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To: Members of the Executive Board  
From: The Secretary  
Subject: The Global Effects of Fund-Supported Adjustment Programs

Following the discussion at Executive Board Seminar 85/3 on July 22, 1985 of the paper on global effects of Fund-supported adjustment programs (SM/85/97, 4/4/85), it was suggested that, after suitable revision, the paper be published. The attached revised version incorporates comments and suggestions made by Executive Directors.

Mr. Goldstein (ext. 7678) is available for further details, prior to Friday, September 20, 1985.

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Department Heads

The Global Effects of Fund-Supported Adjustment Programs

Prepared by the Research Department

Approved by Wm. C. Hood

September 9, 1985

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## I. Introduction

In 1971-73 an average of only eight countries per year had Fund-supported adjustment programs. Also, the world economy had just emerged from a decade (1963-72) in which the volume of world trade grew at an average annual rate of 8 1/2 percent and in which economic growth in industrial and developing countries was close to, or in excess of, 5 percent per annum, respectively. Against such a background of very modest Fund program activity and of generally favorable economic performance, there was little discussion of any "global effects" of Fund programs.

Scarcely more than a dozen years later, the situation is different. To begin with, the number of countries undertaking Fund-supported adjustment programs has increased sharply in response to the severe external payments deficits experienced by many Fund member countries, especially non-oil developing countries. In 1980-83, for example, an average of twenty three countries per year had stand-by arrangements (SBAs) or Extended Fund Facility (EFF) arrangements with the Fund; if countries making purchases under the Fund's Compensatory Financing Facility (CFF) are also included in the program-country group, the corresponding figure rises to thirty one countries per year. <sup>1/</sup> In the background of all this, of course, was the 1980-82 global recession with, inter alia, economic growth falling short of 2 percent per annum in developing countries and of 1 percent in industrial countries, and with the volume of world trade virtually stagnant. Seen in this light, it is perhaps not surprising that the "global effects" of Fund-supported adjustment programs have taken on an increased interest.

At the risk of oversimplifying the relevant arguments, concerns about the global effects of Fund programs and of Fund policy prescriptions have generally fallen into three areas. First, there is the argument that the simultaneous adoption of policies of demand restraint in many program countries could impart a pro-cyclical "deflationary bias" to the world economy, with adverse consequences for real output and employment in non-program and program countries alike. <sup>2/</sup> A second concern relates to the "consistency" of Fund policy prescriptions across countries. More specifically, it is sometimes asserted that Fund policy prescriptions for the appropriate course of monetary and fiscal policies in industrial

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<sup>1/</sup> Since program periods do not coincide neatly with full calendar years, a country was assigned to the program group in any year in which a Fund program was in effect for at least seven months of that year. It should be also noted that in this paper, a country is regarded as a program country only during the period during which it had a Fund program.

<sup>2/</sup> Williamson (1982).

countries imply a demand for imports that is inconsistent with (i.e., lower than) the export objectives specified in Fund programs with non-oil developing countries. 1/ A related consistency concern is that trade linkages among program countries will frustrate the trade balance objectives of individual program countries because one program country's imports are another's exports. 2/ Finally, there is the concern that simultaneous exchange rate devaluation by many program countries, some of which export mainly primary commodities, will result mainly in a lower world price for program-country exports, with little beneficial effect on their export earnings. The common thread running through all these criticisms is the notion that what might be feasible and desirable policy for a single program-country acting alone will not be feasible or desirable policy when many program countries act simultaneously.

This paper contributes to the ongoing analysis and debate on the *global effects of Fund programs* in four ways: (i) it analyses the strengths and weaknesses of alternative ways of defining and measuring "program effects," be they own effects or global effects; (ii) it identifies the channels by which policy actions in program countries might be expected to affect both non-program countries and other program countries; (iii) it reviews the empirical evidence that is relevant for reaching a judgment on the likely size of such "aggregation" or "interdependence" effects of Fund programs; and (iv) it discusses the ways in which the Fund currently takes these aggregation and interdependence effects into account, both in the design of stabilization programs and, more broadly, in the advice it gives to member countries.

Two restrictions have been placed on the scope of the paper. The first restriction is that in keeping with the emphasis on the global effects of Fund programs, the paper does not attempt either to appraise the effects of individual Fund-supported adjustment programs or to assess (in great detail) the effects of all Fund programs on individual regions, countries, industries or financial institutions. Thus, for example, the paper investigates how a 15 percent change in the volume of imports in all program countries might affect export volumes and real GNP in industrial countries. 3/ But it does not investigate how, say, Fund-supported adjustment programs in

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1/ See Dell (1981).

2/ See Meltzer (1983).

3/ An additional restriction is that in estimating the transmission effects of IMF programs, it is unfortunately not possible to give as much attention to oil-exporting countries as to industrial ones. This reflects the fact that the oil-exporting country bloc of practically all existing world trade models is not as developed as the industrial country bloc; in particular, real income of oil-exporting countries is typically exogenous in these models.

Argentina, Brazil and Mexico taken either individually or together, have affected U.S. capital goods exports or the market value of financial claims by the largest commercial banks against these particular countries. Assessment of such "disaggregated" program effects would go beyond the manageable proportion of a single paper.

The second restriction is that the paper is confined to analyzing the global effects of those policy actions by program countries that have been most characteristic of past Fund-supported adjustment programs (e.g., actions on the rate of domestic credit creation, the size of the public sector deficit, the level of foreign borrowing, the level of the real exchange rate and of real interest rates, the restrictiveness of the trade and payments system, etc). The paper cannot consider the international consequences of all possible policy scenarios by program countries. Thus, for example, although eleven of the twenty five "major borrowers" among developing countries had Fund programs in 1983, the present paper does not attempt to estimate the global consequences of say, alternative large-scale debt rescheduling exercises for groups of program countries. 1/

The plan of the rest of the paper is as follows. Section II considers the thorny but important question of how to define the "effects" of Fund programs. It is argued there that if program effects are defined as the difference between what did happen in program countries and what would have happened in these countries in the absence of Fund programs, then any net transmission effects of programs may be quite different from what is often supposed. A case is likewise made for considering the long-run as well as the short-term effects of programs. Section II also shows why in practice it is so difficult to actually measure the effects of programs. Section III then presents some basic characteristics of the programcountry population that a priori should affect the size of any transmission effects from program countries to the rest of the world. These characteristics include: (i) the weight or share of program countries in world imports and exports; (ii) the extent of trade interdependence among program countries; (iii) the share of program countries in international capital flows; and (iv) the size of initiating changes in import volumes, export prices, and real exchange rates in program countries themselves during the program period.

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1/ This is not meant to imply that the size and maturity structure of foreign debt is not of interest in Fund programs, or that some past multilateral bank debt rescheduling have not been contingent upon the country reaching agreement with the Fund on an adjustment program, or even that the Fund does not support rescheduling in cases where there is prior evidence of significant progress in adjustment. For an analysis of these issues, see Brau et al. [1983].

Section IV then utilizes these basic characteristics of program countries, in conjunction with some structural and behavioral parameters in industrial and oil exporting developing countries, to draw some inferences about the transmission effects of expenditure changes in program countries. Simulation results are reported for three World Trade Models, namely, the OECD Interlink Model, the IMF World Trade Model, and the Project LINK Model. The focus of Section V is on the global effects of simultaneous exchange rate changes by program countries. In this connection, a distinction is made between exports of differentiated products (e.g., manufacturers) and exports of homogenous primary commodities. In order to identify those commodities for which exchange-rate induced increases in production could affect the world price, data are presented on the country-concentration of production for many of the primary commodities that are most important in world trade, as well as on supply-price elasticities for these commodities. Indices of export and import "market power" for most IMF member countries are also presented. Section VI considers how the Fund takes aggregation and interdependence effects of programs into account in its operations. Emphasis is given to the World Economic Outlook exercises, to the interchange of information on programs among the Fund's staff, and to the waiver and modification provisions in Fund programs. Finally, Section VII summarizes the paper's main conclusions.

## II. Definition and Measurement of Program Effects

One of the main reasons why the evaluation of IMF programs has often brought forth such widely varying views is that the definition of "program effects" - and perhaps even more so their measurement - is subject to multiple interpretation. In addition, some of the basic characteristics of program countries, particularly their situation prior to the program period, have often gone unnoticed. In this section, both of these issues are explored as a necessary prior step to the discussion of the global effects of programs.

### A. Alternative definitions and measurements of program effects

The broad objective of Fund-supported stabilization programs has been summarized as "... the restoration and maintenance of viability to the balance of payments in an environment of price stability and sustainable rates of economic growth." <sup>1/</sup> How can it then be determined whether Fund programs have in fact fulfilled these objectives?

Review of the existing literature on the evaluation of Fund stabilization programs reveals that no fewer than five alternative interpretations of "program effects" have been employed. These five measuring rods or estimators can be described as follows:

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<sup>1/</sup> Guitian [1981].

(i) the difference between actual macroeconomic performance under the Fund program and actual performance prior to the program, i.e., what is versus what was;

(ii) the difference between actual performance under the program and the performance specified in the targets of the program, i.e., what is versus what was to be;

(iii) the difference between actual performance under the program and the performance that would have taken place in the absence of a Fund program, i.e., what is versus what would have been;

(iv) the difference between actual performance under the program and the performance that could have taken place under an optimal set of policies, i.e. what is versus what might have been; and

(v) the difference between (hypothetical) performance under a set of Fund program-type policies and (hypothetical) performance under some other set of policies, i.e., what might have been under policy A versus what might have been under policy B.

For the ensuing discussion of the global effects of programs, it is useful to identify some of the main strengths and weaknesses of these five alternative measuring rods or interpretations of program effects. 1/

(1) The main strength of the simple "before-after" method (i.e. estimator i) is its objectivity. To calculate program effects, one only has to calculate the changes in the relevant macroeconomic outcome variables as between the pre-program period and the program period. Against this however, must be set its inadequacy as an estimator of the independent effect of Fund programs on observed outcomes. Specifically, the before-after approach falters because the non-program determinants of macroeconomic outcomes in program countries often change markedly as between the pre-program period and the program period. Since the before-after approach implicitly attributes all of the change in outcomes to the program, it will understate or overstate true program effects whenever those non-program factors are changing. This criticism would not be so damning if the 1970s and early 1980s were not so marked by large non-program influences, including, inter alia, two rounds of large oil price increases (1973-74 and 1979-80), widely varying rates of economic activity in industrial countries, and large fluctuations in world real interest

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1/ In thinking about these five alternative measuring rods of program effects, it may be helpful to consider estimator i as a "positive" or "factual" standard, estimator ii as a "normative" standard, and estimators iii-v as "conjectural" or "hypothetical" standards.

rates (1973-79 versus 1980-84). 1/ Because of these changing non-program factors, the before-after approach can be useful for observing what happened in program countries but not for judging why it happened.

For expositional purposes, Table 1 shows some before-after comparisons of internal and external balance for program countries over the 1973-83 period. 2/ Both weighted and unweighted averages of individual-country outcomes are presented. The main point to note is how variable over time the estimated program effects are. For example, using the weighted average figures, whereas changes in real growth rates in program countries were positive in 1973, 1974, 1976, 1981, and 1982, they were negative in 1975, 1977-80, and in 1983. Similarly, whereas the change in the ratio of the current account deficit to GDP was unfavorable in 1974, 1975, and 1980, it was favorable in the eight other years. Since it is unlikely that the design and/or implementation of Fund programs underwent major shifts over this period, the figures in Table 1 are consistent with the suspicion that changing non-program factors (of both the domestic and external variety) are contaminating the true independent effects of programs.

(2) The "actual versus target" method (i.e., estimator ii) likewise carries the advantage of objectivity and ease of calculation. A comparison of actual outcomes and targeted ones may also yield useful information on program design. For example, when such a comparison is done across many programs, it may help to identify those factors (e.g., early adoption of planned policy measures, flexibility in policy formulation, sustained implementation of adjustment measures, etc.) that are most closely associated with the achievement of target outcomes. In addition, and unlike the before-after approach, the actual vs. target method can allow for the influence of non-program factors on actual outcomes by making adjustment for them in the setting of the program targets themselves.

On the other side of the coin, the actual vs. target approach can produce a misleading picture of true program effects when program targets are set too ambitiously or too timidly, or when unexpected non-program factors intrude and cause outcomes to fall short, hit, or exceed targets. Table 2, taken from the staff's "Review of Upper Credit Tranche Stand-By and Extended Arrangements Approved in 1981" (EBS/83/216), shows a representative comparison of actual and target outcomes for 1981 Fund programs. The comparison is shown separately for demand-restraint programs, supply-oriented programs, and mixed-strategy programs. In short, Table 2 shows that while current account, overall balance of payments, and inflation

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1/ Observe that if the changing non-program influences are of domestic origin (e.g., shifts in weather conditions that strongly affect agricultural output), the problem is just as serious.

2/ In this table and all subsequent tables, the set of program countries will include only those countries for which data are available for the year in question. The occasional exclusion of certain program countries for this reason should not qualitatively affect the conclusions.

Table 1. Before-After Comparisons of Macroeconomic Outcomes for  
Program Countries, 1973-83  
Change from Pre-Program Year

(In percent)

	<u>Growth Rate of Real GNP</u>		<u>Inflation Rate</u>		<u>Ratio of Current Account Deficit to GDP</u>		<u>Ratio of Overall BOP to GDP</u>	
	Weighted <u>1/</u>	Unweighted	Weighted <u>1/</u>	Unweighted	Weighted <u>1/</u>	Unweighted	Weighted <u>1/</u>	Unweighted
1973	3.8	1.5	11	12	4.3	2.6	2.5	1.3
1974	4.9	1.5	140	67	-1.8	-4.2	-1.4	-1.0
1975	-8.3	-4.0	-56	-19	-1.8	0.1	0.4	0.9
1976	0.3	2.9	105	+39	4.0	6.5	1.6	1.2
1977	-0.2	1.3	6	-2	4.0	4.5	1.1	1.0
1978	-3.4	0.3	6	2	2.0	0.3	2.0	0.5
1979	-2.7	-3.0	10	6	0.7	0.7	0.6	-0.1
1980	-3.4	-2.5	17	11	-0.8	-1.3	-	-1.1
1981	0.4	0.3	1	2	0.1	-0.3	-0.9	-0.6
1982	1.6	2.6	-1.0	-4	0.7	2.3	0.7	0.4
1983	-0.7	0.4	41	8	3.2	1.4	4.5	2.6

1/ Weights are U.S. dollar value of GNP over preceding three years.

Table 2. Actual Outcomes Versus Targets for 1981 Program Countries

(In percent)

	Demand Restraint Programs	Supply Oriented Programs	Mixed Strategy Programs
Ratio of external current account balance to GDP <u>2/</u>			
Target	-13.6	-4.3	-12.8
Actual	-12.5	-4.3	-12.6
International reserves <u>3/</u> (weeks of imports)			
Target	9.9	10.8	6.3
Actual	8.6	10.6	6.2
Real growth rate			
Target	4.2	5.2	3.7
Actual	0.4	4.7	1.5
Rate of inflation <u>4/</u>			
Target	12.3	14.7	18.2
Actual	15.0	11.7	21.7

Source: Staff estimates, EBS/83/216.

1/ This table presents arithmetic averages of selected variables for all of the programs for which data are available.

2/ Excludes Dominica and Grenada.

3/ Reserve data refer to the end of the indicate dperiod.

4/ Excludes Costa Rica and Uganda.

developments were broadly in line with program targets, real growth rates were less favorable than targeted, especially in demand-restraint and in mixed-strategy programs. The Review goes on to state that this result "...was partly attributable to the impact of depressed international economic conditions on the performance of exports." Indeed, exports grew on average by 11 percentage points less than anticipated. In this connection, a companion paper on 1981 programs (EBS/83/215) reports that in early 1981, prospects for an early world economic recovery seemed considerably more favorable than proved to be the case. Table 3 presents a comparison of these early 1981 prospects or forecasts and actual developments. The point is simply that if forecasts like those in Table 3 did get built into program targets, then any underachievement of say, growth targets need not imply any ineffectiveness of programs. 1/

(3) The actual versus in-the-absence-of approach (i.e. estimator iii) possesses at least three important strengths. First, by comparing actual program outturns to what would have happened in the absence of a program, this approach recognizes that the benefits and costs of a program cannot be meaningfully evaluated in a vacuum; rather, they need to be weighed against the benefits and costs of the alternatives. And while the no-program alternative is not the only alternative, it is in many cases the most realistic one. This comparison of alternatives is particularly relevant for evaluation of Fund programs because, as detailed below, there is strong empirical evidence that program countries are in an unfavorable situation with respect to growth, inflation, and the balance of payments prior to the program period itself. A comparison of actual outturns with the no-program alternative also means of course that programs can have positive (negative) effects even when the macroeconomic indications during the program period itself are unfavorable (favorable) since the relevant alternative policies may have produced a significantly more unfavorable (favorable) result.

The second key strength of the actual versus in-the-absence of approach is that it is able in principle to separate program from non-program influences on observed outcomes, so as to produce an estimate of the independent effects of programs. Specifically, since what would happen in the absence of a program includes all non-program influences, exogenous events like oil price disturbances or marked changes in industrial-country growth need not blur the effects of a program.

The fact that estimates of program effects can be adjusted for unex-pected events constitutes its third advantage. Unlike the actual-versus-target method which compares actual outturns with targets set prior to or

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1/ As Guitian [1981] points out, one has to be careful not to equate forecasts with targets. Indeed, in some cases targets will be set and announced with the intention of altering actual developments. Nevertheless, good targets will usually have to incorporate good forecasts.

Table 3. Forecasts and Actual Developments in Global Non-Program Variables, 1981-82

(Annual average percentage change)

	Forecast <u>1/</u>	Actual
Industrial countries		
Real GDP	1.5	0.4
Import volume	1.5	-1.5
World trade prices		
Oil	12.1	2.5
Non-oil primary commodities	2.4	-13.5
Terms of trade for NODCs	-1.3	-3.3
Interest rates (3-month LIBOR, in percent per year)	12.0	15.0

1/ From IMF, World Economic Outlook, Occasional Paper No. 4. These forecasts were prepared in early 1981.

simultaneous with the program period, the actual versus in-the-absence-of method can make estimates of what would have happened with the benefit of hindsight; it thus bypasses the problem of forecast accuracy.

The chief problem with the actual versus in-the-absence-of approach is its subjectivity. More specifically, it turns out to be very difficult to estimate what would have happened in the absence of a Fund program, that is, to estimate the so-called "counter-factual." In this connection, two earlier approaches have proved to be wanting. First, as indicated earlier, the situation "before" the program will usually not provide a good estimate of the counterfactual because non-program determinants of macroeconomic outcomes often change significantly during the program period itself. Second, and perhaps less obviously, the observed macroeconomic performance of non-program countries will generally not be a good guide because: 1/ (i) program and non-program countries appear to differ systematically prior to the program period in ways that probably matter for subsequent economic performance; (ii) macroeconomic outcomes in non-program countries may not be completely independent of Fund programs; and (iii) the effects of divergent policy strategies in program versus non-program countries may not be adequately captured by the standard macroeconomic indicators unless the observation period is quite long. Each of these points merits a brief comment.

(a) Systematic differences between program and non-program countries - Table 4 provides calculations of mean growth rates, inflation rates, and external positions for both program and non-program countries in the year prior to Fund programs. The calculations are done separately for each year since 1972 and for the 1973-83 period as a whole. The message of those calculations is clear: program countries are different from non-program countries in the year before programs. Specifically, program countries experienced (on average) larger balance of payments deficits in proportion to GNP, larger current account deficits in proportion to GNP, higher rates of inflation, and lower rates of real output growth than did non-program countries. 2/ Further, these differences between program and non-program countries are statistically significant (at the 95 percent confidence level), 3/ and this not only for the program-country group and time period shown in Table 4 but for

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1/ This is so even when, as is the usual case in practice, non-program countries are other non-oil developing countries.

2/ The same result holds if one uses unweighted averages or if the program-country group is expanded to include CFF users.

3/ These differences are confirmed not only by t-tests for individual indicators but also by chi-squared tests for differences in the whole set of mean comparisons and by estimation of a linear discriminant function for systematic differences between the two groups.

