.3	7.8	16.6

Source: Bank of Korea, *Economic Statistics Yearbook*, various issues.

Taiwan Exports by Sector as a Percentage of Total Exports			
	1970	1980	1987
Textile Products	31.7	22.6	16.7
Leather, Wood, Paper Products	10.5	8.4	7.8
Metals and Metal Products	6.3	6.4	7.4
Machinery and Transport Equipment	4.1	7.0	8.7
Electrical Machinery and Apparatus	12.3	18.2	25.2

Source: Council for Economic Planning and Development, Republic of China, *Taiwan Statistical Data Book*, 1988.

and Japan, on the other hand, for two years, 1980 and 1987.¹ The geographical pattern of flows is quite distinct. In the case of Hong Kong, for example, 27.9 percent of Hong Kong exports in 1987 are to the U.S. market, but only 5.1 percent to the Japanese market. At the same time, 19.0 percent of Hong Kong imports are from Japan compared with 8.5 percent from the United States. Korea and Taiwan rely even more on the U.S. market for their exports, 38.7 percent and 44.1 percent, respectively, although the pattern of trade is not quite so lopsided.

This penetration of the U.S. market would not have been possible if the ANIEs had not rapidly transformed the products being produced for export. During the 1980s, the share of traditional exports like textiles and footwear declined, while the share of more technically sophisticated products like electrical machinery increased. Sachs and Sundberg refer to this product transformation in their discussion of Korean exports. But the breakdown of Korean products in their table 6 is not as revealing as in table 2 above, which reports on the export patterns of Korea and Taiwan. The table distinguishes among five sets of products, with the last two categories representing the most sophisticated. In the case of

¹ This table updates a similar one appearing in *World Financial Markets*, January 1987.

Korea, exports of transport equipment have risen from 1.1 percent to 9.1 percent of their total exports, while exports of electrical machinery and apparatus have risen from 5.3 percent to 16.6 percent of total exports. The figures for Taiwan are a little less dramatic, but still reveal a very sharp pattern of product transformation. This product transformation is an essential part of the ANIEs' success story, as essential as their high savings rates to understanding the rapid increase in exports.

Sachs and Sundberg succeed in deflating claims by the U.S. government that one important way to reduce the U.S. trade deficit is for the Asian NIEs to reduce their own trade surpluses. The paper establishes very clearly that a reduction in the trade surpluses of the ANIEs would have only a marginal effect on U.S. trade or output. But they may underestimate the effects on these countries of a reduction in the U.S. trade deficit and the importance of the U.S. market to the continued expansion of Asian exports.

Consider how essential the U.S. market was to the expansion of exports in the 1980s. As table 3 below indicates, total exports grew by \$28.8 billion in Korea and by \$33.7 billion in Taiwan between 1980 and 1987. In the case of Korea, \$13.6 billion or 47.1 percent of the export growth was due to increases in exports to the United States. In the case of Taiwan, \$16.9 billion or 50 percent of the export growth was attributable to the U.S. market. The last column of the table places these figures in perspective by comparing them with the *level* of exports in 1987. In both Korea and Taiwan, about 30 percent of total exports in 1987 consisted of *new* exports to the United States. If growth in this market halts in the 1990s, or if this market contracts as the United States cuts its \$160 billion trade deficit, some other market or markets must replace the U.S. market. And it is not enough to find markets for the 1987 level of exports. The new markets must expand fast enough to replace the rapidly expanding American market of the early 1980s.

Table 3
Growth in Exports by the Asian NIEs, 1980-87

From:	Growth in Total Exports (\$ Bil)	Growth in Exports to U.S. (\$ Bil)	U.S. Share of Total Growth (Percent)	U.S. Share As Percent of Exports in 1987
Hong Kong	\$28.8	\$ 5.5	19.0	11.3
Korea	28.8	13.6	47.1	29.3
Singapore	7.9	4.4	55.8	16.2
Taiwan	33.7	16.9	50.0	31.5

Source: International Monetary Fund, *Direction of Trade Statistics* and *International Financial Statistics*; for Taiwan, Council for Economic Planning and Development, Republic of China, *Taiwan Statistical Data Book*, 1988.

Where will these markets be found? The answer is that the other industrial countries must open their markets to East Asian exports. Hyundais must start appearing in increasing numbers on the streets of Tokyo and Paris as they have on the streets of New York (and Toronto). Exports to Japan and the European Economic Community have already begun to rise, spurred by the depreciation of the East Asian currencies with respect to European currencies and the yen. But the magnitude of the adjustment required is daunting, particularly because exports to these countries start from such a low base.

Japan will clearly have to play the leading role in the adjustment process. The triangular trade pattern between the Asian NIEs, the United States, and Japan should shift somewhat as the exchange rate changes initiated in 1985 begin to affect trade decisions. But the pattern of triangular trade is so pronounced that it is unlikely to be eliminated without painful adjustment on the part of the exporting countries. So the Asian exporters have a major task ahead of them if the United States takes decisive action to reduce its trade deficit. High savings rates will not be enough to keep exports expanding if the other industrial countries maintain barriers to exports from this region.

The Balance of Payments Adjustment Process in Taiwan, Republic of China

*Fai-nan Perng**

It is my pleasure to attend the Conference on International Payments Imbalances in the 1980s, and to be invited to comment on the paper by Jeffrey Sachs. Since only the tables of his paper have just been made available, it is impossible for me to give comments. Therefore, I would like to take this time to present a brief account of the balance of payments adjustment process in my country, a topic closely related to Sachs's paper.

Our current account shifted into surplus in 1981, and thereafter the magnitude of the surplus rose steadily over the years. By 1987, the surplus reached US\$17.9 billion, accounting for 18 percent of that year's GNP. However, the current account surplus was reduced sharply in 1988. In the first half of the year, the surplus decreased to US\$4.5 billion, less than half the level in the same period of last year, and represented only 7 percent of GNP. For the development of our current account balances, see table 1.

Although the expansion in our current account surpluses has driven the economy to grow rapidly, it has also created the problems of misallocated resources and excess liquidity, both putting upward pressures on domestic prices. To redress the external imbalances, our private and public sectors have actively applied the following corrective measures over the years:

(1) Appreciation of the N.T. dollar.

Since September 20, 1985 (the day before the G-5 Plaza Meeting), the N.T. dollar has appreciated 40 percent against the U.S. dollar, while the bilateral trade-weighted real effective exchange rate index of the

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Table 1
Current Account Balances of Selected Countries, 1980 to 1988
Billions of U.S. Dollars

Year	Japan	Federal Republic of Germany	Taiwan R.O.C.	Korea	Singapore
1980	-10.75	-15.90	-.91	-5.32	-1.51
1981	4.77	-3.40	.52	-4.65	-1.47
1982	6.85	4.96	2.25	-2.65	-1.30
1983	20.80	5.40	4.41	-1.61	-.61
1984	35.00	9.65	6.98	-1.37	-.39
1985	49.17	17.03	9.20	-.89	-.01
1986	85.83	39.75	16.22	4.62	.54
1987	87.00	45.40	17.93	9.85	.54
Jan.—June 1987	43.72	22.27	9.44	4.61	n.a.
Jan.—June 1988	43.49	23.76	4.45	6.07	n.a.
Percentage change, Jan.—June 1987 to Jan.—June 1988	-.5%	6.7%	-53.0%	32.0%	

Source: IMF, *International Financial Statistics*, Sept. 1988.

N.T. dollar also went up 8 percent, to a level of 103. (The base year is 1979, when the current account was in balance.)

The appreciation of the N.T. dollar has changed the relative prices of domestic and foreign products, thus reducing the trade surplus. Simultaneously, because of the appreciation of our currency and the decline in oil prices, our terms of trade improved. This has in turn increased the purchasing power of our people's personal income, enabling them to buy more and to increase imports.

(2) Reduction of customs tariffs and elimination of a customs valuation increase of 20 percent added to the CIF value of imported goods.

We have lowered import tariffs gradually. By August of this year, the effective tariff rate had declined to 5.5 percent, marginally higher than the 3.8 percent rate of the United States in 1987. Furthermore, between 1980 and 1986 we completely phased out the policy of adding a customs valuation increase of 20 percent to the CIF value of imported goods. These two measures have reduced the prices of imported goods significantly.

(3) Opening up of the domestic market.

At the end of September of this year, only 398 import items remained on the prohibited and controlled list, representing 1.5 percent of all import items. These items, which include drugs and weapons, are prohibited or controlled purely for reasons of public health, national security, and the maintenance of benevolent customs.

Factors such as the cut in import tariffs, the opening up of the domestic market, and the aggressive marketing of imported goods, have all contributed to a rate of growth of imports that since 1985 has outstripped the rate of growth of domestic production. Consequently, the import penetration rate has increased. Take cigarettes as an example; imports were first permitted only just last year. During the first eight months of this year, imported cigarettes already amounted to some US\$100 million and took up a 17 percent market share. (Of the imported U.S. cigarettes, Winston and Marlboro represented the lion's share. It should be noted that while the importation of cigarettes contributes only marginally to the adjustment of our external imbalances, it brings great hazard to the health of our public.)

Following the opening up of the commodities market, the services market is gradually becoming accessible. Foreign banks are now permitted to establish a second branch in southern Taiwan, in addition to one in Taipei. The insurance and leasing sectors are opening up as well. Furthermore, American fast food chains, such as McDonald's, Wendy's, Hardee's and Pizza Hut, are now conspicuous through Taiwan.

(4) Expansion of direct investments abroad.

The appreciation of the N.T. dollar and the rise in labor costs have caused our labor-intensive industries to slowly lose their comparative advantage, thus forcing them to move their operations abroad to such countries as Thailand and Malaysia, and even to mainland China. Increasing our overseas investments is a sure-fire way to reduce the exports of our domestic products.

(5) Shift to expansionary fiscal policy.

Government spending in fiscal year 1989 (from July 1988 to June 1989) will increase 17.3 percent over that of the previous fiscal year. The budget deficit will account for 16.5 percent of government spending, indicating that the government has begun to adopt an expansionary fiscal policy in order to stimulate domestic demand.

(6) Phasing-out of the tax rebate system.

Since 1984, 1,366 export items have been deleted from the tax rebate system, and the remaining ones will be removed eventually.

(7) Relaxation of foreign exchange controls.

With the drastic relaxation of foreign exchange controls in July 1987, no restriction remains on current account transactions, while the controls on capital transactions are very limited. As a result, service and transfer payments have increased greatly. Substantial outflows of private capital have ensued since early 1988.

Our external imbalances have shown effective adjustment as a result of the redress measures described above. Comparing the first half of this year with that of last year, the reduction in our current account surplus, in both absolute amount and percentage terms, stood as the highest among all industrialized and newly industrialized countries. As

Table 2
Domestic versus External Sources of Growth in GNP, Taiwan, R.O.C., 1980–88

Year	Domestic Demand (Percentage Points)	Net Exports (Percentage Points)	Total Real Growth in GNP (Percent)
1980	6.76	.35	7.11
1981	2.59	3.15	5.74
1982	.17	3.21	3.38
1983	3.93	4.03	7.96
1984	6.35	4.21	10.56
1985	.68	4.45	5.13
1986	4.32	7.33	11.65
1987	12.82	-.96	11.86
1988 (est.)	12.63	-5.39	7.24

Source: DGBAS, ROC, *National Income in Taiwan Area, ROC (1951–1987)*, December 1987.

table 1 indicates, between these two periods our current account surplus decreased 53.0 percent. Japan showed a negligible 0.5 percent drop, whereas Germany and Korea posted increases of 6.7 percent and 32.0 percent, respectively.

Looking at the sources of growth in our GNP, since 1987 the contribution to the real growth rate of GNP from net exports has been negative. Of the estimated 7.2 percent real GNP growth in 1988, 12.6 percentage points will come from domestic demand, whereas -5.4 percentage points will come from net exports. Our economic growth has shifted gear from foreign demand to domestic demand, giving evidence that the adjustment of external imbalances has been effective. For the sources of our economic growth, see table 2.

We understand that there is still much room for improvement in our external imbalances. Just as the buildup of current surpluses occurred over a period of years, it will take time to redress the imbalances. But we are proceeding in the right direction, and we will continue to do so in the future.

I would like to conclude my presentation by noting that the current account surplus of one country is the counterpart to the current account deficit of others; therefore, the balance of payments adjustment should be symmetrical. We are all very pleased to know that U.S. productivity has risen and that unit labor costs have declined; these factors, coupled with the depreciation of the U.S. dollar, have helped to increase the competitiveness of U.S. products. Consequently, both nominal and real trade deficits have decreased. Nevertheless, we all agree that the U.S. trade gap must narrow further. Numerous economists (including many who are present here) believe that the major factor causing the U.S.

trade deficit is her fiscal deficit.¹ If the U.S. fiscal deficit could be reduced further, this would help to restore international payments balances. Concurrently, we earnestly hope that the United States will reduce her protectionist measures, as they are not only detrimental to the benefits of the U.S. consumers, but also harmful to the healthy development of the world economy.

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¹ See Helkie and Hooper (1987) and Sachs and Roubini (1987).

International Capital Mobility and Exchange Rate Volatility

*Jeffrey A. Frankel**

Three post-1980 developments have instilled in many observers a feeling that all is not quite right with the world financial system: the international debt problem of many developing countries, the large U.S. current account deficit and the corresponding cumulation of foreign indebtedness, and the heightened volatility of exchange rates and other asset prices in world financial markets. To what extent are the large swings in prices and quantities on international financial markets attributable to a higher degree of international capital mobility in the 1980s? This paper examines, first, various ways of quantifying the degree of international capital mobility, and, second, implications of high capital mobility for the possibility that exchange rates are “excessively volatile.”

Has the Degree of Capital Mobility Increased?

By the second half of the 1970s, international economists had come to speak of the world financial system as characterized by perfect capital mobility. In many ways, this was “jumping the gun.” It is true that financial integration had been greatly enhanced after 1973 by the removal of capital controls on the part of the United States, Germany, Canada, Switzerland and the Netherlands; by the steady process of

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technical and institutional innovation, particularly in the Euromarkets; and by the recycling of OPEC surpluses to developing countries. But almost all developing countries retained extensive restrictions on international capital flows, notwithstanding the abortive liberalization experiments in the Southern Cone of Latin America, as did a majority of industrialized countries. Even among the five major countries without capital controls, capital was not perfectly mobile by some definitions.

At least four distinct definitions of perfect capital mobility are in widespread use. (I) *The Feldstein-Horioka definition*: Exogenous changes in national saving (that is, in either private savings or government budgets) can be easily financed by borrowing from abroad, and thus need not crowd out investment in the originating country (except perhaps to the extent that the country is large in world financial markets). (II) *Real interest parity*: International capital flows equalize real interest rates across countries. (III) *Uncovered interest parity*: Capital flows equalize expected rates of return on countries' bonds, despite exposure to exchange risk. (IV) *Closed interest parity*: Capital flows equalize interest rates across countries when contracted in a common currency. These four possible definitions are in ascending order of specificity. Only the last condition is an unalloyed criterion for capital mobility in the sense of the degree of financial market integration across national boundaries.¹

As we will see, each of the first three conditions, if it is to hold, requires an auxiliary assumption in addition to the condition that follows it. Uncovered interest parity requires not only closed (or covered) interest parity, but also the condition that the exchange risk premium is zero. Real interest parity requires not only uncovered interest parity, but also the condition that expected real depreciation is zero. The Feldstein-Horioka condition requires not only real interest parity, but also a certain condition on the determinants of investment. But even though the relevance to the degree of integration of financial markets decreases as auxiliary conditions are added, the relevance to questions regarding the origin of international payments imbalances increases. We begin our consideration of the various criteria of capital mobility with the Feldstein-Horioka definition.

Saving-Investment Tests

The Feldstein-Horioka definition requires that the country's real interest rate be tied to the world real interest rate by criterion (II); it is,

¹ There is a fifth possible—yet more narrowly defined—criterion for the degree of integration of financial markets: the size of transactions costs as measured directly by the bid-ask spread in, for example, the foreign exchange market. Surprisingly, the covered interest differential does not appear to be statistically related to the bid-ask spread (MacArthur 1988).

after all, the real interest rate rather than the nominal on which saving and investment in theory depend. But for criterion (I) to hold, it is also necessary that any and all determinants of a country's rate of investment other than its real interest rate be uncorrelated with its rate of national saving. Let the investment rate be given by

$$(I/Y)_i = a - br_i + u_i, \quad (1)$$

where I is the level of capital formation, Y is national output, r 's the domestic real interest rate, and u represents all other factors, whether measurable or not, that determine the rate of investment. Feldstein and Horioka (1980) regressed the investment rate against the national saving rate,

$$(I/Y)_i = A + B(NS/Y)_i + v_i, \quad (1')$$

where NS is private saving minus the budget deficit. To get the zero coefficient B that they were looking for requires not only real interest parity:

$$r_i - r^* = 0, \quad (2)$$

(with the world interest rate r^* exogenous or in any other way uncorrelated with $(NS/Y)_i$), but also a zero correlation between u_i and $(NS/Y)_i$.

The Feldstein-Horioka literature. The Feldstein and Horioka finding that the coefficient B is in fact closer to 1 than to zero has been reproduced many times. Most authors have not been willing, however, to follow them in drawing the inference that financial markets are not highly integrated. There have been many econometric critiques, falling into two general categories.

Most commonly made is the point that national saving is endogenous, or in our terms is correlated with u_i . This will be the case if national saving and investment are both procyclical, as they are in fact known to be. It will also be the case if governments respond endogenously to incipient current account imbalances with policies to change public (or private) saving in such a way as to reduce the imbalances. This "policy reaction" argument has been made by Fieleke (1982), Tobin (1983), Westphal (1983), Caprio and Howard (1984) and Summers (1988). But Feldstein and Horioka made an effort to handle the econometric endogeneity of national saving, more so than have some of their critics. To handle the cyclical endogeneity, they computed averages over a long enough period of time that business cycles could be argued to wash out. To handle other sources of endogeneity, they used demographic variables as instrumental variables for the saving rate.

The other econometric critique is that if the domestic country is large in world financial markets, r^* will not be exogenous with respect to

$(NS/Y)_i$, and therefore even if $r=r^*$, r and in turn $(I/Y)_i$ will be correlated with $(NS/Y)_i$. In other words, a shortfall in domestic savings will drive up the world interest rate, and thus crowd out investment in the domestic country as well as abroad. This "large-country" argument has been made by Murphy (1984), Harberger (1980), Tobin (1983) and Obstfeld (1986a). An insufficiently appreciated point is that the large-country argument does not create a problem in cross-section studies, because all countries share the same world interest rate r^* . Since r^* simply goes into the constant term in a cross-section regression, it cannot be the source of any correlation with the right-hand-side variable. The large-country problem cannot explain why the countries that are high-saving relative to the average tend to coincide with the countries that are high-investing relative to the average.²

If the regressions of saving and investment rates were a good test for barriers to financial market integration, one would expect to see the coefficient falling over time. Until now, the evidence has if anything showed the coefficient rising over time rather than falling. This finding has emerged both from cross-section studies, which typically report pre-and post-1973 results—Feldstein (1983), Penati and Dooley (1984), and Dooley, Frankel and Mathieson (1987)—and from pure time-series studies—Obstfeld (1986a,b)³ and Frankel (1986) for the United States. The econometric endogeneity of national saving does not appear to be the explanation for this finding, because it holds equally well when instrumental variables are used.⁴

The easy explanation for the finding is that, econometric problems aside, real interest parity—criterion (II) above—has not held any better in recent years than it did in the past. Mishkin (1984a, p. 1352), for example, found even more significant rejections of real interest parity among major industrialized countries for the floating rate period after

² Even in a time-series regression for a single country such as the United States, one can correct for the large-country problem by expressing saving and investment rates as deviations from the *rest-of-world* rates of saving and investment, respectively. Under the null hypothesis, an exogenous fall in the U.S. saving rate may drive up the world real interest rate and crowd out investment, but there is no evident reason for the crowding-out to be reflected in U.S. investment to any greater extent than in rest-of-the-world investment. In Frankel (1986, pp. 44–45), I found that the close correspondence between U.S. saving and investment for 1970–85 remains, even with this adjustment.

³ Obstfeld (1986a) finds that the coefficient fell after 1973, in time series correlations for most of his countries, but Obstfeld (1986b) finds that it has risen over time (1967–84 vs. 1956–66), with the United States showing the highest correlation of any.

⁴ In a U.S. time series context, Frankel (1986) used two instrumental variables: the fraction of the population over 65 years of age and the ratio of military expenditure to GNP. The former is considered a determinant of private saving and the latter of public saving, and both have some claim to exogeneity. In the context of cross-sections of developing and industrialized countries, Dooley, Frankel and Mathieson (1987) used the dependency ratio and, again, the military expenditure variable.

1973:II than he did for his entire 1967:II–1979:II sample period. Caramazza et al. (1986, pp. 43–47) also found that some of the major industrialized countries in the 1980s (1980:1 to 1985:6) moved farther from real interest parity than they had been in the 1970s (1973:7 to 1979:12).⁵ In the early 1980s, the real interest rate in the United States, in particular, rose far above the real interest rate of its major trading partners, by any of a variety of measures.⁶ If the domestic real interest rate is not tied to the foreign real interest rate, then there is no reason to expect a zero coefficient in the saving-investment regression. We discuss in a later section the factors underlying real interest differentials.

The U.S. saving-investment regression updated. Since 1980 the massive fiscal experiment carried out under the Reagan administration has been rapidly undermining the statistical finding of a high saving-investment correlation for the case of the United States. The increase in the structural budget deficit, which was neither accommodated by monetary policy nor financed by an increase in private saving, reduced the national saving rate by 3 percent of GNP, relative to the 1970s. The investment rate—which at first, like the saving rate, fell in the 1981–82 recession—had by 1987 at best only reattained its 1980 level.⁷ The saving shortfall was made up, necessarily, by a flood of borrowing from abroad equal to more than 3 percent of GNP. Hence the current account deficit of \$161 billion in 1987 (actually 3.6 percent of GNP). (By contrast, the U.S. current account balance was on average equal to zero in the 1970s.)

