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Compensatory Financing Facility

Louis M. Goreux

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PREFATORY NOTE

The author, a Deputy Director of the African Department of the International Monetary Fund since May 1980, was closely associated with the administration of the compensatory financing facility for the previous five years when he was in charge of the Commodities Division in the Research Department. During that period, 113 drawings were made under the facility which was revised twice, first in December 1975 and later in August 1979.

In preparing this pamphlet, the author has drawn upon his experience with the operation of the facility and he wishes to express his gratitude to others who have contributed, in particular to the staff of the Commodities Division. The opinions expressed in this pamphlet are, however, those of the author only; they should not be construed as representing the views of the Fund.

August 1980

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Compensatory Financing Facility

Introduction

Considerable attention has been given to the problems arising from the instability of export earnings, especially those encountered by developing countries heavily dependent on the export of a few commodities with unstable prices. In order to reduce fluctuations in the export earnings of developing countries or, at least, to mitigate their adverse impact on the development process, three complementary approaches have been followed: export diversification; stabilization of commodity prices through international commodity agreements; and provision of compensatory financing assistance to countries experiencing export shortfalls.

For a number of countries now heavily dependent on one export commodity with highly fluctuating prices, the best solution in the long term is probably to diversify their commodity exports and to increase progressively their exports of manufactures. Export diversification, which normally occurs with economic development, is, however, a lengthy process and cannot be a solution in the short term.

Stabilization of commodity prices was the main objective of the Integrated Program for Commodities that was adopted at the Fourth Session of the United Nations Conference on Trade and Development (UNCTAD IV) in Nairobi in May 1976, but progress has been slow in implementing this program. After five years of negotiations, agreement on the establishment of a Common Fund for Commodities was reached on June 27, 1980. In spite of numerous meetings, international agreements could be successfully negotiated only for sugar in October 1977 and rubber in October 1979. Moreover, the four commodity agreements that have been in force for several years (for coffee, cocoa, tin, and sugar) have contributed only to a limited extent to the stabilization of the prices of these commodities.

Because of the practical difficulties encountered in the stabilization of world commodity prices, UNCTAD V in Manila gave more attention than did UNCTAD IV in Nairobi to compensatory financing schemes, which are easy to administer and can give immediate relief to primary exporting countries when their export earnings fall. In addition to the

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International Monetary Fund's compensatory financing facility, two other schemes exist at present. One, administered by the Arab Monetary Fund, is intended to complement the Fund's facility; it was established in 1978, but no drawing had been made under it by March 1980. The other, known as STABEX,¹ is administered by the European Community. During the first five years of operations, approximately 400 million special drawing rights (SDRs) was transferred under STABEX; for the second five-year period ending in 1984, provision has been made for about SDR 560 million.

The Fund's compensatory financing facility was established in 1963, but only 57 drawings, totaling SDR 1.2 billion, were made during its first 13 years. A turning point was the liberalization of the facility in December 1975, which occurred when commodity prices were at their trough because of the severe recession in 1975. From January 1976 through March 1980, there were 107 drawings totaling SDR 4.0 billion under the facility; these accounted for 31 per cent of the total credit extended by the Fund to all its members, and 45 per cent of the total if the United Kingdom is excluded, during this period (Table 1). The compensatory financing facility has, therefore, become a major facility for providing payments assistance to member countries, especially those heavily dependent on commodity exports.

The purpose of this pamphlet is to describe the objectives and *modus operandi* of the Fund's compensatory financing facility. The first section summarizes the main features of the facility. The second section analyzes the nature of export earnings fluctuations. The third section explains how the facility operates. This presentation is complemented by four appendices. The first reproduces the compensatory financing decision adopted in August 1979 and lists purchases made under the facility until March 1980. The second illustrates the statistics required for a compensatory financing request. The third presents an algebraic analysis of export shortfalls. The fourth compares the main features of STABEX with those of the compensatory financing facility.

¹ STABEX is a shorthand expression for stabilization of export earnings; the scheme was established under the terms of the 1975 Lomé Convention between the European Community and some 50 countries located in the African, Caribbean, and Pacific regions (see Appendix IV).