Table 4. Macroeconomic Outcomes in Program and Non-Program Countries in Year Prior to Program Period 1/

	Outcomes in Pre-Program Year							
	Current Account to GDP		Balance of Payments to GDP		Real Growth Rate		Inflation Rate	
	Program	Non-Program	Program	Non-Program	Program	Non-Program	Program	Non-Program
1973	-4.5	-1.5	0.9	1.2	3.1	5.5	8.0	10.9
1974	-1.5	-1.3	-0.1	1.1	-3.5	10.3	232.9	13.3
1975	-6.0	-3.3	-1.2	0.2	4.5	5.2	230.5	19.9
1976	-6.3	-3.7	-0.8	-0.4	2.6	5.1	79.4	20.7
1977	-11.1	-2.4	-0.3	0.9	3.1	4.0	22.3	39.0
1978	-3.6	-2.5	-1.1	1.1	4.3	5.7	70.1	19.7
1979	-4.3	-2.7	0.2	1.2	3.7	6.8	33.8	23.1
1980	-6.2	-3.0	-0.5	0.9	4.3	5.2	26.9	30.2
1981	-4.7	-4.2	-1.0	0.2	3.4	5.4	20.9	41.6
1982	-9.0	-4.7	-2.3	-0.5	2.3	2.8	37.6	37.8
1983	-5.4	-3.7	-5.6	-0.1	-0.2	3.4	62.8	16.0
1973-83	-5.7	-3.0	-1.1	0.5	2.5	5.4	75.0 (40.2)	24.7 (26.5)

1/ Non-program countries are all non-oil developing countries that do not have programs in that year.

other samples and time periods as well. This finding should not surprise anyone. After all, a necessary (but not sufficient) condition for use of Fund resources is that the country display a "balance a payments need." This implies that among the population of potential claimants for Fund resources, the sample of countries with Fund programs in place at any given time is likely to have displayed less favorable external balance performance prior to the program period than the population at large. 1/ In any case, the important point is that so long as program and non-program differ before the program period in ways that can matter for subsequent performance, 2/ the behavior of non-program countries will not be a good guide to what would have happened in program countries in the absence of a program. 3/

(b) Interdependence between program and non-program countries - To the extent that non-program countries are themselves affected by Fund programs, they will not serve as a satisfactory "control group" and therefore comparisons between program and non-program countries will not yield good estimates of program effects. Note that this would be so even if program and non-program countries were identical in all relevant (non-program) characteristics both before and during the program period.

There are two reasons for suspecting that non-program countries may be affected by Fund programs. One is that policy decisions among any group of countries competing for market shares are bound to be interdependent to some extent. Thus, for example, suppose country A undertakes a Fund stabilization program and in so doing chooses to devalue its exchange rate by 10 percent to improve its trade account. But now consider country B, which has an export structure similar to A and which competes with A in third-country markets. Although country B does not have a Fund program, it may decide to devalue also so as not to lose competitive advantage to

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1/ Even if program countries were not screened by the Fund for a balance-of-payments need, program countries might still differ systematically from non-program countries because they were more or less motivated to adopt the adjustment measures specified in programs. Such "self-selection" as a barrier to control-group methodologies have been much discussed in the labor economics literature, e.g. see Heckman [1979].

2/ Note that this problem would not be evaded by comparing changes in outcomes for program and non-program countries unless the changes were independent of the level of outcomes in the pre-program period; staff work suggests that this condition is unlikely to be satisfied in practice.

3/ This suggests that if non-program countries are to be used as a control group for program countries, any pre-program differences that matter for subsequent performance would have to be accounted for (i.e. held constant) in the analysis. An alternative procedure would be to select a control group from the non-program population that does share the same characteristics as the program-country group. Ongoing staff work has been exploring both these approaches.

A. Hence, in this circumstance, a Fund program has affected both a program country and a non-program country. Also, note that if a devaluation had the same impact in both country A and country B, and if B were used as the control group for A, then a comparison-of-means calculation (for say the trade balance) as between program and non-program countries would suggest Fund programs had no effect. In reality of course, the program might have had quite a sizeable total effect since it affected not only program countries but non-program countries, and since both groups may have gained at the expense of third parties not included in the control group. 1/

The second reason for suspecting an influence of Fund programs on non-program countries is the direct interaction between program and non-program countries that occurs through trade. Clearly, measures that affect domestic expenditure, the real exchange rate, trade restrictions, etc. can have a direct effect on non-program trading partners, with the magnitude of these spillovers depending in large part on the weight of program countries in the world economy. If these interactions are such as to move the macroeconomic outcome variables in non-program countries in the same direction as those in program countries, it is intuitive that a comparison of outcomes in the two groups will understate the true total effect of Fund programs.

(c) Short-run versus long-run program effects - A third problem that can plague estimation of program effects from comparison of program and non-program countries is that the fruits of markedly divergent policy strategies as between the two groups may only be fully apparent well after the end of the program period. 2/ An example should suffice to make the point. Suppose that two countries face identical current account deficits. Country A, with a Fund program, undertakes a devaluation cum expenditure-reducing policy while country B, without a program, relies on increased

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1/ The same problem has long been recognized in the labor economics literature with respect to analyzing the effect of unionization on wages; see, for example, Lewis [1963]. Specifically, if non-union firms set their wages high enough so as to deter their employees from joining unions, then a comparison of mean wages as between union and non-union firms may show no difference even though unionization has actually affected the wages of both groups.

2/ Even for program countries alone, of course, there are apt to be significant differences between the short-run and long-run effects of programs. In particular, the "costs" of adjustment are likely to be evident before the "benefits," owing in large part to the downward stickiness of wages and prices, to the less than perfect mobility of factors of production in the short run, and to the difference between short-run and long-run price elasticities of demand for tradable goods.

trade restrictions and increased international borrowing. Over a one-year period, the change in the overall balance of payments could well be similar for the two countries and it is even possible, again over the short run, that the non-program country will suffer less real output and employment contraction. But when country B is forced to adjust, as it ultimately must, the adjustment costs in terms of growth, employment, and reallocation of resources may well be larger than the cumulative ones for country A. Yet this would not be reflected in one year comparisons of program and non-program countries. Indeed, in some analyses of program effects, country A would be regarded as a non-program country after the program year. In short, it is necessary to have a good idea of the time lags associated with the effects of alternative policies if true program effects are to be adequately captured.

As a final note on the actual versus in-the-absence-of approach, it should be mentioned that there is no compelling reason why the counter-factual cannot be ascertained from a more subjective, but perhaps still accurate judgment about what was the most likely alternative policy scenario at the time of the program. Put in other words, the fact that it may be difficult to find a good control group for program countries, or that the global economic situation may have changed markedly since the pre-program period, does not destroy the usefulness of the actual versus in-the-absence-of method. It just means that it may have to be applied in a more judgmental way.

(4) The "actual versus optimal policy" approach (i.e., estimator iv) is similar in many ways to the "actual versus in-the-absence-of" approach. The main difference is that it uses a different counter-factual, namely, what could have happened under some hypothetical "optimal" set of policies. That optimal set of policies could differ from the policies implemented under a Fund program either in the weight given to various program objectives (e.g., less to the balance of payments and say, more to income distribution) or in the mix of policies deemed to be consistent with the same objectives (e.g., less reliance on expenditure-reducing policy and more on expenditure-switching policy).

Plainly, the usefulness of the "actual versus optimal policy" approach depends on the feasibility both of defining the optimal set of policies relevant to program countries and of inferring the effects of such policies on macroeconomic outcomes during the program period. In this regard, four points are relevant. First, the optimal set of policies will need to be defined within the international constraints and generally adverse initial conditions faced by program countries. This means, for example, that if the optimal policy calls for less rapid adjustment and more financing than does the existing program, then the optimal policy scenario will need to identify the sources of that additional financing (be they private or official)--and this within the prospective overall "climate" for foreign investment or lending offered by the program country. Second, if the optimal set of policies is to be supported by

Fund lending, the optimal policies will have to be framed within the constraints faced by the Fund itself, including its obligation to protect the revolving nature of its resources and its inability to dictate social or political objectives to sovereign governments; the former constraint places (lower) limits on the speed of adjustment that can be supported with Fund resources while the latter circumscribes the Fund's role in initiating or appraising measures aimed specifically at, say, better distribution of income. Third, the optimal set of policies needs to be defined at the same level of specificity as the actual program. For example, if the optimal policy suggests that more emphasis in securing external adjustment be placed on increasing exports, the specific price incentives or other measures directed toward that aim have to be outlined. Fourth and finally, as with the actual versus-in-the absence-of approach, the counterfactual has to be estimated, because what would happen under the optimal set of policies is unobservable. Indeed, this is likely to be harder to estimate than what would have happened in the absence of a program because past observations on optimal policy configurations are apt to be harder to find (either in the program country or in other countries) than are policy configurations characteristics of no programs.

None of this should be taken to imply that calculation of the effects of alternative policy scenarios is not useful. Rather, the point is simply that if optimal policies are to be used as standard of comparison for the effects of a Fund program, they should be subject to similar requirements so that we are comparing "oranges with oranges."

(5) The "comparison of policies" approach (i.e., estimator v) is different from the four approaches outlined earlier in one important respect: it does not infer program effects by comparing actual outcomes in program countries to some past outcome or estimated counterfactual. Instead, it infers the effects of programs from studies of the effects of those policies that typically make up a Fund program. For example, if a representative Fund program calls for, inter alia, a decrease in the government's fiscal deficit, a lower rate of domestic credit expansion, a depreciation of the real exchange rate, and increases in real interest rates, and if one knows the relationship between these policy instruments and the macroeconomic outcome variables of interest (i.e., the current account, the inflation, the real growth rate, etc.), then one can simulate the effects of programs by comparing a Fund-program-type policy scenario with an alternative policy scenario. 1/ The parameters used for that exercise often come from small macroeconomic models that have been estimated on a pooled cross-section time-series sample that includes both program and non-program countries. 2/

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1/ The series of empirical studies done at the World Bank on the effects of "outward-looking" versus "inward-looking" policies is one example of this approach; see, for example, Balassa [1983].

2/ See, for example, Khan and Knight [1981].

Table 5, adapted from the staff's review of 1980 SBA's and 1978-80 EFFs (EBS/82/97, Supplement 1), provides a summary of the policy content of Fund programs. It can be seen from Table 5 that a typical Fund program encompasses a rather comprehensive set of measures, with particular emphasis usually laid on credit ceilings, restraint of public expenditure (especially as regards wage and salaries), increases in tax rates and improvements in tax administration, adjustment of tariffs and administered prices, reduction in the ratio of the public sector deficit to GDP, formulation of an investment plan, control of public or publicly guaranteed debt commitments and disbursements, exchange rate reform, export promotion, and overall wage and price policies.

The "comparison of policies" approach carries three principal advantages. First, observations are not restricted to Fund program experience; the approach can draw on a much wider body of evidence on how various policies might affect the objectives of programs. By inferring what programs do from what programs are rather than from what happened during program periods, one can make use of the considerable existing literature on the effects say, of exchange rate changes, or more restrictive monetary policy, etc. Second, by its very nature, this approach focuses on the relationship between policy instruments and policy targets, thereby yielding useful information on how programs work--a feature that is not shared by those approaches (e.g., the before-after approach) that dwell only on the "bottom line" of programs. Third, because the "comparison of policies" approaches contrasts various hypothetical policy packages, its results are not blurred by incomplete implementation of policies. Note that in the other four approaches, "program effects" reflect both the degree of implementation of policies and the effects of those policies that are implemented. This is not a trivial concern. Previous staff reviews of SBA's and EFF programs suggest that most policy measures are implemented as planned in programs only in one-third to two-thirds of cases. 1/

On the negative side of the ledger, the "comparison of policies" approach, while it may be able to contrast the effects of "good" policies and "bad" ones, may yield incomplete or even misleading information on Fund programs for at least three reasons. One is that the theoretical models underlying such exercises are seldom capable of simulating the range of measures that make up a Fund program. As Table 5 suggests, the characterization of a Fund program by, just say, credit and fiscal deficit measures would be a poor approximation. At the very least, one would also want to take into account the incentives included in programs to generate more domestic savings, more investment, and more exports. Failure to do so could impart a deflationary bias to the simulation exercise itself. Second, even for a given policy measure, the effects may differ depending on whether that measure is introduced within the context of a Fund program.

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1/ See Table B.6, EBS/82/97, Supplement 1.

Table 5. Policy Content of 1980 Fund Programs

Policy	Policy Specified (No. of Programs) 1/		
	SBA	EA	Total
Monetary policies	17	13	30
Credit ceilings	17	12	29
Reserve requirements	3	2	5
Interest rate policies	11	7	18
Other	2	--	2
Public sector policies	17	13	30
Restraint of expenditure	14	12	26
Curtailement of investment	8	4	12
Curtailement of subsidies	5	8	13
Curtailement of transfers	5	7	12
Wages and salaries	10	6	16
Other current expenditure	5	3	8
Other	3	4	9
Reform/improvement of the system	14	13	27
Reform of tax structure	5	6	11
Increase in tax rates	9	8	17
Improvement in tax administration	10	9	19
Other	3	1	4
Nonfinancial public enterprises (NPE)	12	11	23
Curtailement/rationalization of expenditure	6	2	8
Adjustment of tariffs and administration prices	8	10	18
Employment	1	1	2
Wages	2	--	2
Other	1	3	4
Overall public sector			
Reduction in deficit/GDP ratio	12	10	22
Improvement in NPE performance			
Reduced bank borrowing (real)	3	3	6
Reduced transfer from government (real)	6	6	12
Formulation of investment plan	6	9	15

Table 5 (concluded). Policy Content of 1980 Fund Programs

Policy	Policy Specified (No. of Programs) 1/		
	SBA	EA	Total
External debt policies	<u>15</u>	<u>12</u>	<u>27</u>
Control of commitments/ disbursements			
Public/publicly guaranteed	14	11	25
Private sector	3	2	5
Improvement of maturities			
Public/publicly guaranteed	6	4	10
Private sector	2	--	2
Other	2	1	3
Exchange and trade policies	<u>12</u>	<u>12</u>	<u>24</u>
Exchange rate reform	<u>6</u>	<u>6</u>	<u>12</u>
Fixed rate	2	2	4
Frequently adjusted rate	3	4	7
Floating rate	1	--	1
Liberalization/reform of exchange system	3	6	9
Liberalization/reform of trade system	4	5	9
Import substitution measures	--	2	2
Rationalization of import protection	2	1	3
Export promotion or liberalization	5	6	11
Reduction of arrears			
Other	4	3	7
Wage and price policies	<u>15</u>	<u>9</u>	<u>24</u>
General wage restraint policies	10	6	16
Wage guidelines in public sector	9	5	14
Producer price adjustments	7	3	10
Retail price adjustments	7	5	12

Sources: Executive Board papers; and staff assessments.

1/ The total number of programs is 30, of which 17 are SBAs and 13 EAs.

For example, an announced new real exchange rate target may be viewed as more likely to be adhered to if it is a component of a Fund program than otherwise. More generally, to the extent that participation in a Fund program alters the credibility of announced policies, it will be misleading to assume that program effects depend only on the magnitude of the change in policy instruments. Third, unless model simulations take due account of the adverse (pre-program) initial position facing the hypothetical program country, they may give an erroneous impression of the effect of policy instruments on macro-target variables. For example, if the profitability of producing exportables is very low relative to other activities because of the long-term maintenance of an increasingly over-valued exchange rate, a small or even moderate exchange rate depreciation may have little effect on production of exportables. In such a case, an exchange rate simulation based on an equilibrium starting position will not produce a good estimate of the program effects that would follow from initiating such action in the disequilibrium situation faced by a real-world program country.

#### B. Summary

Before the global effects of IMF programs can be assessed, it is necessary to have a clear idea of how "program effects" are to be defined and measured. The main message of this section, simply put, is that not only the size but even the direction of program effects is likely to be quite sensitive to alternative definitions and estimating methodologies. Specifically, after reviewing five possible interpretations of program effects, it was found that measured program effects can vary substantially depending on, inter alia: (i) whether changes in non-program factors as between the pre-program and program period are accounted for; (ii) whether program targets incorporate unexpected developments in the global environment; (iii) whether program countries are systematically different from non-program countries prior to the program period in ways that matter for subsequent performance; (iv) whether non-program countries are themselves affected by Fund programs; (v) whether the medium and long-run effects of programs are considered in addition to the "impact" effects; (vi) whether, because of confidence and credibility factors, the imposition of a given policy within the context of Fund program has different effects than without it; and, perhaps most important, (vii) whether the most relevant comparison for actual outcomes under a Fund program is what would have happened in its absence or what could have happened under some (hypothetical) optimal set of policies.

Perhaps the best recent illustration of how such alternative definitions of "program effects" can color the evaluation of programs is provided by the interpretation given to the much discussed "import compression" experienced by 1983 program countries. On a weighted average basis, the volume of imports in program countries fell by almost 8 percent in 1983. What role should be assigned to Fund programs in this outcome?

First, consider the naive "before-after" approach to program effects. Here, because all changes are attributed to the program, the interpretation would be that Fund programs "caused" the fall in import volumes. Since a lower demand for imports by program countries implies, *ceteris paribus*, lower exports for the rest of the world, this would imply, in turn, that Fund programs had a deflationary effect on global economic activity.

Next, consider the analysis suggested by the "actual-versus-in-the-absence-of" approach. In this case, one wants to weigh the actual decline in import volumes against the change that would have occurred without Fund programs. In this connection, it is relevant to note: (i) that the Fund's lending in 1983 exceeded SDR 12 billion and that it helped to secure over SDR 20 billion in new bank lending to non-oil developing countries; 1/ (ii) that it is likely that without the Fund's direct and "catalytic" lending effects, the flow of financing to 1983 program countries would have been much smaller; and (iii) that, based on past empirical work, 2/ the main determinant of the demand for imports in developing countries is the availability of foreign exchange receipts. All of this would point strongly to the conclusion that the effect of Fund programs was to make the decline in import volume smaller than it would have been in their absence. 3/ Hence, using the same import-transmission argument, the implication would be that Fund programs had an expansionary effect on global economic activity. In addition, one would also want to note that, based on preliminary trade data for 1984, the same group of 1983 program countries exhibited an average increase of 10 percent in their import volumes in 1984--a piece of information that is consistent with the view that the medium-run effects of programs are probably quite different from the "impact" effects.

Yet a third more mixed verdict might well emerge from the "actual versus target" approach or the "actual versus optimal policy" approach. If, for example, the fall in import volumes exceeded the program target, the verdict might be that the external adjustment achieved under 1983 programs was both unavoidable and better managed than would have occurred without programs but still that the compression of imports went further than would be optimal or desirable from a longer-term growth perspective. The import outturn could be attributable to overachievement of fiscal

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1/ See de Larosiere [1984].

2/ See Hemphill [1974], Deppler and Ripley [1978], UNCTAD [1973], OECD [1982], Glowacki and Ruffing [1979].

3/ This conclusion, of course, applies to program countries as a group. There may be individual program countries where limited access to capital markets and/or the need to use additional financing to build up reserves has resulted in a less discernible effect on imports.

targets, or to greater than anticipated adjustment pressures linked to higher than expected world real interest rates, or even to the application of restrictive trade controls by program countries counter to program intentions. In any case, the conclusion emanating from this perspective could be that the "effect" of programs on imports was more expansionary than in their absence but not as expansionary as would be desirable or optimal given the operating environment.

In sum, "program effects" can mean different things to different people. This is not all bad because, as shown earlier, none of the separate definitions of program effects is free of shortcomings. Still, unless these different definitions or interpretations of program effects are explicitly recognized, there is the danger that different views on the global effects of Fund programs will be due in large part to the application of different yardsticks to the same evidence.

### III. Characteristics of the Program-Country Group

Quite apart from the definition selected for "program effects," it is clear that the global effects of IMF programs will be much influenced by various structural and behavioral characteristics of the program-country group. In this section, four such characteristics are examined, namely: (i) the share of program countries in world trade; (ii) the degree of trade interdependence among program countries; (iii) the share of program countries in international capital flows; and (iv) the typical size of initiating changes in import volumes, export prices, and real exchange rates in program countries. As a first approximation, it would be expected that, other things equal, the larger were these four parameters and/or disturbances, the greater would be the transmission of program effects to the rest of the world or to other program countries; i.e., the larger would be the "global effects" of programs. In Section IV and VI, such global effects will be considered within more general-equilibrium models and in greater detail. Nevertheless, the characteristics of program countries examined below place natural bounds on the size of these global effects.

#### A. Share of program countries in world trade

Table 6 provides a capsule picture of the share of program countries in world trade over the 1973-83 period. Two groups of program countries are considered so as to provide information on the sensitivity of the results to alternative definitions of the program-country population. Group A contains all those countries that had stand-by arrangements or Extended Fund Facility programs with the Fund in a given year. Group B includes all Group A countries plus those countries that made purchases under the Fund's Compensatory Finance Facility in that year.