By now, the divergence between U.S. national saving and investment has been sufficiently large and long-lasting to show up in longer-term regressions of the Feldstein-Horioka type. If one seeks to isolate the degree of capital mobility or crowding out for the United States in particular, and how it has changed over time, then time series regression is necessary (whereas if one is concerned with such measures worldwide, then cross-section regressions of the sort performed by Feldstein and Horioka are better). Table 1 reports instrumental variables regressions of investment against national saving for the United States

⁵ Other studies that reject real interest parity for major industrialized countries include Mishkin (1984a, 1984b), Cumby and Obstfeld (1984), Mark (1985), and Cumby and Mishkin (1986). Glick (1987) examines real interest differentials for six Pacific Basin countries vis-à-vis the United States.

⁶ The 10-year interest differential vis-à-vis a weighted average of G-5 countries was about 3 percent in 1984, whether expected inflation is measured by a distributed lag, by OECD forecasts, or by DRI forecasts. In 1980 the differential was about –2 percent by contrast (Frankel 1986, pp. 35–36).

⁷ Gross investment was 16.0 percent of GNP in 1980, down from 16.5 percent in 1971–80, which was itself considered a low number. Net investment was 5.4 percent of GNP, down from 6.2 percent in the 1970s.

Table 1
Instrumental Variables Regression of U.S. Investment against National Saving,
Decades 1869–1987

	Constant	Coefficient	Time Trend in Coefficient	Durbin-Watson Statistic	Autoregressive Parameter	R ²
1.	.411 (1.340)	.976 (.086)		1.45		.96
2.	3.324 (1.842)	.785 (.118)			.46 (.33)	.97
3.	3.291 (6.176)	.854 (.279)	-.011 (.021)	.73		.92
4.	1.061 (1.507)	.924 (.093)	.001 (.005)		.03 (.08)	.96

Source: Frankel (1989).

from 1870 to 1987.⁸ Decade averages are used for each variable, which removes some of the cyclical variation but gives us only 12 observations. (Yearly data are not available before 1930.) That is one more observation than was available in Frankel (1986, Table 2.2), which went only through the 1970s.

As before, the coefficient is statistically greater than zero and is not statistically different from 1, suggesting a high degree of crowding out (or a low degree of capital mobility, in Feldstein and Horioka's terms). But the point estimate of the coefficient (when correcting for possible serial correlation) drops from 0.91 in the earlier study to 0.79. We can allow for a time trend in the coefficient; it drops from plus 0.01 a year in the earlier study to minus 0.01 a year (or plus 0.001, when correcting for serial correlation) in the longer sample. Thus the additional years 1980–87 do show up as anticipated, as exhibiting a lower U.S. degree of crowding out, even though the change is small. (The trend is not statistically significant, but this is not surprising given the small number of observations.)

A data set that begins later would seem more promising than the 12-decade averages. Table 2 reports regressions for yearly data beginning in 1930. Much of the variation in the yearly data is cyclical, so table 3 uses saving and investment rates that have been cyclically adjusted, for a sample period that begins in 1955. (The cyclical adjustment of each

⁸ The instrumental variables used are the dependency ratio (the sum of those older than 64 and those younger than 21, divided by the working-age population in between), which is a determinant of private saving, and military expenditure as a share of GNP, which is a determinant of the federal budget deficit. A data appendix is available in the working paper versions of Frankel (1989) for details on these and the other variables.

Table 2
Instrumental Variables Regression of U.S. Investment against National Saving,
1929-1987

	Constant	Coefficient	Durbin-Watson Statistic	Autoregressive Parameter	R ²
1929-87	2.99 (.88)	.79 (.06)	.64		.94
1930-87	4.85 (2.61)	.67 (.19)		.77 (.09)	.89
1929-79	1.89 (.61)	.86 (.04)	1.31		.97
1930-79	2.00 (.66)	.85 (.05)		.38 (.13)	.95
1980-87	13.73 (3.85)	.15 (.27)	2.09		.17
1981-87	-.36 (.56)	.03 (.02)		-.37 Not Converged	.00

Source: Frankel (1989).

is accomplished by first regressing it on the GNP gap, defined as the percentage deviation from the U.S. Bureau of Economic Analysis "middle expansion trend" of GNP, and taking the residuals.)

In previous work with a sample period of 1956-84, the coefficient in a regression of cyclically adjusted saving and investment rates was estimated at 0.80, statistically indistinguishable from 1 (Frankel 1986, pp. 43-44). But now the coefficient has dropped essentially to zero, suggesting a zero degree of crowding out (or, in the Feldstein-Horioka terminology, perfect capital mobility). This finding is the result of the addition to the sample of another three years of record current account deficits, 1985-87, a period also in which the cyclically adjusted national saving rate was historically low. When the equation is estimated with an allowance for a time trend in the coefficient, the trend is negative (though statistically insignificant), whereas the earlier sample that stopped in 1984 showed a time trend that was positive (and insignificant).

To verify that the 1980s experience is indeed the source of the precipitous fall in the saving-investment coefficient,⁹ the sample period

⁹ There are two other potential sources of differences from the results in Frankel (1986): the U.S. Commerce Department released revised national accounts data for the entire period in 1986, and we now use the dependency ratio as the demographic instrumental variable in place of the ratio of the over-65 to the over-20 population. But the years 1985-87 are indeed the source of the fall in the coefficient; when these three years are omitted the coefficient is over 1 (as when the 1980s are omitted in Table 3).

Table 3
 Instrumental Variables Regression of U.S. Investment against National Saving,
 1955–1987
 Cyclically Adjusted Savings and Investment

	Constant	Coefficient	Durbin-Watson Statistic	Autoregressive Parameter	R ²
1955–87	*	-.06 (.25)	.96		.25
1956–87	*	.03 (.26)		.50 (.15)	.42
1955–79	-.68 (.17)	1.37 (.23)	1.61		.73
1956–79	-.57 (.18)	1.05 (.19)		.35 (.20)	.70
1980–87	.39 (.36)	.13 (.17)	2.46		.30
1981–87	.58 (.37)	.22 (.16)		-.13 (.41)	.34

* Constant term is automatically zero because cyclically adjusted rates are residuals from a 1955–1987 regression against the GNP gap.

Source: Frankel (1989).

is split at 1980. For the period 1955–79, not only is the coefficient statistically indistinguishable from 1, but the point estimate is slightly *over* 1.¹⁰ It is clearly the unprecedented developments of the present decade that have overturned the hitherto robust saving-investment relationship for the case of the United States. It is likely that financial liberalization in Japan, the United Kingdom, and other countries, continued innovation in the Euromarkets, and perhaps the repeal by the U.S. Treasury in 1984 of the withholding tax on interest payments to foreign residents, have resulted in a higher degree of capital mobility, and thereby facilitated the record flow of capital to the United States in the 1980s. But the magnitude of the inflow is in the first instance attributable to the unprecedented magnitude of the decline in national saving.

¹⁰ If the 1956–87 sample is split at 1974, when the United States and Germany removed capital controls, rather than at 1979, there is still a precipitous decline in the cyclically adjusted saving-investment coefficient over time: from 0.87 (statistically, no difference from 1) to 0.31 (borderline difference from 0). If the 1930–87 sample is split at 1958, when many European countries restored currency convertibility, there is a small increase in the coefficient over time: from 0.83 (statistically different from 1) to 1.14 (no difference from 1). But this is no doubt because the saving and investment rates are not cyclically adjusted for this period (the BEA series is not available back to 1930). Only when expressed on a cyclically adjusted basis is the U.S. national saving rate of 1985–87 devastatingly low.

Differentials in Expected Rates of Return, and Expected Real Depreciation

If the goal is to measure the degree of integration of capital markets, rather than the degree to which decreases in national saving have crowded out investment, then it is better to look at differences in rates of return across countries rather than looking at saving-investment correlations.¹¹ But measuring real interest differentials will not do the trick. An international investor, when deciding which country's assets to buy, will not compare the interest rates in different countries each expressed in terms of expected purchasing power over that country's goods. When he or she thinks to evaluate assets in terms of purchasing power, all assets will be evaluated in terms of the same basket, the one consumed by that particular investor. The expected inflation rate then drops out of differentials in expected rates of return among assets.

The differential in expected rates of return on two countries' bonds is the uncovered interest differential, the nominal interest differential minus the expected change in the exchange rate: $i - i^* - (\text{exp depr})$. If asset demands are highly sensitive to expected rates of return, then the differential will be zero, which gives us uncovered interest parity:

$$i - i^* - (\text{exp depr}) = 0. \quad (3)$$

To distinguish this parity condition, which is Criterion (III) above, from the other definitions, it has often been designated "perfect substitutability:" not only is there little in the manner of transactions costs or government-imposed controls to separate national markets, but also domestic-currency and foreign-currency bonds are perfect substitutes in investors' portfolios. Just as Criterion (I) is considerably stronger than Criterion (II), so is Criterion (II) considerably stronger than Criterion (III). For real interest parity to hold, one must have not only uncovered interest parity, but an additional condition as well, which is sometimes called *ex ante* relative purchasing power parity:

$$\text{exp depr} = \text{exp infl} - \text{exp infl}^*. \quad (2')$$

¹¹ Measuring barriers to integration by difference in rates of return has the problem that a given degree of integration can appear smaller or larger depending on the disturbances to saving (or to other variables) during the sample period in question. (The same is true of measuring by saving-investment correlations.) For example, the greater degree of variability in the U.S. real interest differential in the 1980s, as compared to the 1970s or 1960s, should be attributed to the greater swings in variables such as the structural budget deficit, not to a lower degree of capital mobility. (In any case, the degree of variability in *covered* interest differentials is very low in the 1980s.) All we can say for sure is that if the barriers to integration are essentially zero (the degree of capital mobility is essentially perfect), then differentials in rates of return should be essentially zero.

Table 4
Purchasing Power Parity between the United States and the United Kingdom
1869–1987

	1973–87	1945–72	1945–87	1869–1987
Statistics on Percent Deviation from Mean				
Mean Absolute Deviation	.120	.074	.110	.093
Standard Deviation	.156	.091	.156	.121
Time Trend	.001 (.010)	-.001 (.002)	.006* (.002)	-.001* (.000)
Regressions of Real Exchange Rate				
Autoregressions				
Deviation From Mean	.687* (.208)	.722* (.130)	.830* (.092)	.844* (.050)
Deviation From Trend	.688* (.208)	.730* (.131)	.741* (.101)	.838* (.052)
Regression Against Nominal Exchange Rate				
Coefficient ^a	2.516* (.417)	1.220* (.103)	1.687* (.186)	.916* (.093)
Autocorrelation Coefficient	.959* (.054)	.989* (.015)	.992 (.011)	.988* (.014)

* Significant at the 95 percent level.

Note: Standard errors are reported in parentheses.

^a With constant term and correction for autocorrelation.

Source: Frankel (1989).

Equation (2') and equation (3) together imply equation (2). If goods markets are perfectly integrated, meaning not only that there is little in the manner of transportation costs or government-imposed barriers to separate national markets, but also that domestic and foreign goods are perfect substitutes in consumers' utility functions, then purchasing power parity holds. Purchasing power parity (PPP) in turn implies (2'). But as is by now well known, goods markets are not in fact perfectly integrated. Because of the possibility of expected real depreciation, real interest parity can fail even if criterion (III) holds perfectly.

Table 4 shows updated annual statistics on the real exchange rate between the United States and Great Britain. During the floating rate period 1973–87, though there is no significant time trend, there is a large standard error of 15.6 percent. The serial correlation in the deviations from PPP is estimated at 0.687, with a standard error of 0.208. (The equation estimated is $(er_{t+1} - er_{t+1}) = AR(er_t - er_t)$, where er is the real exchange rate, er is the long-run equilibrium level, alternatively estimated as the sample mean or a time trend, and AR is the autoregressive coefficient.) This means that the estimated speed of adjustment to PPP is 0.313 per year, and that one can easily reject the hypothesis of instantaneous adjustment.

From the ashes of absolute PPP, a phoenix has risen. In response to findings such as those reported here, some authors have swung from one extreme, the proposition that the tendency of the real exchange rate to return to a constant is complete and instantaneous, to the opposite extreme that there is no such tendency at all. The hypothesis that the real exchange rate follows a random walk is just as good as the hypothesis of absolute PPP for implying *ex ante* relative PPP. But there is even less of an *a priori* case why PPP should hold in rate-of-change form than in the level form.

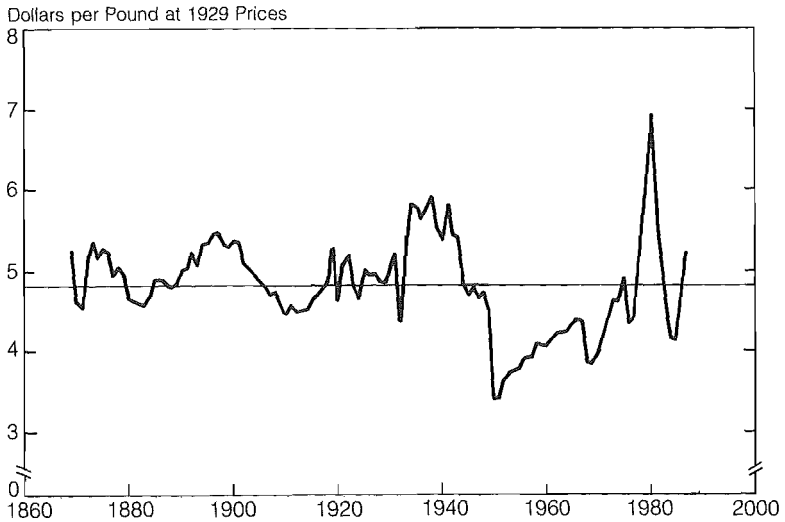
Even though *ex ante* relative PPP has little basis in theory, it does appear to have some empirical support. Typically, the estimated speeds of adjustment during the floating rate period, 0.31 in table 4 (1973–87), while not so low as to be implausible as point estimates, are nevertheless so low that one statistically cannot reject the hypothesis that the autoregression coefficient is 1.0.

A 95-percent confidence interval on the autoregressive coefficient covers the range 0.27–1.10. If the null hypothesis is an autoregressive coefficient of 1.0, one cannot legitimately use the standard t-test derived from a regression where the right-hand-side variable is the level of the real exchange rate, because under the null hypothesis the variance is infinite. There are a number of ways of dealing with this nonstationarity problem. Here one simply applies the corrected Dickey-Fuller 95-percent significance level, 3.00. The 0.31 estimate for the floating-rate period is insignificantly different from zero. This failure to reject a random walk in the real exchange rate is the same result found by Roll (1979), Frenkel (1981, p. 699), Adler and Lehman (1983), Darby (1981), Mishkin (1984a, pp. 1351–53), and Piggott and Sweeney (1985).

A more promising alternative is to choose a longer time sample to get a more powerful estimate. Table 4 also reports statistics for the entire postwar period 1945–87. PPP held better for the Bretton Woods years than it did after 1973, as measured either by the mean absolute deviation and standard deviation of the real exchange rate, or by the ability to reject the hypothesis of zero autocorrelation. But, despite the longer time sample, one is only at the borderline of being able to reject the random walk. The 95-percent confidence interval for AR runs from 0.64 to 1.02, and the t-ratio of 1.85 falls short of the Dickey-Fuller 95-percent significance level of 2.93.

The standard error of an estimate of AR is approximately the square root of $(1 - AR^2)/N$. So if the true speed of adjustment is on the order of 30 percent a year ($AR = .7$), we would require at least 49 years of data ($2.93^2(1 - .7^2)/(1 - .7)^2 = 48.6$) to be able to reject the null hypothesis of

Dollar/Pound Real Exchange Rate 1869–1987, with Period Average



AR = 1. It is not very surprising that 43 years of data is not enough, much less the 15 years of data used in most studies.¹²

The last column of table 4 presents an entire 119 years of United States-United Kingdom data, shown graphically as well in the figure. With this long a time sample, the standard error is reduced considerably. The rejection of no serial correlation in the real exchange rate is even stronger than in the shorter time samples. More importantly, one is finally able to detect a statistically significant tendency for the real exchange rate to regress to PPP, at a rate of 16 per cent a year. The confidence interval for AR runs from 0.75 to 0.94, safely less than unity, and the t-ratio of 3.12 exceeds the Dickey-Fuller significance level of 2.89.

The motivation for looking at PPP in this section has been to obtain insight into the expected rate of real depreciation, because that is the variable that can give rise to real interest differentials even in the presence of uncovered interest parity. In rejecting the random walk description of the real exchange rate, one has rejected the claim that the

¹² An AR coefficient of 0.7 on a yearly basis corresponds to an AR of 0.97 on a monthly basis ($.97^{12} = .70$). Thus it would take 564 months of data ($2.93^2(1 - .97^2)/(1 - .97)^2 = 563.7$) to be able to reject the null hypothesis of AR = 1. This is 47 years, very little gain in efficiency over the test on yearly data.

rationally expected rate of real depreciation is zero.¹³ To take an example, in 1983–84, when the dollar had appreciated some 30 percent above its PPP value, survey data show expected future real depreciation of 4.3 percent per year. It is thus not difficult to explain the existence of the U.S. real interest differential, even without appealing to any sort of risk premium. There is little excuse for authors such as Koraczyk (1985, p. 350) and Darby (1986, p. 420) ruling out the possibility of expected real depreciation a priori and thereby concluding that real interest differentials *necessarily* constitute risk premiums.

If the failure of ex ante relative purchasing power parity could, in itself, explain the failure of real interest parity, then it could also, by itself, explain the failure of saving and investment to be uncorrelated. In the recent U.S. context, a fall in national saving could cause an increase in the real interest differential and therefore a fall in investment, even if financial markets are perfectly integrated and even if the fall in saving is truly exogenous, provided the real interest differential is associated with expected real depreciation of the dollar.

Demonstrating that the failure of ex ante relative purchasing power parity is capable of producing a correlation between saving and investment is, of course, not the same thing as asserting that this in fact is the explanation for the observed correlation. Plenty of other competing explanations have been proposed. But some support for the idea that the existence of expected real depreciation is key to the observed correlation comes from Cardia (1987). She simulates saving and investment rates in a sequence of models featuring shocks to fiscal spending, money growth, and productivity, in order to see which models are capable, for empirically relevant magnitudes of the parameters, of producing saving-investment correlations as high as those observed. To get at some of the explanations that have been most prominently proposed, she constructs models both with and without purchasing power parity, both with and without endogenous response of fiscal policy to current account imbalances, and both with and without the small-country assumption. The finding is that the model that allows for deviations from purchasing power parity is able to explain saving-

¹³ The rationally expected rate of real depreciation estimated from a specific time series process is not necessarily the same as the actual expectation of real depreciation held by investors. Frankel (1986, pp. 58–59) used survey data on expectations of exchange rate changes (collected by the *Economist*-affiliated *Financial Report*) and forecasts of price level changes (by DRI) to compute a direct measure of expected real depreciation for the dollar against five currencies. The numbers showed an expectation that the real exchange rate tends to regress back toward PPP at a statistically significant rate of 8 to 12 percent a year.

The expectation of *nominal* depreciation back toward PPP is estimated more sharply at 12 to 16 percent a year in Frankel and Froot (1987). For a thorough rejection of the view that investors' expected exchange rate changes are zero, see Froot and Frankel (1989).

investment correlations as high as one, while the various models that impose purchasing power parity are generally not as able to do so.¹⁴

Covered Interest Differentials

The differential in real interest rates is defined as:

$$r - r^* = (i - \text{exp infl}) - (i^* - \text{exp infl}^*).$$

We saw in the first section that real interest parity could hold, and yet the saving-investment coefficient will be non-zero if other determinants of investment are correlated with saving. We then saw analogously, in the second section, that uncovered interest parity can hold, and yet real interest parity will fail if there is a non-zero expected rate of depreciation of the currency. Decomposing the real interest differential into the expected rate of depreciation and the uncovered interest differential, we have,

$$r - r^* = (\text{exp depr} - \text{exp infl} + \text{exp infl}^*) + (i - i^* - \text{exp depr}). \quad (4)$$

The sequence of logic is concluded by noting that covered interest parity can hold, and yet uncovered interest parity will fail if there is a non-zero exchange risk premium, defined as ($\text{fd} - \text{exp depr}$). The complete decomposition of the real interest differential is:

$$\begin{aligned} r - r^* = & (\text{exp depr} - \text{exp infl} + \text{exp infl}^*) + (\text{fd} - \text{exp depr}) \\ & + (i - i^* - \text{fd}). \end{aligned} \quad (5)$$

The covered interest differential ($i - i^* - \text{fd}$) is the proper measure of capital mobility, in the sense of the degree of integration of financial markets across national borders. It reflects such things as capital controls, tax laws that discriminate by country of residence, default risk, risk of future capital controls, transactions costs, and information costs.

Many studies have examined covered interest differentials for the largest industrialized countries. Frankel and MacArthur (1988) give references to those studies, and then look at differentials for 24 countries vis-à-vis the Eurodollar market, for the period 1982 to 1987. Forward rate data are used to decompose the real interest differential into the three components shown in equation (5). Frankel (1989) adds a 25th country, and updates the results through 1988. The results are similar. Although

¹⁴ Obstfeld (1986a) shows, in a life-cycle model of saving with actual OECD data on the functional distribution of income and on population growth, that the coefficient in an investment regression can be similar to those estimated by Feldstein and Horioka.

all 25 countries have real interest differentials that are substantial and variable, 11 have quite small covered interest differentials: Canada, Germany, the Netherlands, Switzerland, the United Kingdom, Hong Kong, Singapore, Austria, Belgium, Sweden, and Japan. These 11, and the United States, may be said to have essentially open capital markets. Their real interest differentials consist of some combination of exchange risk premium and expected real depreciation, factors associated with the currency in which the asset is denominated, rather than with the country in which it is issued.

The case for highly integrated financial markets would appear to be well established. But Feldstein and Horioka (1980, p. 315) argue that financial markets are less well integrated at longer-term maturities, as compared to the three-month maturities used in tests of covered interest parity such as those reported above:

It is clear from the yields on short-term securities in the Eurocurrency market and the forward prices of those currencies that liquid financial capital moves very rapidly to arbitrage such short-term differentials. . . . There are, however, reasons to be sceptical about the extent of such long-term arbitrage.