TABLE 1. USE OF FUND CREDIT, JANUARY 1976-MARCH 1980¹

(In billions of SDRs)

Type of Transaction	Group of Countries		
	Industrial ² and oil exporting ³	Other	All Fund Members
Credit tranches	3.0	2.6	5.6
Extended Fund facility		0.6	0.6
Supplementary financing facility		0.4	0.4
Oil facility	1.0	1.1	2.1
Compensatory financing facility		4.0	4.0
Buffer stock financing facility		0.1	0.1
Total credit	4.0 ⁴	8.8	12.8

Source: International Monetary Fund.

¹ Excludes reserve tranche drawings of SDR 3.8 billion (of which SDR 3.3 billion by industrial countries) and Trust Fund loans of SDR 1.6 billion.² United States, Canada, Japan, Austria, Belgium, Denmark, France, the Federal Republic of Germany, Italy, Luxembourg, the Netherlands, Norway, Sweden, and the United Kingdom (member countries classified as industrial in the International Monetary Fund's *International Financial Statistics (IFS)* until March 1980).³ Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Oman, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.⁴ Credits to the United Kingdom alone were equivalent to SDR 3.9 billion.

Main Features of the Facility

The compensatory financing facility was established by the International Monetary Fund to provide additional assistance to member countries experiencing balance of payments difficulties arising from export shortfalls, provided the latter are temporary and largely attributable to circumstances beyond the member's control. Ideally, the facility should enable a member to borrow when its export earnings and financial reserves are low and to repay when they are high, so that its import capacity is unaffected by fluctuations in export earnings caused by external events.

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Additional Assistance

Assistance extended by the Fund under the compensatory financing facility is additional to other forms of Fund assistance: drawings under the facility do not affect the amounts that a member can draw under its reserve tranche or its credit tranches or under other special Fund facilities. A member can draw under the compensatory financing facility an amount not exceeding 100 per cent of its quota in the Fund, which is equivalent to four credit tranches combined. Compensatory drawings and credit tranche drawings are both financed from the Fund's own resources, which consist mostly of the subscriptions paid by each member in accordance with its Fund quota. Charges and repurchase provisions² are the same for compensatory drawings as for credit tranche drawings. Since April 1, 1977, the annual charge has been 4.375 per cent for the first year, rising by 0.5 percentage point a year to 6.375 per cent in the fifth and last year. Repurchases are normally made within three to five years of drawings and must be completed within five years.³

Temporary Shortfall

Because the aim of the facility is to cushion the adverse effects which could otherwise have resulted from temporary export shortfalls, assistance under the facility should be provided as soon as the existence of a shortfall can be established. For this reason, the decision setting up the facility specifies that the shortfall must relate to the most recent 12-month period for which data are available; this is referred to below as the shortfall year.⁴ The drawing should be made within the 6 months following the end of this 12-month period. The amount of the shortfall is measured by the discrepancy between the value of export earnings in the shortfall year and the medium-term trend value of export earnings

²By analogy with terminology used for commercial loans, repurchase corresponds to repayment of the principal.

³Article V, Section 7(b) of the Fund's Articles of Agreement specifies that the member will be expected normally to repurchase earlier "because of an improvement in its balance of payments and reserve position," and Decision No. 6172-(79/101) (*Annual Report of the Executive Board for the Financial Year Ended April 30, 1979* (Washington), p. 138) provides guidelines for early repurchase under Article V, Section 7(b).

⁴The member may receive more timely compensation by using an early drawing procedure which allows the member to estimate earnings for up to 6 months of the shortfall year for merchandise exports and up to 12 months for services (see pp. 27-28).

in that year; the latter is defined for the purpose of the Fund facility as the five-year geometric average centered on the shortfall year. Since, at the time of drawing, export earnings are not known beyond the end of the shortfall year, the calculation of the shortfall requires a forecast of export earnings during the 24-month period following the end of the shortfall year.