Table 6. Program Countries' Share of World Trade, 1973-83

(In percent)

	World Imports		World Exports		NODC Imports		NODC Exports	
	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
1973	0.75	1.38	0.75	1.33	2.70	4.96	2.84	5.05
1974	0.42	1.22	0.43	1.07	1.99	5.83	2.67	6.68
1975	0.87	0.99	0.53	0.58	3.99	4.56	3.41	3.77
1976	2.59	9.65	2.53	8.11	13.15	48.67	16.08	51.61
1977	12.30 (1.92) 1/	14.94 (4.56) 1/	10.81 (1.16)	12.83 (3.25) 1/	9.81 1/	23.08 1/	7.14 1/	19.87 1/
1978	2.13	5.22	1.58	3.89	10.79	26.06	9.93	24.12
1979	3.12	3.47	2.35	2.59	8.38	17.46	8.03	15.69
1980	3.84	5.54	2.56	3.85	18.28	26.22	15.05	22.43
1981	4.70	4.76	3.00	3.03	20.50	20.79	16.63	16.79
1982	1.53	3.47	0.94	2.58	6.97	15.81	5.08	13.85
1983	6.80	7.60	7.40	8.30	37.15	37.71	41.61	42.19
1973-83 (avg.)	3.55 (2.61) 1/	5.29 (4.35) 1/	2.99 (2.11) 1/	4.38 (3.51) 1/				

1/ Excludes the United Kingdom and Italy.

The story told by Table 6 can be succinctly summarized as follows. First and most important, even though the share of program countries in world trade has been on a rising trend over the past decade, that share is still quite modest, accounting in 1983 for about 7-8 percent of global imports and exports and roughly one-third of the trade of all non-oil developing countries. 1/ To place those figures in perspective, it can be noted that in 1983, the seven largest industrial countries took 49 percent of world imports; 2/ indeed, the United States alone accounted for over 15 percent of world imports in 1983. Put simply, even with nearly 40 countries under Fund-supported adjustment programs in 1984, the potential for these program countries to affect economic activity in the rest of the world via decreases or increases in their demand for imports would seem to be quite limited, especially in comparison with the industrial countries. In this sense, the fact that most world trade models are designed to trace the transmission of economic activity from the North to the South can be seen as no accident.

A second point that emerges from Table 6 is that the share of world trade attributable to program countries varies quite a bit over time with changes in the size and composition of the program-country population. Note, for example, that the program-country share of world imports for 1983 was 10 times larger than that for average 1973-75 (0.68 percent for Group A), and more than 4 times larger than that for 1982 (1.53 percent for Group A). The main reason why this share of world imports jumps so much in 1983 is that several "large" trading countries (i.e., Argentina, Brazil, Chile, Hungary, Korea, Mexico, and Turkey) were added to the program-country group in that year. Likewise, the program-country share of world trade hit a peak of over 12 percent of world imports in 1977 because the United Kingdom and Italy had programs in that year. Perhaps the main implication of this temporal instability in world trade shares is that one should not expect any transmission effects from program countries to be stable from year to year. This of course makes the estimation of the global effects of programs that much more difficult.

Finally, Table 6 also demonstrates that in recent years (1979-82) the share of world trade accounted for by program countries is not much altered by enlarging the program-country group to include CFF drawings; i.e., compare the figures for Group B with those for Group A. The reason for that is simply that most countries with stand-by arrangements or EFF

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1/ To guard against the possibility that the share of program countries in world trade could itself be affected by IMF programs, the calculation for 1983 was redone using 1982 (pre-program) trade data. The results were qualitatively similar: Group A program countries then took 8 percent of world imports and 8 percent of world exports.

2/ The corresponding 1983 figures for oil exporting and non-oil developing countries were 7 and 22 percent, respectively.

programs also made CFF purchases during the 1979-83 period. Hence, the country-composition of Groups A and B is quite similar during this period. This was not so during the 1976-78 period when the program-country group inclusive of CFFs was considerably larger than the one excluding them. In short, we can be confident that estimates of the global effects of programs will not be very sensitive to the inclusion of CFF recipients but only if we are dealing with the last four or five-year period.

The fact that program countries as a group have typically taken a rather modest share of world imports (3.5 percent for average 1973-83) does not mean either that individual countries or industries could not be seriously affected by changes in program-country import behavior or that these induced export effects would be roughly similar across countries and industries. While this study cannot explore such disaggregated distribution effects in great detail, Tables 7 and 8 provide some basic information on the share of individual-country exports going to program countries, and on the commodity composition of program-country imports, respectively.

Perhaps the most interesting finding in Table 7 is that group averages on the share of exports going to program countries conceal quite a bit of individual country variation. For example, even among the seven largest industrial countries, the United States and Japan seem to have been about twice as dependent on program countries for export markets over the past decade as have the other five largest industrial countries. 1/ Similar inter-country variations can be seen in Table 7 among smaller industrial countries and among oil-exporting countries. It is also worth mentioning that the individual-country export shares to program countries are quite variable over time (e.g., note that the U.S. share increased from 2.1 percent in 1982 to 14.1 percent in 1983), again a reflection of the large changes in the country-composition of the program-country group over time.

Turning to the commodity-composition of program-country imports, Table 8, drawing on World Bank data for 1980, shows that the bulk (61 percent) of program-country imports are manufactured goods, followed in descending order by fuels (22 percent), foods (9 percent), and other primary commodities (8 percent). This calculation was done using the 1983 program-country group but it is likely that the predominant share of manufactures would also emerge for earlier program-country groups. 2/

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1/ In large part, this finding reflects the joint facts that most program countries are non-oil developing countries and that the United States and Japan send about twice as much of their total exports to this group as do the other five large industrial countries.

2/ In 1960, for example, manufactures still accounted for roughly 55-65 percent of total imports of non-oil developing countries. Indeed, in comparing 1960 to 1980, the major change is that the share of fuels doubles at the expense of food and other primary commodities; see Table 11, 1983 World Development Report.

Table 7. Share of Country's or Groups's Total Exports  
Going to Program Countries

(In percent)

	1973-83	1973	1974	1975	1976	1977 <sup>1/</sup>	1978	1979	1980	1981	1982	1983
Industrial countries	2.4	0.8	0.3	0.8	2.7	2.4	2.4	1.8	3.5	3.1	1.7	6.8
United States	4.0	1.5	0.5	1.4	4.3	6.5	3.2	2.5	4.9	2.9	2.1	14.1
Canada	0.9	0.5	0.1	0.7	0.9	1.0	0.7	0.7	1.2	1.2	0.5	2.8
Japan	4.1	2.1	0.3	1.3	7.3	1.7	2.9	3.4	7.9	3.6	3.3	11.6
United Kingdom	2.3	1.1	0.5	1.3	3.6	2.3	2.7	2.2	2.2	3.7	1.5	4.7
France	2.1	0.3	0.2	0.5	1.7	1.6	2.5	1.5	3.8	4.2	3.0	4.2
Germany	1.8	0.3	0.2	0.5	2.0	1.4	2.2	1.2	2.9	3.2	0.7	5.1
Italy	2.0	0.2	0.2	0.5	1.4	1.8	3.1	1.9	3.6	3.6	1.8	4.0
Australia	2.6	1.0	1.3	1.1	3.4	2.1	2.1	2.3	3.9	3.2	0.6	7.5
New Zealand	2.1	1.7	0.3	0.4	2.3	0.9	0.9	2.4	3.5	2.8	1.6	5.3
Austria	2.0	0.2	1.5	0.3	1.2	0.9	2.0	1.6	4.5	5.0	0.5	4.6
Belgium	1.1	0.2	0.1	0.4	0.6	1.6	1.0	1.0	1.4	2.6	0.7	2.3
Denmark	1.2	0.3	0.3	0.6	0.6	0.9	1.0	0.8	1.4	2.2	0.9	2.3
Finland		0.2	0.1	0.2	0.7	1.1	2.0	0.9	1.2	1.3	0.3	2.5
Iceland	1.0	0.0	0.0	0.0	0.0	0.1	4.5	0.2	0.8	1.0	0.1	1.2
Ireland	0.7	0.2	0.1	0.4	0.7	0.9	0.8	0.5	0.7	1.0	0.5	1.0
Netherlands	1.0	0.3	0.1	0.4	0.7	1.1	1.4	0.7	1.4	1.9	0.8	2.1
Norway	1.4	0.2	0.1	0.3	0.7	1.7	2.0	1.4	1.6	2.4	1.5	3.5
Spain	2.6	0.3	0.5	0.6	0.9	1.7	5.1	1.4	3.9	4.5	3.4	7.0
Sweden	1.4	0.2	0.2	0.4	1.0	1.2	2.1	1.0	2.1	2.7	1.0	3.3
Switzerland	2.3	0.4	0.2	0.4	1.9	3.5	3.2	1.8	3.0	2.9	1.3	6.2
Oil Exporting Countries	3.0	0.8	0.3	0.7	1.9	0.5	1.6	1.8	4.8	5.0	4.9	10.0
Algeria		-	-	-	-	-	-	0.1	-	-	-	-
Indonesia		0.1	0.1	0.6	2.8	0.7	-	1.3	2.4	0.6	-	-
Iran		-	-	-	-	-	-	-	-	-	0.2	-
Iraq		-	-	-	-	-	-	-	-	-	-	-
Kuwait		3.0	0.2	0.6	9.1	1.8	0.4	2.2	8.5	6.5	-	-
Libya		-	-	-	0.1	0.0	2.5	2.1	4.4	3.9	-	-
Nigeria		-	-	-	-	-	0.2	1.1	-	-	-	-
Oman		-	-	-	-	-	-	-	-	0.7	2.3	-
Qatar		0.0	0.0	-	-	-	-	-	-	-	-	-
Saudi Arabia		2.0	0.6	1.0	2.9	0.7	1.1	1.7	5.3	3.9	2.6	-
United A. Emirates		-	-	-	-	1.0	0.8	1.0	3.3	7.7	3.3	-
Venezuela		1.0	0.3	0.3	0.5	1.3	3.9	3.1	1.4	2.9	1.3	-

<sup>1/</sup> Excludes Italy and the United Kingdom from the program-country group.

Table 8. Commodity Structure of Imports and Exports: 1983 Program  
Countries and Other Country Groups

(In percent of total imports or exports)

<u>Country group</u>	<u>Manufactures</u>	<u>1980 Imports</u>		<u>Other primary commodities</u>
		<u>Food</u>	<u>Fuels</u>	
1983 Program countries <u>1/</u>	61	9	22	8
		<u>1980 Exports</u>		
	<u>Manufactures</u>	<u>Fuels, minerals, and metals</u>		<u>Other primary commodities</u>
Industrial countries	72	13		15
Developing countries				
Low income				
China and India	50	20		30
Other low income	30	9		62
Middle income				
Upper middle income	45	32		23
Lower middle income	18	44		38
Oil exporters	7	78		15
Oil importers	54	12		34
High income oil exporters	2	98		-

Source: 1983 World Development Report, Tables 10 and 11.

1/ Weighted averages using 1981 value of imports as weights.

This suggests of course that the major beneficiaries or victims of sharp changes in program-country imports are likely to be those countries for which manufactures bulk large in their total exports. As shown in the bottom panel of Table 8, it is the industrial countries and the middle-income oil-importing developing countries that best fit that characteristic. The data do not permit us to go much beyond that.

To summarize, the program-country share of global imports and exports has grown rapidly over the past decade, but even in 1983 it was still modest (7-8 percent) alongside those of other country groups; that share is quite variable over time, changing markedly with changes in the number and trading size of program countries; there has been a lot of inter-country variation in the share of exports going to program countries over the past decade; and the bulk of program-country imports seem to be manufactured goods.

B. Extent of trade interdependence among program countries

The greater the degree of trade interdependence among program countries, the greater, ceteris paribus, would be the risk that any program-induced changes in the demand for imports (be these changes negative or positive) would be mutually reinforcing--perhaps with multiplier effects on aggregate demand that were larger than desired or anticipated.

Table 9 provides some basic information on this issue by showing the share of each program country's total imports and total exports that come from, or go to, all other program countries. <sup>1/</sup> To get an upper-bound estimate of trade interdependence among program countries, 1983 Group B as well as Group A program countries were used for the calculations. In addition, the calculations were done using 1981 and 1982 trade data so as to safeguard the findings from being unduly influenced by the contemporaneous effects of programs themselves. Since the results were quite similar, the following discussion uses only those based on 1981 data.

Two conclusions stand out in Table 9. First, the average degree of trade interdependence among program countries is rather low. Specifically, for the 37 program countries shown in Table 9, the (unweighted) mean shares of imports and exports that derive from other program countries were 9 and 8 percent, respectively; if only Group A program countries are considered,

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<sup>1/</sup> A comprehensive definition of trade interdependence among program countries should also include export competition in third markets; this subject is considered in Section V.

Table 9. Share of Trade Among 1983 Program Countries 1/

(In percent)

Country	Group B		Group A	
	Imports	Exports	Imports	Exports
Argentina	19.2	15.4	15.6	14.0
Bangladesh	5.7	11.9	3.3	10.9
Barbados	3.1	0.9	2.3	0.1
Belize	5.8	1.0	-	-
Bolivia	32.0	38.4	-	-
Brazil	10.7	15.4	9.2	13.7
Burma	3.9	19.3	-	-
CAR	0.3	0.1	0.2	0.1
Chile	14.9	17.4	14.9	16.8
Costa Rica	19.7	14.1	19.6	0
Dominican Rep.	10.3	0.7	9.3	0.7
Ghana	4.1	2.7	4.1	2.5
Guatemala	13.3	12.9	13.3	12.5
Guyana	2.9	2.6	-	-
Hungary	3.1	1.1	3.1	1.1
Iceland	1.6	0.4		
Indonesia	8.8	4.2		
Kenya	1.4	4.5	1.2	4.4
Korea	5.0	7.7	3.4	5.9
Liberia	2.2	2.4	1.7	2.5
Malawi	41.5	16.2		
Mauritius	16.2	1.9	14.8	1.9
Mexico	4.7	7.9	4.6	7.8
Niger	1.2	0.2		
Panama	14.2	8.9	14.2	8.2
Philippines	7.2	7.8		
Senegal	4.3	5.1	4.5	5.1
Sierra Leone	0.5	0.6		
South Africa	1.2	1.4	1.1	1.4
Sudan	5.9	0.6	5.9	0.5
Thailand	3.6	5.9	3.2	3.9
Togo	2.2	6.8	2.0	5.8
Turkey	1.9	0.8	1.9	0.8
Uruguay	31.1	26.9	31.1	26.7
Western Samoa	0	0.0		
Zambia	8.3	6.8	7.7	5.9
Zimbabwe	27.4	28.2	29.0	27.9
Unweighted mean	9.2	8.1	8.5	7.0
Weighted mean <u>2/</u>	7.3	7.9	6.2	7.4
Median	5.0	5.1	4.6	4.8

1/ The calculations use 1981 trade data.

2/ Weighted means use 1981 values of imports or exports as weights.

these means fall to 8 and 7 percent, respectively. 1/ This rather low average degree of program-country trade interdependence reflects the more general facts that most program countries are non-oil developing countries and that such countries have most of their trade with industrial countries. For example, in 1983 industrial countries accounted for 59 percent of the total imports of non-oil developing countries and for 57 percent of their exports; 2/ in contrast, trade among non-oil developing countries represented 20 percent of total imports and 24 percent of total NODC exports in 1983. 3/

Second, and operating in the other direction, there clearly are some program countries where intra-program-country-trade is significant. In this connection, it can be noted that 11 of the 37 program countries in Table 9 have program-country trade shares that exceed 10 percent (for an average of imports and exports), and for four of them (Bolivia, Malawi, Uruguay, and Zimbabwe), that average is above 25 percent. In these latter countries at least, one could not without peril ignore multiplier effects arising from programs in other countries. By the same token, Table 9 also reveals that there are some relatively large program countries (e.g., Hungary, Kenya, Korea, Mexico, and South Africa) where intra-program-country trade is quite limited. Again, the aggregate figures conceal quite a bit of inter-country variation.

Because the extent of trade interdependence among Latin American countries has sometimes been cited as a concrete example of why the global effects of programs are apt to be much larger than the "own" effects, 4/ Table 10 provides a more detailed breakdown of intra program-country trade for five such 1983 program countries, namely Argentina, Brazil, Chile, Mexico, and Uruguay. The tale told by that table is that aside from Uruguay, and to lesser extent Argentina, trade among these Latin American program countries, even prior to program period, was rather limited and certainly less important than their trade say, with the United States. If we take these five 1983 program countries as a group, what happens to the U.S. demand for imports and to the U.S. supply of exports would in quantitative terms be a significantly more powerful engine of transmission for their own trade accounts than what happens in partner program countries.

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1/ When weighted means are employed, the conclusions on trade interdependence among program countries are unaltered; see Table 9.

2/ In 1982, industrial countries took 55 percent of NODC exports and supplied 57 percent of NODC imports.

3/ In 1982, intra-NODC trade accounted for 25 percent of total NODC exports and for 19 percent of total NODC imports.

4/ For example, see Meltzer [1983].

Table 10. Trade Interdependence Among Selected 1983 Latin American  
Program Countries

(In percent of total exports or total imports)

	<u>Argentina 1/</u>		<u>Brazil 1/</u>		<u>Chile 1/</u>		<u>Mexico 1/</u>		<u>Uruguay 1/</u>	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Argentina	-	-	3	3	3	4	-	1	11	9
Brazil	4	13	-	-	4	7	3	2	10	11
Chile	2	3	1	2	-	-	-	-	1	1
Mexico	1	1	1	4	-	1	-	-	-	10
Uruguay	1	2	1	1	-	1	-	-	-	-
United States	10	22	23	15	28	26	58	60	16	8

1/ Exports and imports from country listed in heading to country listed in column 1.

Moving to the commodity structure of intra program-country trade, is there any reason to believe that it would differ from the structure of the overall trade of program countries? The answer appears to be "yes" based on the observations that most program countries are NODCs and that intra-NODC trade is apparently more capital-intensive than are NODC exports to industrial countries. Table 11, adapted from Havrylyshn and Wolf [1981], speaks directly to this point by providing rough figures on the commodity composition of both exports and imports for a sample of 33 non-oil developing countries in 1977. Note that the weight of capital goods in intra non-oil developing country exports is more than twice as high as for exports from the non-oil developing countries to industrial countries. Similarly, in accord with the well-known factor endowments theory of trade flows (i.e., Heckscher-Ohlin trade theory), the weight of capital goods (presumably the scarce factor in NODCs relative to industrial countries) is more than twice as high for NODC imports from industrial countries as for NODC exports as a whole. One interesting implication of this difference in the commodity structure of trade is that changes in intra program-country trade would presumably have smaller employment effects per unit of exports than changes in trade with industrial countries (because the former is more capital-intensive than the latter).

To sum up, for the majority of program countries, trade with other program countries accounts for only a small share of total exports or total imports. Intra-program-country trade has, however, been on the increase, and there are some program countries where it is unmistakably important. Finally, it appears that intra program-country trade is more capital intensive than the trade of program countries with industrial countries.

### C. Share of program countries in world capital flows

Policies in program countries could potentially affect other countries via trade in financial assets as well as via trade in goods and services. Also, because the availability and terms of financing strongly influence the speed of external adjustment and because current account deficits create the need for financing, there is a very real sense in which capital flow effects of programs cannot be divorced from trade flow effects. In this subsection, therefore, evidence relevant to the global capital flows effects of programs is examined.

As with trade flows, one would expect the global effects of programs to be larger, the larger the weight of program countries in international capital flows. Table 12 provides some useful background information for subsequent program-country share calculations by showing the size

Table 11. Commodity Composition of Trade Among Non-Oil  
Developing Countries and of Trade Between Industrial  
Countries and Non-Oil Developing Countries, 1977

(In percent)

	Non-Oil Developing Countries' Exports		Non-Oil Developing Countries' Imports From Industrial Countries
	To industrial countries	To other non-oil developing countries	
Food and beverages	35.1	32.3	10.1
Nonfood agriculture	7.8	9.9	3.0
Metals and minerals	6.3	2.7	2.3
Manufactures	<u>49.9</u>	<u>54.4</u>	<u>82.0</u>
Total nonfuel	100.0	100.0	100.0
Capital goods--broad	9.4	20.4	42.1
Capital goods--narrow	5.3	15.8	38.4
Fuels	19.1	22.3	1.8

Source: Havrylyshyn and Wolf (1981), Tables 8 and Table 10, pp. 58. 60.

and structure of external liabilities of all non-oil developing countries in both 1973 and 1983. The main points to note in Table 12 are: (i) NODCs have been more attractive as a destination for international lending than as one for foreign investment, with the 1983 stock of external debt about four times larger than the stock of foreign direct investment, and with the former having grown at a much faster rate over the past decade than the latter (18 percent versus 12 percent per year); (ii) private creditors have become much more important as a source of external lending to NODCs over the past decade, with their share of long-term debt rising from 54 percent in 1973 to 62 percent in 1983; and (iii) financial institutions, primarily commercial banks, have been at the forefront of this "privatization" of lending to NODCs, increasing their share in long-term debt from 15 percent in 1973 to 36 percent in 1983--an increase that was reflected in an annual average growth rate of 28 percent per year versus 18 percent per year for the growth of all long-term debt to NODCs.