Studies of international interest parity have been restricted by a lack of forward exchange rates at horizons going out much further than one year.¹⁵ But even without the use of forward rate data, there are ways of getting around the problem of exchange risk. Data on currency swap rates can be used in place of forward exchange rates to test the long-term version of interest rate parity. Popper (1987) finds that the swap-covered return differential on five-year U.S. government bonds versus Japanese bonds averaged only 1.7 basis points from October 3, 1985 to July 10, 1986, and that the differential on seven-year bonds averaged only 5.3 basis points. The means mask some variation in the differential. A band of 46 basis points is large enough to encompass 95 percent of the observations for the five-year bonds; the band is 34 basis points for the seven-year bonds. The means on five-year bonds for some other major countries are as follows: Canada 15.9 basis points, Switzerland 18.7, United Kingdom 51.1, and Germany 28.4.

¹⁵ Taylor (1988) is one of the most recent of many studies of covered interest parity *within the London Euromarket*. Such studies do not get at the degree of financial market integration *across national boundaries*. When authors find deviations from covered interest parity in such data, it is often due to low quality of the data, e.g., inexact timing. With high-quality data, Taylor finds that covered interest parity held extremely well in 1985, that it held less well in the 1970s, particularly during "turbulent" periods, that the differential had mostly vanished by 1979, and that the differentials that do exist are slightly larger at the longer-term than shorter-term maturities. But, like other studies, Taylor has no data on maturities longer than one year.

The magnitude of these long-term differentials compares favorably with the magnitude of the short-term differentials. The implication is that Feldstein and Horioka are wrong in their conjecture that there is a term-structure wedge separating national capital markets. At both long and short maturities, the covered interest parity tests show a high degree of financial market integration across national boundaries in the late 1980s, even for countries that retained formidable capital controls in the 1970s.¹⁶ This conclusion is consistent with our earlier finding that the U.S. saving-investment coefficient has fallen sharply in the 1980s.

Does High Capital Mobility Lead to Excessive Exchange Rate Variability?

The first half of this paper was intended to establish that capital is indeed highly mobile internationally, in the sense of integration of financial markets across national borders. As we have seen, this fact does not mean that real rates of return will necessarily be equalized across countries, or that a saving shortfall in one country will be fully financed in the form of a current account deficit of equal magnitude. But it does mean that there are no significant barriers separating international investors from the portfolios they wish to hold. Slight increases in the expected rate of return on one currency, or any other source of an increase in demand for the currency, will be instantaneously reflected in the price of that currency on the foreign exchange market. This helps explain why exchange rates have been so highly variable since 1973.

This half of the paper examines the question whether the high degree of capital mobility might result in "excess volatility" of exchange rates. Many practitioners believe that exchange rates are driven by psychological factors and other irrelevant market dynamics, rather than by economic fundamentals. Support seems to have grown in the 1980s for "target-zone" proposals, the imposition of barriers to international capital mobility, or other sorts of government action to stabilize exchange rates.¹⁷

Among American academic economists, a majority continue to believe that exchange rate movements reflect changes in macroeconomic

¹⁶ It is still quite likely, however, that there is a wedge in each country separating the long-term interest rate from the after-tax cost of capital facing firms. Such a wedge could be due either to the corporate income tax system or to imperfect substitutability between bonds and capital. Hatsopoulos, Krugman and Summers (1988) argue that the cost of capital facing U.S. corporations is higher than that facing Japanese corporations, even when real interest rates are equal, because U.S. companies rely more heavily on equity financing, which is more expensive than debt financing.

¹⁷ See, for example, Williamson (1985).

policy or in other real fundamentals, even if the fundamentals remain unobserved by the econometrician.¹⁸ In this view, it follows that there would be no advantage in attempting to suppress exchange rate variability. But others support the position that exchange rates have in some sense been more volatile than necessary.

Stabilizing and Destabilizing "Speculators"

Those economists who believe that exchange rates have been excessively volatile vary in their arguments. Some, like Tobin (1978) and Dornbusch (1986), argue that exchange rates are too variable because financial markets are "excessively efficient," that capital sloshes back and forth among countries in response to trivial disturbances, and that a tax on foreign exchange transactions would reduce volatility. But there is another view, associated with McKinnon (1976), that exchange rates are too variable because of a "deficiency of stabilizing speculation," in other words because capital flows are not responsive enough to expected rates of return.

These two seemingly contradictory views can be reconciled. Assume two groups of participants in the foreign exchange market, whom we will call "investors" and "spot traders," the first with regressive expectations and the second with bandwagon expectations.

The investors can be thought of as "stabilizing speculators." When the value of the domestic currency lies above its long-run equilibrium, they expect it to depreciate in the future back toward equilibrium. If they act on this expectation, they will move into foreign currency, driving the price of the domestic currency down in the present. They thus act to mitigate fluctuations of the currency around its long-run equilibrium. The spot traders can be thought of as "destabilizing speculators." When the value of the currency has risen above its long-run equilibrium, they expect it to continue to rise in the future. If they act on this expectation, they will buy more of the currency, driving the price up further in the present. They thus act to exacerbate fluctuations.

The reconciliation of the Tobin and McKinnon views is now possible. When McKinnon says that exchange rates are too variable because there is a deficiency of stabilizing speculation, he means that there are not enough people of the first type, or their actions are insufficiently responsive to their (stabilizing) expectations. When Tobin

¹⁸ Regression equations have been notoriously poor at using money supplies and other economic fundamentals to explain exchange rate movements. So-called "variance-bounds" tests purport to evaluate directly whether asset prices have been excessively volatile. But if simple regression tests fail to identify an agreed-upon set of relevant economic fundamentals, as they have in the case of exchange rates, then variance-bounds tests add nothing (Frankel and Meese 1987).

says that exchange rates are too volatile because there is too much speculation, he means that there are too many people of the second type, or their actions are excessively responsive to their (destabilizing) expectations.

To write down the argument in symbols, assume that the spot rate, s in log form, is determined by the ratio of the relative supply of domestic assets, m in log form, to the relative demand for domestic assets, d in log form:

$$s = m - d + u, \quad (6)$$

where u is an unknown error term. Assume that a fraction w of participants¹⁹ in the foreign exchange market are investors and a fraction $1 - w$ are traders:

$$d = w d_i + (1 - w) d_t. \quad (7)$$

Assume that the investors expect the exchange rate to regress toward its long-run equilibrium value at rate θ , and that the traders expect it to diverge, as along a "speculative bubble path," at rate δ :

$$\exp \text{depr}_i = \theta(s - \bar{s}) \quad (8)$$

$$\exp \text{depr}_t = -\delta(s - \bar{s}). \quad (9)$$

Assume further that f_i and f_t represent the elasticity of each group's demand for foreign assets with respect to their expectations. The f parameters can be interpreted as the degree of international capital mobility, or substitutability, under definition III in the first part of this paper. Then total demand for domestic assets is given by:

$$d = w f_i \theta(s - \bar{s}) - (1 - w) f_t \delta(s - \bar{s}). \quad (10)$$

Solving for the spot rate gives:

$$s = \{m + [-(1 - w)f_t\delta + (w)f_i\theta] \bar{s} + u\} / \{1 - (1 - w)f_t\delta + (w)f_i\theta\}. \quad (11)$$

Thus the variability of the spot rate is given by:

$$\text{Var}(s) = \text{Var}(m+u) / [1 + wf_i\theta - (1 - w)f_t\delta]^2.$$

¹⁹ To be more precise, we should define d to be the fraction of world wealth allocated to domestic assets, and define w and $1 - w$ to be the shares of wealth held by the two classes of market participants. Then s would be given by $m - \log(d/l - d) + u$.

For a given variance of money supplies (m) and other determinants (u), the investors (i) act to reduce the variance of the exchange rate, and the traders (t) to increase it. McKinnon's position could be interpreted as worrying that volatility is too high because f_i , the responsiveness of investors to their expectations, is too low, and the Tobin position that it is too high because f_t , the responsiveness of traders to their expectations, is too high. The overall argument could also be stated alternatively: high volatility stems from a low w , the number of investors relative to traders. The argument would then belong to the chorus of popularly voiced concerns to the effect that U.S. capital markets are hampered by excessively short horizons.²⁰

In what follows we briefly do three things: (1) examine some empirical evidence that these two classes of market participants do indeed exist; (2) consider the question that occurs most obviously to economists, why the destabilizing traders are not driven out of the market; and (3) ask if a Tobin tax on transactions would be a solution to excess volatility.

Survey Data on Short-Term versus Long-Term Expectations

Until recently, there were only two methods in use by econometricians to measure exchange rate expectations. The econometrician either used the forward exchange market, in which case the expectations were measured with a possible error generally referred to as the exchange risk premium, or used observed patterns in the ex post or realized spot rate during a particular sample period, in which case the expectations were measured with a possible error consisting of the forecasting errors that happened to be made during that sample period. In either case, the empirical literature followed most of the theoretical literature in making an implicit assumption, that all participants in the foreign exchange market held the same expectation.

By now, there are a number of regularly conducted surveys of the forecasts of participants in the foreign exchange market. Such surveys may measure expectations with error as the two already established techniques do. But they can be argued to be a better way of getting at expectations, on the grounds that the measurement error is smaller and less likely to bias tests of the existence of such things as systematic expectation errors, the exchange risk premium, and stabilizing speculation.²¹

²⁰ For example, Hatsopoulos, Krugman and Summers (1988) argue that the discount rate used by U.S. corporations to evaluate investments is too high.

²¹ The data from three surveys are analyzed in Frankel and Froot (1987) and Froot and Frankel (1989). Dominguez (1986) has also used the MMS data. Froot and Ito (1988) have recently analyzed extensively the data from a survey conducted in Tokyo by the Japan Center for International Finance (JCIF).

Working with the survey data forces one to confront the fact that market participants do not all share the same expectations. The *Economist* survey, for example, reports a high-low range of responses which for the case of six-month expectations averages 15.2 percent. The dispersion of opinion reflected in the Money Market Services (MMS) survey was particularly high in early 1985. This was precisely when the dollar was peaking in value, and when a forecasting rule based on regressive expectations would have given the answer (a future depreciation back toward equilibrium) that most strongly contradicted forecasting rules based on bandwagon or bubble expectations (continued extrapolation of the past appreciation).

A pattern that emerges strongly from the survey data is that those who forecast at relatively longer horizons tend to have regressive expectations as in equation (8), and those who forecast at shorter horizons tend to extrapolate recent trends, or to have the bubble expectations represented by equation (9). The *Economist* 12-month forecasts, for example, show that for every 1 percent that the dollar has appreciated above purchasing power parity equilibrium, survey respondents forecast a future depreciation of 0.175 percent. (See table 4 in Frankel and Froot (1988). The standard error is 0.0216. The sample period is June 1981 to December 1985.) The opposite answer is given by the MMS survey, which is conducted at shorter horizons and which more directly covers foreign exchange traders. The MMS forecasts, for example, show that for every 1 percent that the dollar has appreciated, respondents forecast a further appreciation of 0.078 per cent over the coming month. (The standard error is 0.013. The sample period is October 1984 to February 1986.)²² Froot and Ito (1988) have found exactly the same pattern in the Tokyo market participants' responses to the JCIF survey.

Why Isn't There More Stabilizing Speculation?

Ever since Friedman (1953) pointed out that if speculators are destabilizing then they must buy high and sell low, and therefore must lose money and eventually drop out of the market, some economists have tried to concoct elaborate counterexamples. The theory of rational speculative bubbles, developed in its stochastic form by Blanchard (1979), makes counterexamples easy. In a rational speculative bubble, market participants lose money if they don't go along with the herd.

²² In addition to regressive expectations of the form of equations (8) and (9), Frankel and Froot (1987, 1988) also estimate adaptive and extrapolative expectations. The same pattern emerges: "destabilizing" speculation at horizons of one week to three months in the MMS survey, and "stabilizing" expectations at horizons of three months to one year in the *Economist* and American Express surveys.

Recent theories feature a class of "noise traders" who engage in activity that creates needless volatility and that thereby forces more sensible traders to play a more restricted role in the marketplace. In DeLong, Shleifer, Summers and Waldman (1987), the noise traders are unjustifiably optimistic about the risk/return tradeoff of the risky asset; as a result, they take a larger share of the risky asset than do rational risk-averse investors, and then prosper over time because the mean return on their wealth is greater. In Frankel and Froot (1988), "fundamentalists" who forecast a return of the dollar to its fundamentals equilibrium are assigned less weight by the aggregate marketplace each period in which the dollar confounds their forecasts by appreciating further from equilibrium; the dollar in turn appreciates further each period in which portfolio managers place less credence in forecasts of future dollar depreciation and therefore increase their demand for dollar assets.

This section presents the outline of an argument why destabilizing short-term spot traders have such a large role in the foreign exchange marketplace and stabilizing longer-term investors have a relatively small role. The argument is based on bank behavior. We set the stage with a few facts about foreign exchange trading.

The volume of trading in foreign exchange markets is enormous. In March 1986, transactions in the U.S. foreign exchange market (eliminating double-counting) averaged \$50 billion a day among banks (up 92 percent from 1983), and \$34.4 billion among brokers and other financial institutions. Most importantly, only 11.5 percent of the trading reported by banks was with non-bank customers (of which 4.6 percent was with nonfinancial customers). In London the total was \$90 billion a day. Only 9 percent of the banks' transactions were directly with customers. Foreign exchange trading in Tokyo has grown so fast in recent years that it is now thought to be about to surpass New York.²³

Clearly, trading among themselves is a major economic activity for banks. Schulmeister (1987, p. 24) has found that in 1985, twelve large U.S. banks earned a foreign exchange trading income of \$1.165 billion. Every single bank reported a profit from its foreign exchange business in every year that he examined.

Goodhart (1987, p. 25 and Appendix D) has surveyed banks that specialize in the London foreign exchange market: "Traders, so it is claimed, consistently make profits from their position-taking (and those who do not get fired), over and above their return from straight dealing, owing to the bid/ask spread" (p. 59). The banks report that their speculation (that is, taking an open position) does not take place in the

²³ *Economist*, July 23, 1988. Sources for the other statistics, and estimates for other financial centers, can be found in Frankel and Froot (1988, p. 21).

forward market (and only 4 to 5 percent of their large corporate customers were prepared to take open positions in the spot market). Apparently they consider the taking of long-term positions based on fundamentals, or of any sort of position in the forward exchange market, as too "speculative" and risky. Bankers recall the Franklin National crisis and other bank failures caused by open foreign positions that were held too long. But the banks are willing to trust their spot exchange traders to take large open positions, provided they close most of them out by the end of the day, because these operations are profitable in the aggregate. (It is almost as if the banks do not realize that a strategy of making a series of repeated one-day bets in foreign currency is just as risky as a strategy of buying a portfolio of foreign securities and holding them.) In the description of Goodhart, and others as well, a typical spot trader does not buy and sell on the basis of any fundamentals model, but rather trades on the basis of knowledge as to which other traders are offering what deals at a given time, and a feel for what their behavior is likely to be later in the day.

The reported profits are not so large that, when divided by the volume of "real" transactions for customers (for the U.S. market, $0.115 \times \$50 \text{ billion/day} \times 365 = \2 trillion/year), they need lie outside the normal (small) band of the bid-ask spread. In other words, the profits represent the transactions costs for the outside customers. One might expect that this large volume of trading therefore cannot be relevant from a larger macroeconomic perspective, that is, for understanding the movement of the exchange rate. But this look at some of the mechanics of trading does offer some inspiration for a possible model of noise traders and why they prosper.

Consider the decision problem facing a bank executive who has responsibility for two divisions: a foreign exchange trading room, staffed by people who specialize in short-term trading, and an international securities portfolio investment fund, where the people specialize in longer-term investment. The question is how much of the banks' resources the executive should assign to long-term investing versus shorter-term trading. (We can think of this as determining the share w in equation (7) above.) Note that, given the high hourly volatility in the spot market, for a bank's trading room to meet the foreign exchange needs of customers *necessarily* entails placing risky bets on which way the exchange rate will move in the time it takes to unload an open position. As we saw in equation (11), the high volatility will follow from a model in which insufficient weight w is given to the stabilizing investors. The question is why w is not close to 1.

Assume that, within each profession, some people are better-than-average at their job and others worse-than-average. The requisite skills in the case of portfolio investing would include the ability to evaluate, based on economic fundamentals, the longer-term determi-

nants of the exchange rate (as well as the determinants of prices of various countries' government bonds, private corporate bonds, and equities). The requisite skills in the case of spot trading would include the quick reflexes to act on new developments faster than others, the stamina to work long hours without breaks (and, in a world of 24-hour trading, to check positions regularly during the night), and the instinct to know what other traders are going to do. (These skills are to a degree reminiscent of those necessary to do well at video games.)

The only way the directors of the two bank divisions can assess and reward the abilities of their employees is by means of their track records. In the case of the foreign exchange trading room, the series of daily bets placed over the preceding year constitutes a statistically significant sample on which to evaluate whether a given trader has the requisite skills, in which case she should be rewarded and perhaps allowed increased discretion in her activities, or whether he lacks them and should be let go.

In the case of portfolio investment, a year may not be long enough to judge whether a given analyst is good or bad at picking currencies or securities that are overvalued or undervalued. Given high short-term volatility, many years of data may be necessary to discern statistically a slowly disappearing mis-valuation in the marketplace (as Summers (1986) has pointed out in the context of possible fads in the stock market). Thus it may be perfectly rational for the bank executive to restrict the size of the investment portfolio on the grounds of risk aversion, and yet at the same time allow the spot traders to take a sequence of large open positions.

Would a Tobin Tax on Foreign Exchange Transactions Reduce Volatility?

Tobin's call for a small tax on all foreign exchange transactions, in order to "throw some sand in the wheels of our excessively efficient financial markets," has been widely quoted. Dornbusch (1986) has supported it, and Summers (1987) has suggested a similar turnover tax to reduce volatility in the stock market. Some countries like Japan and Switzerland have long had such a turnover tax and are considering the possibility of abolishing it. Interestingly, when the argument is made in these countries in favor of retaining the tax, it is almost invariably on the grounds of raising tax revenue (from the wealth-owning class), rather than on the grounds of reducing excessive market volatility.

To my knowledge, there has been little if any attempt to appraise the Tobin proposal in the context of an appropriate macroeconomic model. Equation (11), though extremely simplistic, constitutes such an attempt. One can interpret proposals in general to decrease the degree of international capital mobility as proposals to decrease the f param-

ters in the equation. The point is often made that there is no way of discouraging "destabilizing speculation" without at the same time discouraging international capital flows which are desirable for all sorts of other reasons ("stabilizing speculation," international risk-sharing, intertemporal consumption-smoothing and the like). But it is possible to put a positive interpretation on the Tobin proposal in particular.

A small tax in proportion to the size of the foreign exchange purchase will not be much of a deterrent to anyone contemplating the purchase of a foreign security for longer-term investing.²⁴ But it will discourage the spot trader who is now accustomed to buying foreign exchange with the intention of selling it a few hours later. If the destabilizing speculators in equation (11) are indeed the short-term spot traders that the expectations survey data suggest, and the stabilizing speculators are the long-term investors, then the tax may indeed reduce the volatility of the exchange rate. In other terms, it will reduce f_t without having much effect on f_i . The turnover tax in this light is crucially different from the taxes on international interest earnings that were levied before 1973, by the United States to discourage capital outflow or by Germany to discourage capital inflow. Such taxes reduced the rate of return to long-term investing just as much as the rate of return to short-term speculation (perhaps more, if one considers that capital gains from currency speculation were taxed at a lower rate than interest earnings).

A favorable verdict on the Tobin tax is of course entirely dependent on the assumed existence of destabilizing short-term speculators, which remains unproven in the eyes of most economists. But there is in any case another reason why the Tobin tax is unlikely to be a practical solution to the problem of exchange rate volatility. The proposal does get around the practical enforcement problem of trying to distinguish between foreign exchange purchases for "speculative" purposes versus purchases for the purpose of acquiring foreign goods or longer-term securities (as under the "real demand rule" that governed forward exchange transactions in Japan until 1985, for example). But the prime reason Japan and Switzerland are debating the removal of their stock market turnover taxes is the fear that Tokyo and Zurich are losing business to other financial centers. In the modern technological and economic environment, if the United States were to impose a tax on foreign exchange transactions, the business would simply go to London and Tokyo. If the G-10 countries were to impose the tax simultaneously, then the business would go to Singapore, and so forth. Thus the Tobin tax does not appear to be the solution to exchange rate volatility.

²⁴ Dornbusch and Frankel (1988) show the expression for the incidence of such a tax on short-term transactions.

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Discussion

Michael P. Dooley*

Two important findings are reported in this paper. The first is that the very large external deficit of the United States in recent years might indicate a new era of capital mobility. Recent U.S. deficits are sufficiently large to throw doubt on the view that shocks to savings and investment ratios originating in the United States are bottled up. Frankel suggests that a relaxation of capital controls outside the United States may explain the transmission of savings investment shocks across industrial countries. If he is right, one of the dominant empirical regularities characterizing the linkages among industrial countries has been altered.

The second finding, and the one I want to focus on, is the evidence that *real* exchange rates change predictably over substantial time periods. This is an empirical regularity that opens up a whole new area of research that might help us understand exchange rate behavior. It should be recalled that the overshooting model developed by Dornbusch did not attract attention simply because it was theoretically elegant, but because it offered an explanation for rational jumps in nominal exchange rates following a monetary disturbance. In a similar way, a theoretical explanation of relative price changes that "overshoot" long-run equilibrium values might provide a basis for evaluating the welfare implications of the changes in real exchange rates that have characterized the floating rate regime. As Frankel points out in the second half of his paper, proposals to reform the international monetary system rest on the assumption that real exchange rate changes reflect a failure of long-term stabilizing speculation or an excess of destabilizing short-term speculation. But if the real exchange rate changes are a part

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of the adjustment to changing fundamentals, there is no presumption that they reflect a failure of the present system. They may, instead, be an integral aspect of an efficient adjustment mechanism.