The calculation of the shortfall, which is based on the nominal value of export earnings, can be illustrated by three numerical examples (Table 2a). In the three examples, export earnings are known for the shortfall year (called year 0) and for the two preceding years (called years -1 and -2). In the first example (first column of Table 2a), the value of export earnings increased by 10 per cent in each of the years -1 and 0, and is projected to increase also by 10 per cent in each of the years +1 and +2. The five-year geometric average centered on year 0 is 100; since it is identical to the value of export earnings in year 0, there is no shortfall. In the second example (second column), the value of export earnings is only 95 in year 0, but remains as in the first example in the four other years; the amount of the shortfall is 4, even though earnings actually increased in year 0. In the third example (third column), the value of export earnings is raised to 105 in year 0, and there is an export excess of 4. It is clear from these examples that a shortfall occurs when the growth rate of export earnings falls in the shortfall year, while an excess occurs when that rate rises.⁵ The existence of a shortfall does not require an absolute decline in nominal export earnings, but only a decline in their growth.

Calculations in Nominal Terms

All calculations relating to the use of the Fund's compensatory financing facility are made in SDRs at current prices. The possibility of making calculations in real terms was considered several times by the Fund's Executive Board, but on each occasion the Board decided that calculations should continue to be made in nominal terms. One consideration underlying the Board's decision is that the amount of the calculated shortfall would not be modified by making calculations in real terms if the

⁵ In these examples, export earnings would increase at a constant rate if it were not for a disturbance which may occur in year 0.

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TABLE 2a. CALCULATION OF SHORTFALL IN NOMINAL TERMS

	No Shortfall	Shortfall	Excess
Nominal value of yearly earnings	(1)	(2)	(3)
Year -2	82.6	82.6	82.6
Year -1	90.9	90.9	90.9
Year 0	100.0	95.0	105.0
Year +1	110.0	110.0	110.0
Year +2	121.0	121.0	121.0
Trend value	100.0	99.0	101.0
Shortfall	0	4	4

TABLE 2b. CALCULATION OF SHORTFALL IN REAL TERMS AT PRICES OF YEAR 0 WITH A 10 PER CENT YEARLY RATE OF INFLATION¹

	No Shortfall	Shortfall	Excess
Nominal value of yearly earnings	(1)	(2)	(3)
Year -2	100	100	100
Year -1	100	100	100
Year 0	100	95	105
Year +1	100	100	100
Year +2	100	100	100
Trend value	100	99	101
Shortfall	0	4	4

¹ With a 10 per cent inflation rate, the nominal value of 90.9 in year -1 is raised to 100, while that of 110 in year +1 is reduced to 100.

rate of inflation were constant.⁶ This can be illustrated from the previous example of Table 2a, by assuming a 10 per cent yearly rate of inflation, as is done in Table 2b. The real export earnings shown in Table 2b are derived from nominal export earnings in Table 2a by dividing the latter by a price index taken as unity in the shortfall year. In year 0, real and nominal values are identical as both are measured at prices of year 0. For

⁶ In order to measure the purchasing power of exports, nominal export earnings should be divided by the average import unit value of the country concerned. An algebraic demonstration of this is given in the last section of Appendix III.

all other years, the value of export earnings in real terms is 100, since the 10 per cent increase in nominal terms is offset by the 10 per cent rate of inflation. The real value of export earnings is always 100, except in year 0 when a disturbance occurs in that year. A shortfall occurs only when the real value of export earnings falls, but the amount of the shortfall is the same whether calculations are made in real or nominal terms (second columns of Tables 2a and 2b).

Conducting calculations in real rather than in nominal terms would, nevertheless, affect the amount of the shortfall because the rate of inflation would not remain constant. It would increase the amount of the shortfall if the rate of inflation in the shortfall year was above average, but would reduce it if that rate was below average. As the latter would tend to offset the former, the sum of the shortfalls calculated for a large number of consecutive years would remain about the same whether calculations were made in nominal or in real terms; the distribution of shortfalls from year to year would, however, be changed.

If changes in the price indices used for calculating export earnings in real terms reflected accurately the changes in the average price paid by the country for its imports, variations in real export earnings would represent accurately variations in the purchasing power of export receipts in terms of imports. Accurate indices of average import unit values are not, however, available for all countries, and, when they are, their values are released later than those of nominal export earnings. Since it would not be possible to derive real export earnings from the average import unit value of the country concerned in all cases, a solution would be to use a common price deflator for all countries. However, for countries having an import pattern which did not reflect the weights used in the common deflator, the calculation in real terms might not result in a better timing of the purchase than the calculation in nominal terms.