What then about the share of program countries in these NODC external liabilities? Taking foreign direct investment first, this is the area where evidence is most scanty. Nevertheless, piecemeal data on foreign direct investment, taken from SM/84/145, suggest: (i) that program countries accounted for roughly 55 percent of total foreign direct investment in NODCs in 1983; (ii) that within the program-country group, about 70 percent of the total in 1983 was attributable to only three countries (namely, Brazil, Mexico, and South Africa); and (iii) that in earlier years, program countries seem to have had only a small share (less than 10 percent) of total foreign direct investment in NODCs.

Moving to external debt, Table 13 shows the share of program countries in the stock of external debt outstanding by all NODCs during the 1977-83 period. Observe that prior to 1983, program countries took only a modest share of total debt, ranging from a low of about 8 percent in 1982 to a high of roughly 23 percent in 1980 (for Group A program countries). However, with the inclusion of 11 "major borrowing" NODCs in the program-country group in 1983, the situation changes dramatically, as (Group A) program countries then account for 56 percent of total outstanding NODC debt, 79 percent of their short-term debt, and 67 percent of the long-term debt owed to private financial institutions. This latter finding reflects the facts that bank lending to NODCs is concentrated in a relatively small number of major borrowers (see Chart 1), that some of these major borrowers experienced serious debt-servicing difficulties in 1982-83 in response to a harsh external environment and inappropriate past domestic policies, and that some of these same major borrowers agreed to Fund-supported adjustment programs in 1983.

Table 12. Non-Oil Developing Countries: Changes in External Liabilities, 1973-83

	Stock of Liabilities		Implied average annual growth rate 1973-83 (in percent)
	1973 (in billions of U.S. dollars)	1983	
Total external liabilities	177.1	826.4	
Foreign direct investment	47.0	140.9	11.6
Total external debt	130.1	685.5	18.1
Short-term debt	18.4	110.6	19.6
Long-term debt	111.8	574.9	17.8
Official creditors	51.0	219.9	15.7
Private creditors	60.8	355.0	19.3
of which			
Financial institutions	(17.3)	(204.1)	(28.3)

Table 13. Program Countries' Share of NODC External Debt, 1977-83 1/

(In percent)

	1977	1978	1979	1980	1981	1982	1983
Total Outstanding Debt	18.9	14.5	12.7	22.6	18.4	7.6	56.2
Short-term debt	8.4	26.5	17.8	28.2	7.8	2.9	78.6
Long-term debt	20.5	12.6	11.9	21.6	20.3	8.5	52.9
To official creditors	16.3	13.5	17.5	27.4	33.7	14.9	31.3
To government	18.0	13.5	17.3	27.7	32.6	16.0	27.8
To international institutions	12.8	13.5	17.9	26.9	35.5	13.2	36.9
To private creditors	24.0	11.9	9.7	18.1	13.5	6.2	64.0
To financial institutions	28.6	10.5	11.0	16.9	13.4	7.4	66.9
To other private creditors	20.2	13.3	8.4	19.5	13.7	4.7	59.8

1/ Group A program countries only.

In order to place the historically high (67 percent) 1983 program-country share of bank lending to NODCs in perspective, Chart 1 indicates that NODCs as a group accounted for roughly 30 percent of banks' international claims in 1983 and that international claims, in turn, represented about 18 percent of total claims of banks in that year. All told then, even in the peak year of 1983, program countries probably accounted for only 3-4 percent (i.e.,  $.67 \times .30 \times .18$ ) of banks' total (domestic and international) claims. All of this suggests that for commercial banks in the BIS reporting area as a whole, the potential global effects arising from the servicing of program-country debt are likely to be limited. The problem of course, brought home vividly in the last two years, is that some large individual commercial banks can have much higher exposure to program countries. <sup>1/</sup> But even this is informative because it implies that if debt-servicing difficulties in program countries were to generate transmission effects on lending countries, that channel of transmission would likely be via the policies adopted to safeguard the survival of individual financial institutions rather than via a generalized direct effect on a broad spectrum of lending institutions.

Although international bank lending represents the major share (e.g., 66 percent in 1982) of net lending through international capital markets, it is not the only source of such lending. International bond issues are also important. As Table 14 shows, however, NODCs have not been major borrowers in the foreign and Eurobond markets in the 1978-83 period. That role instead goes to industrial countries and international organizations. Specifically, in 1983 NODCs accounted for only 3 percent of all foreign bonds offered and for only 4 percent of Eurobonds offered; the corresponding percentages for industrial countries and international organizations, taken together, were 96 and 94 percent, respectively. Presumably, the preference of investors for "low risk" investments in the turbulent 1982-83 global financial environment contributed to that outcome. In any case, the data do not reveal a significant role for program countries as borrowers in international bond markets.

What about the role of program countries as a source of funds for international lending and investment? Here, the hard reality has been that since NODCs have run continuous current account deficits over the past decade, their ability to act as a source of funds has obviously been limited. As shown in Table 15, NODCs have contributed about 9 percent of the total sources of funds for external bank lending over the 1978-83 period, with that contribution, not surprisingly, varying with the severity of their current account pressures. Again, since program countries represent by and large a subset of NODCs, their weight in global financial aggregates, this time as a source of funds for external bank lending, is limited.

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<sup>1/</sup> See Brau et al. [1983].

Table 14. International Bond Issues and Placements, 1978-83

(In millions of dollars)

	1978	1979	1980	1981	1982	1983
<b>Foreign bonds</b>						
Industrial countries	10,328	13,421	11,339	14,129	16,837	18,624
Developing countries	2,583	1,431	746	1,212	726	894
Oil exporting	571	105	46	242	38	78
Non-oil developing	2,012	1,326	700	970	688	816
Centrally planned economies <sup>1/</sup>	--	43	--	--	--	--
International organizations	4,906	5,259	5,714	5,030	7,461	7,265
Other	<u>2,896</u>	<u>154</u>	<u>125</u>	<u>159</u>	<u>191</u>	<u>323</u>
Total foreign bonds	20,713	20,308	17,924	20,514	25,199	27,042
<b>Eurobonds</b>						
Industrial countries	9,774	14,212	17,206	25,210	42,816	41,013
Developing countries	3,162	1,885	1,403	3,185	3,970	2,382
Oil exporting	1,110	329	132	170	470	288
Non-oil developing	2,052	1,556	1,271	3,015	3,500	2,094
Centrally planned economies <sup>1/</sup>	30	30	--	55	--	25
International organizations	1,820	2,220	1,710	2,486	3,280	6,073
Other	<u>175</u>	<u>344</u>	<u>75</u>	<u>358</u>	<u>263</u>	<u>602</u>
Total Eurobonds	14,961	18,691	20,394	31,294	50,329	50,095
<b>International bonds</b>						
Industrial countries	20,102	27,633	28,545	39,339	59,653	59,637
Developing countries	5,745	3,316	2,149	4,397	4,696	3,276
Oil exporting	1,681	434	178	412	508	366
Non-oil developing	4,064	2,882	1,971	3,985	4,188	2,910
Centrally planned economies <sup>1/</sup>	30	73	--	55	--	25
International organizations	6,727	7,479	7,424	7,516	10,741	13,338
Other	<u>3,071</u>	<u>498</u>	<u>200</u>	<u>517</u>	<u>454</u>	<u>925</u>
Total international bonds	35,674	38,999	38,318	51,808	75,528	77,137

Source: Organization for Economic Co-operation and Development, Financial Market Trends.<sup>1/</sup> The country classifications are those used by the Fund.<sup>2/</sup> Excluding Fund member countries.

Table 15. External Lending and Deposit Taking of Banks in the  
BIS Reporting Area, 1978-83

(In billions of U.S. dollars)

	1978	1979	1980	1981	1982	1983
Destination of lending	90	125	160	165	95	85
Industrial countries	38	69	96	99	55	51
Oil exporting countries	15	7	6	2	8	9
Non-oil developing countries	24	40	49	51	25	17
Centrally planned economies	7	6	5	5	-4	-1
International organizations and unallocated	6	3	4	8	11	9
Share of NODCs (in percent)	27	32	31	31	26	20
Sources of funds	90	125	160	165	95	85
Industrial countries	68	66	103	141	100	77
Oil exporting countries	3	37	41	5	-19	-11
Non-oil developing countries	14	13	8	9	5	13
Centrally planned economies	2	5	1	-	2	1
International organizations and unallocated	3	4	7	10	7	5
Share of NODCs (in percent)	15	10	5	5	5	15
NODC current account deficit (in billions U.S. dollars)	-42	-62	-88	-109	-86	-53

Finally, in making an a priori assessment of the global effects of Fund programs that operate via international capital flows, one has to beware of a crucial distinction, namely that between the influence of Fund programs and the influence of program countries. This is because in recent years a number of important Fund programs have involved an understanding not only between the Fund and the program country (i.e. the borrower) but also between the Fund and various private financial institutions (i.e. the lenders)--and this precisely out of concern for the "global" or "systemic" effects that might follow if lenders and borrowers in international capital markets took too narrow a view of their own self interest. 1/ In these much-discussed Fund programs with major-borrowing countries, lenders have been encouraged to maintain enough new financing to program countries so that the speed and costs of adjustment (in terms of cuts in expenditure and imports) do not become too onerous and so that the Fund's own contribution to filling the financing gap is not merely offset by declines in bank lending. By the same token, the borrowers have been encouraged to take firm adjustment measures so that the economic basis for sound debt-servicing can be restored. Recalling the earlier discussion of "program effects" in Section II, the concern was that in the absence of such programs, private lenders might have cut back even more sharply than they did in 1982-83 their loans not only to program countries but to other NODC borrowers as well 2/ (i.e., the so-called "contagion effect" in international bank lending.) 3/ Suffice it to

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1/ The distinction between the influence of Fund programs and that of program countries on global capital flows also applies, of course, beyond the very largest NODC borrowers. Here, one could point to the stabilizing effects of Fund programs on the international financial system through the establishment of private sector confidence in program countries following the adoption of Fund policies, and through the Fund's role in the orderly achievement of multilateral debt-rescheduling operations not only with commercial banks but with official creditors as well. In the latter connection, it is worthy of note that Paris Club creditors require as a critical element in the process of debt negotiation the existence of a financial arrangement with the Fund.

2/ Even with the efforts made by the Fund and national governments to maintain an adequate flow of financing to NODCs, lending to them fell from \$43 billion in 1982 to \$26 billion in 1983; also, more than half of the growth of banks' claims on NODCs in 1983 was in the form of coordinated lending to four Latin American countries and Yugoslavia in conjunction with bank debt restructurings and Fund supported programs; see IMF [1984]. It is probably true, however, that the decline in lending to NODCs as between 1982 and 1983 partly reflected lower demand for financing as a reflection of greater adjustment; thus, it should not be viewed exclusively as a supply-constraint.

3/ See Saunders [1983] for empirical evidence on the contagion effect in the international loan market.

say that the global effects of such a counterfactual could well have been serious; a cut-off of new private lending to almost all NODCs would inevitably have necessitated larger cutbacks in imports than actually occurred, to say nothing of its adverse effect on the "willingness to pay" of borrowers.

The point of all this is not to arrive at a consensus scenario of what would have happened in the absence of some recent Fund programs with major international borrowers. Instead, it is to suggest that because such programs involve lenders as well as borrowers, and because international capital flows seem to be more susceptible than international goods flows to abrupt changes and to contagion effects, <sup>1/</sup> it will be difficult to gauge the global financial effects of programs from shares of program countries in various financial flows or stocks alone.

D. Size of initiating changes in program countries

The characteristics of program countries that have been reviewed thus far are relevant for determining how strongly a given income or price change in program countries might be transmitted to the rest of the world. Clearly, however, the global effects of programs will also depend on how large are the changes themselves in program countries that initiate the transmission process. If these initiating changes were very large, it would be possible to generate significant transmission effects of programs even with relatively small shares of program countries in global aggregates.

In this sub-section, we investigate the average size of three types of developments in program countries over the 1975-83 period: changes in import volumes, changes in export prices, and changes in real effective exchange rates. <sup>2/</sup> Changes in import volumes are the main channel by

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<sup>1/</sup> The rate of growth in bank claims on non-oil developing countries, which averaged 25 percent per year during 1979-81, declined to less than 9 percent in 1982. Similarly, bank lending to NODCs in the Western Hemisphere fell from \$30 billion in 1981 to \$11 billion in 1982; see Williams et al. [1983], pp. 25-27.

The fact that private lending to NODCs in toto has been so variable over time also casts doubt on the thesis that any program-induced increases in lending to program countries must come at the expense of less lending to non-program countries. In other words, the pool of private lending to NODCs is not fixed (except in the very short run). In this connection, it is well to recognize that "contagion effects" can be positive as well as negative. For example, a recovery of confidence in, and lending to program countries, can also encourage lending to non-program countries.

<sup>2/</sup> Interest rates are not considered here because program countries are best viewed as "price takers" in the international capital market. In fact, because most program countries are "price takers" for their primary commodity exports, the term "initiating" is not really appropriate for export prices either; see Section V.

which "income" or output effects get transmitted from program countries to those countries that export to them. Export prices are included because they represent the channel by which price changes in program countries first get reflected in other countries' (import) prices. Finally, changes in real exchange rates are considered as a rough indicator of changes in "competitiveness" of program-country exports and import-competing products; such changes in competitiveness presumably affect other countries' tradable goods. *Ceteris paribus*, one would expect the global effects of programs to have been larger the larger were the average size of these initiating changes in program countries in the past.

Table 16 provides the requisite information for both Group A and Group B program countries over the 1975-83 period. Taking imports first, Table 16 shows that the (weighted) mean change in import volumes for Group A program countries was -5.5 percent over the past nine years; for Group B program countries, it was a smaller -2.5 percent. In this light, the 7.7 percent fall in import volumes recorded by 1983 program countries should be seen as unusual and as reflecting the strenuous adjustment efforts made by these countries as well as their reduced access to external finance, especially bank lending. <sup>1/</sup> The average import volume figures also demonstrate that the very large import volume reductions recorded in 1983 by Argentina (17 percent), Brazil (15 percent), Mexico (42 percent), and Uruguay (34 percent) should not be taken as representative of all Fund programs; the increases in import volumes experienced in 1983 by Hungary (19 percent), Korea (14 percent) and Thailand (25 percent) also need to be taken into account. In any case, it is informative to note that a 5 percent change in import volume by program countries, when multiplied by the mean 7 percent share of program countries in world imports, implies (as a first approximation) a 0.35 percent change in world exports. Even though this admittedly represents only the "first round" in any transmission of income effects from program countries to the rest of the world, it hardly seems like the kind of magnitude relevant to initiating or seriously exacerbating global recessions.

Turning to the price side, the (weighted) mean change in program-country export prices (in U.S. dollars) over the 1975-83 period was about 4 1/2 percent. As indicated in Table 16, this mean figure conceals two quite different subperiods, namely 1981-83 when export prices of program countries (and more generally, of all NODCs) were falling under the influence of the world recession, and 1976-80 when those export prices were buoyant under the influence of more satisfactory growth in export markets. <sup>2/</sup> It might also be observed that because the program-country

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<sup>1/</sup> Another indicator of the adjustment effort made by 1983 program countries is that the ratio of the fiscal deficit to GNP was reduced from 4.1 percent in 1982 to 2.8 percent in 1983 (for Group A).

<sup>2/</sup> For all NODCs, real GNP growth in export markets average 1.3 percent in 1981-83 versus 4.0 percent in 1976-80; see IMF [1984], Table 14.

Table 16. Average Size of Initiating Changes in Program Countries, 1975-83

Time period	Percentage change, volume of imports	Percentage change, export prices (in U.S. dollars)	Percentage change, real effective exchange rate
1975 A	-7.9	-10.8	-13.4
1975 B	-7.9	-10.8	-11.7
1976 A	-5.4	13.5	13.3
1976 B	1.4	7.1	4.0
1977 A	-2.5	12.7	-9.6
1977 B	-1.9	11.6	-7.4
1978 A	-14.5	7.2	1.1
1978 B	-5.0	7.6	0.4
1979 A	-1.4	20.2	6.4
1979 B	2.3	20.3	10.0
1980 A	-3.4	12.7	-8.3
1980 B	-0.3	11.7	1.7
1981 A	-4.4	-4.1	-5.2
1981 B	-4.8	-1.3	-3.9
1982 A	-2.5	-7.3	-4.8
1982 B	1.2	-6.0	-1.6
1983 A	-7.7	-1.1	-11.5
1983 B	-7.7	-1.2	-11.3
1973-83 A	-5.5	4.7	-3.5
1973-83 B	-2.5	4.3	-2.2
avg			

group has rarely included oil exporting countries, one finds relatively small export price spikes around the time of the large 1979-80 oil price increases. 1/ Again employing a rough calculation, an average export price increase of say, 5 percent, multiplied by an average program-country share of world exports of 8 percent, yields a 0.40 percent increase in world export prices. In short, there is nothing in Table 16 to suggest that export price changes in program countries over the past nine years have had major global effects.

Last but not least, the real effective exchange rate of program countries depreciated on average by 3 percent per year during the past nine years. Again, 1983 stands out as an unusual year and the 11 percent real depreciation recorded by program countries in that year is yet another indication of the strength of their adjustment effort. The fact that the real effective exchange rate of program countries has usually depreciated during the program year is understandable once one recalls (see Table 4) that program countries typically face relatively large current account deficits at the inception of the program period and that improvements in competitiveness are one of the main avenues for reducing such deficits. In fact, if one is concerned about the global output effects of programs, expenditure-switching policies (like changes in real exchange rates) are to be encouraged because they reduce the need to rely on expenditure-reducing policy as a means of securing external adjustment. As for the size of the real exchange rate depreciation experienced by program countries in 1983 (11 percent), it was somewhat larger than that either for all NODCs (8 percent) or for the 25 major borrowing developing countries (9 percent), 2/ but this again probably reflects the more pressing external adjustment demand faced by the program-country group. Also, in view of the much larger variability in real exchange rates of the largest industrial countries over the past few years, it would be difficult to argue that the real exchange rate movements recorded by program countries were "disruptive" to the system. In short, at least on the surface, there is little indication that the changes in competitiveness experienced by program countries over the past few years were inappropriate either in direction or in magnitude.

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1/ For comparison, the export price for "net oil exporters" in the NODC group increased by 39 percent in 1979 and 33 percent in 1980.

2/ It should be recognized that these three groups overlap to a significant extent because 11 major borrowing NODCs had Fund programs in 1983 and because some of largest NODCs were similarly in the 1983 program group.

#### IV. The Global Effects of Import Changes in Program Countries

The broad characteristics of program countries that were reviewed in Section III are helpful in gaining a rough picture of the potential of program countries to influence macroeconomic outcomes in the rest of the world. In order, however, to gain a more focused view of the global effects of Fund programs, it is useful to study such effects within the more formal framework of an econometric global trade model for at least three reasons.

First, while crude share calculations can provide estimates of the "impact" or "first-round" effects of program-country actions on other country groups, they typically cannot provide estimates of the induced "later round" effects; yet these later round, more general-equilibrium effects quantitatively could be quite significant. To take a specific example, suppose that program countries, on average, experience a 5 percent fall in import volume during the program year and that: (i) industrial countries, on average, send 5 percent of their total exports to program countries; and (ii) exports represent 15 percent of GDP, on average, for industrial countries. <sup>1/</sup> In this case, the "impact" effect of the fall in program-country imports on industrial-country GNP would be  $-.0375$  percent (i.e.,  $-.0375 = 5.0 \times .05 \times .15$ ). But what happens next? In order to estimate the "full" effect of the same (program-country) import disturbance, one would want to know how the induced change in industrial-country GNP affects: (i) consumption, investment, the demand for money, interest rates, etc. in the typical industrial country; (ii) trade flows and ultimately real income again within the industrial-country group, as each industrial country's lower income lowers its imports from other industrial countries, hence lowering their exports, real income, and imports as well; and (iii) subsequent trade flows between industrial countries and developing countries (including program countries), as lower industrial-country income reduces the volume and prices of developing-country exports to that region, and in turn, developing-country foreign exchange receipts, import volumes, real incomes, etc. and on and on. Although it is difficult to generalize across global trade models, recent research seems to suggest that such "later-round, linked" effects can multiply the impact effect of the disturbance by two to three times. <sup>2/</sup> Returning to our example, this would mean that the "full" effect of the 5 percent fall in program-country imports on industrial-country real GNP could be  $-.075$  to  $-.1125$  percent (versus the impact effect of  $-.0375$  percent).