It is often the case that specific economic interactions are best identified in extreme circumstances. For example, the relationships between money and prices and exchange rates are brought into sharp focus during hyperinflations. In a similar way, the international debt crisis provides an unfortunate laboratory for examining the behavior of relative prices and real exchange rates.

In several cases, the real value of debtors' exchange rates fell by about half during 1982. (See the figure.) In the years that followed, this real depreciation has persisted. The obvious implications of the debt crisis were twofold. First, it could be reasoned that the inability to borrow would force governments of debtor countries to increase money growth in order to increase inflation tax receipts. This could explain a temporary fall in the measured real exchange rate, but as prices started to rise in the debtor country, this would be gradually eliminated.

The second effect, emphasized in Dooley and Isard (1986) and Isard (1988) was that the debtor countries would be forced to adjust from a situation in which foreign savings equal to about 3 percent of GNP would be lost, and net service payments equal to 2 to 3 percent of GNP would have to be made to nonresidents. The question then was whether there was a sensible story that related the real exchange rate to the net transfer of resources, as conventionally measured by the current account.

It is clear that there is no unique "reduced-form" relationship between trade balances and real exchange rates. In a two-country model, if residents of a debtor country consumed the same basket of goods as residents of creditor countries and if current consumption in creditor countries rose, then the same output would simply be consumed by a different set of identical consumers at unchanged relative prices.

The debate over whether real exchange rate changes would be a part of the adjustment to a new current account pattern is an old and important one. German reparations payments following World War I raised the same issues. Would it have been necessary to lower the real exchange rate in order to free domestic output for export in Germany and to induce nonresidents to purchase it? This issue, which Keynes identified as the "extra burden" of adjustment, was analyzed using the standard trade theory. The theoretical results, then as now, were inconclusive.

This is a very difficult problem because of the infinite variety of ways that economic activity in both countries can be rearranged that would result in a swing in current account positions. Income could change relative to potential output in both countries, consumption and

investment decisions could be altered, and so forth. It is clear, therefore, that the implied change in the current account position was not a sufficiently "structural" question to determine the direction of real exchange rate changes.

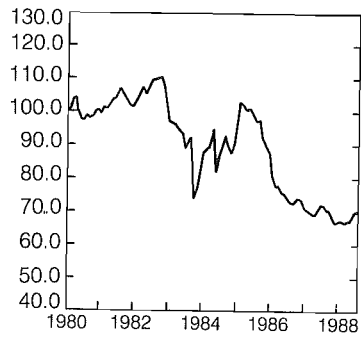
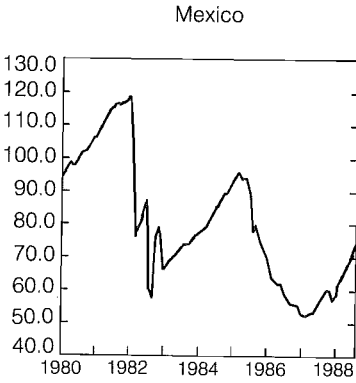
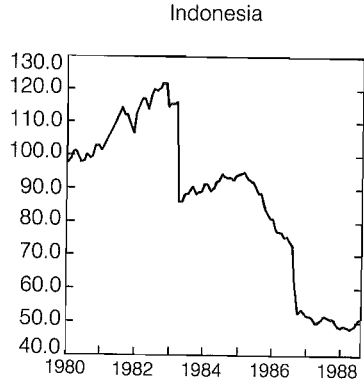
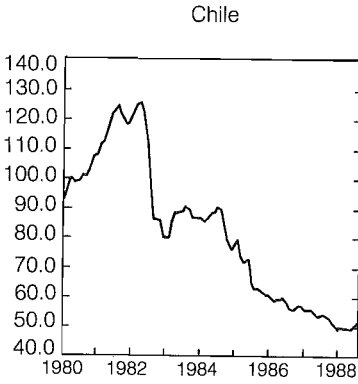
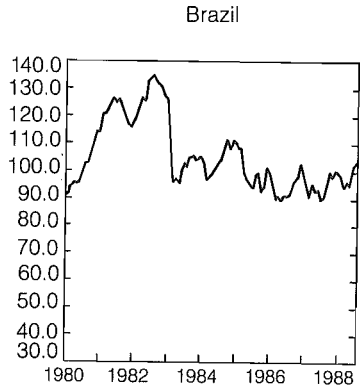
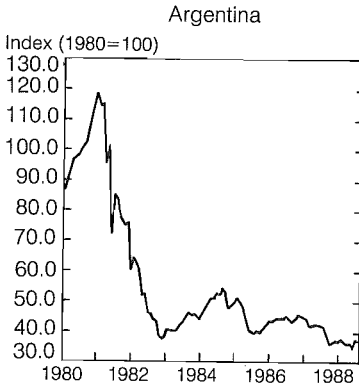
Fortunately, another obvious empirical regularity exists in debtor countries: because the government had to make the interest payments on external debt, and because the government had been borrowing abroad, it was clear that the fiscal status of governments of debtor countries had deteriorated sharply in the summer of 1982. Perhaps this was the key to "identifying" the exchange rate effects. An explanation that seems promising is that the uncertainty surrounding the government's tax policy would provide a strong incentive for the private sector to protect its wealth from the debtor government.

This, we conjecture, can only be accomplished by moving physical assets out of the debtor country. We also reasoned that offering financial claims to nonresidents in exchange for "safe" financial claims on nonresidents would not reduce the risk of taxation, since this merely shifts the risk of taxation from residents to nonresidents. The central hypothesis that results from these observations is as follows.

The private sector of a country can protect its net worth from an insolvent government only by net sales of goods and services to nonresidents. Our definition of an insolvent government is crucial to the argument. We view the existing tax laws as a contract between the government and the private sector. The present value of the contract depends upon its terms and expectations about the future income this contract will yield to the government. If the present value of the existing tax contract is less than the present value of the government's obligations, including external and internal debt, defense expenditures and the like, then we say that the government is insolvent. This is important because such a government must be expected either to default on its expenditure obligations or to default on its "tax contract" with the private sector by increasing taxes on some segment of the private sector.

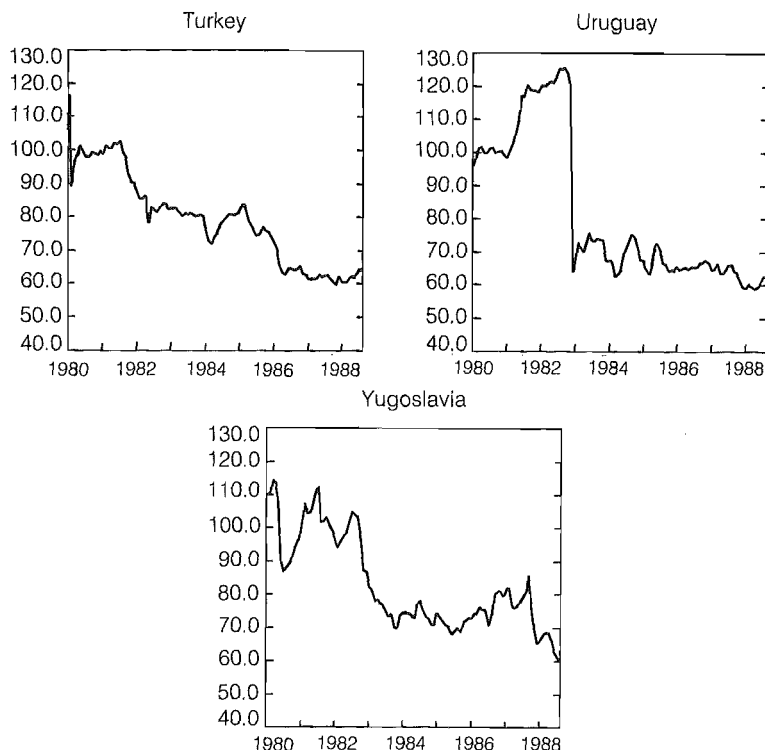
The second part of the hypothesis is that prices of goods and services that can be removed from the potential tax base of the insolvent government would instantly rise relative to prices of goods and services that cannot be removed. An existing plant, for example, cannot easily be picked up and exported to a safer environment. It does no good to ship the stocks or bonds representing ownership of the plant. In a similar fashion, the flow of certain types of output, haircuts, construction work, or schoolteaching, cannot easily be shipped across international boundaries. This it seems to us, ensures that the relative prices of such nontraded goods will fall relative to tradable goods in a country when the government has recently become insolvent. Moreover, as these "movable" or "tradable" goods are thrown into the safer country's markets, their price relative to nontraded goods in that market will fall.

Real Effective Exchange Rates^a January 1980 to June 1988



^a Based on consumer price indices.

Real Effective Exchange Rates^a January 1980 to June 1988
(continued)



^a Based on consumer price indices.

Finally, we can translate changes in relative prices to changes in the nominal exchange rate given a monetary policy rule and the assumption that prices of traded goods follow the law of one price.

An important aspect of this argument is that it does no good to transport financial claims on immovable goods out of the debtor country since the asset remained behind to be taxed or confiscated. The existing literature on international capital flows has not fully come to grips with the fact that cross-border exchanges of financial instruments are often motivated by the desire to avoid taxes on holders of financial instruments. In contrast, net capital flows across borders can be motivated by the desire to avoid taxes on physical assets located in a country.

There has been tremendous volume of two-way trade in financial capital among industrial countries. However, we regard this as largely reflecting attempts to avoid taxation on financial intermediation, including the taxes implicit in regulation of financial markets of industrial countries, and attempts to avoid the monopoly "taxes" imposed by

protected private financial intermediaries in industrial countries. This admittedly stands the conventional interpretation of the development of international financial markets on its ear. Taxes and regulatory constraints that fall *directly* on financial intermediation in industrial countries are regularly and successfully avoided by two-way trade in financial intermediation services across national borders.¹ A by-product of this is a huge volume of gross capital movements. But net capital movements have been quite small, and when they are large, as they are now for the United States, Germany, and Japan, the markets become very uneasy.

The heavily indebted developing countries offer a striking example of what a change in expected taxation of domestic capital can do. Before 1982, taxes on financial instruments were avoided by round-trip flows of financial capital. At the same time, *net* capital inflows increased the exposure of nonresidents to taxes imposed on physical capital located in debtor countries. After 1982, round-trip tax arbitrage was greatly reduced for reasons discussed in Dooley (1988). But the threat of taxes on net positions was sufficient to generate a net capital outflow and the associated fall in real exchange rates.

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¹ Such tax arbitrage is the explanation of capital flight offered in Dooley (1988).

The Adjustment Mechanism: Theory and Problems

*Rudiger Dornbusch**

Large deficits, persistent swings in real exchange rates, and sharply increased volatility of month-to-month exchange rate movements have alerted the policy community to the need to do something. Financing of imbalances at times seems too ample, at other times too scarce. Real exchange rates seem to be dominated by the news of the day rather than the productivity of the decade. Disagreement prevails on what is expected of a well-functioning international monetary system. Should it sustain a pattern of purchasing power parity (PPP) exchange rates or of balanced current accounts? provide open-ended financing or force maximum adjustment? equalize inflation across countries or maximize independence? And if the system performs poorly, what are appropriate directions of reform?

These are the questions in today's debate on the international monetary system. Not surprisingly, no unanimity exists, but it is significant that policymakers are inclining toward a resumption of actively managed exchange rate targets while academic opinion is sharply divided between agnostics and activists. This paper reviews some of the conceptual and empirical issues involved in the debate.

Activists believe that there should be a comprehensive, actively managed system of policy coordination. Agnostics do not have much enthusiasm for exchange-rate-oriented monetary policy and do not believe that fiscal coordination is always desirable or ever practicable. Agnostics share with activists the belief that asset markets can grossly misprice exchange rates and, after encouraging a major departure from equilibrium rates, suddenly lose faith and strand the world economy in

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a major misalignment. Both the “new classical” economics and the activists have strong policy views and strictly opposed preferences; the agnostics are groping for a policy.

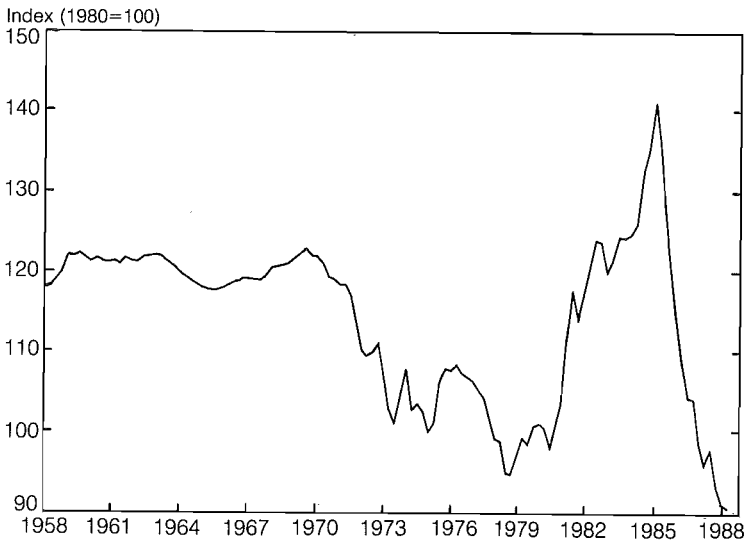
New classical economists dismiss the entire debate, arguing that even large fluctuations in real exchange rates are merely a reflection of the adjustment to changes in underlying fundamentals. They share a belief in more stable macroeconomic policies—more rules, fewer ad hoc, discretionary moves in policy settings—but they have little sympathy for such notions as overvaluation or a dollar overhang. The new classical economics has challenged the entire view of exchange rate and adjustment policy by questioning the effectiveness of monetary and fiscal policy.

Volatility and Imbalances

The problems of the international monetary system are typically discussed in terms of three issues: the swings of the real exchange rate; the volatility of the real exchange rate; and the large and seemingly persistent current account imbalances and deteriorating net creditor

Figure 1

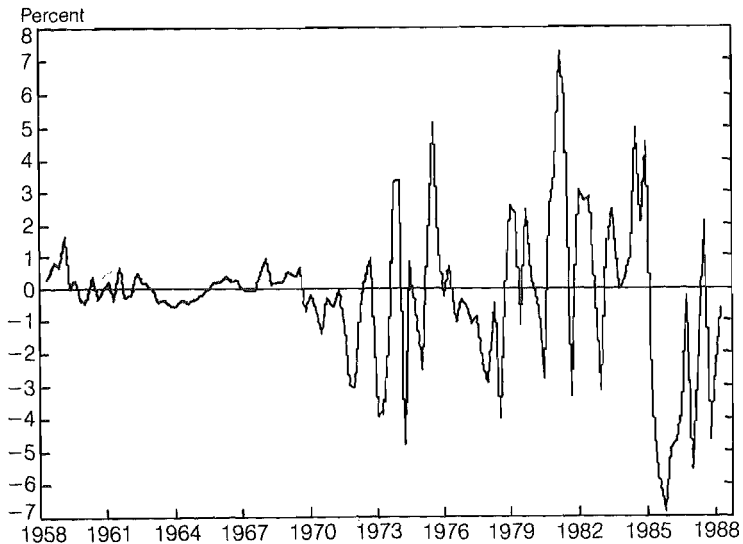
U.S. Real Exchange Rate^a



^aU.S. CPI compared to a trade-weighted index of foreign CPIs in a common currency.
Source: Data Resources, Inc.

Figure 2

Quarterly Changes in U.S. Real Exchange Rates



Source: Data Resources, Inc.

position of the United States, including doubts about the desirability of the net foreign direct investment position. Those who express doubt about the adjustment mechanism argue that exchange rate movements work poorly, and perhaps even perversely, and that selling out to foreigners and cutting real wages are undesirable adjustment mechanisms. By implication they prefer an alternative strategy, often protection.

Consider first the real exchange rate issue. Figure 1 shows the U.S. real exchange rate.¹ The figure highlights the propensity of the current exchange rate system to take cumulative departures from a "realistic level." Whatever "realistic" means is left open, but as in the case of the proverbial elephant, it is difficult to interpret some exchange rate movements (for example, between 1980 and 1985) as anything but an aberration.

Figure 2 shows the quarterly percentage changes of the same series. The figure emphasizes the second aspect of our exchange rate experience: real exchange rates are highly volatile, compared to the fixed exchange rate experience of 1958-70.

¹ The series constructed by Data Resources, Inc. compares the U.S. rate to a trade-weighted index of foreign CPIs in a common currency.

Table 1
 Variability of Real Exchange Rates
 Coefficient of Variation

	1958-72	1973-87
United States Effective Real Rate	.04	.11
United States-Germany	.07	.21
United States-Japan	.14	.15
United States-United Kingdom	.05	.14
United States-France	.10	.19
United States-Sweden	.08	.21

Note: Variability is measured by the coefficient of variation of the real bilateral exchange rate. The real exchange rate is the ratio of consumer prices in two countries measured in a common currency.

A question remains as to whether this volatility reflects, in fact, increased volatility of underlying fundamentals, possibly including the lack of a nominal anchor, or whether a flexible rate system, because of a lack of stabilizing speculation, produces more noise. There is the additional question of whether the fact of noise, and trading on noise, can become a source of cumulative departures of the exchange rate level from fundamentals.

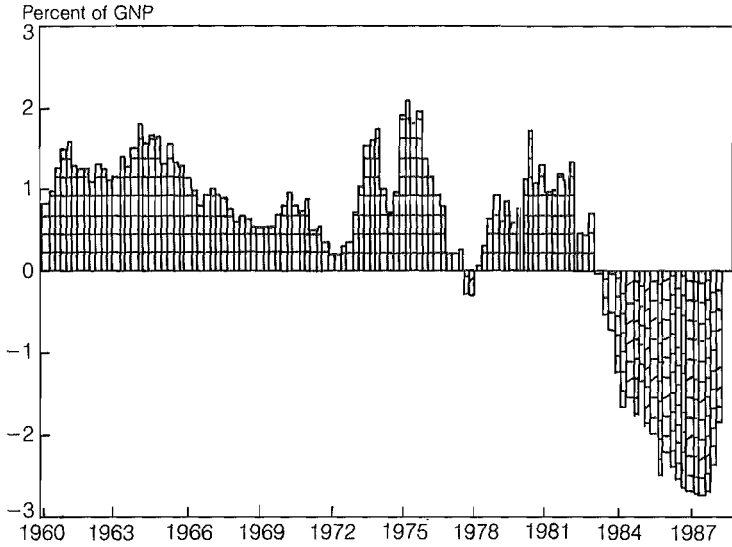
The third issue in the adjustment mechanism is the persistent U.S. external deficit, shown in figure 3. Is the deficit primarily the result of exchange rate movements and fiscal developments in the United States and abroad, or is it a reflection of structural trends in the world economy? Among candidates for structural trends, the most visible are the less developed country (LDC) debt crisis and the growing emergence of the newly industrializing countries (NICs) as manufacturing exporters. The question arises whether exchange rate movements can eliminate the deficit, and whether they can do so in a way that has acceptable micro and macroeconomic implications.

Finally, the financing question: if adjustment is very slow, can we be sure that the imbalances can be financed in the meantime? The capital markets' impatience could lead to a loss of confidence in the adjustment process, with one of two results. Either the monetary authorities induce financing by a high interest rate (and recession) policy, or else a hard landing occurs as the exchange rate, for lack of financing, goes into a free fall as in the Marris (1985) scenario. An increasing dollar overhang, even in the most favorable scenario, severely constrains monetary policy.

Side issues in the financing discussion are the problem of the declining position of the United States as net creditor in the world and misgivings about the increasing foreign direct investment in the United States, as shown in table 2. The low cost of capital in the United States and the extremely high purchasing power of foreign currencies in terms

Figure 3

Net Exports of the United States



Source: Data Resources, Inc.

of U.S. assets bring about a bargain basement sell-off of U.S. assets to foreign firms. An even lower dollar may ultimately be required to balance the current account, but an even lower dollar seems to put all of U.S. real assets in easy reach of foreign investors.

The International Monetary Fund (IMF) forecasts that the net foreign asset position of the United States will have shifted to a debit of 24 percent of GNP by 1989. That is still far from the net debt positions of Latin America, but ultimately such a position would become troublesome. By contrast, by 1989, Germany and the United Kingdom are

Table 2
The Net External Creditor Position of the United States
Billions of Dollars, Year End

	1980	1985	1987
Total Net Position	106	-112	-368
Direct Investment			
U.S. Assets Abroad	215	230	309
Foreign Assets in U.S.	83	185	262

Source: *Economic Report of the President and Survey of Current Business*.

Table 3
 External Imbalances, Selected Countries
 Percent of GDP, National Income Account Basis

	1950-59	1960-69	1970-79	1980-86
Japan	.1	.2	.8	2.3
Germany	2.7	2.1	2.6	2.5
United States	.2	.2	-.5	-1.8
Korea	-8.7	-10.1	-5.9	-1.6

Source: International Monetary Fund.

expected to have net creditor positions of 20 percent of their GNP, and Japan, 15.8 percent; thus, a major redistribution of world wealth is underway.

Deficits and Adjustment

No presumption exists that current accounts should be balanced in the short run or even over extended periods of time and in fact they have not, as table 3 shows.

Figures 4a and 4b show the net external balances for Germany and Japan. Germany has a virtually uninterrupted string of surpluses in the past 25 years, and Japan exhibits a growing trend toward external surpluses, with reversals in the 1970s associated with the oil price shocks.

To discuss the adjustment mechanism and problems of adjustment, it is useful to start off with a classification of external imbalance.