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<sup>1/</sup> In fact, these figures conform rather closely to the actual situation of industrial countries, with 1983 exports to program countries accounting for about 7 percent of their total exports (see Table 7) and with total exports, in turn, representing roughly 15 percent of industrial-country GNP in the same year.

<sup>2/</sup> See, for example, Helliwell and Padmore [1984], Fair [1979], Larsen et al. [1983], and Hickman and Filatov [1983].

The second area where econometric models have a comparative advantage over share calculations is in estimating the timing of program effects. It is one thing to assert that, say, a fall in the flow of financing to program countries will eventually affect their imports. It is quite another to identify the short-run (one year) and long-run (3 year) elasticities of import volume with respect to foreign exchange receipts, to say nothing of how these elasticities may differ across groups of developing countries (e.g., low-absorbing oil exporting developing countries versus low-income non-oil developing countries). <sup>1/</sup> Since most econometric global trade models allow explicitly for lagged effects in the determination of trade volumes and prices, they can tell us something about the speed with which disturbances in program countries might be transmitted to non-program countries.

Yet a third reason for turning to trade models is that marginal trade propensities may differ significantly from average propensities, and it is changes at the margin that are most relevant for assessing the transmission effects of Fund programs. In this connection, it is worth recalling that the share of imports and exports in (industrial-country) GNP has been on a clearly rising trend over the last thirty years, <sup>2/</sup> and that marginal propensities will exceed average ones when the average propensities are rising. As was the case with timing effects, econometric trade models yield estimates of the relevant marginal propensities (or elasticities) directly from the estimated coefficients.

In this section, three world trade models are used to simulate the trade and output effects on industrial countries of a hypothetical \$20 billion reduction in developing-country imports. Three models are employed in the simulation exercises because each has strengths that at least partially compensate for the weaknesses of the others.

The OECD Interlink model contains a fully articulated income-expenditure model for each of 23 OECD countries. In these individual country models, blocks of equations determine the main components of demand, wages and prices, foreign trade price and volumes, the distribution of income, output and employment, and financial variables. The non-OECD regional models are much simpler, containing only reduced-form equations for import volume and export-pricing behavior. Because output in the OECD model is endogenously determined for the industrial countries, it is possible to calculate traditional foreign-trade-multiplier effects on industrial-country real GDP in response to exogenous foreign trade

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<sup>1/</sup> In this connection, Larsen et al. [1983].

<sup>2/</sup> The share of exports in industrial-country GNP rose from about 8 1/2 percent in the late 1950s, to roughly 9 1/2 percent a decade later, to some 15 percent by the late 1970s and early 1980s.

disturbances. The second appealing feature of the Interlink model is that it contains an up-to-date (1982) foreign trade matrix so that the direction of trade as between industrial countries and developing countries, both in the aggregate and on an individual-country basis, is accurately reflected. On the negative side of the ledger, the simulation properties of the Interlink model have to be gleaned from published results and these results only consider the non-OECD area as a group. 1/ This means, for example, that program countries (the great majority of which are non-oil developing countries), are being lumped together with, say major oil-exporting developing countries, as well as with non-member planned economies; to the extent that the trade behavior of these non-program countries differs from that of program countries, such aggregation into one "non-OECD region" could distort the results. 2/

The second model employed in the simulations, namely the IMF World Trade Model, carries the advantage that one can treat non-oil developing countries as a separate group. Since the commodity composition and direction of trade is apparently quite similar as between (1983) program countries and all non-oil developing countries, 3/ aggregation problems are reduced. The World Trade Model's two disadvantages for our purposes are that industrial-country income is not endogenously determined, so that only trade effects of a change in NODC imports can be studied, and that the model's foreign trade matrix relies on 1970 data for the direction of trade as between industrial and developing countries.

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1/ The Interlink model itself distinguishes eight separate non-OECD regions, three of which are for oil-producing countries (i.e., less absorptive OPEC countries, more absorptive OPEC countries, and oil producing developing countries). The problem is therefore not with the model but only in the restrictiveness of the published simulation exercise to the problem at hand in this paper.

2/ Differences between oil exporting and non-oil developing countries have led some researchers (e.g., Marquez [1984]) to build three-region world trade models (industrial countries, oil exporting developing countries, and non-oil developing countries).

3/ In 1983, program countries sent 61 percent of their total exports to industrial countries and obtained 58 percent of their total imports from them; the corresponding figure for all NODCs was 57 percent for both exports and imports. As regards commodity composition, 1983 program-country exports were apportioned as follows: 44 percent manufactures, 34 percent primary commodities, and 22 percent fuels. The corresponding figures for all NODCs are 59, 33, and 7 percent, respectively. On the import side, 1983 program-country composition is 61 percent manufactures, 22 percent fuels, and 17 percent other primary commodities; the comparable NODC figures are 68, 15, and 17 percent, respectively.

The third and last model considered is the LINK model of Project LINK. It has two strong points for our purposes: (i) real output is endogenous in both industrial countries and non-oil developing countries, with the latter depending not only on the NODC capital stock but also on NODC non-fuel imports; and (ii) the published simulation results confine the import shock to non-oil developing countries rather than to all developing or non-OECD countries. The disadvantages are that the published simulation results consider the effects of a \$20 billion change in transfers to NODCs rather than in their imports, and that both the underlying estimation results and the "base-line scenario" for computing impact and dynamic multipliers are based on pre-1977 data and forecasts. <sup>1/</sup> Of these deficiencies, probably only the outdated estimation period is potentially serious because the estimated import volume equations in the Link model itself suggest that NODC imports respond to foreign exchange receipts with a one-year elasticity that approaches unity (i.e., \$20 billion less in transfers to NODCs results, within a year, in \$16.4 billion less of developing countries imports), and because the multipliers in the model are apparently not very sensitive to the characteristics of the "base-line" or "control" solution.

Finally, before turning to the simulation results themselves, it is appropriate to emphasize three caveats about the inferences that can legitimately be drawn from them. To begin with, it should be recognized that so long as import decisions in program countries are affected by the availability of foreign exchange receipts, changes in imports can reflect a wide variety of program (and non-program) influences; in particular, such changes in program-country imports may be reflecting the effects of Fund programs on program-country exports and on program-country net capital inflows, as well as on overall public and private absorption. For example, the move from an over-valued to a more realistic exchange rate could simultaneously increase the production of exportables and reduce capital flight in a program country; on both counts, the availability of foreign exchange receipts would be altered and imports would change, and this quite apart from any changes in, say, the government's fiscal position induced by the program. For this reason, import simulations should not be interpreted as implying that Fund programs "work," and have international effects, only by directly affecting program countries' ability to import. Second, the earlier discussion of "program effects" in Section II should caution us against the practice of equating historical or observed changes in program-country imports with the effects of Fund programs. As such, the \$20 billion fall in program-country imports used in the simulation exercises should be viewed without prejudice as to the sign of any transmission effects of programs. If, for example, one adopted the position that in the absence of Fund programs the decline in program-country imports would

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<sup>1/</sup> In contrast, the base-line scenarios in the Interlink and IMF World Trade Model simulations apply to the 1983-86 period.

have been much larger in say, 1982-83, then the simulations could just as well be run using some \$X billion increase in imports. In other words, what is of interest in the simulations is the size of the cross-country multipliers, not the sign of the initiating import disturbance. The third caveat deals with the precision of the simulation results. Here, it needs to be acknowledged that such exercises are apt to be subject to fairly wide margins of error because: (i) the trade, and especially the income, determination process in developing countries remains the most primitive part of most global trade models; 1/ (ii) such trade models are designed for, and best suited to, analyzing transmission from North to South rather than the other way around; and (iii) the financial linkages among developed and developing countries (some of which may respond to the same program measures as imports are not well developed in these models. In short, all of this suggests that the simulation results should be viewed as indicative rather than conclusive.

#### A. Simulation results

Tables 17 and 18 trace out the real output and trade balance effects of a hypothetical \$20 billion exogenous reduction in the imports of the developing countries, using the OECD Interlink Model and the IMF World Trade Model, respectively; in the former model, the import reduction applies to the whole non-OECD group while in the latter, it occurs only for non-oil developing countries. Table 19 represents the results of a similar exercise, namely a \$20 billion exogenous reduction in financial transfers to non-oil developing countries, (implying a \$16 billion fall in developing countries' imports), this time using the Project Link model.

Employing the 1983 value of imports as a base, it is relevant to point out that a \$20 billion reduction in imports would represent a 14.5 percent fall in (Group A) program-country import volumes--a figure twice as large as that recorded by program-countries in 1983, and one almost three times as large as the historical average for the 1973-82 period as a whole. Clearly, even if we allow for some spillover from program countries to other NODCs, the size of the import disturbance in these simulations should be large enough to produce an upper bound estimate of the global output and trade effects associated with changes in program-country import behavior.

Taking the Interlink model results in Table 17 first, four findings are apparent. To start with, the transmission effect of the non-OECD import reduction on OECD real income (GDP) is rather small, with the \$20 billion decline in non-OECD imports calling forth a 0.3 percent decline in OECD real GDP. This is in part a reflection of the more

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1/ To take but one example, developing-country exports in these models are independent of imported inputs.

Table 17. Real Output and Trade Balance Effects of a \$20 Billion  
Decline in Imports of Non-OECD Regions: Interlink Model

(Percent change from base-line solution)

<u>Total OECD</u>	<u>1st year</u>	<u>2nd year</u>	<u>3rd year</u>
Real GDP	-0.3	-0.3	-0.3
Exports of goods and services, volume	-1.1	-1.1	-1.1
Imports of goods and services, volume	-0.5	-0.5	-0.5
Total domestic demand deflator	-	-0.1	-0.2
Current balance (billions U.S. dollars)	-9.0	-8.6	-9.1
<u>Non-OECD Region</u>			
Export of goods and services, volume	-0.9	-0.9	-0.9
Import of goods and services, volume	-1.8	-1.8	-1.8
Current balance (billions U.S. dollars)	9.0	8.9	9.4
<u>Effects for selected countries (3rd year only)</u>	<u>Real GDP</u>	<u>Volume of Exports</u>	
United States	-0.1	-1.0	
Japan	-0.4	-1.0	
Germany	-0.4	-1.2	
France	-0.3	-1.3	
United Kingdom	-0.3	-1.2	
OECD Europe	-0.3	-1.2	

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Source: Larsen et al. [1983], Table A10.

Table 18. Merchandise Trade Balance Effects of a \$20 Billion Decline in Imports on Non-Oil Developing Countries: IMF World Trade Model

(Billions U.S. dollars or percentage change from base-line solution)

<u>Industrial countries</u>	<u>1st year</u>	<u>2nd year</u>	<u>3rd year</u>
Merchandise trade balance (in billions U.S. dollars) (percentage change)	-10.1	-11.4	-11.2
Exports (in billions U.S. dollars) (percentage change)	-11.6 -1.1	-13.0 -0.1	-12.9 -0.1
Imports (in billions U.S. dollars) (percentage change)	-1.5	-1.6	-1.6

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Source: Staff estimates.

Table 19. Real Output and Trade Balance Effects of a \$20 Billion Decline in Financial Transfers to Non-Oil Developing Countries: Project Link Model

(Percentage change from base-line solution)

<u>OECD countries</u>	<u>1st year</u>	<u>2nd year</u>	<u>3rd year</u>
Real GDP	-0.5	-0.6	-0.4
Implicit price deflator	-0.1	-0.1	-0.3
Value of exports	-3.1	-3.1	-2.3
Value of imports	-1.3	-1.6	-1.5
Trade balance (billions of U.S. dollars)	-11.2	-9.5	-6.6
<u>Developing countries</u>			
Real income	-1.7	-1.8	-1.5
Value of exports	-1.4	-1.7	-1.4
Value of imports	-8.4	-7.1	-4.6
Trade balance (billions U.S. dollars)	+13.0	+11.3	+7.9

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Source: Weinberg [1979], Table II f.

general empirical regularity that cross-country expenditure multipliers are much smaller than own-country ones, usually on the order of one-tenth to one-twentieth as large. <sup>1/</sup> It is also the basis for Hickman and Filatov's [1983] conclusion for 13 OECD countries that:

"... it remains true that the cross-multipliers, even in elasticity form, are generally low except for small countries that are close trading partners of larger ones. This implies that independent domestic shocks even in large countries are unlikely to lead to synchronized fluctuations in the industrialized world...."  
(p. 349).

Perhaps the chief implication of this finding is that one should expect the own effects of expenditure-changing policies in Fund programs to be more significant than the cross country (i.e., the global) effects--and this even when the program-country group contains some relatively large traders.

A second finding, implicit in Table 17, is that the final cross-country output effects of import changes in developing countries appear to be about 2 1/2 times as large as the "impact" effects. To see this, note that because the non-OECD area accounts for approximately 30 percent of total OECD exports, and because total exports constitute roughly 20 percent of OECD GDP, one would expect a 2 percent fall in non-OECD imports to generate an initial -0.12 percent fall in OECD GDP (i.e.,  $-0.12 = -2.0 \times 30 \times 20$ ). But Table 17 indicates that after the induced domestic and foreign trade effects of this initial income decline are accounted for, the fall in OECD GDP will be -0.3 percent. An international multiplier of about 2 1/2 (i.e.,  $-0.30 / -0.12$ ) is thus implied. At the same time, Table 17 also suggests that these multiplier effects die off very quickly after a one-year period, with the third-year effect on OECD GDP being identical to the first year effect. This quick decay in the transmission process reflects the rather short time lags in many of the behavioral relationships in the model (e.g., non-OECD regional groups reach their peak import spending propensities out of foreign exchange earnings within a one-year interval), as well as the dampening influence of the moderate export openness (OECD exports/OECD GDP) and export destination (OECD exports going to non-OECD/total OECD exports) ratios. In any case, the key message is that any global effects associated with import changes in program countries should have pretty much run their course within a year of those changes.

Third, Table 17 shows that in tracing out the global effects of changes in developing-country imports, one also has to be aware of the linkages going in the opposite direction, namely, from induced lower OECD imports to lower non-OECD exports. Indeed, for country groups as

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<sup>1/</sup> See, for example, Hickman and Filatov [1983], Table 2.

broad as those in Table 17, the calculations suggest that non-OECD exports fall by half as much (0.9 percent) as do non-OECD imports (1.8 percent). This means that if developing countries want a current account improvement of \$10 billion, they would need to reduce their imports by approximately \$20 billion. Since this "feedback effect" increases with the size of group initiating the import change, it is certainly true that the prospects for external adjustment are different when one country reduces imports on its own than when many countries do so simultaneously.

Fourth, the individual-country results shown in Table 17 reinforce the earlier conclusion from simple export-destination ratios (Table 7) that changes in program-country imports will likely impact quite differently across supplying countries. In particular, Table 17 reminds us that even when the transmission effects on exports are quite similar across supplying countries, the effects on supplier-countries' real output can be quite variable across countries because of inter-country variations in export to GDP ratios. In this respect, the main reason why the United States GDP is less affected by the reduction in non-OECD imports than are the other industrial countries is that its export/GDP ratio is much lower than for the others.

Moving to the simulation results from the IMF World Trade Model in Table 18, it is interesting, and perhaps encouraging, that the trade balance effects of the \$20 billion NODC import reduction are similar to those emerging from the OECD Interlink model. For example, the World Trade Model estimates that the industrial-country trade balance would deteriorate by about \$10 billion in the first year after the import shock, whereas the corresponding estimate in the Interlink model is roughly \$9 billion. <sup>1/</sup> The induced export and import volumes effects

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<sup>1/</sup> One reason why the trade balance results from the two models are so similar is that two differences in the models tend to offset one another. The first difference concerns model coverage. Because the non-OECD region in the OECD model is much broader than the NODC group in the IMF model, the former permits less "linkage" from the trade multiplier than does the latter; for example, when NODC imports fall only a fraction shows up as decreased industrial-country exports since other region's exports can also fall. Other things equal, this coverage difference leads to a smaller trade balance effect for industrial countries in the IMF World Trade Model (for the same size import shock). The second difference operates in the opposite direction. Because prices and output in the OECD model are endogenous, a trade shock produces feedback effects that moderate the original disturbance. For example, when industrial-country exports fall in response to a fall in non-OECD imports, so too does the former's income, and, in turn, its imports. This is not so in the IMF model because prices, income, and exchange rates are exogenous. This difference produces a smaller industrial-country trade balance effect in the OECD Interlink model.

for industrial countries are likewise similar across the two models. In short, there is nothing in the World Trade model numbers to contradict our earlier inference that import changes on the order of \$20 billion by NODCs should not produce large trade and real output dislocations in the rest of the world.

Finally, we come to the simulation results for the Project LINK model. Because income in both OECD countries and developing countries is endogenous in this model, these are perhaps the most interesting estimates for the purposes of this study. Two aspects of the Project Link results in Table 19 are worthy of explicit mention.

First, the cross-country real output and trade balance effects of the import decline in NODCs are larger in this model than in the earlier two, albeit still considerably below the magnitudes one would associate with "throwing the world into a recession" or "pulling the world out of an existing recession." More specifically, the \$20 billion drop in transfers to NODCs reduces OECD real GDP by 0.5 percent, OECD exports by 3.1 percent, and OECD imports by 1.3 percent--all within a one-year period. As before, the transmission effects after three years are quite similar to the one-year results.

Second, and consistent with the aforementioned evidence on the size of own versus cross-country expenditure multipliers, it can be seen that the import reduction has a much larger (over three times as large) effect on developing-country real income than on real income in industrial countries). This large own-effect arises because, as previously mentioned, the Project Link model allows a direct role for (non-fuel) import volumes in explaining NODC real income.

#### B. Summary

To sum up, the simulation experiments reviewed in this section show that import changes in program countries do affect economic activity in the rest of the world, and in the expected direction. But just as importantly, they strongly suggest that the size of such global transmission effects is small. Specifically, even a 7 percent change in the value of program-country imports such as occurred in 1983 (i.e., \$10 billion), appears to be associated with only a 0.1-0.2 percent change in industrial-country real GNP (in the same direction). This is not the stuff of which global recessions are made or ended. The same simulation exercises also indicate: (i) that the lion's share of these trade and output transmission effects take place within one year of the import change; (ii) that the full or final effect on industrial-country GNP, albeit small, is considerably larger (say, two to three times) than the "impact" effect; and (iii) that even among the seven largest industrial countries, these induced output effects differ across countries because of inter-country differences in both the share of total exports going to NODCs (or program countries), and the

share of exports in GNP itself. Finally, the simulation results imply that the effects of changes in program-country imports are likely to weigh much more heavily on their own real income and growth rates than on those of their trading partners.

#### V. The Global Effects of Changes in Program-Country Exchange Rates

Nowhere perhaps have "aggregation effects" been so long recognized and so much discussed as in the context of simultaneous exchange rate action by primary-producing countries. 1/ Just recently, for example, Please [1984] has criticized the World Bank and the Fund for taking too "piece-meal" an approach to exchange rate policy and has suggested that developed countries collectively devalue against the currencies of the developed countries. On the other hand, as noted earlier, some observers have taken precisely the opposite tack--warning that exchange rate-induced increases in production and in exports of primary commodities, if implemented simultaneously by many program countries, will merely depress the world price of these commodities and unfavorably affect the instigator's terms of trade, and this for little benefit since the demand for these goods is quite price inelastic.

In this section, the aggregate or global effects of multilateral exchange rate changes by a group of program countries are examined. The examination proceeds in three steps: first, conventional trade theory when products are alternatively perfect and imperfect substitutes is reviewed for whatever light it can shed on the world price and export effects of multilateral exchange rate changes; 2/ second, several empirical characteristics of primary-commodity trade and of the commodity structure of developing-country exports are presented so as to delineate the practical relevance of the problem; and third, the role played by non-program countries, and particularly the industrial countries, in conditioning the effectiveness of exchange rate action by program countries, is discussed.

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1/ See, for example, Ridler and Yandle [1972], Belanger [1976], Clark [1977], Isard [1977], Feltenstein et al. [1979], Dell [1981], and Please [1984], as well as the staff study on "Exchange Rate Policies in Developing Countries," SM/82/8.

2/ The focus is on the export price and volume effects of multilateral exchange rate changes because these are the variables most often mentioned in the debate on the global effects of programs. It is well to keep in mind, however, that exchange rate adjustments can affect other variables as well (e.g., absorption).

A. Differentiated versus homogeneous goods in international trade

In thinking about the effects of multilateral exchange rate action by program countries, it is useful to make a distinction between exports of differentiated goods (e.g., manufactures) and exports of homogeneous goods (e.g., primary commodities like wheat, sugar, tin, etc.). <sup>1/</sup> Two aspects of that distinction are particularly pertinent for this paper.