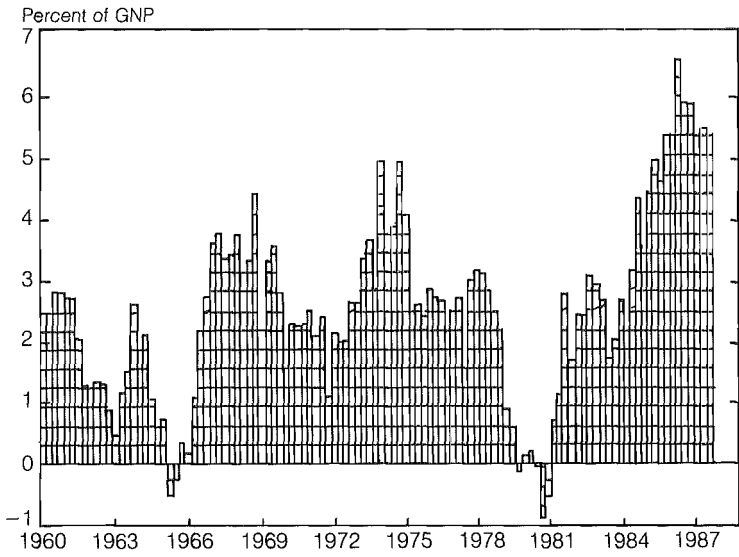
Kinds of Deficits

The most helpful point of departure in classifying deficits is the national income accounts identity:

$$\text{Current Account} = \text{Saving} - \text{Investment}$$

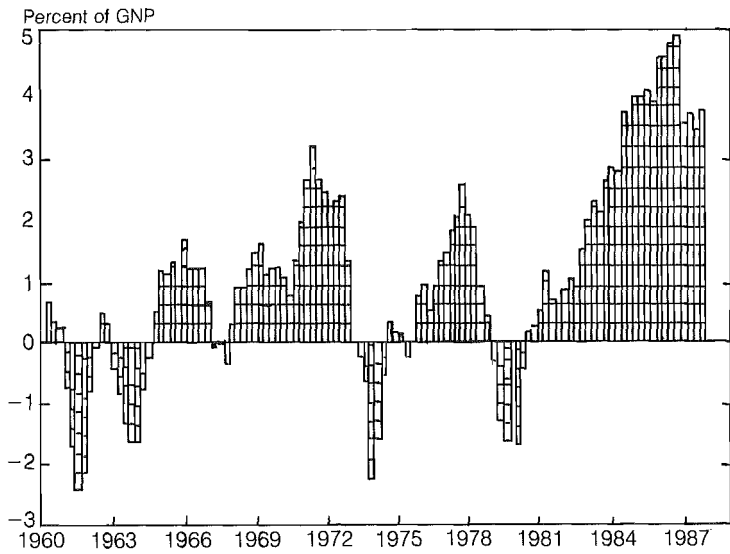
Because this is an identity, a deficit reflects an excess of spending over income or of investment over saving. Any theory of the deficit must ultimately explain why a particular disturbance affected the balance between saving and investment. An incipient or virtual link between a disturbance and the external balance always exists, but it is often difficult to understand why (with budget constraints in mind) the disturbance should translate into actual imbalances. A tariff, for example, is likely to raise the relative price of imports. But why should that lead to lower saving or higher investment and thus to an external

Figure 4a
Net Exports of Germany



Source: Data Resources, Inc.

Figure 4b
Net Exports of Japan



Source: Data Resources, Inc.

Table 4
U.S. Saving, Investment and the Budget
Percent of GNP

	Federal Budget Deficit	Net Domestic Saving	Net Domestic Investment	Current Account
1950–59	–.1	7.8	7.5	.3
1960–69	.3	7.8	7.1	.7
1970–79	1.7	7.2	6.9	.3
1980–86	4.0	3.3	4.6	–1.3
1987	3.4	1.9	5.3	–3.4

Source: *Economic Report of the President*

imbalance? In looking at particular “stories” of the sources of imbalances we have to bear in mind the need to establish a link between the disturbance and its effects on the saving-investment balance. Often the government’s budget provides at least the missing link.

Consider now eight different sources of external imbalance.

- Development deficits. In countries with low per capita income, saving is low relative to the investment opportunities. Net foreign borrowing will supplement domestic saving in providing resources for investment. By contrast, in mature creditor countries, investment opportunities are low relative to saving. Thus high-income countries tend to be capital exporters. Table 3 illustrates both cases.
- Deficits driven by poor public finance. The prototypes of this kind of deficit are to be found in the experience in Latin America in the 1970s, in Ireland in the 1970s and early 1980s, and in the United States in the 1980s. The U.S. data are particularly striking (table 4).
- Deficits induced by adverse terms of trade shocks. Because the disturbance is transitory or adjustment is not instantaneous, a transitory imbalance arises between income and expenditure. If disturbances are transitory, consumers will smooth consumption and absorb the adverse terms of trade effect over time. If disturbances are permanent (and understood to be such), consumers may respond immediately, but there will typically be an investment response to adjust the economy to the new price structure.
- Deficits resulting from new investment opportunities, say an oil discovery. In fact, if the opportunity brings good news for households, increased consumption (ahead of the as yet unexploited income opportunities) will add to the deficit.
- Deficits resulting from enhanced financial intermediation (domestic or international) which gives households or firms financing

Table 5
 U.S. Manufacturing Trade with Developing Countries, 1981 and 1987
 Billions of Dollars

	Exports	Imports	Balance
1981	67.3	39.1	28.4
1987	62.9	99.2	-36.4

Source: U.S. Department of Commerce.

opportunities (or terms) that were unavailable before. Improved financial intermediation (with lower rates or reduced credit rationing) will induce individuals looking forward to a rising income profile to anticipate future incomes. Rationed firms will increase investment spending.

There is also, of course, disintermediation. Countries that can no longer borrow in world capital markets are forced into involuntary trade surpluses.

- Deficits resulting from structural change in the world economy. Traditionally this was called "loss of markets." In the case of the United States, this might today be called new competitors or new entrants in world manufacturing. Table 5 shows the change in U.S. trade with the NICs since 1981. Part of the \$70 billion shift in trade reflects the debt crisis (loss of markets), but a major part is a reflection of the entrance of new competitors in world trade. These deficits will be persistent only to the extent that exchange rates are not allowed to adjust and the income adjustment process is slow.
- Demographic deficits during a transition period as the economy adapts to a changing age structure. Demographic factors influence the external balance via the saving-investment relation.² A slowing down of population growth implies an increase in the average age of the population. In the beginning, the average household becomes relatively more middle-aged. In a life-cycle saving context, this implies an increase in average, hence national, saving. There is no presumption of an increase in investment, so the nation's current account surplus would increase.

As the demographic structure converges to the new steady state a relatively larger fraction of households are in retirement, thus in the dissaving phase of their life cycle. At this stage, their

² The first formulation highlighting demographic issues is von Furstenberg (1980).

Table 6
 Changing Age Structure in OECD Countries
 Percentage of Population Age 65 and Over

	Japan	United States	Germany	OECD
1980	9.1	11.3	15.5	12.2
2000	15.2	12.2	17.1	13.9
2020	20.9	16.2	21.7	17.9

Source: OECD.

dissaving implies a lower national saving rate. Thus, for the entire transition period, there would be a transitory bulge of the saving rate and a long-run decline. This is the explanation often offered for the growing Japanese and German external surpluses.

Table 6 shows the changing actual and prospective age structure in the United States, Japan and Germany. The exact effect on the current account will depend on the relative decline in population growth and on national saving characteristics including, in particular, differences that stem from social security systems. These differences in country-specific saving rates potentially increase the impact of differential rates of slowdown in population growth.

- Finally, trade deficits resulting from misaligned exchange rates. Misalignments of exchange rates only imply a sustained deficit if some process (like fiscal policy) sustains a level of spending in excess of income.

With alternative hypotheses about imbalances in hand, we now turn to the new classical model to see how this approach represents adjustment. We want to underline a point made strongly in this "equilibrium" approach, namely that trade imbalances and fluctuations in real exchange rates need not require policy responses. This recognition disciplines the subsequent discussion with the burden of identifying which particular assumptions of the new classical model need to be questioned, in order for adjustment to be a problem in need of a policy response.

The Classical Model

A classical rendition of the world economy has no room for an adjustment "problem." Agents and governments optimize; they choose the welfare-optimizing path of consumption given current information about their future path of endowments. Governments optimize in

selecting a time-consistent, optimal tax and spending structure. All wages and prices are fully flexible.

Adjustment to Disturbances. In the new classical model, households select a path of consumption that depends on the term structure of interest and satisfies their budget constraint. This optimization implies a substantial separation between current income and the path of consumption. The model predicts that households smooth their consumption in the face of income fluctuations, so that volatility in endowments is reflected primarily in the trade balance rather than the level of consumption.

The response to (non-distortionary) government fiscal policies also involves consumption smoothing. An increase in government spending that is fully financed by current taxation will lead to a trade deficit. The reason is that households will borrow in the world capital market to finance most of the current tax liability. As a result, national absorption rises with government spending and the country runs a trade deficit. In future periods, after government spending has fallen back, households and the country run a trade surplus to finance the interest on the accumulated debt. In fact, it makes no difference whether the government finances itself by debt and a corresponding permanent tax or whether it uses current taxes and the households, for consumption-smoothing reasons, go to the world capital market.

The extreme implication of Ricardian equivalence can be dampened by assuming mortal individuals. Blanchard (1985) has offered such a model, and Frenkel and Razin (1987) have explored the implications in an open economy. Spending that is financed by a permanent tax now leads to a larger trade deficit than spending that is fully financed by current taxation. The reason is that deferral of tax liabilities is viewed by mortal individuals as implying lower tax incidence than a current tax. As a result, their spending falls less, and national absorption rises by more. The more mortal the individuals, the larger the trade deficits implied by current government spending with deferred taxation. Conversely, with full current taxation, the trade deficit is less since it implies a larger reduction in lifetime income.

It is immediately apparent that the story can be further enriched by allowing (sector-specific) investment to take place. Now the effects of policies or shocks on relative prices have implications for the sectors in which investment takes place. The investment, in turn, influences future output levels and the future path of equilibrium prices. For example, in the simplest world, an expected increase in government spending on a country's nontraded goods is expected to create rents for capital installed in that sector. As a result, an incentive exists to invest in the sector ahead of the increase in government spending. The increased investment spending is financed in the world capital market and leads to an increase in the deficit ahead of the increased government spending.

Consumers of the home country will save in anticipation of future taxes, and crowding out is reduced to that extent. If taxes are distant, the presumption remains that the anticipation of government spending creates a trade deficit.

The point of developing the new classical model is as follows. The model helps explain that trade imbalances are optimizing responses to shocks in technology, endowments or policies. Trade imbalances and movements in relative prices are interpreted as *equilibrium* phenomena. Nothing is wrong with large and highly persistent trade imbalances. If consumers and households optimize, using information efficiently, and there are no externalities, all is well.

Exchange Rate Implications. Stockman (1987, 1988b) has confronted the task of setting out the claims of the new classical or equilibrium approach, its empirical relevance, and the evidence that favors this view over an alternative approach that relies on price stickiness. Stockman writes (1987, p. 12):

Economic theory predicts that real disturbances to supplies or demands for goods cause changes in relative prices, including the 'real exchange rate.' In a wide variety of circumstances, these changes in the real exchange rate are partly accomplished through changes in the nominal exchange rate. Repeated disturbances to supplies or demands thereby create a correlation between changes in real and nominal exchange rates. This correlation is consistent with equilibrium in the economy, in the sense that markets clear through price adjustments.

He further notes (1988b, p. 538):

There is a large set of negative results, these can often be as useful as positive results for assessing alternative viewpoints for policy purposes. First, there is no known systematic relation between the current account and the real or nominal exchange rate. Nor is there any known systematic relation between government budget deficits and either the current account or the exchange rate, between nominal interest rate differentials across countries and the exchange rate or the current account, or between real interest differentials and the exchange rate or the current account. Models that produce clear and reliable relations between these variables are evidently missing some important features of the world.

Stockman further emphasizes several points, of which three deserve special emphasis:

- The correlation between nominal and real exchange rates is not exploitable by government policy.
- Statistical evidence indicates that changes in exchange rates (real and nominal) are nearly permanent. This persistence is inconsistent with the view that monetary shocks or transitory real shocks

are the source of exchange rate movements. Instead, it is consistent with the view that most changes in real exchange rates are due to real shocks with a large permanent component. Because of the high correlation of nominal and real exchange rate changes the evidence is consistent with the view that most changes in nominal exchange rates are caused by largely permanent real disturbances.

- The observation of greater variability of a price of real exchange rates under floating does not, by itself, have any obvious implications for government policy.

Consider, then, what this approach has to say about government policy.

The Role of Government. Lucas (1986) has set out the principles of monetary and fiscal policy. The benevolent government (if any) will follow optimal rules of public finance. Specifically, the tax structure is set so as to minimize the excess cost of taxation. Marginal tax rates as seen by the forward-looking economic agent are flat and do not invite distortionary intertemporal substitution. The government will typically rely on seigniorage as part of its revenue. Like marginal tax rates, inflation rates will also be constant *ex ante*.

Two major issues with respect to the role of government arise in the classical rendition. The first is what activities the government should engage in. The second concerns time-consistent revenue policies. The only plausible role for government is to fill the gap opened by market failures. That means providing public goods, imposing corrective taxes, and, possibly, opening missing markets, including financial intermediation via the issuance of public debt.

Interesting problems for the role of government arise on the side of tax, debt, and inflation policy. The issue here is the time consistency of policies. Rather than raising distortionary taxes, a government has an incentive to first borrow and issue money and then, at some point, fall upon the unsuspecting public by a repudiation of all its liabilities. As Lucas notes (1986, p. 127):

Defaulting on nominal debt, currency included, is not simply a problem with gangster government, though it arises there too, but with the ideally beneficent government of welfare economics.

But the public is not unsuspecting, and therefore the likelihood of default is internalized and leads to suboptimal debt and money issue unless there can be a credible precommitment of policies. From the perspective of this theory, the absence of effective mechanisms (the gold standard and Victorian fiscal precepts having possibly been such rules) to establish precommitment is the major policy problem today.

In the new classical economics, the only policy issues concern the welfare-maximizing *timing* of taxation (and the efficient structure across goods, including money) and the *time consistency* of policies. It is entirely obvious that no role exists for government in relation to real exchange rates or trade imbalances. As these are optimizing, equilibrium adjustment processes to disturbances, they are presumed to be optimal.

Open-economy policy issues involve only two questions: optimal commodity and finance taxation that exploits a country's international monopoly, and the optimal exchange rate system. Whether a country should have a fixed or flexible rate system reflects to two considerations: which system provides lower-cost seigniorage, and which provides a more effective means of precommitment. Once again, the emphasis is on the choice of a policy regime or rule, not on policy reactions to current realizations of particular variables.

Evaluation. The most immediate implication of the new classical model for the question of the adjustment mechanism is that there is no "problem." The budget constraint assures that spending plans cannot (ex ante) be out of line with incomes. Government policy is optimizing in imposing an efficient timing of taxes. The entire economy behaves as if maximized by a social planner. Nothing is left for policy to do.

The new classical approach leaves policy activists speechless. A world where all is well, except overzealous government, squares poorly with perceptions that exchange rate movements are excessive, trade imbalances too large and too persistent, and complacency overabundant. It is tempting to dismiss the new classical approach simply on the grounds that it has nothing to offer about "obvious" policy problems.

But if the new classical model cannot support policy activism, it also challenges policy activists to demonstrate rather than assert the need for and the welfare-improving effects of their policy intervention. Policy activists have not brought that proof, which removes some of the persuasiveness of their case. A useful beginning might be to question particular assumptions in the new classical model and explore whether, on that basis, policy activism comes into its own.

In two areas, a new classical approach has always had broad appeal. These are the long-run issues of demographic transitions and the process of catching up with technical progress in advanced countries. These are long-run adjustment processes that affect, respectively, a country's saving rate and the equilibrium pattern of relative prices. It is important to recognize these long-run processes, because they are potentially part of the current imbalances and correcting them by offsetting macroeconomic policies would certainly be undesirable. We have already noted above the issue of demographic transitions. We note here, in addition, the effect of large productivity growth differentials on trend real exchange rates.

Table 7
Labor Productivity Growth in Manufacturing
Percent per Year

	Korea	Taiwan	United States	Japan
Pre-1973	n.a.	n.a.	3.4	10.3
1973-79	9.6	7.1	1.0	5.2
1979-85	5.8	6.1	3.6	6.3

Note: Data for Korea and Taiwan refer to 1975-79 and 1979-84.

n.a.: not available.

Source: *OECD Economic Studies*, Spring 1988.

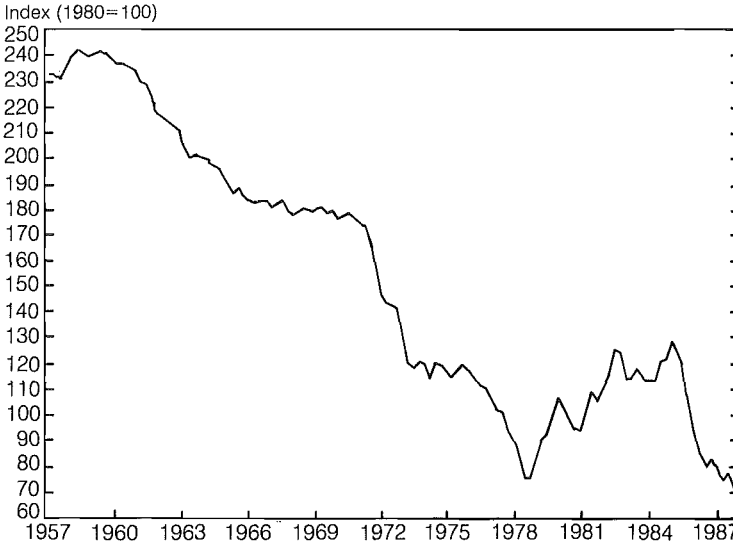
Large differentials in productivity growth, sustained over a significant stretch of time, are a further important structural factor. If in one country, productivity grows at a rate of 6 percent and in another, at only 3 percent, the steady divergence of productivity growth will be reflected in the equilibrium trend of the real exchange rate. This point goes back to Ricardo and was formalized by Balassa and Samuelson in the 1960s. Table 7 illustrates the very large differences in productivity growth among the NICs, Japan and the United States.

The Balassa-Samuelson theory predicts that the country with a higher rate of productivity growth will experience trend real appreciation. This fact is shown in figure 5 for the case of the United States-Japan bilateral real exchange rate in the past 30 years.³ The explanation is as follows: high productivity growth in manufacturing (a tradable goods industry) will bid up wages, which raises (in a Ricardian world) the relative cost of nontraded goods (services) where productivity growth tends to be minimal. We thus observe a country gaining in international competitiveness even with a higher rate of inflation than that of trading partners who experience a lower rate of productivity growth.

It is clear that in looking at real exchange rates over time, divergences in the growth rates of productivity should be an important factor. It helps explain why Japan experienced real appreciation in the past. As Marston (1986) has emphasized, continued real appreciation of the yen is a counterpart of the continuing Japan-United States productivity growth differential. Looking ahead, the theory predicts real appreciation of the currencies of the Asian NICs, unless labor leaving agriculture continues to depress wages relative to productivity.

³ The figure shows the ratio of U.S. to Japanese CPIs in a common currency.

Figure 5

The United States-Japan Real Exchange Rate^a

^aRatio of U.S. to Japanese CPIs in a common currency.

Source: Data Resources, Inc.

Issues in the Adjustment Process

In this section, we discuss three issues raised by the adjustment mechanism. The first is whether exchange rates “work” as an adjustment tool. Further questions concern the lack of long-term stabilizing speculation, the distribution of adjustment, and the monetary-fiscal mix for the world economy.

Do Exchange Rates Work?

A central question about the adjustment mechanism is whether exchange rate changes do affect trade volumes and whether the volume responses are sufficiently strong to change the nominal trade balance. The answer is yes. This is not a foregone conclusion, for the following reason. One can imagine a world where an exchange rate depreciation is fully offset by an increase in domestic wages and prices. In that case, competitiveness is unchanged, hence trade volume will be unchanged. In fact, however, the U.S. evidence supports the view that trade flows and competitiveness do respond to the exchange rate. In fact, perhaps surprisingly, nominal and real exchange rate movements are almost perfectly correlated.

Table 8
Growth in U.S. Exports and Imports
National Income Account Basis, Constant 1982 Prices, Percent

	Exports	Imports
1980-85 Cumulative	-7.0	37.4
1986	3.1	9.4
1987	13.1	7.9
1988	17.9	6.5

Source: Data Resources, Inc.

A range of evidence exists on the effect of trade flows on trade volume and value. Table 8 shows the response of trade volume in the 1980s. Of course, these volume changes reflect domestic and foreign spending growth, but it is clear that the pattern of changes reflects the change in competitiveness. In particular, the strong export volume growth of 1987 and 1988 is a reflection of the gain in competitiveness.

Considerable difficulty is involved with measuring competitiveness. Measures such as relative CPIs in a common currency primarily reflect changes in exchange rates and give relatively little weight to offsetting changes in the transactions prices of traded goods. Table 9 shows actual transactions prices for particular traded goods. Note that import prices rose significantly more than export prices, as would be expected if suppliers in each country based pricing primarily on their domestic cost, with only partial pricing to market.

Another comparison, using GNP deflators, is shown in table 10. In the consumer goods group, we see the expected effects of a depreciation: a moderate rise in export prices, a sharp increase in import prices, and strong growth of export volume relative to import volume. This is, however, not the case for capital goods, where import growth continues at a very high rate despite some price adjustment. The reason for this can be seen in figure 6, which shows prices of imported and domesti-

Table 9
Export and Import Prices, 1988
Index of Prices in U.S. Dollars, 1985:I=100

	Export Price 1988: II	Import Price 1988: II
Nonelectric Machinery	101.3	142.9
Electric Machinery	103.4	116.1
Scientific Instruments	111.6	141.8
Transportation Equipment	111.1	136.3

Source: U.S. Bureau of Labor Statistics.