First, whereas producers of differentiated goods can charge a price that is different from those of their competitors, producers of homogeneous goods are constrained to price their goods at the "world" price. This world price, in turn, will be determined by the interaction of world supply and world demand for the traded good. This means that program country *i*, or even a group of program countries, will be able to affect the prices of their primary commodity exports only if they can (collectively) influence either world supply or world demand for those goods. In general, it can be shown that (in the absence of inventory and order backlog changes), a country's ability to influence the world price of a homogeneous good will depend (positively) on its shares of world production (or exports) and world consumption (or imports), and on the (absolute) value of its own price elasticities of supply and demand for the good. <sup>2/</sup> If a country or country group is too "small" to affect the world price, then increases in domestic supply of the good will merely increase export volumes or reduce import ones (at the given world price).

The clear implication of the global character of price determination for primary commodities is that we must look to production (or export) shares and supply-price elasticities in assessing the likely price effects of multilateral exchange rate action by primary-producing program countries. The number of program countries taking exchange rate action, by itself, is not likely to be a useful indicator of serious aggregation effects. For example, simultaneous depreciations by two rice producers that together account for say, 35 percent of world rice exports and have relatively high supply-price elasticities could well have more serious global price effects than simultaneous exchange rate depreciation by ten program countries that either export quite different primary commodities, or collectively account for only a small share of world exports of a single primary commodity.

A second related distinction between the two types of tradable goods is that any "beggar thy neighbor" effects associated with multilateral

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<sup>1/</sup> Formal models of the determination of trade volumes and prices for the "perfect" and "imperfect substitutes" cases can be found in Goldstein and Khan [1984]. Also, Feltenstein *et al.* [1979] contains a simple model of the world price effects of multilateral exchange rate action by primary-producing countries.

<sup>2/</sup> See Clark [1977], Isard [1977], and Feltenstein, Goldstein, and Schädler [1979].

exchange rate action would likely show up as price effects for homogeneous goods but as a combination effect of volume and price changes for a producer of differentiated goods. In other words, the concern with primary commodities is that ignoring aggregation and interdependence can result in all producers receiving a lower price than they expected, while with manufactured goods, the worry is that these interdependence affects will result in all (devaluing) producers receiving a smaller market share and lower export volume than they expected (because the competitive price advantage initiated by devaluation is less long-lasting than expected). <sup>1/</sup> The same distinction also explains why the key parameters of interest in the differentiated goods case are not global production or consumption shares but rather are the elasticity of substitution in demand among export bundles of different producers, the pass-through effects of exchange rate changes on to local currency factor costs and export prices (i.e., how much of the nominal devaluation can be converted to a real devaluation), and the difference between short-run and long-run price elasticities of demand.

If the commodity structure of trade matters for assessing the global effects of exchange rate changes, it should also be pointed out that some conclusions drawn about the inefficiency of exchange rate measures for producers of primary commodities seem of dubious validity. Perhaps chief among these is the notion that if a country's terms of trade are fixed (ie., if it can affect neither the foreign-currency price of its exports nor of its imports), then exchange rate changes can be of no value to it. Such an analysis ignores the point that exchange rate adjustments can still "work" on the supply side by increasing the relative price of tradable goods vis-a-vis nontradable goods, that is, by altering the internal terms of trade. Indeed, no matter what the commodity structure of a country's trade, one of the more robust lessons seems to be that a sine qua non for successful export performance is that exporting be consistently profitable relative to other activities in the economy. Put in other words, the relative price variable in the export supply function may well have a different denominator in the case of homogeneous products than in the case of differentiated ones

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<sup>1/</sup> There are two different exchange rate scenarios here that should be distinguished. One is the case where all producers of the differentiated good change their exchange rates by the same amount. In this case, no one gets the competitive advantage he was seeking and the only result is presumably that nominal prices are higher in all devaluing countries. The other scenario is where only some producers change their exchange rates. Here, while each devaluing producer gets less of an improvement in competitiveness than if he acted alone, the devaluing group as a whole still gains at the expense of others. This latter externality can be beneficial or harmful for the world economy depending on a host of factors, including the pre-devaluation external balances of the two groups.

(e.g., the price of nontradables rather than the domestic price of tradables), but this does not change the basic message that the supply response to an exchange rate change hinges on engineering an improved rate of return to exporting activities. <sup>1/</sup> It also follows that even when a country or country group is too "small" to affect the world price for a given primary commodity, exchange rate changes can still improve their export earnings by increasing their export volumes.

As a final comment on the effect of exchange rate changes under alternative commodity structures of trade, it is well to keep in mind that in the real world, neither countries nor tradable goods fit neatly into categories like "price-takers" versus "price-setters" or "homogeneous" products versus "differentiated" ones; instead, they fall on a spectrum between these poles, having more market power in some commodities and less in others. This caveat should be recognized in interpreting the summary empirical characteristics that follow.

#### B. Empirical evidence

The previous discussion suggests that the global effects of multilateral exchange rate changes by program countries cannot be assessed without information on such empirical parameters as the share of primary commodities in program-country exports, production and consumption shares of program countries in global production and consumption of primary commodities, supply and demand-price elasticities for primary commodities in program countries, demand-price elasticities for manufactured exports of program countries, etc. In this subsection, some empirical evidence on those characteristics of trade are presented. Because the country composition of the program-country group changes so much from year to year, most of the calculation use figures for non-oil developing countries, or sometimes even for all developing countries.

##### (1) The changing commodity composition of NODC trade

One of the more fundamental but still relatively unappreciated changes in international trade over the past two decades is the large increase in the share of NODC exports accounted for by manufactured goods. <sup>2/</sup> As shown in Table 20, adapted from the World Bank's 1984 World Development

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<sup>1/</sup> Consistent with this proposition, it is often the case that where exporting has been consistently unprofitable, depreciation induces a large increase in recorded exports of even price-inelastic commodities due to the induced decrease in smuggling.

<sup>2/</sup> In contrast, no such dramatic increase in the share of manufactures has occurred on the import side for developing countries; see World Bank [1984], Table 11.

Table 20. Changing Commodity Composition of Developing  
Country Exports, 1960 Versus 1981

(Percentage share of total merchandise exports) 1/

	<u>Manufactures</u>		<u>Primary Commodities</u>	
	<u>1960</u>	<u>1981</u>	<u>1960</u>	<u>1981</u>
Middle income developing countries				
Oil importers	17	59	83	41
Oil exporters	4	7	96	93
Low-income developing countries				
China and India	n.a.	54	n.a.	46
Other low-income	5	9	95	91
<u>Memorandum item</u>				
1983 program countries	-	44	-	56

Source: World Bank, World Development Report 1984, Table 10.

1/ Weighted average.

Report, middle-income oil-importing developing countries have seen the share of manufacturing in total exports more than triple (from 17 percent to 59 percent) over the past twenty years. Manufacturing's share has also increased sharply in the cases of low-income countries and of middle-income oil exporters, although the level of that share was still quite low (<10 percent) for these two groups of developing countries. Table 21 provides further documentation on this shift toward manufactures in NODC exports, this time using a regional disaggregation of NODCs, focusing on the 1968-70 versus 1979-81 periods, and disaggregating primary commodity exports into energy and non-energy components. The salient points emerging from Table 21 are that: (i) by 1979-81, fully 59 percent of NODC total merchandise exports were manufactures; (ii) only among Western Hemisphere NODCs did manufactures account for less than one-half of total exports in 1979-81; (iii) the rise in manufacturing's share between 1968-70 and 1979-81 was greatest among Asian NODCs but substantial increases were recorded in the other four regional groups as well; and (iv) the falling share of primary commodities in NODC exports reflects a decline in non-energy commodities. 1/ Indeed, the share of energy primary commodities in NODC total exports actually rose from 1 percent in 1968-70 to 7 percent in 1979-81.

This increased importance of manufactured goods in developing-country exports carries two implications. First, in assessing the global price effects of multilateral exchange rate changes by developing countries, it would be misleading to assume that they by and large fit into a primary-commodity framework. As indicated in Table 20, the dominance of primary commodities on the export side still is accurate for low-income developing countries (exclusive of China and India) and for middle-income net oil exporters, but it is decidedly not so for middle-income oil importers. On a weighted-average basis, non-oil developing countries now as a group have only one-third of their total exports in non-energy primary commodities (Table 21) and only two-fifths in primary commodities as a whole. Interestingly enough, the 1983 class of program countries had a primary-commodity export share significantly above that average, namely 56 percent (see Table 20).

The second implication of the growing importance of manufactures is that because both the price and income elasticities of demand for manufactures are generally higher than those for other commodity groups, 2/

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1/ Among non-energy primary commodities, the largest declines occurred in agricultural raw materials and in metals and minerals; the share of beverages and tobacco remained nearly constant while the share of food actually rose significantly.

2/ See, for example, Goldstein and Khan [1984], Table 4.

Table 21. NODC Merchandise Exports: Changes in Commodity Composition  
Between 1968-70 and 1979-81

Commodity Groups	Country Groups	Non-Oil Developing Countries					
		Total	Africa	Asian	Europe	Middle East	Western Hemisphere
<u>(In percent of total)</u>							
<u>Value Share</u>							
<u>Total</u>							
	1968-70	100	100	100	100	100	100
	1979-81	100	100	100	100	100	100
<u>1. Primary Commodities</u>							
	1968-70	57	61	53	29	46	73
	1979-81	41	48	34	20	35	60
<u>A. Non-Energy</u>							
	1968-70	56	59	52	29	42	72
	1979-81	33	36	27	20	17	53
<u>B. Energy</u>							
	1968-70	1	1	2	0	3	1
	1979-81	7	11	7	0	18	7
<u>2. Manufactures</u>							
	1968-70	43	39	47	71	54	27
	1979-81	59	52	66	80	65	40

Source: Based on United Nations, D-Series Trade data.

there is a strong likelihood that the aggregate price and income elasticities of demand for (non-oil) developing country exports are now considerably higher than they used to be. Consistent with this proposition, Goldstein and Khan [1982] found that the income elasticity of demand for NODC export volumes was higher during the 1973-80 period than during 1965-72. Similarly, there is increasing evidence that NODC exports do respond significantly to competitive-price effects on the demand side. For example, Khan [1974] found that the quantity of exports could be well explained for 15 individual NODCs by the level of industrial-country real income and by the ratio of developing country's export price to an average of export prices of industrial countries; for the 9 of those 15 NODCs where this price elasticity was significant, its average value over a one-year period was 0.94. <sup>1/</sup> More recently, Grossman [1982] estimated quarterly import demand equations for 11 representative manufactured commodities that entered the U.S. market during 1968-78. Since separate equations are estimated for imports from industrial countries and those from non-oil developing countries, Grossman [1982] is able to determine the substitutability among three classes of goods--domestically produced goods, imports from industrial countries, and imports from NODCs. One of the Grossman's main conclusions is that U.S. imports of manufactures from the NODCs are quite price sensitive, with a mean (own) price elasticity of demand of 1.7 (for a one year period). These results do not point toward any "elasticity pessimism" for NODC exports.

(2) Characteristics of primary commodity trade

Although manufactures are now clearly much more important than they used to be in NODC exports, this does not alter the facts that primary commodities still represent more than half of (1983) program-country exports, and that such commodities constitute the mainstay of foreign exchange earnings in many individual program countries. For example, again using World Bank data for 1981, primary commodities accounted for 90, 88, 80, 70, and 60 percent of total exports in Chile, Kenya, Argentina, Uruguay, and Brazil, respectively. This is reason enough to examine those factors identified earlier (i.e., shares in world production and supply elasticities) as crucial in determining the world price effects of multilateral exchange rate changes by primary-producing countries.

Table 22 shows the share of world exports of primary commodities accounted for by developing countries in both 1968-70 and 1979-81. Share figures for oil exporting developing countries and for NODCs, and for energy and non-energy primary commodities, are provided separately.

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<sup>1/</sup> In a recent study, Winters [1984] was unable to find significant relative price effects in several models of NODC manufactured exports for the 1967-84 period but attributes that result to "...poorly measured prices and the slightness of relative price changes compared to other shocks to the system", not too low price elasticities themselves.

Two conclusions stand out. First, the weight of developing countries as a whole, and of NODCs in particular, in world exports of primary commodities is much lower than is often supposed. Specifically, as shown in Table 22, by 1979-81, NODCs accounted for only 19 percent of world exports of all primary commodities and for only 29 percent of exports of non-energy primary commodities. Clearly, the dominant exporters of non-energy primary commodities are not the NODCs but rather the industrial countries (68 percent of world exports), whereas for energy primary-commodities, the dominant exports are, of course, oil-exporting developing countries (75 percent of world exports). If anything, the value-share figures in Table 22 probably under-state the dominance of industrial countries in exports of non-energy primary commodities because they do not take into account exports of synthetic substitutes for these commodities. The second conclusion is that the share of NODCs in world exports of primary commodities has fallen rather significantly over the past decade or so. Whereas the NODC share for all primary commodities was 31 percent in 1968-70, it was, as noted earlier, only 19 percent in 1979-81; similarly, the decline for non-energy primary commodities was from 38 percent of world exports in 1968-70 to 29 percent in 1979-81. More disaggregated figures reveal further that the declines in the NODC export share were most pronounced in agricultural raw materials, in metals and minerals, and in food; the decline was smallest in beverages and tobacco.

More information on the potential of developing countries to influence world commodity prices can be obtained by moving to an individual-commodity basis and by examining production, consumption, and import shares as well as export ones.

Table 23 shows the shares of world production, consumption, exports, and imports accounted for by developing countries for 23 of the more important (non-oil) primary commodities in international trade. Separate share figures are given for all developing countries and for the top 3 and top 5 developing country aggregates. In brief, two features of the results deserve mention. First, not surprisingly, developing countries have considerable more weight in the world supply of primary commodities (i.e., on production and export shares) than on the world demand (i.e., consumption and import shares) for them. <sup>1/</sup> This means of course that their influence on world prices of these commodities typically comes from their role as suppliers. Second, there is considerable variation across commodities in the concentration of production and of exports by developing countries. Note that whereas production was highly concentrated for coffee, cocoa, tea, rice, jute, natural rubber, tin, and manganese,

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<sup>1/</sup> Of the 23 primary commodities shown in Table 23, developing countries had a 50 percent or greater share of world production in 16 of them; the corresponding figure for world consumption was only 8.

Table 22. World Merchandise Exports: Changes in Country Shares Between 1968-70 and 1979-81

Commodity Groups	Value Share									
	World Value	World	Industrial Countries	Oil-Exporting Countries	Developing Countries					
					Total	Non-Oil Developing Countries				
						Africa	Asia	Europe	Middle East	Western Hemisphere
	<u>(In billions of U.S. dollars)</u>				<u>(In percent of World Total)</u>					
<u>Average Annual</u>										
1968-70	242	100	78	6	16	3	4	2	1	5
1979-81	1,558	100	74	12	14	2	6	2	1	3
<u>1. Primary Commodities</u>										
1968-70	70	100	51	18	31	7	8	2	1	12
1979-81	471	100	44	37	19	3	6	1	1	7
<u>A. Non-Energy</u>										
1968-70	56	100	60	3	38	9	10	3	2	15
1979-81	247	100	68	2	29	5	9	2	1	12
<u>B. Energy</u>										
1968-70	14	100	17	80	4	1	1	0	0	1
1979-81	224	100	18	75	7	2	3	0	1	1

Source: Based on United Nations, D-Series Trade data.

Table 23. Shares of Developing Countries in World Production, Consumption, Exports, and Imports for 23 Individual Primary Commodities, 1980

(In percent of world totals)

	Production				Consumption				Exports				Imports			
	World	Developing countries			World	Developing countries			World	Developing countries			World	Developing countries		
		All	Top 3	Top 5		All	Top 3	Top 5		All	Top 3	Top 5		All	Top 3	Top 5
Coffee	100	99.1	43.0	51.4	100	32.9		n.a.	100	94.6	45.7	55.0	100	11.4	n.a.	n.a.
Cocoa	100	99.9	56.1	74.4	100	10.7		n.a.	100	100.0	57.9	76.6	100	2.8	n.a.	n.a.
Tea	100	84.2	57.9	68.4	100	57.9	36.8	n.a.	100	100.0	55.6	77.8	100	44.4	n.a.	n.a.
Sugar	100	57.2	24.5	n.a.	100	56.1	22.3	n.a.	100	45.4	18.3	n.a.	100	41.7	n.a.	n.a.
Beef	100	35.1	16.1	n.a.	100	35.4	15.9	n.a.	100	17.6	8.8	n.a.	100	18.8	n.a.	n.a.
Bananas	n.a.	n.a.	n.a.	n.a.					100	97.1	49.3	71.0	100	11.9	n.a.	n.a.
Citrus fruits	100	58.1	26.5	32.2	100	50.7	23.9	n.a.	100	73.2	46.5	n.a.	100	14.3	n.a.	n.a.
Rice	100	89.8	63.5	73.3	100	90.7	63.6	72.6	100	57.5	40.2	48.8	100	76.9	n.a.	n.a.
Wheat	100	36.8	23.2	n.a.	100	47.0	25.9	n.a.	100	5.7	n.a.	n.a.	100	56.2	24.0	n.a.
Oilseeds	100	59.5	25.4	35.7	100	58.1	27.1	n.a.	100	64.0	37.7	49.1	100	55.0	25.7	n.a.
Cotton	100	59.0	33.3	n.a.	100	59.7	36.8	n.a.	100	42.9	12.2	18.4	100	50.0	34.0	n.a.
Jute	100	97.5	85.0	n.a.	100	75.6	51.2	n.a.	100	83.3	66.7	n.a.	100	66.7	16.7	n.a.
Natural rubber	100	100.0	81.6	89.5	100	38.5	17.9	n.a.	100	100.0	90.9	n.a.	100	29.4	n.a.	n.a.
Tobacco	100	61.1	31.5	n.a.	100	51.9	27.8	n.a.	100	57.1	21.4	n.a.	100	21.4	n.a.	n.a.
Copper	100	50.0	26.9	n.a.	100	16.8	n.a.	n.a.	100	62.7	39.2	51.0	100	15.1	n.a.	n.a.
Tin	100	86.0	55.4	76.6	100	19.7	n.a.	n.a.	100	85.4	64.4	79.1	100	12.0	n.a.	n.a.
Bauxite	100	52.5	32.7	39.4					100	71.5	47.7	54.9	100	1.6	n.a.	n.a.
Nickel	100	33.2			100	5.9	n.a.	n.a.	100	34.9	n.a.	n.a.	100	3.2	n.a.	n.a.
Primary alumin.	100	16.1	n.a.	n.a.	100	16.3	n.a.	n.a.	100	17.0	n.a.	n.a.	100	13.3	n.a.	n.a.
Iron Ore	100	36.4	22.8	n.a.	100	19.4	n.a.	n.a.	100	46.3	32.1	n.a.	100	6.1	n.a.	n.a.
Manganese	100	59.4	45.5	54.4	100	27.3	n.a.	n.a.	100	74.5	63.8	70.2	100	12.8	n.a.	n.a.
Lead	100	30.6	13.9	n.a.	100	20.4	n.a.	n.a.	100	30.0	n.a.	n.a.	100	11.1	n.a.	n.a.
Zinc	100	27.4	12.9	n.a.	100	21.0	n.a.	n.a.	100	23.7	n.a.	n.a.	100	11.4	n.a.	n.a.

Source: World Bank Report No. 814/82, Price Prospects of Major Primary Commodities.

it was much less so for beef, nickel, primary aluminium, iron ore, lead, and zinc. It also follows that it is for this former group of primary commodities that the potential is greatest for collective exchange rate action to influence world prices; where the concentration in production is relatively low, as in the latter group of primary commodities, it would take simultaneous exchange rate action by many producing countries to achieve the same impact on world supply.

As indicated earlier, the world price effects of exchange rate-induced supply shifts depend not only on the global production shares of the developing countries but also on their supply-price elasticities for the relevant primary commodities. High supply elasticities, *ceteris paribus*, increase the influence of supplying countries on the world price and low elasticities lower it. Table 24 presents some representative estimates of supply elasticities for a variety of agricultural and mineral primary products. <sup>1/</sup> While such estimates are known to be quite sensitive to the choice of country and commodity, to the specification of the model, and to the estimation period, the results seem to point to three general conclusions.

One is that the short-run (one year) price elasticities are usually much smaller than long-run ones. This suggests that the danger of significant world price effects being generated by multilateral exchange rate action is much less in the short run than in the long run. Second, for some of the commodities with relatively high producer concentration, such as copper, even long-run elasticities are low enough to dampen the world price effects of exchange rate changes. For other such high-producer-concentration commodities, however, such as cocoa and perhaps coffee, the potential for induced long-run price effects looms larger because the supply elasticities are themselves larger. Third, the sample of significant supply-price elasticities in Table 24 lends support to the proposition advanced earlier that even with fixed external terms of trade, the capability exists to boost exports by real exchange rate depreciation if such depreciation can be translated into an increase in the real return for producing exportables.

Thus far, we have made a preliminary identification of those primary commodities where the potential is greatest for multilateral exchange rate action by producers to affect the world price. It would similarly be useful to know which countries have such a relatively high potential to affect world prices by their own supply or demand actions. For this purpose, we need to know not only the relative degree of producer concentration by commodity but also the

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<sup>1/</sup> Most of the estimates in Table 24 are taken from the studies by Bond [1983] and by Feltenstein et al. [1979].

Table 24. Representative Estimates of Supply-Price Elasticities  
for Primary Commodities

Commodity	Country	Period	Author of Study	Short-run elasticity (one year)	Long-run elasticity
Cocoa	Ghana	1949-62	Bearman	0.39-0.87	0.71-1.28
	Nigeria	1947-64	"	-	0.45-0.71
	Ivory Coast	1947-64	"	-	0.80
	Cameroon	1947-64	"	0.68	1.81
Coffee	Kenya	1946-64	Maitha	0.64	1.33-1.48
	Brazil	1943-60	Bacha	0.14-0.24	0.37-0.60
	Africa	1947-73	de Vries	0.12	0.44
Cotton	Nigeria	1950-64	Diejomach	0.67	0.67
	Sudan	1951-65	Medani	0.39	0.50
Rubber	Liberia	1950-72	Ghoshal	0.14	0.22
	Nigeria	1952-72	Olayemi & Olayide	0.04	1.75
Tobacco	Malawi	1926-60	Dean	0.48	0.48
	Nigeria	1945-64	Adesimi	0.60	0.82
Copper	Chile	-	-	0.11	0.30
	Peru	-	-	0.15	0.40
	Zaire	-	-	0.17	0.60
	Zambia	-	-	0.20	0.65
Iron ore	Chile	-	-	0.20	0.60
	Peru	-	-	0.20	0.60
Zinc	Peru	-	-	0.19	3.34

shares of those commodities in each country's exports or imports. Clearly, a country whose exports are highly concentrated in a few high-producer-concentration commodities will have higher export "market power" than one whose exports are more diversified as between low and high-producer-concentration commodities.

Fortunately, Branson and Katseli [1979] have recently constructed just such an index of market power for the exports and imports of 101 countries, both developing and developed. Specifically, they define export market power ( $Z_x$ ) as

$$Z_x = \sum_i \lambda_i \delta_i$$

where  $\lambda_i$  is the country's export share of commodity  $i$  in total world exports of  $i$ ,  $\delta_i$  is commodity  $i$  as a proportion of the country's total exports, and  $\lambda_i \delta_i$  is then the country's export share of commodity  $i$  weighted by the relative importance of commodity  $i$  in the country's exports. The index of import market power ( $Z_m$ ) is defined symmetrically. The results, based on 1974 United Nations trade data, are shown in Table 25. Three conclusions stand out.

First, consistent with our earlier results on the shares of developing countries in world production and consumption of individual primary commodities, Table 25 suggests that developing countries have appreciably more market power on the export side than in the import one. For 1983 (Group A) program countries, for example, the index of export market power was .073, while that for imports was only .003--only 1/25 as large. Second, even within the non-oil developing country group, there are large differences among countries in their degree of export market power. Note, for example, that the export market power index for say, Malaysia (49 percent of world tin exports and 26 percent of world rubber exports in 1974), or even that for Ghana, Zambia, or Chile, is four to five times higher than that (.042) for all NODCs, and more than twice as high as that for all 1983 (Group A) program countries. Clearly, in assessing the likely world price effects of multilateral exchange rate action by a group of program countries, it does make a difference which countries participate in that action; specifically, joint action by high-market-power countries would have more serious price repercussions than joint action by (even a larger group) of low-market-power countries. Observe also that, on this index of market power, global export or import shares alone are not necessarily a fail-safe predictor of market power; for example, Table 25 indicates that Japan, not the United States, has the highest import market power of the 101 countries in the table (presumably because high-concentration consumption goods represent a larger share of its imports). Third, at least for 1983 program countries, it is found that program countries had about the same degree of import market power as all NODCs but a significantly higher degree of export market power (.073 versus .042). This suggests that the risk of aggregate

Table 25. Indices of Export and Import Market Power

Countries	Market power indices on	
	Export side ( $Z_x$ )	Import side ( $Z_m$ )
(1) Afghanistan	0.0199	0.0024
(2) Argentina	0.0439	0.0074
(3) Australia	0.0937	0.0042
(4) Austria	0.0070	0.0033
(5) Bahamas	0.0441	0.0105
(6) Bahrain	0.0615	0.0042
(7) Barbados	0.0019	0.0001
(8) Belgium	0.0279	0.0091
(9) Benin	0.0014	0.0011
(10) Bolivia	0.0700 <u>1/</u>	0.0025 <u>1/</u>
(11) Brazil	0.0815	0.0139
(12) Burma	0.0163	0.0003
(13) Burundi	0.0070	0.0002
(14) Cameroon	0.0322	0.0003
(15) Canada	0.0500	0.0394
(16) Central African Empire	0.0016	0.0001
(17) Chad	0.0037	0.0003
(18) Chile	0.1240	0.0044
(19) Colombia	0.0600	0.0015
(20) Congo	0.0024	0.0007
(21) Costa Rica	0.0121	0.0004
(22) Cyprus	0.0035	0.0006
(23) Denmark	0.0386	0.0039
(24) Ecuador	0.0075	0.0005
(25) Egypt	0.0850	0.0172
(26) Ethiopia	0.0039	0.0003
(27) Fiji	0.0075	0.0005
(28) Finland	0.0560	0.0040
(29) France	0.0171	0.0247
(30) Gambia	0.0059	0.0004
(31) Germany	0.0646	0.0272
(32) Ghana	0.1525	0.0008
(33) Greece	0.0091	0.0027
(34) Guyana	0.0046	0.0008
(35) Haiti	0.0023	0.0002
(36) Honduras	0.0048	0.0004
(37) Iceland	0.0313	0.0019
(38) India	0.0240	0.0188
(39) Iran	0.1244	0.0061
(40) Iraq	0.0036	0.0073
(41) Ireland	0.0133	0.0021
(42) Israel	0.0488	0.0100
(43) Italy	0.0318	0.0266

Table 25. (continued). Indices of Export and Import Market Power

Countries	Market power indices on	
	Export side ( $Z_x$ )	Import side ( $Z_m$ )
(44) Ivory Coast	0.0596	0.0008
(45) Jamaica	0.0535	0.0007
(46) Japan	0.1068	0.1104
(47) Jordan	0.0128	0.0005
(48) Kenya	0.0226	0.0008
(49) Kuwait	0.0774	0.0014
(50) Laos	0.0011	0.0009
(51) Liberia	0.0345	0.0006
(52) Libya	0.0685	0.0019
(53) Madagascar	0.0168	0.0019
(54) Malawi	0.0151	0.0002
(55) Malaysia	0.1928	0.0023
(56) Mali	0.0034	0.0039
(57) Malta	0.0006	0.0008
(58) Mauritania	0.0285	0.0029
(59) Mexico	0.0089	0.0041
(60) Morocco	0.2519	0.0029
(61) Netherlands	0.0393	0.0115
(62) New Zealand	0.0861	0.0018
(63) Nicaragua	0.0143	0.0005
(64) Niger	0.0027	0.0002
(65) Nigeria	0.0737	0.0033
(66) Norway	0.0342	0.0242
(67) Oman	0.0737	0.0033
(68) Panama	0.0056	-
(69) Pakistan	0.0402	0.0032
(70) Papua	0.0427	0.0005
(71) Peru	0.0219	0.0016
(72) Philippines	0.0552	0.0019
(73) Portugal	0.0337	0.0019
(74) Qatar	0.0015	0.0041
(75) Rwanda	0.0034	0.0008
(76) Saudi Arabia	0.2770	0.0023
(77) Senegal	0.0213	0.0029
(78) Sierra Leone	0.0102	0.0002
(79) Singapore	0.0761	0.0115
(80) Somalia	0.0092	0.0003
(81) South Africa	0.0160	0.0067
(82) South Korea	0.0206	0.0100
(83) Spain	0.0144	0.0140
(84) Sri Lanka	0.0894	0.0399
(85) Sudan	0.0177	0.0021
(86) Sweden	0.0374	0.0105
(87) Syrian Arab Rep.	0.0094	0.0012

Table 25. (concluded). Indices of Export and Import Market Power

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Market power indices on

Countries	Export side ( $Z_x$ )	Import side ( $Z_m$ )
(88) Thailand	0.0529	0.0018
(89) Togo	0.5500	0.0005
(90) Trinidad-Tobago	0.0571	0.0083
(91) Tunisia	0.0198	0.0006
(92) Turkey	0.0278	0.0037
(93) Uganda	0.0369	0.0001
(94) United Kingdom	0.0324	0.0303
(95) United States	0.0881	0.0825
(96) Upper Volta	0.0026	0.0003
(97) Uruguay	0.0134	0.0004
(98) Venezuela	0.1283	0.0136
(99) Yugoslavia	0.0055	0.0024
(100) Zaire	0.0466	0.0007
(101) Zambia	0.1410	0.0007

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Source: Branson and Katseli [1979], Table 4.

1/ Data refer to 1972.

price effects from multilateral exchange rate action is somewhat greater for program countries than for NODCs at large. This conclusion however seems to be quite sensitive to the year's country-composition of program countries. In 1982, for example, program countries had slightly lower average export market power (.034) than all NODCs (.044).

C. The role of industrial countries

To this point, we have analyzed the likely impact of multilateral exchange rate changes by program countries almost exclusively from the "producer" or "exporter" side of the market. It is abundantly clear, however, that the impact of such exchange rate action will be no less conditioned by what happens on the "consumer" or "importer" side of market. Since, as previously documented, the majority of NODC and program-country exports go to industrial countries, this means that the effectiveness of exchange rate action by program countries cannot be evaluated without discussing the economic policy scenario and underlying trade behavior of those industrial countries. Such a discussion ought to acknowledge two basic points.

First, if NODCs are to further reorient their export structures toward manufactures so as to benefit from the relatively high price and income elasticities of demand for manufactured goods, industrial countries will have to be willing allies in that transformation.

As shown in Table 26, adapted from Goldstein and Khan [1984], both price and income elasticities of demand appear to be higher for manufactures than for non-manufactures, at least in industrial countries. This, coupled with the fact that manufactures have been the fastest growing component of NODC exports over the past twenty five years, has acted as an incentive for developing countries to orient their production and export patterns more and more toward (labor intensive) manufactures. But even if many primary-producing NODCs were convinced of the wisdom of such a change in export structure, and could obtain the funds to finance it, their efforts could go for naught unless industrial countries were willing to provide satisfactory access to their own markets. Without such access, the greater volume of manufactures could not be sold at above "dumping" prices (or in sufficient volume if quantitative restrictions applied). Also, without such access, it would be impossible to induce those NODCs that are already major exporters of manufactures to move up the "chain of comparative advantage" and produce more skill and capital-intensive manufactures so as to make room for the "new" producers of manufactures. <sup>1/</sup> This is why the staff report on Exchange Rate Policies in Developing Countries," (SM/82/8) concluded that:

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<sup>1/</sup> For an empirical analysis of how the structure of developing-country exports changes with the stages of development, see Balassa [1980].

Table 26. Representative Estimates of Long-Run Price and Activity Elasticities for Disaggregated Import Categories in Industrial Countries

Commodity categories	Deppler- Ripley <u>1/</u> (1978)	Taplin <u>2/</u> (1973)	Basevi <u>3/</u> (1973)	Clark <u>4/</u> (1977)	Ball- Marwah <u>4/</u> (1962)	Houthakker- Magee <u>4/</u> (1969)	Barker <u>5/</u> (1976)	Stern et al. <u>6/</u> (1976)	Theil and Clements <u>7/</u> (1978)
<u>Price elasticities</u>									
Foods and beverages (SITC0+1)	-0.34	-0.57	-0.55	-1.14	-0.47	-0.18 to -1.28	-0.13 -0.18	-0.78	-0.58
Raw materials (SITC2+4)	-	-0.63	-0.13	-1.25	-0.83	-0.18	-0.44	-0.50	-0.95
Fuels (SITC3)	-	-0.63	-0.04	-	n.a.	-	-	-0.96	n.a.
Manufactures and misc. goods (SITC5-9)	-0.97	-1.23	-0.71	-4.72	-1.98	-1.8 to -4.0	-1.37	-1.34	-1.16 to -1.4
<u>Activity elasticities</u>									
Foods and beverages (SITC0+1)	2.83	0.84	1.08	0.38	0.96	0.30 to 1.28	1.12 1.16	n.a.	0.14
Raw materials (SITC2+4)	0.32	0.75	0.83	0.96	1.15	0.61	1.91	n.a.	0.25
Fuels (SITC3)	1.22	0.96	1.40	-	n.a.	-	-	n.a.	n.a.
Manufactures & misc. goods (SITC5-9)	1.27	1.44	1.46	2.60	2.07	1.11	1.99	n.a.	0.28 to 0.32

Source: Goldstein and Khan [1984], Table 4.

1/ Unweighted average, 14 industrial countries.

2/ Unweighted average, 25 industrial or semi-industrial countries.

3/ Unweighted average, 10 industrial countries.

4/ United States.

5/ United Kingdom.

6/ Median estimate, all industrial countries.

7/ Pooled, cross-section for 13 industrial countries.

"Thus, from an optimal standpoint, the speed of adjustment of the non-oil developing countries exporting primary products should in part be related to the speed at which industrial countries are able to adjust to a larger and more diversified flow of imports from the rest of the world." p. 23.

It is also why projections for NODC exports in WEO scenario exercises are always made conditional on the stance of protectionism in the industrial countries.

The importance of increased access to industrial-country markets would not have to be so emphasized were it not for evidence: (i) that the postwar momentum toward trade liberalization came to a halt in 1979 and has suffered some reversal since then; 1/ (ii) that the piecemeal protectionist measures adopted by industrial countries have tended to fall hardest on sectors (i.e., labor-intensive manufactures) where NODCs have, or are likely to have in the future, a comparative advantage, 2/ and (iii) that industrial countries have recently (1983) begun to rely more on quantitative controls and quotas (i.e., on measures that cannot be offset by exchange-rate induced gains in price-competitiveness). 3/

While the effects of existing industrial-country trade barriers on NODC exports are notoriously difficult to quantify, 4/ estimates from the recent empirical literature strongly suggest that these effects are far from trivial. For example, Cline et al. [1978] have estimated that a 60 percent reduction in industrial countries' tariff and agricultural nontariff barriers would increase NODC exports, exclusive of oil and textiles, by approximately 3 percent (using 1974 values); a similar liberalization of textile trade would, according to the same authors, produce perhaps another 3 percent increase in NODC export earnings. More recently, Whalley [1984] has used an applied general-equilibrium trade model to estimate the income effects associated with, *inter alia*, the abolition of tariff and non-tariff barriers in the industrial countries. Interestingly enough, he finds that removal of protection in the North would increase income in NODCs by roughly \$30 billion-- a figure larger than the approximately \$20 billion annual aid flow from the North to the South. 5/

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1/ See Bergsten and Cline [1983].

2/ See Anjaria et al. [1982].

3/ See IMF [1984].

4/ For an analysis of the problems, issues, and methods associated with quantifying protection, see Kirmani et al. [1985].

5/ It should be mentioned that Whalley [1984] also finds that protection in the South carries large welfare costs; this occurs because even though the South is relatively "small" in world trade, its ad valorem tariff rates are relatively high.

The second basic point about the role of industrial countries is that their own business cycle, inflation, and exchange rate developments can often--in fact usually do--swamp the effect of exchange rate changes by NODCs on world commodity prices. In this connection, Goreux [1979], analyzing a sample of 37 (non-oil) primary commodities over the 1962-79 period, found that each 1 percent change in an industrial-country business-cycle index was associated (*ceteris paribus*) with a 2.2 percent change in primary commodity prices, while each 1 percent change in industrial-country manufactured export prices was associated with a 0.7 percent change in primary commodity prices. <sup>1/</sup> More recently, Chu and Morrison [1983] undertook a more extensive analysis of the determinants of non-oil primary commodity prices over the 1958-82 period. They found that much of both the long-term and short-term movements in these commodity prices could be explained by changes in industrial-country industrial production, and in industrial-country inflation rates adjusted for changes in major currency exchange rates (*vis-a-vis* the U.S. dollar). The point of this is not that exchange-rate induced production changes by NODCs do not matter for primary commodity prices. Like other supply shocks, surely they do. Rather, the point is that they are by no means all that matters, or even probably what matters most. For this reason, it is important not to conclude that because the prices of non-oil primary commodity exported by NODCs were weak in 1981-82, <sup>2/</sup> and because NODCs were depreciating their exchange rates during that period, the latter necessarily was responsible for the former. The roles played by the industrial-country recession, the high inflation and interest rates in industrial countries, and the appreciation of the U.S. dollar *vis-a-vis* other industrial-country currencies also need to be taken into account. <sup>3/</sup>

#### D. Summary

To summarize, this section has explored the possibility that simultaneous exchange rate action by program countries could have serious aggregation effects for the prices of program-country exports. It has been argued that this proposition should be applied mainly to primary commodities and that the potential for significant aggregate price

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<sup>1/</sup> It is interesting to note that in Project LINK, commodity prices are similarly made a function of OECD real GNP, the price of OECD manufactures, and world production of the commodity; see Glowacki and Ruffing [1979].

<sup>2/</sup> The prices of non-oil primary commodities exported by NODCs fell by about 15 percent by 1981 and by roughly 13 percent in 1982; see IMF (1984, Table 11).

<sup>3/</sup> The most recent World Economic Outlook (IMF 1984) concludes: "...Changes in economic activity in the industrial countries, as measured by movements in their composite index of industrial production, appear to have been the most important factor affecting commodity prices both in the 1972-1977 cycle and subsequently." (p. 139).

consequences depended mainly on the ability of program countries to affect world supply. While this potential is clearly much higher for some commodities (e.g., cocoa, coffee, natural rubber, tin) than for others (e.g., wheat, citrus fruits, iron ore), and in the long run rather than the short run (because supply elasticities were much larger in the long run than in the short run), the risks are much reduced in practice because (i) primary commodities now represent a significantly smaller share of NODC exports than they did two decades ago; (ii) similarly, the share of NODCs in world exports of primary commodities is now considerably smaller than even a decade ago; and (iii) not all program countries change their exchange rates at the same time and those that do will usually not export the same products. <sup>1/</sup> Still, such interdependence and aggregation effects associated with multilateral exchange rate action need to be closely monitored and this section has identified the individual NODCs and individual primary commodities where "market power" seems to be relatively high. A case has also been made for the view that exchange rate adjustment can be useful as a means of protecting the profitability of exporting even for those NODCs who face fixed external terms of trade. Last but not least, the role played by industrial-country policies in conditioning the effects of exchange rate action by program countries has been emphasized.

#### VI. Consideration of Aggregation and Interdependence Effects in Fund Operations

The theoretical and empirical materials presented thus far are relevant for assessing the likely size and direction of any global effects of Fund-supported adjustment programs. In this section, attention is turned toward an equally important and closely related subject, namely, if and how the Fund accounts for aggregation and interdependence effects in both the advice it gives to member countries and in the design of Fund programs themselves. The reason this latter subject is important is that even if Fund programs did carry strong potential global effects, these effects could in principle be compensated for both in the design of programs and in the advice given by the Fund to non-program countries. For example, if the process of achieving greater fiscal responsibility in program countries had significant multiplier effects on aggregate demand in non-program countries, and if these spillover demand effects were both larger than desired and known in size and timing, then an "adjustment" could be made in program design to reduce such spillovers. Similarly, if the international adjustment process is working smoothly, any reduction in absorption in countries experiencing

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<sup>1/</sup> It is likewise relevant to note that exchange rate changes in program countries are typically made only when the exchange rate has become unrealistic and when alternative actions to exchange rate policy have already been considered and rejected.

balance of payments deficits should be offset by the increase in absorption in surplus countries, leaving global aggregate demand little affected. Put in other words, trouble arises only if global effects of programs are significant and if these effects are ignored in the design of policy in both program and non-program countries.