Table 10
U.S. Exports and Imports, Price and Volume Changes: 1985-88:l
Cumulative Percentage Change

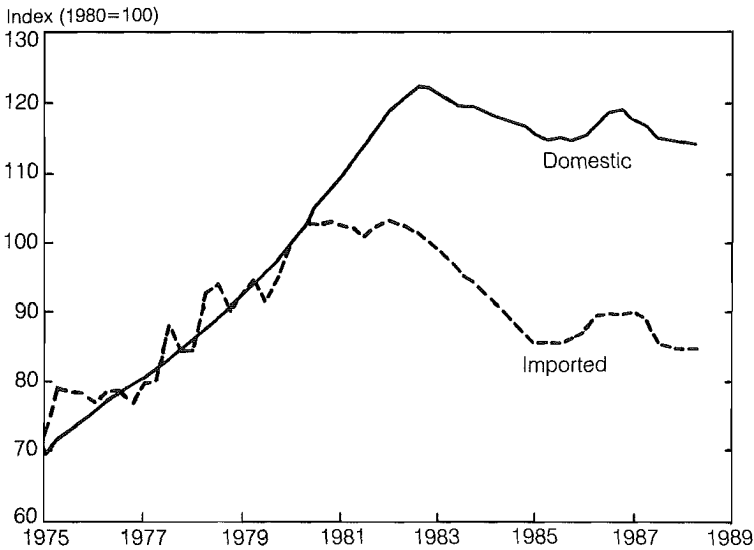
	Exports		Imports	
	Price	Volume	Price	Volume
Consumer Goods	8.7	50.0	20.7	16.8
Capital Goods	3.1	58.3	18.2	57.4
Autos	4.9	16.2	21.3	11.0

Source: *Survey of Current Business*.

cally produced capital goods. The striking fact is that import prices in dollars and the relative prices of imports are even today below the 1980 level.

Figure 7 shows a comparison of transactions prices of exports (using trading partner weights) for Japan and for Germany relative to the United States. The pattern of these relative export prices (which, with some qualification, are an indication of competitiveness in third markets) reflects that of the dollar exchange rate. Since the first quarter of 1985, the 1980-85 loss in competitiveness has been broadly regained, but

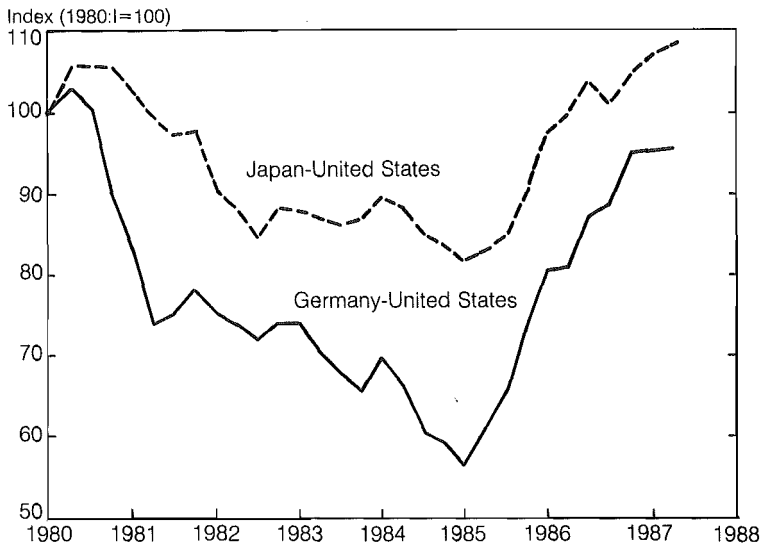
Figure 6
Prices of Capital Goods in the United States



Source: Data Resources, Inc.

Figure 7

Relative Export Price Comparisons



Source: Data Resources, Inc.

no more. The dollar depreciation of the past three years has only put the United States back to the level of competitiveness of 1980.

In summary, nominal exchange rate changes do affect relative prices, and changes in relative prices do affect trade flows. But as more detailed transactions prices for international trade become available, it is also clear that the price response differs widely across products and industries and differs between the home market, exports, and imports. Some recent work on price responses to exchange rates (Dornbusch 1987, Krugman 1985) addresses this question in the context of industrial organization pricing theory. The point of that literature is that exchange rate movements (given unit labor costs in national currencies) will change the industrial organization landscape. This is particularly true, as Krugman has argued, if fixed costs of entry or exit are brought into play by a major misalignment.

Asset Market Problems

A central question about the adjustment process concerns the functioning of speculation in exchange markets. Does the foreign exchange market set the exchange rate on a path that minimizes excess

Table 11
The Effect of U.S. Monetary and Fiscal Shocks
Percent Deviation from Baseline

	1988	1989	1990	1991
Fiscal Expansion^a				
Short-Term Interest	.1	.3	.4	.5
Nominal Effective				
Exchange Rate	2.3	2.2	2.1	2.1
Current Account	-2	-3	-3	-4
Monetary Expansion^b				
Short-Term Interest	-4	-4	-3	-2
Nominal Effective				
Exchange Rate	-5.4	-5.0	-4.8	-4.7
Current Account	.1	.2	.2	.2

^a Increase in U.S. government spending of 1 percent of GNP.

^b Increase of 5 percent in the U.S. money supply target. Effective exchange rate: +=appreciation; Current account: percent of baseline GNP.

Source: International Monetary Fund (1988).

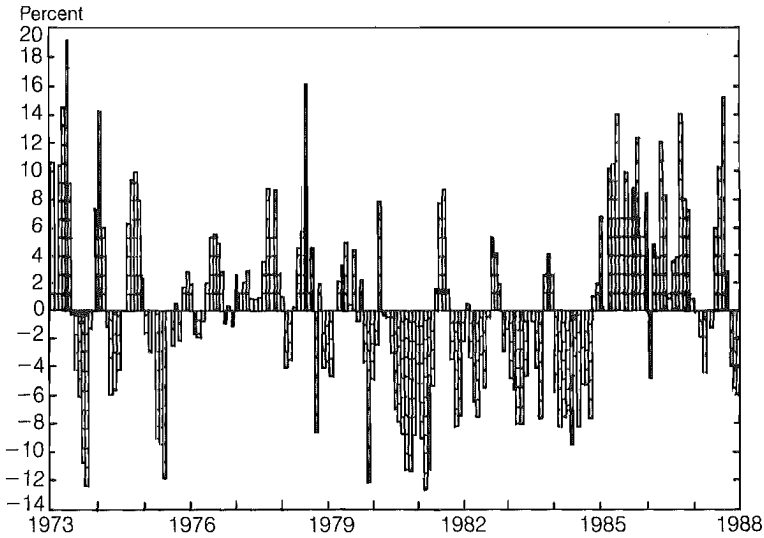
volatility and misallocation of resources over time? Or are asset markets shortsighted, extrapolating current trends without much concern about cumulative misalignments? The same questions have been asked about financial markets in general. The work of Shiller (1986) and Summers (1988) on these issues does not inspire confidence that asset markets are farsighted. In fact, the very operation of the foreign exchange market is discouraging in this respect. The majority of trading is "day trading," and, to the extent that participating institutions do take a long view, "long" tends to be a few weeks. In Dornbusch and Frankel (1987), we argue that markets that trade on noise may well cause cumulative departures from a path supported by fundamentals.

This conclusion may be supported in one of three ways. The first is an appeal to the poor performance of model-based estimates of the determinants of exchange rates. A random walk model tends to outperform most macroeconomic models. A second perspective is given by the predictions of econometric models about the effects of monetary and fiscal shocks. We show here in table 11 the predictions of the IMF Multimod.

The table supports the Mundell-Fleming model of flexible exchange rates, which predicts that fiscal expansion leads to appreciation and a worsening of the current account (that is, current account crowding out). The table also shows that monetary expansion brings about depreciation and an improvement in the current account. The point we want to emphasize is that the predicted deviations from base line are very small compared to the actual U.S. experience in the 1980-88 period. Nominal exchange rate movements of 50 percent are out of line with the

Figure 8

Forecast Errors Implied in Three-Month Forward Exchange Rates^a



^aForward rates as a percent of spot rates at maturity.
Source: Data Resources, Inc.

predictions of this model and, indeed, any macroeconomic model. This suggests either that other (unknown) fundamentals accounted for the sharp rise and fall of the dollar or that asset markets put the dollar out of line with fundamentals.

The third perspective on the functioning of asset markets comes from forecast errors. One cannot infer that these large real exchange rate movements represent misalignments simply because they are sizable and ultimately are reversed. It is even less appropriate to assume that they reflect equilibrium relative prices, although one cannot offer an explanation for the size and pattern of changes over time.

Poor forecasting performance of forward rates is a central feature of the exchange rate experience in the past 15 years. Figure 8 shows the percentage forecast error (forward rates as a percent of spot rates at maturity) implied in three-month forward exchange rates. Forecast errors are always large, although their sign varies sufficiently to give the impression of randomness.

In fact, however, forecast errors are not even random. A regression of forecast errors on *past* changes in the actual exchange rate yields significant explanatory power:

$$\begin{aligned} \text{Error} &= 1.61 + 1.02 \text{ Depreciation,} \\ &\quad (0.64) \quad (6.24) \\ R^2 &= 0.61 \quad DW = 2.04 \quad \text{Rho} = 0.88 \end{aligned} \tag{1}$$

where the terms in parentheses denote t-statistics.⁴ The equation implies that when the DM/\$ exchange rate is depreciating, as in 1980–85, the forward price of marks underestimates the actual price at maturity. This is a reflection of the fact that the forward rate (with small interest differentials) is basically equal to the current spot rate. Therefore, when the spot rate is depreciating, the forward rate is below the future spot rate. The fact that past depreciation predicts future forecast errors is a consequence of the lasting one-directional trips in the exchange rate.

Frankel and Froot (1986a) have shown extensive evidence of large discrepancies among forecasts gathered from market surveys, forward premia, and realized depreciation. In Froot and Frankel (1988) the question is asked whether the bias of forward rates in predicting depreciation arises from a risk premium or from a lack of rational expectations. The latter is firmly sustained as the source of the bias. In the same direction, Ito (1988) concludes that in Japanese survey data the rational expectations hypothesis can be firmly rejected. He notes (pp. 22–23):

Among different groups, unbiasedness of expectation was rejected in a few instances for shorter horizons and unanimously rejected in the six-month horizons. The orthogonality [of forecast errors] was soundly rejected. We may conclude that we have a strong evidence against rational expectation formation in the Tokyo foreign exchange market.

The growing body of evidence supporting the lack of rational expectations in foreign exchange markets has dramatic implications for policy. If asset markets do not work efficiently, then there is definitely the potential (and the need) for policy intervention to improve the allocation of resources.

Financing versus Adjustment

Aside from the working of asset markets, another major question is whether adjustment and financing of external imbalances can be expected to continue smoothly. Will the cumulative dollar depreciation

⁴ Let ${}_t f_{t+3}$ denote the three-month forward rate prevailing at time t and e_t the spot rate. The left-hand side is defined as: $\text{Error} = 100 * (({}_t f_{t+3} - e_{t+3}) / e_{t+3} - 1)$ and depreciation = $100 * ((e_t - e_{t-3}) / e_t - 1)$. In the regression, the depreciation variable is entered as a four-quarter distributed lag.

Table 12
 Forecasts for the United States Current Account
 Billions of U.S. Dollars

	1987	1988	1989	1990
OECD ^a	-160.7	-150.0	-132.0	n.a.
IMF ^b	-154.0	-138.8	-134.7	n.a.
DRI	-154.0	-136.9	-124.9	-100.4

^a OECD *Economic Outlook*, July 1988.

^b IMF *World Economic Outlook*, August 1988.

since 1985 be sufficient to eliminate the external deficit, and is there assurance that financing will be available smoothly while the adjustment is underway?

Table 12 shows three different forecasts for the next few years. The forecasts all predict external deficits for the United States that will not fall far below \$100 billion by 1990. That raises the question of whether further adjustment is required and whether this adjustment will come about spontaneously or require policy intervention.

An answer to this question starts from the assertion that the U.S. deficit is not primarily a result of the U.S. fiscal position. It is true that the United States has had a massive fiscal deterioration relative to other countries. But there are other factors at work, too, including the drop in the private saving rate and the large invasion of the U.S. market by the NICs. This invasion reflects, in part, the debt crisis which forces developing debtor countries into premature resource transfers abroad. But it reflects even more the sharply increasing export competitiveness of the Southeast Asian NICs. Whereas the United States was exporting capital goods to these countries in the 1970s, today the capital goods are exported to the United States, directly or via Japan.

Against the view that further exchange rate adjustment is required, one can hold the alternative of an adjustment by differential growth rates of real spending. If Europe and Japan and some NICs had demand growth on a sufficient scale, and the United States had a fiscal retrenchment, then by absorption changes alone, external balance would come about in time. Table 13 shows that this process has, in fact, been underway since 1985. It is doubtful, however, if it can go on long enough and provide enough of an effect on the external balance to be the main remedy.

The Policy Mix. In addition to an international differential demand growth pattern, or as a substitute for it, further dollar depreciation of course remains a possibility. Dollar depreciation is an effective tool for external balance adjustment, but it raises the question of the impact on the regions that suffer a loss in competitiveness and demand. U.S.

Table 13
Adjustment of World Imbalances, 1985–88
Cumulative Percentage Increase

	United States	Europe	Japan
Export Volume	51.9	15.9	8.8
Import Volume	34.1	29.3	36.9
Domestic Demand	12.3	13.8	19.3
GNP	11.8	10.8	16.2

Source: OECD.

adjustment in the external balance simply cannot come about except with the support of *worldwide* changes in the monetary and fiscal mix.

In the United States, there is a recognized need for fiscal correction. The reason is not so much an imminent fiscal crisis but rather the fact of full employment. An improving external balance is becoming a source of crowding out and would do so even more strongly if the external deficit were to vanish. Abroad, in Europe and in Japan, budget deficits continue to be large and a source of concern. For the seven major industrialized countries (excluding the United States), the central government budget deficit averaged 3.7 percent of GNP in 1986–88, and it would therefore be difficult to argue that these countries should embark on a *sustained* fiscal expansion to stimulate demand.

There is obviously an adding-up problem at the world level—some regions will have to spend more to compensate for the effect of reduced U.S. demand. With fiscal expansion an inappropriate solution, one can look in two directions. Some argue that the Southeast Asian NICs should have a spending boom and import liberalization, but the quantitative impact would not go far. Others argue that the debtor countries should be given relief. That makes sense, but, on welfare grounds, why not make these transfers to Africa or poor countries in Asia?

Piecemeal demand policy will not go very far and is difficult to justify. But there is another possibility, namely radically lower world interest rates. In the 1980s, fiscal policy was expansive (on average), but at the same time, monetary policy showed a sustained tightness reflected in extremely high *realized* real short-term interest rates (table 14).

How might the adding-up work out? The fiscal tightening in the United States will, by itself, slow down the growth in demand, which will spill over to the rest of the world by reduced U.S. net imports. The fiscal correction, if sufficiently vigorous, risks creating a U.S. recession. An offset in the form of crowding in is needed: the crowding in has to come from investment and from increased net exports. Higher investment requires lower interest rates. To some extent, these may come

Table 14
Real Short-Term Interest Rates

	1960-67	1968-73	1974-79	1980-86	1987	1988
United States	1.4	.4	-1.0	4.1	2.8	2.7
Germany	1.1	1.6	.6	3.9	1.9	2.2
Japan	.6	-1.5	-2.6	3.1	3.7	2.1

Source: OECD

about as a result of the expectations effects generated by fiscal correction, but, presumably, monetary policy must help. The external balance improvement clearly requires further depreciation, especially if investment responds strongly and has significant import content.

The decline in worldwide interest rates would help make things add up without recession abroad. Significantly lower real interest rates offset the deflationary shock of the U.S. trade improvement by increased domestic investment abroad. They also significantly reduce public debt service and, to that extent, allow resources to be used for sustainable, supply-side-oriented tax cuts. Lower interest rates also help all those countries that are currently constrained by their debt situation. The worldwide effects of reduced real interest rates thus operate in the right direction: in the full employment deficit country, demand growth slows down because of fiscal correction; in the rest of the world, lower interest rates (and some fiscal expansion financed out of the interest saving) speed up the growth of demand.

In this scenario, there is no need to see whether the U.S. accounts come literally to balance. As sustained deficits shrink radically and the dollar declines, thus eliminating the perception that there could be yet a further large drop ahead, financing of any residual imbalance is not an issue.

It is also interesting to ask what happens if there is no fiscal correction in the United States in 1989-90. One possibility is particularly disturbing: a relatively strong U.S. economy moves ahead with 2.5 to 3 percent growth in output, partly as a result of an improving external balance. The increasing use of capacity and overemployment lead to rising inflation, and ultimately, the Fed steps in with monetary tightening. There is little doubt that increased U.S. interest rates would very quickly attract a capital inflow and cause a dollar appreciation. Trade improvement would thus be jeopardized by another round of crowding out.

The example makes another point: financing the U.S. external deficit is not a problem in the short run. If interest rates are high enough and there are no immediate prospects of depreciation, all the world's money will come. Financing only becomes a problem when speculators

are paid little interest and see the risk of exchange losses. That is the situation at the tail end of a dollar overhang, when speculators have driven the dollar too high and the high dollar and high interest rates start slowing down the economy. To have low interest rates without an external crisis, foreign interest rates must be low and/or the dollar must be low. Neither is the case today.

Policymakers face the immediate problem of designing a policy mix that will assure continued growth without creating unsustainable disequilibria. They also face the question of whether there is a better system of running international interdependence and adjustment. We conclude with a comment on that question.

System Reform

Critics of the present exchange rate system emphasize excessive volatility and persistent, large swings in real exchange rates unrelated to fundamentals. Proponents of thoroughgoing monetary reform have argued a return to fixed exchange rates. The proposal that has received most attention focuses on target zones for exchange rates, supported by strongly coordinated monetary and fiscal policies.⁵ An entirely different approach goes back to a proposal of Tobin (1982), a tax on financial transactions. The rationale for this approach, preferably extended to a tax on all financial transactions and not only those involving foreign exchange, is the belief that there is excess capital mobility.

A Financial Transactions Tax

Advocates of a financial transactions tax start from the premise that the problems of the exchange rate system stem from excessive capital mobility. Controls, they argue, are an impractical way of dealing with this problem. They claim that a much better way to cope with excess capital mobility is a worldwide financial transactions tax. A moderate, worldwide tax on *all* financial transactions would force asset markets to take a long-run view of the assets they price. As a result, there would be more stabilizing speculation.

Advocates of a financial transactions tax argue that financial markets exhibit, among others, the following problems:

- The disappearance of transactions and information costs, as a result of technological developments, has reduced the horizon of traders to a few hours. Participants in financial markets believe

⁵ See Williamson and Miller (1987).

that they are liquid. The technology of transactions and information encourages this view even if, in the aggregate, it is a fallacy. Long-term markets dry up because they are thought to be too risky. Asset management focuses almost exclusively on short-term capital gains.

- The high volatility in asset prices and the resulting scope for capital gains have made asset market participants more trigger-happy than ever.
- Financial fragility is pervasive. Excessive accumulation of debt has made many sectors vulnerable to shocks in relative prices and interest rates. This is a consequence of a poor regulatory framework that has failed to discourage excessive debt accumulation and has allowed itself to err on the side of concessions because "financial deregulation" was accepted as an irreversible trend, made necessary by international competition.
- Monetary policy is increasingly becoming a hostage of financial fragility. That recognition itself encourages financial markets to incur ever larger exposure. Monetary policy risks becoming entangled in its own effects. The Fed plays strategic games with the market, the market speculates on what the Fed (and other central banks) speculates on and, in the end, short-term noise and imagination, not long-term fundamentals, come to determine asset prices and monetary policy. The more the Fed looks at noisy indicators, the more the market is drawn to concentrate on these indicators. Month-to-month trade numbers and employment figures, both of which are exceptionally noisy, are now the principal determinants of the 30-year bond yield and the value of the dollar!

Given these premises, the proponents of a financial transactions tax claim that it is impracticable to attempt to roll back technological gains and integration of financial markets. But they believe it is equally essential to recognize that there is a need for what James Tobin has called "putting some sand in the wheels." An effective way to achieve this result, in their opinion, is the introduction of a moderate financial transactions tax that would apply to all transactions. The purpose of the tax is to lengthen the horizon of the market and thus throw weight to speculation in fundamentals and away from noise trading.

A financial transactions tax would be expected to increase the expected holding period of assets and hence would filter out much of the noise, and cumulative trading on noise, in asset markets. The attraction of such a tax resides in the fact that when levied at a very moderate rate, it taxes short-term (round-trip) transactions, while leaving the profitability of long-term investment virtually unaffected.

There are two major objections to such a tax. One is the resource cost of implementing yet another tax. That cost would have to be held

against the costs of high asset price volatility and misalignment and the resulting resource cost. On that basis, it presumably comes out small. The second is the argument that with the tax implemented in only one or a few countries, business would merely shift to offshore centers. It is an open question whether coordinated application of the tax would do away with much of this problem.

Appendix

Consider a simple version of an open (barter) economy where agents can borrow and lend in world capital markets at a given interest rate and can buy or sell goods at a given price.⁶ In addition to traded goods for which world prices are given, there are also nontraded goods. The endowments of traded and of nontraded goods may vary over time, and this is one of the disturbances we consider here.

Optimization by households (subject to their intertemporal budget constraints) yields demand functions for present goods, both traded and nontraded, and for the amount of lending or borrowing in the world market. If the interest rate households face is equal to the world interest rate, the optimal consumption profile will be flat. But if the interest rate exceeds the rate of time preference, the path of consumption is rising over time. Conversely, it is declining when the current interest rate falls short of the rate of time preference. Let $\lambda_t = c_{t+1}/c_t$ be the growth rate of consumption. The theory predicts the following relation:

$$\lambda_t = \lambda(r^* - \delta - (1 - \alpha)\sigma_t); \lambda' > 0, \quad \lambda(0) = 1, \quad (\text{A.1})$$

where σ denotes the rate of inflation between t and $t+1$ of nontraded goods in terms of traded goods, and $1 - \alpha$ is the expenditure share of nontraded goods.

In equation (A.1), the growth rate of consumption, λ_t , is a function of the consumption-based real interest rate, which is the world nominal interest rate less the weighted average inflation of traded and home goods. In what follows, we assume a given world inflation and equality of the world real interest rate, $r^* = \delta$, and the discount rate. In that case, the optimal consumption profile is flat, provided the real price of home goods is constant over time. In figure A-1, we show the $\lambda\lambda$ schedule, drawn for a given world real interest rate.

We can derive the rate of inflation of nontraded goods (in terms of traded goods) in the home goods market as a function of the relative size of endowments (y_{t+1}/y_t) and the growth rate of consumption. For given

⁶ See Dornbusch (1985) and Frenkel and Razin (1987).

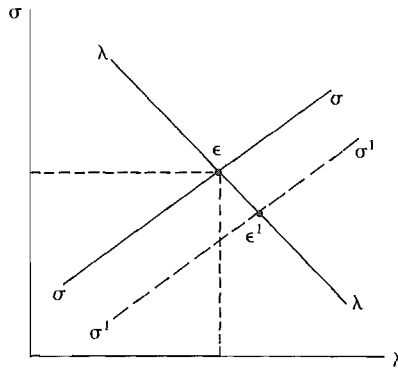


Figure A-1

endowments, the equilibrium price will be rising if consumption is rising over time. This is shown as the schedule $\sigma\sigma'$.⁷

$$\sigma_t = \sigma(\lambda_t; y_{t+1}/y_t) \quad \sigma_1 > 0, \sigma_2 < 0 \tag{A.2}$$

When the endowment profile is flat, the equilibrium of this economy, the path of consumption is also flat and the real exchange rate between home and traded goods remains constant. This is the equilibrium shown at point E in figure A-1. This equilibrium may or may not involve a trade imbalance. If the country, for some historical reason, is a net debtor, then there will be trade surplus just sufficient to pay the interest on the outstanding debt. If the country is a creditor, consumption is permanently above the value of the income endowment, the difference being financed by the interest income.

This model can be used to look at three kinds of disturbances: current endowment changes, future endowment changes, and transitory changes in world interest rates. To illustrate the working of the model consider a future (permanent) change in the endowment of home goods. In figure A-1, this is shown as a downward shift of the $\sigma\sigma'$ schedule. Consumers respond immediately to the higher level of permanent income, but the endowment of home goods has not yet changed. The current price of home goods is therefore bid up relative to future levels ($\sigma < 1$ in figure A-1), which means that the consumption-based real interest rate rises.

The equilibrium profile of consumption will be upward tilted ($\lambda > 1$). What does this imply for the trade balance? The answer depends on the

⁷ Let P_t be the price of home goods and c_t the level of consumption. Then $\sigma_t = P_{t+1}/P_t$ and $\lambda_t = c_{t+1}/c_t$.

degree of intertemporal substitution. If there is little substitution, we must expect a trade deficit as consumers spend income they have not yet received. But if the response to real interest rates is strong (λ in figure A-1 is nearly flat), then there is a possibility that higher *future* income leads to a present trade surplus. Exactly the same result applies if there is a transitory decline in the current endowment of home goods: spending is almost unchanged, because permanent income is virtually unchanged. The decline in home goods' endowment leads to a higher current price and hence the expectation of a declining price as output returns to normal in the future. The declining price of home goods (deflation) raises real interest rates, which tends to reduce the extent of consumption smoothing. A trade surplus in response to a fall in output is possible if the interest response of the consumption profile is very high.

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Discussion

*W. Max Corden**

Professor Dornbusch has given us a stimulating and wide-ranging paper that deals with many issues. Here I shall take up just one topic, namely the question of whether current account deficits matter or whether there is an “adjustment problem.” As he points out, the “new classical” model does not have a place for an adjustment problem.

Let me begin by considering one of the central themes of this conference, namely the massive current account imbalances of the United States, Germany, and Japan. It is conventionally argued that these imbalances should be reduced and that Japanese or German fiscal expansion would contribute—as supplements to U.S. fiscal contraction—in dealing with the problem. Given that the United States is now close to its full employment or full capacity output level, the mechanism by which Japanese (or German) fiscal expansion would reduce the U.S. current account deficit would be as follows: Japanese fiscal expansion would raise world interest rates, and that would reduce U.S. investment. U.S. private savings and the budget deficit need not be affected. The question then is whether it is really desirable that the U.S. current account be reduced by cutting U.S. investment. Is not the real problem that the budget deficit is too high or the personal savings rate too low?

The moral is that it is not the current account itself that is significant but rather the major components that make it up, that is, the fiscal

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balance, private investment, and private savings. One should focus on the optimality or non-optimality of these.

One approach is to argue that the private sector can look after itself, so that the levels of private savings and private investment are not a matter of public policy concern at all. Only the budget deficit and its components (expenditure and revenue) are. The current account, as such, does not matter.¹ A country may be in fiscal balance, and its savings may be high by any objective standards, while an investment boom based on reasonable expectations of the profitability of investment may produce a current account deficit. That should be no problem. After all, in the nineteenth century the United States was a deficit country, and Canada and Australia have consistently run current account "imbalances," essentially reflecting their favorable investment opportunities.

Of course savings or investment may not be optimal because of various public-policy-imposed distortions, especially distortionary taxes, but then the policy recommendation is to adjust these. If it is thought that private savings are too low for some reason—for example, private misjudgments or myopia—and no direct measures are possible to rectify this, extra public savings should substitute. But can we be sure that governments or those who advise them know better what the savings rate should be?

One might also ask whether it matters that Germany lends its excess savings to other European countries, or to countries outside Europe, rather than using them at home, provided the uses of the funds are sound. It matters no more than when funds flow from one part of Germany to another. One must look at the underlying savings and investment behavior, private and public, to assess the desirability of these flows, and hence whether current account imbalances within Europe are a problem. This bears on issues raised in Professor Branson's paper.

The "new classical" (debt neutrality) approach assumes that private behavior is optimal but adds the implication that such behavior takes into account the fiscal situation—that is, future tax obligations incurred. In its extreme form, it argues that private savings behavior fully compensates for budget deficits, so that fiscal policy (referring to public deficits, not the level of government expenditure) should not matter at all.

One can thus contrast three approaches. First, the traditional approach, which is still popular: policymakers have a view about the optimal level of national savings and hence (with private and public

¹ I developed this argument, with qualifications and elaborations, in Corden 1986, pp. 43–51 and 171–173.

investment given) about the optimal current account, while private savings behavior is *not* assumed to be socially optimal. Fiscal policy is then recommended to compensate for departures of private savings from optimality: if private savings fall below the optimum and this leads to a current account deficit, a policy of fiscal contraction designed to improve the current account will be proposed.

Second, the new classical approach in its early (extreme) version, which implies that fiscal policy may well be non-optimal—or determined in some arbitrary or political way—but private savings behavior (which is optimal) compensates fully for fiscal policy effects, so that optimal national savings result. In that case, not only does the current account not matter, as Dornbusch notes, but the budget deficit does not either. As Dornbusch has observed, this extreme result has to be qualified once allowance is made for individual mortality (and possibly for other realistic considerations discussed in the debt-neutrality literature).

Third, the point of view I advanced at the beginning of these comments, which is between these two extreme positions and coincides, I think, with where Dornbusch comes out. Because the private sector does not fully offset the possible non-optimal savings (or dissavings) behavior of the public sector, the budget deficit *does* matter, even though the current account as such does not.

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To Coordinate or Not to Coordinate?

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To open, it is perhaps worthwhile making some semantic distinctions. Macroeconomic coordination is a strong form of international economic cooperation, which can take many other forms, ranging up from the simple exchange of information among different governments to joint action to achieve a shared objective. Macroeconomic coordination can involve the coordination of targets of economic policy, as in the abortive OECD effort in 1974–75 to coordinate the current account objectives of its member countries following the first oil shock. More recently, we have seen some loose attempts to coordinate exchange rate targets. Or it can involve coordination in setting the instruments of economic policy, as for example the coordinated reduction in interest rates agreed at Chequers in 1967, or coordinated fiscal actions agreed at the Bonn economic summit meeting in 1978. The latter effort also involved trade and energy policies as well as fiscal policies.

Moreover, coordination can be rule-based or process-oriented. The two forms differ sharply in principle but blur in practice. Under rule-based coordination, countries agree on certain basic rules concerning the issue at hand, and are able to act freely and independently within those rules. Process-oriented coordination, in contrast, involves close consultation on actions to be taken shortly before they are taken. In practice, rule-based frameworks, such as the General Agreement on Tariffs and Trade or the original Bretton Woods Agreement, also involve occasional close consultation.

The case for macroeconomic coordination is that completely independent national action is likely to involve a lower level of world welfare

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than could be attained. The case arises formally for two and possibly three reasons. The first is that large nations can influence their own terms of trade—their real exchange rate—and that possibility, if exercised, will lead to suboptimal outcomes from a world perspective. The second is that nations cannot make policy continuously in response to new information. This is especially true of fiscal policy, which in practice is fixed once or at most twice a year. For that reason nations are likely to remain further from where they would like to be in a world of interdependent but independently acting governments. Strictly speaking, what is required here is accurate information on what other governments will do. But since that is contingent, in general, on what our country's government will do, intense exchange of contingent information is hardly different in practice from coordination of actions. The third reason for macroeconomic coordination, more controversial perhaps, is that macroeconomic stabilization is an international public good, which will be undersupplied without coordination among the major national governments.

Stating the case for coordination is not to suggest that it is easy to achieve, or even that if achieved, it will be successful in its aims. At any point in time, governments may well differ in their preferences about which way to push the world economy, each wishing to maximize the help the world economy can give in attaining its immediate domestic objectives. Governments will often disagree on the outlook for the near future, hence on desirable actions to be taken. They will sometimes disagree on the relation between actions and outcomes—on how their economies actually work—and of course even when they agree on the theory they may be wrong, so that coordination fails to achieve expected and desired results.¹

The pragmatic conclusion I draw from these various considerations is that major countries—the G7 is the currently available forum—should be constantly alert to the possible gains from macroeconomic coordination, and they should try to coordinate their aims and actions to achieve those gains. But we should not expect too much coordinated action to emerge from that process.

That is perhaps a sound conclusion, but it is not a very exciting one. One purpose of conferences such as this is to provoke thought beyond the conventional wisdom. With that in mind, I would like to introduce an old but still important and still unanswered question, put in a contemporary setting. At the present time, is it desirable that the North German mark be depreciated against the South German mark? Or should the New England dollar—the A dollar in your wallet—be appreciated against other U.S. dollars (the B to L dollars in your wallet)?

¹ For a discussion of these issues see Cooper (1988) and Frankel and Rockett (1988).

Each of these actions has something to be said for it. North Germany is relatively depressed at present, while South Germany is buoyant, yet wages are more or less determined at a national level, so that North German wages are too high relative to South German wages. A depreciation of the North German mark could possibly correct this and stimulate economic activity in the North, while dampening it somewhat in the South.

Similarly, New England at present is booming, with house prices and other prices on non-tradeables rising especially rapidly. The oil and gas regions of the U.S. economy and to a lesser extent the industrial Midwest remain somewhat depressed. Appreciating the New England dollar against other U.S. dollars, and in particular against the Dallas dollar and the Cleveland and Chicago dollars, would redistribute economic activity to some extent in a desirable direction.

Since these would be generally desirable things to do, why do we not think about the actions I suggest? The answer is probably that it is totally impractical politically, and runs strongly against the national unity, including a unified currency area, that the Federal Republic of Germany and the United States of America have each established. The proposal is simply too radical, even quixotic.

But I suggest that there is another, more analytical reason for not seriously thinking about these suggested currency changes. To depreciate the North German mark against the South German mark, or to appreciate the Boston dollar against the Cleveland dollar, would jar economic relations within each country badly. It would create a major new source of uncertainty in making contracts and in investing on the strength of future expected demand. Businessmen must worry about the real value of money, but the rate of inflation is likely to change slowly compared with real exchange rates under flexible exchange rates. Changes in exchange rates can wipe out—or double—a 5 percent profit margin in a week. Movements in nominal exchange rates, which as we have learned in recent years do more than simply correct for differential rates of inflation, introduce great uncertainty for prospective investors who are exposed to international—or in the context in which I have raised the question, interregional—trade.

Credibly fixed exchange rates—in effect, one currency—represent an extreme form of rule-based macroeconomic coordination. In the presence of an integrated capital market, permanently fixed exchange rates require a single, fully coordinated monetary policy. The possible cost of moving to a single currency is loss of an instrument of policy, namely local monetary policy (monetary policy remains an instrument for the larger region). The gain is in a reduction in the real uncertainty facing the productive sectors of the economy, uncertainty that is generated by changes in sentiment, from whatever source, in the purely financial sectors of the economy.

If this gain applies to the United States, or to the Federal Republic, why does it not also apply to Western Europe as a whole, or even to Europe, the United States, and Japan taken together? This is the old question of the optimum currency area, first posed by Robert Mundell in 1961. Economists have never answered this important question satisfactorily.

The answer usually runs in terms of whether exchange rate changes are helpful in adjusting an economy to a "fundamental disequilibrium," in the words of the original Bretton Woods Agreement. Clearly they can be. But these gains must be set against the introduction of real exchange rate uncertainty that nominal exchange rate changes introduce. A standard argument for flexible exchange rates is that they reduce real exchange rate uncertainty in the presence of diverse national monetary policies. But even if true, that particular source of uncertainty would disappear under a common currency, such as prevails through the United States.

Nonetheless, it is necessary to assess the loss of an instrument of policy in adjusting to fundamental disequilibrium. The point cannot be developed here at any length. Adjustment within nations involves the movement of labor and capital, plus some cushioning through fiscal transfers from temporarily advantaged regions to temporarily disadvantaged ones. With a common currency, that is, with full coordination of monetary policy, the capital market would develop fully throughout the entire currency area and capital would move readily to any region able and willing to borrow. It is more difficult to envisage extensive labor mobility or fiscal transfers among the industrial democracies, but the European Community has moved toward both fiscal transfers (through the common agricultural policy and the European Fund) and higher labor mobility, supplied mostly, at the margin, by southern Europeans moving to locations of greatest employment opportunity. No doubt these fiscal transfers and labor mobility are not so well developed as they are in the Federal Republic alone, but the gap is certainly closing, and probably rapidly.

The question then is whether adjustment *within* the large and diversified regions of Europe, Japan, and the United States may not be sufficient to reduce the incremental advantages of real exchange rate adjustments among these regions below the incremental costs of the real exchange rate uncertainty that preservation of diverse monetary policies permits and encourages.

In other words, whatever may be appropriate for the immediate future, in the longer run will we not want an extreme form of coordination of monetary policy, namely, a single monetary policy among the major countries, in the interests of eliminating exchange rate uncertainty among major economies? If in the end the answer is negative, we then have to provide the analytical (as distinguished from

the political) reasons why each of the 12 Federal Reserve Banks should not be encouraged to frame its own, uncoordinated monetary policy, with floating exchange rates among their diverse regional dollars.

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International Nominal Targeting: A Proposal for Policy Coordination

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After some time spent studying the formidable obstacles to international macroeconomic policy coordination, I have begun to think about the more constructive question of defining the necessary characteristics of a coordination plan best suited to overcoming these obstacles. If international coordination agreements are to be *substantive*, they must comprise packages of policy changes that each country would not necessarily be willing to make on its own, but that each believes will be beneficial when enacted jointly. If coordination agreements are to be *enforceable*, the individual authorities must commit to specific "performance criteria," and these criteria must be closely enough related to the policy instruments they control directly that they can be held loosely accountable for deviations. On the other hand, if coordination agreements are to be *successful* at raising economic welfare, the specific criteria that the authorities have committed to must be closely enough related to their ultimate goals—such as output and inflation—that the desirability of having achieved those criteria is not negated by velocity shifts and the other large uncertainties that plague economic relationships.

The current G-7 system of indicators, originally formulated at the Tokyo Economic Summit in May 1986 and supposedly refined at subsequent meetings, lacks some of the characteristics needed to produce substantive, enforceable, successful coordination agreements. I mean this judgment to go far beyond the simple point that the member countries are not yet politically ready to give up the amount of sovereignty needed for full-scale joint optimization. It goes without

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saying that the day of such a degree of political consensus lies far off in the future, if indeed it ever comes. The most we can hope for is to begin in the early 1990s a system in which countries agree to give up just a small amount of sovereignty, hoping to get in return a small joint gain. Then, if coordination is successful on this small scale, the demonstrated record of compliance by the members, and the demonstrated benefits, may engender enough trust in the system to support a greater degree of commitment in subsequent stages if it is desired.

The first reason why the present G-7 indicator system is not as well-suited as it might be to such a plan is that the group does not announce the numbers agreed upon, if indeed it in fact bargains over specific targets for its list of indicators at all.¹ The second reason is that, even if the G-7 were to progress to the point of negotiating and announcing the indicators, there are too many indicators on the list to constitute any serious constraint on policymaking by national authorities. Given that each country has only two or so policy instruments at its disposal—monetary policy and fiscal policy—some indicators will always be moving in such a way as to justify whatever policy settings the country wants. The third reason is that, even if the G-7 continues to winnow down the list of 10 indicators mentioned in the Tokyo Summit (11, if one includes former Treasury Secretary Baker's 1987 suggestion of adding the price of gold and other commodities to the list) to just one indicator, none of them is a good candidate to be that one. All are either too far removed from the policy instruments that authorities have under their direct control and can therefore be held accountable for, or are too far removed from the output and inflation target variables that ultimately matter.

I would like to offer the modest proposal that the G-7 in their future negotiations focus on setting for each member a single target variable: the rate of growth of nominal GNP, or better yet, nominal demand. At the risk of over-glorifying what is a fairly simple and obvious proposal, I have given it a name: INT, for International Nominal Targeting.

Let me begin by noting that one cannot know what kind of coordination is desirable without first knowing the nature of the "externality" that is thought to characterize the noncooperative

¹ There is no question that the G-7 meetings have produced specific sets of (secret) numbers for their list of indicators. The question is whether they are forecasts/goals that each member government sets independently, or whether a genuine element of bargaining goes into them. The fact that the numbers are not made public, and indeed that their secrecy is carefully guarded, suggests the possibility that there may be little genuine policy coordination going on, but that the members find it politically useful to hold meetings nevertheless; the communiqués are sufficiently vague that each member can interpret them to his own advantage. If the meetings were to be true exercises in cooperative policy-setting, the targets should be announced so as to enlist public expectations on the side of attaining the targets.

("Nash") equilibrium. The INT proposal presupposes that the motivation for coordination in a given year is that the noncooperative equilibrium is either overly contractionary because of a proclivity toward "beggar thy neighbor" policies—suggesting a need for joint expansion, as under the "locomotive theory"—or overly inflationary—suggesting a need for joint discipline, as in the logic that apparently underlies the European Monetary System. The proposal is not designed to address externalities regarding the mix between monetary and fiscal policies, the level of real interest rates, or exchange rates.²

In my major paper for this conference, I address one proposal aimed at reducing excessive exchange rate variability, the "Tobin tax" on foreign exchange transactions. In my view, a more promising route if one wishes to try to stabilize exchange rates would be a supranational bank, sometimes called a "Hosomi Fund," which could intervene in the foreign exchange markets, without national central banks surrendering their own rights to operate in the markets. In each case—International Nominal Targeting and the Hosomi Fund—a key element of the proposal as I see it is that it could begin on a very small scale so that the members would at first be sacrificing very little policymaking sovereignty, could then build up trust and confidence in the institution slowly, and might thus progress to higher degrees of commitment and coordination if they so desired. I spell out both proposals at somewhat greater length in a paper for an NBER/IMF conference on international policy coordination.³

The argument for nominal GNP targeting in a closed-economy context has been made well by others. Nominal GNP targeting has the advantage that all nominal anchors do: by pre-committing to a rate of growth for some nominal magnitude, monetary authorities can reduce inflationary expectations and thus, in long-run equilibrium, attain a lower level of inflation for a given level of real output. But nominal GNP dominates the other nominal anchors that have been proposed. It is clear by now that following the monetarist prescription of setting rigid

² In particular, the proposal is not designed to address the major macroeconomic disequilibrium of the 1980s: the U.S. structural budget deficit and consequent trade deficit. I continue to believe that these deficits represent a unilateral failure of U.S. policymaking, rather than an international "coordination failure." Neither the INT nor any other proposals for coordination should be allowed to distract attention from the need for a U.S. fiscal correction in 1989, which exists independently of any arguments for German or Japanese expansion. Results in Frankel and Rockett (1988) show that the potential gains from international coordination are generally less than the gains from the United States discovering that it has been using the wrong model, and unilaterally adjusting its policies accordingly.

³ See Frankel (1989). The paper also gives references to relevant work by others, such as the Miller-Williamson "blueprint." Ten proposals for world monetary reform are reviewed in Dornbusch and Frankel (1988).

targets for M1 would have been disastrous in the 1980s, because of large velocity shifts: the 1981–82 U.S. recession would have lasted another five years. Choosing the price of gold or the price of foreign exchange as the nominal anchor has analogous problems. In each case, large shifts occur in the behavioral relationships that tie the nominal magnitude in question to the economic variables that we ultimately care about, such as real output and inflation. Committing to any one of the three—money, the price of gold, or the exchange rate—as the nominal anchor would mean allowing these shifts to be transferred into undesirable changes in output and inflation. As a further consequence, strong political demands would inevitably arise for government policy to offset, for example, a large recession that resulted needlessly from such a shift, which means that the commitment would not be very credible from the beginning.

In my view, the argument for choosing nominal GNP as the target variable is even stronger in the context of international coordination than in domestic policymaking. The reason is that such an approach is the one most likely to be able to overcome the daunting obstacles to successful coordination that a number of economists have begun to point out in the last few years. Those obstacles are of three sorts: uncertainty, enforcement, and time-consistent inflation-fighting credibility.

Uncertainty is itself of three kinds: uncertainty regarding the current and future position of the economy (the “baseline”), uncertainty regarding the desirable goals (such as full employment), and uncertainty regarding the effects on the target variables of changes in those policy instruments that the policymakers directly control (“model uncertainty”). Uncertainty regarding transmission of monetary policy internationally is much worse than domestically: whereas we generally agree at least on the sign of a monetary expansion’s effect on domestic output and inflation, the leading econometric models disagree completely on the sign of the effects in the international case. So Germany could respond to U.S. requests for faster money growth (on the theory that faster growth in German income will result in more imports from the United States), and yet the U.S. trade balance and output might subsequently fall rather than rise (in response to a depreciation of the mark against the dollar). I have shown (Frankel and Rockett 1988) that in the presence of such uncertainties, policy coordination as usually thought of—where policymakers bargain over money supplies and fiscal policies—can turn out to reduce economic welfare as easily as to raise it.