It is worth noting right at the outset that by its very nature the Fund must be concerned about the "global" or "systemic" effects of policies of its individual members. Indeed, it could be said with justification that the *raison d'etre* of the Fund and most of its activities is precisely the belief that the effects on other countries of the policies of individual members can be significant and that an institution is needed to ensure that countries with balance of payments problems do not take measures having dramatic and unsatisfactory international repercussions; in fact, both the Fund's lending activities and its surveillance functions can be thought of as directed in large part toward meeting that objective. Also, as suggested in Section II, some of the Fund's most visible activities during the past few years ought to be seen as motivated by just such global or systemic concerns. Two of the best examples are the Fund's efforts to deal with the debt problems of a number of members which had borrowed in amounts beyond their debt-servicing capacity and the Fund's recent policy advice to the United States concerning its fiscal policy. In short, the relevant question is not whether the Fund ought to consider the global and systemic effects of its advice and programs but rather how it can best do so.

Since so many of the Fund's normal activities are associated with the monitoring of the "third-party" or "systemic" effects of member-country policies (e.g., the monitoring of new trade and exchange restrictions), the discussion of aggregation and interdependence effects in this section will be selective rather than comprehensive. Specifically, the focus will be on three aspects of policy advice and program design, namely: (i) consistency and aggregation of policy effects across countries, as analyzed with the Fund's World Economic Outlook (WEO) exercises; (ii) the incorporation of information on other countries' policies into policy recommendations for a given country; and (iii) the provisions for waivers and modifications in Fund programs.

A. Consistency and aggregation of policies across countries

If there is perhaps a single guiding rationale for the Fund's WEO exercises it is that surveillance of the international monetary system, or even of an individual country's economic policies, must at some stage be done in a global framework; for only in such a framework can consistency of policy objectives and macroeconomic forecasts across countries be checked; can the repercussions of one country's policies

on others be examined; and can the aggregate effect of (largely) un-coordinated policy strategies be evaluated. Appraisal of country policies in the depth normally associated with individual Article IV consultations is of course also necessary--but it does not ensure global consistency.

The methodology employed in the WEO is largely geared to achieving global consistency, especially as regards the short-term projections, which presently cover the period to end-1986. For the purposes of this paper, it is enough to stress three aspects of that methodology. First, projections of growth, trade flows, balance of payments, external debt, and debt service are derived in three complementary ways, namely, by a survey approach that relies on the forecasts of desk economists in the Area Departments, by an econometric approach that involves the estimation of regression equations for key trade relationships (e.g., the response of exports to market growth and changes in competitiveness), and by an historical approach that relies on past historical relationships when econometric estimates are not available. A virtue of this multiplicity of approaches is that it provides some protection against what might be called independence error, that is, against the error that arises when each country does not take into account the actions of other countries in making its own forecasts. Suppose, for example, that each NODC assumes incorrectly that its own devaluation will not be matched by other NODCs. In that case, each NODC will over-estimate its export earnings. This type of independence error, however, should be uncovered either when the estimates are aggregated across all countries or when the survey projections are compared with the projections derived from the econometric approach. In the absence of offsetting errors, the over-estimation of export earnings will lead to an excess of global exports over global imports and to an improvement in the global balance on current account. These developments in turn would trigger a search for the likely source of the difficulty, a search that would include checking the econometric evidence. This evidence should, at least in principle, serve to pinpoint the root cause of the inconsistencies, since (for NODCs) the econometric approach is done for analytical subgroups of NODCs (e.g., major exporters of manufactures, low-income oil-importing countries, etc.) rather than for individual countries; because construction of the group variables requires explicit accounting for all component-country changes within the group, and because the econometric results are done by another department (i.e. the Research Department) that acts as the clearing house for all Area Department inputs.

A second related feature of the WEO exercises is that the final projections emerge out of an iterative process that itself provides some safeguard against aggregation errors. (For an overview of the iterative process with respect to the WEO short-term projections, see Chart 2. Perhaps the best example of this is the interaction between the so-called environmental assumptions and developing-country projections. These environmental assumptions pertain to those features of the world economy that have the greatest impact on the developing countries, such

as average growth of GDP among partner countries, prices of manufactured goods imported by developing countries, interest rates on commercial credits to developing countries, the world price of oil, etc. In some sense, these environmental assumptions can be thought of as the "exogenous" variables necessary to project developing-country outcomes in either a regression equation or in the survey approach. But as the projection exercise continues, the environmental assumptions themselves need to be checked for consistency against the developing-country forecasts that they generate. Suppose, for example, that each program-country desk economist ignores other program-country policy actions in making his export and import projections. Also suppose that the effect of this exclusion is to make these individual program-country projections of both exports and imports too large: i.e, when these country projections are aggregated, projected developing-country exports are inconsistent with the imports of industrial countries that corresponds to the assumed real GNP in industrial countries. In that case, the initial program-country export and import forecasts will have to be scaled back to be consistent with the environmental assumptions.

Alternatively, the effects of programs could be adequately captured in the survey projections but underestimated in the environmental assumptions. In such a situation, those assumptions will have to be adjusted to ensure consistency with the country-desk projections. In any case, the important point is that so long as an adjustment for the global effects of programs is made for one of the country groups, and so long as a check for consistency of projections is done across country groups, then any error due to the omission of cross-country effects of programs should be uncovered. <sup>1/</sup> By an analogous argument, it also follows that such an (iterative) consistency check of projections across country groups should bring to light cases where the policy stance in, say, the industrial countries is inconsistent with the objectives in Fund programs. For example, if the monetary, fiscal, and commercial policies followed by industrial countries implied a demand for imports that was considerably below the export forecasts specified in Fund program countries, then one would expect to find an inconsistency between the export projections in the survey approach and the industrial-country import projections from the econometric approach.

The third feature of the WEO exercises worth mentioning is the attention paid to the impacts on developing countries of alternative environmental assumptions. This feature is characteristic of the medium-term scenarios. Assuming changes in either one environmental variable, or a combination of them, from their values in the "base

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<sup>1/</sup> It needs to be acknowledged that the existence of the global current account asymmetry makes more difficult the application of consistency checks across country-groups, at least as regards balance-of-payments projections.

scenario," can be quite helpful for inferring, inter alia: (i) what changes in the global environment would be necessary to satisfy the types of external and internal objectives typically specified in program countries; and (ii) how the prospects for alternative groups of NODCs (including, in principle, program countries) would likely be affected in the medium term by alternative optimistic or pessimistic states of the world economy and by alternative degrees of effectiveness of their own policies. In brief, such scenario exercises provide some protection against the risk that judgments about the feasibility of program-country objectives would be too narrowly tied to one uncertain combination of policies and events in the world economy.

B. Information on other countries' policies

The bi-annual World Economic Outlook exercise ensures that aggregation and interdependence effects of Fund programs get some consideration by Fund staff at the time when projections are being debated and finalized. But what about recognition of interdependence and aggregation effects at the level of the individual-country Fund mission? Here, at least three aspects of Fund operations should be explicitly noted.

First, Fund programs are set sequentially--not all at any given moment for the year to come. <sup>1/</sup> Thus, when setting the program for country y, it is possible and it is practice to recognize the consequences, direct and indirect, for y of the program for country x that was set earlier. This recognition is assisted by the practice of circulating among Heads of Departments all back-to-office reports sent by mission chiefs to management, and by the circulation for comment by other departments of all staff appraisals (including those from missions where use of Fund resources has been discussed and/or agreed). This means that all Fund missions have available to them the latest information on all earlier Fund missions and on all earlier Fund programs. Recall also that such country reports not only describe past policies but also provide some discussion of the authorities' policy intentions over the next year or so. All of this suggests that the design of Fund programs ought to be able to incorporate some estimate, albeit often a rough one, of how country y's program targets are likely to be affected by policies in its trading partners.

Second, as a useful by-product of the data collected and of the projections made for the World Economic Outlook, it is possible to provide each outgoing IMF mission with a table of summary indicators of foreign demand and prices for both partner and competitor countries. These indicators cover not only the current year and the three previous

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<sup>1/</sup> As an example of this sequencing, the number of Stand-by and EFF missions over the July 1983-June 1984 period can be classified by month as follows: July (21), August (19), September (8), October (14), November (25), December (17), January (17), February (20), March (12), April (15), May (24), and June (21).

ones but also extend roughly a year and a half into the future. Also, the weights used to average foreign developments are "custom-made" for the particular country in question; both export and import weights are used to compute changes in a country's competitive position; and more than one measure is employed for both foreign demand and competitiveness. With such indicators in hand, the mission has at least a crude assessment of how prospective developments in other countries may influence the feasibility of a given potential Fund program. For example, if adjustment efforts in partner countries with Fund programs entail some slowing of import growth in those countries, this should be reflected in the figures for import volumes of partner countries. Similarly, the impact of multilateral exchange rate changes by other program countries on this country's competitiveness ought to be approximately captured by the indicators for costs and prices in partner suppliers. This is not to say that such summary indicators can act a substitute for a more comprehensive analysis of the interactions between a given program country and other program countries. Clearly, they cannot, nor has it been possible to revise these summary indicators as frequently as one might like for the purposes of program negotiation. Nevertheless, they can act as a useful ingredient in the analysis of interdependence and they do illustrate rather well that information on other country policies, be they program countries or not, have become standard-issue material for Fund missions.

More recently, yet a third mechanism for introducing information on other-country policies into Fund missions has been introduced, namely, the assignment of a mission chief from a close trading partner to act as an additional member of a mission. Thus far, the experiment has been carried only for the G-5 countries where interdependence effects are strong and, perhaps most important, where the global effects of policy actions by the countries in question are likely to be most significant. In any case, one of the primary purposes of such a staffing procedure is to have first-hand information on other countries' policies in the design of Fund policy advice to a given country. One might also note that because staff members in most Fund Area Departments typically go on missions to a number of countries in their region within a year or two, this same first-hand knowledge of policies in close-trading partners is often available on Fund resource missions as a matter of course.

### C. Waivers and modifications in Fund programs

No matter how careful the design of Fund-supported adjustment programs, it is almost inevitable that events unforeseen at the time of inception of programs will occur during the program period. Given that Fund performance criteria are stated in explicit quantitative terms and

that these criteria are usually set with a reasonable degree of tightness so as to monitor closely developments in the economy, it is to be expected that such unforeseen developments will sometimes produce departures from these performance criteria--and sometimes for reasons beyond the control of the country authorities. It is for this reason that provisions for waivers and modifications in Fund programs have evolved. 1/ In brief, the basic guidelines for these provisions are summarized in EBS/81/70 as follows:

"...waivers were seen as appropriate for dealing with minor ex post deviations from performance criteria, that is, with deviations that did not represent departures from agreed policies and that were considered of a temporary or reversible nature; modifications would be appropriate when departures from performance criteria were expected to occur because of the failure of basic program assumptions to materialize or of the emergence of developments that had not been anticipated at the inception of the programs. However, when divergences were of a nature or magnitude so as to cast doubts on the program's viability, new understandings or further policy measures were to be reached, at times within the framework of the existing arrangement, but in cases of unusual severity, in the context of a new arrangement altogether." (page 3)

These provisions for waivers and modifications in Fund programs have indeed been used. For example, in 1974-77, upper credit tranche arrangements with waived or modified performance criteria accounted for 26 percent of the total number of arrangements approved during that period, and the corresponding figure for 1978-80 was 57 percent. 2/ A review of experience for the 1981-84 period is not yet complete.

The important implication of the waiver and modification provisions is that Fund programs are not set in concrete. In those cases when, say policy actions by a group of other program countries were to materially affect the external balance prospects of a program country in an unforeseen way, the need for waivers and/or modifications of performance criteria would be assessed.

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1/ In addition to waivers and modifications, some Fund programs have introduced automatic or self-adjusting performance criteria; see EBS/82/97.

2/ See EBS/81/70, p. 5.

D. Summary

To summarize, the view that individual-country policies can generate serious "externalities" for other countries is central to the justification for an IMF and indeed many of the Fund's activities involve the monitoring or "surveillance" of just such externalities. In this sense, global effects of program-country policies, or interdependencies among program countries, are certainly no less a cause for concern than are the global effects of, or interdependencies among policies of non-program countries. The main mechanism within the Fund for appraising the global effects of country policies, as well as the consistency of policies across country groups, is the World Economic Outlook--a Fund-wide exercise that now takes place at least twice a year. Because of the sequential time-setting of Fund programs and because of the distribution to outgoing missions of information on both previous Fund programs and foreign demand and price developments, it is also possible for program design to incorporate effects from other programs. In a similar vein, the provisions for waivers and modifications in Fund programs represent a well established mechanism for dealing with departures from performance criteria, including those attributable to unforeseen aggregation and interdependence effects. None of this, of course, means that aggregation and interdependence effects of Fund programs are fully and adequately accounted for in all individual Fund programs. But it does suggest that if reference to the global or cross-country effects of Fund programs and Fund policy advice is not found more often in Board papers on particular programs or consultations, it is because of the formidable difficulties of estimating of these effects rather than because of the failure to be cognizant of them.

VII. Conclusions

This paper has made a rather comprehensive appraisal of the arguments surrounding, and the empirical evidence on, the global effects of IMF-supported adjustment programs. The paper's main findings can perhaps best be summarized as follows.

First, in assessing not only the size but even the direction of program effects, it is important to recognize that alternative definitions of "program effects" can yield markedly different results. In our review of five such alternative definitions, it was found that measured program effects can vary substantially depending on: (i) whether changes in non-program factors (e.g., industrial-country economic activity, world interest rates and world oil prices, weather conditions in program countries) as between the pre-program and program period are taken into account; (ii) whether program targets incorporate accurate forecasts of the global economic environment during the program period; (iii) whether program countries are systematically different from non-program countries prior

to the program period in ways that matter for subsequent performance; (iv) whether non-program countries are themselves indirectly affected by Fund programs; (v) whether the medium and long-run (i.e., greater than one year) effects of programs are considered in addition to the impact or short-run effects; (vi) whether, because of confidence and credibility factors, the imposition of a given policy within the context of a Fund program has different effects than without it, and (vii) whether the most relevant comparison for actual outcomes under a Fund program is what would have happened in its absence or instead, what could have happened under some (hypothetical) optimal set of policies. All of this suggests that one reason why the evaluation of Fund program has produced such widely varying verdicts is that different judges have often applied different "yardsticks" to the same data.

The Fund's interpretation of "program effects" can perhaps best be summarized as follows: (i) actual outturns in program countries are best compared to what would have happened in these countries in the absence of Fund programs; (ii) in forming a judgement about what would have happened in the absence of programs, it is important to take account of the Fund's direct and indirect catalytic role in providing additional finance to program countries; this means that any compression of expenditure and imports during the program period needs to be weighed against the (larger) expenditure and import changes that would have likely occurred in the absence of this program-induced financing; (iii) IMF programs should be characterized by the full range of policy measures included in typical past programs and not just by government budget targets, domestic credit ceilings, and exchange rate changes alone; similarly, given the adverse initial position of most program countries and the failures of policy in the pre-program period, it should be recognized that credibility and confidence factors may produce a different result from a given policy package within the context of a Fund program than without it; and (iv) the effects of Fund programs, particularly the growth consequences, should be assessed in the medium to long-term (certainly more than a year) rather than in the short-run; adoption of an excessively short-run framework will almost inevitably ignore any positive growth effects of supply-side and structural measures in programs, and will make it very difficult to distinguish between the adjustment to a sustainable internal and external position and that sustainable position itself. In short, by comparing what is versus what would have been, by considering the influence of foreign exchange availability on import decisions in program countries, by accounting for the full range of policy changes in programs as well as for the contribution of programs to the credibility of those proposed policy changes, and by adopting a medium-term rather than a short-term true horizon, the Fund has come to a rather different assessment of "program effects" than some other observers. Since assessment of the "own" effects of Fund programs is a logically prior input to the assessment of the "global" effects of programs, it likewise follows that the Fund's appraisal about the size and even the sign of such global effects of programs also often differs from that of some others.

Third, to the extent that Fund programs do lead to changes in expenditure, output, and import volumes in program countries, one should expect these changes to induce changes in these same macroeconomic variables in the rest of the world, and in the same direction. After all, one should not expect cross-country expenditure multipliers to cease operating just because the initiating changes in expenditure or imports results from a Fund program. But perhaps the more telling point is that even with roughly 35 developing countries undertaking programs supported by the Fund, the size of these global trade and economic activity effects is likely to be small. This results from the facts that: (i) program countries still account for rather small shares (7-8 percent) of world imports and of world exports; (ii) relatively little (8-9 percent) of program countries' trade is with other program countries; and (iii) the average size of the initiating changes in import volumes in program countries has been rather small (3-6 percent) over the past decade. Indeed, even when the "later-round" effects of changes in program-country imports are considered and when marginal trade propensities replace average propensities--as revealed in simulation exercises with several global trade models, the global effects of expenditure changes in program countries remains limited. To take a specific example, results from both the OECD Interlink Model and the Project Link World Trade Model suggest that even a 15 percent decline in (1983) program-country import volumes--a figure twice as large as that recorded by program countries in 1983 and one almost three times as large as the average for 1973-82--would lead after a year to perhaps a 0.3-0.5 percent decline in OECD real GNP. In the end, all analyses of the global effects of programs must face the twin realities that it is expenditure changes in the North (i.e., in the industrial countries) that have by far the greatest impact on global economic activity and that "own-country" expenditure multipliers are typically much larger than "cross-country" ones. This means that, for better or worse, the primary impact of Fund programs falls on program-country themselves, and that serious, or potentially serious, global effects will be the exception rather than the rule. None of this of course denies that the external effects of Fund programs on individual countries, industries, firms, or perhaps even regions, can be serious indeed. Further, if the program-country group were to become considerably larger in the future, the global effects of programs would certainly need to be reassessed.

Fourth, the concern that the simultaneous exchange rate depreciations by program countries could have serious and deleterious effects on program-country export prices is certainly a reasonable one in theory. Indeed, economic theory suggests that for a homogeneous primary commodity, the ability of program countries to affect the prices of their exports depends (positively) on their ability to affect world production or world consumption of the good, and on the (absolute) value of their own price elasticities of supply and demand for the good. In

practice, however, the risks of adverse aggregate export price effects are much reduced because (i) primary commodities now represent a much smaller share of NODC exports than they did two decades ago; (ii) NODCs now account for only about 30 percent of world exports of non-energy primary commodities; (iii) supply-price elasticities for most primary commodities are rather low in the short-run; (iv) the program-country share of world production of various primary commodities is much below the share for all developing countries; and (v) not all program countries change their exchange rates during the same period, and those that do will usually not export identical bundles of primary commodities. But a "reduced" risk is not the same as no risk. There are some primary commodities (e.g., coffee, cocoa, natural rubber, tin) for which world production is relatively highly concentrated in the top 3 or top 5 developing-country producers, and there are quite a few NODCs where exports are still highly concentrated in only a few primary commodities. It is in these cases of relatively high "market power" that aggregate price effects cannot be lightly dismissed. Also, "beggar-thy neighbor" effects of exchange rate changes are not confined to primary commodities. For manufactured exports, simultaneous exchange rate depreciation by many producers can mean that each producer gets less of a gain in market share than the expected and that the devaluing group takes export volumes away from the passive group of manufacturing NODCs. For these reasons, the Fund needs to monitor closely the aggregation and interdependence effects of exchange rate changes by program countries. Equally important, the Fund needs to continue to urge the industrial countries to improve the access of developing countries to their large markets, for whatever the effectiveness of devaluation in increasing export supply, the amount of developing-country exports actually sold will be the minimum of the demand for and the supply of these goods.

Fifth and finally, the *raison d'etre* of the Fund is precisely the view that the global, systematic, and third-country effects of the policies of individual countries do matter and that efforts must be made to ensure that countries experiencing balance of payments problems seek solutions that are not destructive of the general welfare. Also, because the Fund is offering its advice on economic policies to almost all countries in the system, it must be concerned about the aggregate effects of that advice, as well as with its consistency and feasibility across countries. To this end, a number of procedures have evolved in the Fund for the evaluation of such aggregation and interdependence effects. At the broadest level, these aggregation and interdependence effects are analyzed by the staff and discussed by the Fund's Executive Board at least twice each year during the World Economic Outlook exercises. Program countries are of course included in that analysis and discussion, albeit as part of more structural country-classification groups (e.g., major exporters of manufactures, low-income countries, 25 major borrowing countries) rather than as a separate entity. At the level of individual-country consultation missions and program negotiations, cross-country effects are analyzed as part of normal mission preparation and

of normal program design. Further, the waivers and modifications provisions in Fund programs represent a well established mechanism for assessing, and if necessary, redressing the consequences of, inter alia, unforeseen interdependence effects. None of this means that the evaluation of the global effects of Fund programs within the Fund staff itself is unerring. But it does suggest that serious efforts are being made to consider the repercussions of these Fund programs on other countries and on the operation of world economy as a whole.

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