Enforcement of a coordination agreement can be difficult in the best of circumstances, but it is greatly complicated by the existence of uncertainty. In some years, some countries will lose by the agreement, for example because their economies turn out to be operating at a higher (or lower) level of capacity than they thought they would be when they

entered into the agreement, so that more (or less) stimulus coming from trading partners now turns out to be bad rather than good. In such years, the temptation to abrogate the agreement will be especially strong.

Cooperative setting of nominal GNP (or demand) targets on a year-by-year basis provides the best chance of overcoming these two obstacles to coordination, because it combines the necessary characteristics of a coordination plan that I mentioned at the outset. Nominal GNP constitutes a specific "performance criterion" closely enough related to the policy instruments that national monetary authorities control directly, that they can be held loosely accountable for it. At the same time, nominal GNP is closely enough related to the ultimate goals, output and the price level, that the desirability of having achieved the target will not be negated by velocity shifts or other uncertainties.

Cooperative setting of nominal GNP targets on a longer-term basis also provides the best chance of overcoming the third obstacle to successful coordination. This is the problem pointed out by Ken Rogoff (1985): if governments set up the machinery for joint policy-setting period by period, it will likely turn out to entail expansion to reduce unemployment, and thereby in the long run will undermine the governments' inflation-fighting credibility. The need for time-consistent inflation-fighting credibility points to some commitment on a global scale to a nominal anchor; just as on a national scale, nominal GNP seems the best choice to be that nominal anchor.

My specific proposal is as follows. At each G-7 meeting, the national authorities would (a) commit themselves, without any obsessive degree of firmness, to target rates of growth, or ranges, for their countries' levels of nominal demand for five years into the future, and (b) commit themselves, with somewhat greater firmness, to targets for the coming year.⁴ In the first stage, that is, the early 1990s, there would be no explicit enforcement mechanism. But the targets would be publicly announced, and if a country's rate of growth of nominal demand turned out to err significantly in one direction or the other, the fact would be noted disapprovingly at the next G-7 meeting. This cannot happen under the current system. Aside from the fact that the targets for the current 11 indicators are secret, can one imagine the G-7 admonishing a member because his country's real growth rate turned out to be higher

⁴ There is a reason for choosing nominal demand (defined as GNP minus the balance on goods and services) as the target variable in place of nominal GNP, even though the latter is a more familiar concept. In the event of a recession, countries need to be discouraged from the temptation to accomplish their expansion of output through net foreign demand—for example, through protectionist trade measures—as opposed to domestic demand.

than targeted? (or because its inflation rate turned out to be lower than targeted?)

I would prefer to leave to each country the specific means of attaining the nominal demand target to which it has committed itself. But perhaps a proposal for reform is obligated to be specific. In that case, my favored instrument would be monetary policy. One could follow Bennett McCallum (1988), who has suggested a specific monetary feedback rule in a closed-economy context: for each 1 percent that nominal GNP deviates from its target in a given quarter, the monetary base is expanded an additional 0.25 percent over the subsequent quarter. He suggests setting a trend growth rate in the target of 3 percent per year, and subtracting from this the average growth rate of base velocity over the preceding four years. I would accept the 3 percent trend as a target average at the five-year horizon. But the international cooperative policy-setting process would involve somewhat higher targets in some years or for some countries, and somewhat lower targets in other years or for other countries (without being allowed to degenerate into unprincipled "fine-tuning"). To constrain the target to 3 percent for all countries right from the start would doom the proposal to the same sort of political irrelevance as a return to the gold standard and all the other impractical proposals for world monetary reform that one hears.

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The Coordination of Economic Policies

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A distinction was drawn earlier between cooperation and coordination, where cooperation means sharing of information and all the rest. And the argument has been made that once you share information you cannot really avoid coordination as well. Since we are on the eve of Columbus Day, let me just share with you information that I received yesterday from our colleague Buirra; I think that it will raise the welfare of all of us. He says we are all economists, we are talking about cooperation and Columbus Day. What is common to Columbus and economists? The answer is both left their home place without knowing where they would arrive. Once they arrived, they did not know where they were. And both did so at public expense.

The title of this panel session is so dramatic, almost Shakespearean—To Coordinate or Not To Coordinate—that obviously we cannot offer a very simple answer. So in outlining my ten minutes I thought of at least four w's and one h that one has to address, namely: why coordinate? what to coordinate? who should coordinate? when should coordination take place? and finally, the how. Well, we do not have time to go through all of that, so I will just indicate some of the answers.

The intellectual case for coordination is rather well known and obvious, especially in view of the discussion this morning. We know that capital markets have become more and more integrated and that floating rates have turned out to be less than insulating. In other words, there are externalities, and when one country is under tight policy measures, it affects the rest of the world. And if there are externalities,

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we feel that there must be a mechanism to internalize those externalities, in order to bring us to something consistent with a global welfare. So in this context, coordination can be thought of as the mechanism that is used in order to internalize those externalities. But this suggests in general the perspective that we see in some of the public pronouncements that country A should take into account the effect of what it does on country B, and therefore be "a little more realistic." That is really the non-argument. The argument that should be used is the argument of self-interest, the argument that basically a nation is in the same boat with others. October 1987 illustrated it, and as a result we see that it is in one's self-interest to recognize that one is in the same boat with others.

Now the process of coordination or cooperation tries to resolve the paralysis that arises from excessive politeness, where everyone says, "You go first." "No, you go first." The notion of coordination is to try to get out of this particular bind. Of course all of the dangers of coordination that have been already mentioned divert attention from the real fundamentals that are out of line. Coordination may be on the wrong policies. Countries do not share objectives. Countries do not share beliefs about the way the economic system works. But all of these, I think, are arguments against bad policies rather than arguments against a mechanism for internalizing externalities, whether it is cooperation or coordination. No system can be designed that is immune from bad policies, so the real question is whether a cooperative framework will generate marginally somewhat better policies. Now what perspective should one take? On the average I would say "No." I would say in cases of crisis, in extreme cases, that is where coordination counts. I don't know how many times the red telephone has been used, but it is there precisely for that particular extreme case. Now you may say, "Why have these ongoing meetings, if the cooperative framework is useful only to resolve an extraordinary crisis?" The answer is that it is very difficult to have a club where you can decide unilaterally that you're going to go out, take the key with you, and come back when you want. If you are loud enough and you leave the club, even with the hope of coming back, you may not find the club when you return. Coordination is something that has to be routinely part of an ongoing process. One of the difficulties we have is that excessive drama has been associated with all of these meetings, and therefore a lot of expectations, resulting in a lot of frustrations. Many, therefore, would like to have this machinery in place on an ongoing basis, where most of the time it is sharing information and things of that type and occasionally it is extinguishing important fires.

About the next question, what should be coordinated, well, one should probably back up and say what we should avoid. I think we should clearly avoid coordinating the instrument that happens to be the

easiest to coordinate, or we will also end up with the fallacy of the lamppost and the coin. It is indeed the case that monetary policies are the most flexible and have the machinery for communication. Monetary authorities meet on a regular basis. But before long, you also end up saying that political reality dictates that fiscal policies are slow; we cannot do much, there are election cycles, so let us focus on monetary policy. Then you end up wishing to have targets on interest rates, because you worry about that, and growth and investment; you worry about inflation, you worry about exchange rates. Finally everything is loaded overwhelmingly on monetary policy, and that is an important danger one should avoid.

On the other hand, one has also to avoid over-coordination. One should not, of course, have a situation where one ignores the political reality that sovereign states differ. And, therefore, one has to have enough safety valves to allow the steam to go out without necessarily creating a crisis. There must be room for a real exchange rate change, if circumstances necessitate it, and there must be room for some flexibility, so that not every little change means loss of credibility.

Let me say a word here about the INT, International Nominal Targeting. One of the dangers of having those kinds of initials is that international nominal targeting may also be thought of with INT—Independent National Targeting—and I think a danger lies there. How do you end up creating good initials that bring you to the right thing?

When should you coordinate and why? As I said, I believe that you cannot expect or, therefore, call for anyone to undertake a policy that is against his own perceived interest. So why should one coordinate? I would like to think about it as a Weight Watchers' Club. Some of us join a Weight Watchers' Club and you wonder why. After all, if you want to go on a diet, you do it. But the fact of the matter is, we do not go to a Weight Watchers' Club to do what we do not want to do, but because we think that somehow the peer pressure will be helpful. When I think of some of the actions that have taken place during the last year on the budgetary side, maybe in Japan, and even the limited budgetary actions in the United States and some other policy actions, it would be hard envision them taking place at that particular time without the "Weight Watchers' Club" discipline.

Who should coordinate? Well, again, the G-3 already exists, and the G-5, G-10, G-7, G-22, G-24, G-77. We know that such groups should definitely include those whose actions matter, so the major industrial countries should be there. And how do you incorporate those who are affected by these actions? Here the procedures are very important. I want to say something about the line that Jeff Frankel suggested, the nominal income targeting and the indicators, and what the G-7 should set aside. The process itself of coordination has turned out to be extremely important. The choice of indicators never emerged from any

request to the economics profession to supply (in its wisdom) the single indicator that will do the job. So, therefore, I do not believe that this should be regarded as the final revelation. We must understand why the initial set of indicators was chosen, what political equilibrium it has established, and how we can replicate what has been accomplished using whatever more efficient process is available.

Let me just mention one or two last points. First, one of the things we have to keep in mind is that we economists think of policy instruments as the things that we use in carrying out the policy actions; therefore, we have tax policy, fiscal spending, and defense, and all the rest. Now there is a little problem when some of these instruments become objectives rather than instruments in the particular case, because of other considerations. So suddenly defense, for example, and taxes, are not so much instruments but are themselves objectives.

And, finally, the coordination of economic policies is a subset of a broader domain of coordination and cooperation among sovereign states. It is very difficult to take a specific summit and to look at the deals that have been struck there on economic policy without concluding that somebody seems to have given more and somebody else to have got less. The accounting must be done in a broader context, since countries have broader relations with others involving defense and otherwise, and the economic summits are but part of it. You may then ask another valid question: If economic summits are only a subset of the broader range of relations among countries, why should we limit a session to just economic matters? But, I guess that is a question for a different time. Thank you.

The Requirements for Successful International Macroeconomic Cooperation

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To start with, the question "To coordinate or not to coordinate?" arises in light of the fact that in recent years the susceptibility of national economies to external influences has increased. For one thing, right up to the present time world trade has been growing faster than global GNP. For another—and a far swifter development—the integration of national financial markets has been making ever-greater headway. With the dismantling of controls on capital movements, the introduction of sophisticated communications techniques, and the advent of the financial innovations these techniques make possible, the mobility of capital has been greatly augmented and the "global village" has become reality. Financial news—good news and bad news, genuine news and false news—spreads today no less quickly than news did in the villages of our ancestors.

The Federal Republic of Germany has participated in a special way in this growing interdependence of the world economy. Despite its comparatively small size, my country's exports in 1987 were higher than those of the United States or Japan, although this admittedly owed something to the fact that we still regard as exports our deliveries to other countries of the European Economic Community, which one day will only be deliveries within the single internal market. At all events, economic growth in Germany hinges crucially on developments in world markets and on the competitiveness of German industry. In addition, the deutsche mark continues to be a major international reserve and investment currency. Hence, interest rate movements in the German capital market and the exchange rate of our currency reflect not

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only domestic economic influences but also trends in international financial markets and fluctuations in the currency preferences of international investors. But even such an enormous economic area as the United States increasingly feels the effects of international interrelationships, the pressure of foreign competition on domestic and foreign markets, the impact of exchange rate changes on global competitive conditions, and their repercussions on national financial markets.

The high degree of interdependence of the goods and financial markets throughout the world causes disturbances on specific markets to spread very quickly to other countries. The oil price shocks, the overshooting of the dollar rate in one direction or the other, the debt problems facing many developing countries, and the stock market crash in the fall of 1987 are examples of how strong global interdependence has become. The same is true of national economic policy measures. When making their decisions, economic policymakers must make allowance for influences from abroad and the effects of measures taken abroad. They also ought to pay regard to the repercussions of their own actions on partner countries. They are not obliged to do so, and they often fail to do so. But such "lone wolf" approaches to economic policy are apt to come up against limits—the more so, the smaller the country. "Le cavalier seul" is a common French expression for a lone ranger. But many "lone ranger" expeditions have become proverbial for the early end they have met.

In view of the clear loss of autonomy by national economic policy, the calls for closer international cooperation are perfectly understandable. For example, if—as at the moment—external disequilibria are difficult to remedy by means of isolated measures because of possible adverse "spillover effects," international accords are an obvious step to take. Without any doubt, some of the arguments adduced in the literature in favor of international cooperation are quite convincing at first sight. What has been referred to as the "theater syndrome"—an attempt by some of the audience to improve their view by standing up—implies in the end, when all are standing up, that all are worse off. This strengthens the expectation that a cooperative approach is preferable to a "non-cooperative equilibrium." In particular, international cooperation is expected to bring about greater consistency in the objectives and measures of economic policy in individual countries, so that self-generated disruptions of the world economy can be avoided. By stabilizing expectations, it is claimed, international cooperation would provide a "public good," with the aid of which the unavoidable swings in economic activity could be diminished in scale or shortened in duration.

On closer inspection, however, the advantages of coordination are by no means so unmistakable. They are difficult to demonstrate empirically. Rather like Stanley Fischer, Horne and Masson (1988) conclude in

an IMF staff paper that the gains deriving from cooperation are fairly small: "Although the theoretical case in favor of policy coordination may be strong, there are real-world problems that may limit its practical possibilities (p. 284)." It appears that the success of a cooperative strategy depends on a number of conditions that are not necessarily fulfilled in economic reality:

- First, the economic policymakers must have clear and consistent ideas about the transmission mechanisms of their decisions. Jeffrey Frankel has just pointed out that cooperation may even lead to worse results than isolated national action if the cooperation process is based on a misspecified macroeconomic model or the participants hold differing views. Let us suppose, for instance, that one country believes that changes in its national interest rate level have no effect on the exchange rates of its national currency, while its partner countries are convinced that these changes are operating in the wrong direction. How can cooperation be possible in such a case?
- Second, all parties to the cooperative process will therefore be required to keep to the "rules of the game," and in the same way. The question that arises in this context concerns the sanctions to be imposed if a country deviates—no matter for what reasons—from the internationally agreed economic policy stance. "Peer pressure" or "reputational considerations" are conceivable, but can be applied only within limits. A country's feeling of sovereignty must not be disregarded. Nor may the impression be given that adjustment burdens are being passed on to others by means of the coordination. This applies not least to the one "big shot" in the boat and its attitude with respect to all the other lesser lights.
- Third, the joint economic policy objectives must actually be attainable using the available economic policy instruments. Besides the final targets (price stability and economic growth), intermediate targets—such as the stabilization of (real) exchange rates—may be helpful in the short run. But if the cooperative approach is spelled out in overmuch detail, there is a danger that attainability by means of economic policy measures might be overrated.

In the light of such uncertainties regarding international cooperation, it is not surprising that quite recently a number of skeptics have been raising their voices more loudly and warning against illusions about the possibilities inherent in cooperation. As you will know, Martin Feldstein goes so far as to recommend the United States bid a fond farewell to the strategy of international coordination of macroeconomic policy. Without any doubt, coordination cannot be a substitute for necessary economic policy action at home. Even so, in my view there

is no alternative to it, if a further disintegration of the world economy is to be prevented. James Tobin expressed himself very clearly on this point in a recent essay (1988, p. 77):

Coordination of macroeconomic policy 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. Wars among nations with those weapons are likely to be mutually destructive. Eventually, they too would evoke agitation for international coordination.

The most important thing seems to me to be that the concrete blueprint of international cooperation not be overburdened with unrealistic expectations. A danger exists that responsible policymakers may overestimate their own possibilities and underestimate or even disregard obvious economic relationships. Let me enumerate a few basic principles that appear to me to be essential in the cooperation process (without wishing to make any claim to completeness):

- First, international cooperation should be confined to a broad adjustment of economic policies, the detailed implementation of which should remain the responsibility of the respective countries. Attempts at "fine-tuning" already founder frequently at the national level; in an international context the problems would be exacerbated. Correspondingly, historical experience of international overall control of economic policy is not particularly encouraging. The economic summit meeting in Bonn in 1978 may serve as one unfavourable example of this.
- Second, the international coordination of economic policies is likely to promise particular success when unmistakable disequilibria are to be rectified. For one thing, a coincidence of national interests and global economic requirements can no doubt be achieved relatively easily in such circumstances. For another, the necessary economic policy actions are easier to identify, despite the above-mentioned uncertainties with respect to the model. We may take as an example the Plaza Agreement of 1985, when all those concerned agreed that the envisaged measures were in everybody's interest.

This should not be taken to imply that efforts at economic policy coordination only make sense when "the cat is already among the pigeons." However, permanent macroeconomic coordination extending beyond special occasions would, in the long run, impose too great a strain on the cooperation process. Signs of "wear and tear" and a loss of credibility might be the consequences. "In normal circumstances"—that is, given a reasonable degree of economic convergence—mutual information and consultation in the context of a "multilateral surveillance" procedure

should suffice, without any formal coordination of concrete economic policy measures being necessary. Under these conditions, allegiance to a definite policy stance is not to be recommended, if only because national interests not infrequently diverge. It is, however, an illusion to believe that, for the sake of cooperation, a country would act for any length of time contrary to its own best interests. In Europe, and more precisely within the European Economic Community, we have had enough experience that goes to show that a determination to act in concert must not be overstrained.

- Third, an envisaged closer coordination of economic policy must not be confined to monetary policy but must be extended to include the other economic policy areas as well. It is true that fiscal and structural policy are comparatively inflexible (not least because they affect firmly entrenched interests and require protracted parliamentary deliberations), yet an unsatisfactory policy mix and structural distortions are often the cause of economic disequilibria. As it is, monetary policy is often overburdened when it is expected, on its own, to stabilize exchange rates, keep inflation rates low, and maximize the rate of economic growth. It may easily happen here that economically inconsistent objectives are set, and their achievement perhaps even promised by politicians, even though in this combination they are not attainable at all.
- Fourth, mechanistic rules and automatically operating economic policy mechanisms should be avoided in the cooperation process. So-called "objective indicators," which are the focus of so much attention today, are no doubt a necessary instrument of analysis, but no unambiguous instructions for action can be derived from them. "Target zones" with their obligatory interventions may considerably impede a stability-oriented monetary policy without actually stabilizing exchange rate expectations in the final analysis. In this context, I do not intend to be unfair to various authors who understand "target zones" to mean wide margins of fluctuation for exchange rates and who envisage an adjustment of these margins to inflation differentials, that is, in principle are thinking of stable real exchange rates. Politically, such shifts in the exchange band, especially when the top or bottom end of the band has already been reached, arouse strong resistance; this fact is borne out by experience of the regionally limited exchange rate system of the European Monetary System (EMS).

National economic policy must remain sufficiently flexible. It is unrealistic to suggest that in democratically governed countries economic policy decisions should be taken as soon as particular indicators point to certain maladjustments. Decisions will always

depend on a comprehensive general appraisal of the prevailing economic conditions and an overall consensus on the necessary measures, particularly in the field of fiscal policy.

- Fifth, economic policy cooperation should be underpinned by market mechanisms. Under a free market system, coordination is effected primarily through market processes, that is, above all through price adjustments. Thus, not only the prices of goods but also those of capital (interest rates) or of currencies (exchange rates) must be able to respond adequately to changed scarcity conditions. Furthermore, in the event of adjustable exchange rates, the problem of asymmetry in economic policy adjustment, which is so often deplored today, would be largely defused. While, under conditions of fixed exchange rates, most deficit countries are induced to adopt unilateral economic policy measures relatively quickly, owing to their losses of reserves, under a regime of floating exchange rates the surplus countries likewise bear part of the real adjustment burden, owing to the deterioration of their international competitiveness caused by the appreciation of their currencies.

Relative to the expectations, which are sometimes set fairly high, the framework outlined here for the international coordination of economic policy admittedly appears to be rather more modest. Even so, cooperation among the major industrial countries remains very important; it has now developed into an integral part of the world economic system. The Deutsche Bundesbank, too, has always played its part in international cooperation (and the experience gained in the process has been incorporated into the five points raised above). The Bundesbank has endorsed the various accords reached by the Group of Seven, from the Plaza to Louvre II, and has participated time and again in the concerted efforts to stabilize exchange rates, right up to the present. Within Europe, cooperation among the central banks is particularly close on account of the regulations governing the EMS. The Bundesbank has belonged to this narrower margins arrangement from the very beginning in 1973, doing so without any break at all, which can be said of only three other central banks. Moreover, we, the Bundesbank, have so far made the largest active financial contributions—ones resulting from our commitments and ones going beyond that level. (I say this because the impression has arisen among the public at large that we are the chief brakemen on monetary policy developments in Europe.)

However, I do believe that national policy objectives are not in all cases suitable as objects for exchanging in the international cooperation process. Slightly less monetary stability, for example, would promote neither economic growth nor exchange rate stability. The declarations of the global economic summits therefore rightly state that the supreme

goal is "non-inflationary growth"—a form of words that is interesting, because some participants nevertheless continue to speak of growth with low inflation rates. International cooperation can do a great deal to ensure that these "correct" words are followed by matching policy actions, although the degree and depth of the coordination of the individual national economic policies must be kept in line with the prevailing circumstances. To sum up, I should like to associate myself with the conclusions that Norman Fieleke recently reached in an article on "Policy Coordination" (pp. 34–35):

Coordination is not an absolute good or bad or even a matter of principle; it is a method to be chosen or rejected depending on the circumstances. . . . The issue is not one of decentralized isolation versus full coordination at all times, but of adaptation to the situation. . . . At a minimum, governments should share current information on policy measures, and all may profit from frequent discussion and debate in the various international forums.

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