Shortfall Beyond Member's Control

If the shortfall resulted essentially from circumstances beyond the member's control, a solution to the member's balance of payments difficulties might not require changes in its economic and financial policies. In such instances, the member could draw under the facility without having to present a financial program that the Fund could support with the use of its resources.

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The circumstances which may lead a member to draw under the facility may be illustrated by a few examples. Consider a country which derives most of its export earnings from copper. When the world price of copper falls because of a recession in the industrial countries, the country's export receipts also fall and remain low until copper prices recover. Consider another country depending almost entirely on exports of groundnuts and groundnut products. When groundnut production falls sharply because of a drought, the volume of its exports also falls. If the country accounts for only a small part of world exportable supplies of fats and oils, the decline in the volume of its exports is not offset by a proportional increase in export unit value and its export earnings from groundnuts fall. In these two examples, the country would be able to maintain smooth growth of its capacity to import, if it could borrow when its export earnings are low and repay when they are high. In both cases, because the export shortfall is presumed to be temporary and not attributable to inappropriate policies, the member could draw expeditiously under the facility without having to negotiate a financial program.

Shortfalls in export earnings do not always result from a decline in world prices or from natural causes such as droughts or floods. They may result from a decline in the volume of exports caused by inappropriate exchange rate or price policies or by other forms of export disincentives. They may also result from a reduction in exportable supplies caused by excessive domestic demand in an overheated economy. In these instances, a solution to the member's balance of payments difficulties would normally require policy changes, and the member should formulate a financial program that could be supported by credit tranche drawings, with the conditionality attached to such drawings.

Cooperation

When the shortfall results mainly from a decline in the volume of exports, it is not always easy to determine whether it is due mainly to circumstances beyond the member's control or to inappropriate policies which need to be corrected. The member is generally given the benefit of the doubt in borderline cases, especially if it has been cooperating with the Fund in order to find appropriate solutions to its balance of payments difficulties. The decision establishing the facility specifies that a stricter test of cooperation should be applied when the drawing

raises the member's outstanding drawings under the facility above 50 per cent of the member's quota.⁷

Need

As with any other drawing from the Fund, a member can draw under the compensatory financing facility only if it has a need to do so in terms of its balance of payments or reserve position or because of developments in its reserves. A large shortfall in export earnings generally results in an overall balance of payments deficit, which is financed partly from reserves. This is not, however, always true because the fall in export earnings may be offset by movements in other items of the balance of payments.⁸ For example, a decline in export earnings by a country importing raw materials and exporting manufactured products would normally be associated with a reduction in the volume of raw material imports. This would cushion the effect of the decline in export earnings on the trade balance. Moreover, the impact on the trade balance could be offset by a higher net inflow of capital.

If international reserves exceeded their normal level before the export shortfall occurred, or if they could easily be restored to their normal level by borrowing from abroad, the import capacity of the country might not be adversely affected by the export shortfall even if the member was unable or unwilling to draw under the facility. However, if reserves were already low, and if the country had no easy access to capital markets, the authorities could be constrained to restrict imports and/or to accumulate payments arrears if the country did not have access to the facility. Such measures would not only adversely affect the economic development of the country concerned but would also aggravate any balance of payments difficulties being experienced by its trading partners. The availability of compensatory financing helps to avoid such a sequence of events.

Since its establishment in 1963, the compensatory financing facility

⁷See pp. 44-45, below.

⁸The overall balance of payments deficit is calculated by netting out the items of the current and capital accounts shown "above the line." The financing of the deficit is calculated by netting out items "below the line," such as changes in the level of international reserves and use of Fund credit. In the absence of Fund credit, a balance of payments deficit would normally result in a reduction of gross international reserves. The drawing under the facility is one way of restoring reserves to an appropriate level.

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has been intended to be of special benefit to primary exporting countries, which are subject to wide fluctuations in export earnings, and to developing countries which do not have easy access to capital markets. The facility is open to all members as the Fund cannot discriminate among its members, but no industrial country⁹ has so far requested assistance under the facility, although some are large exporters of primary commodities.

Nature of Export Shortfalls

The amount that a member can draw under the facility is based on the net shortfall in its total export earnings. In virtually all cases, this net shortfall is smaller than the gross shortfall (i.e., the sum of the commodity shortfalls), because shortfalls experienced for some commodities are partly offset by excesses for other commodities. Consequently, the financial resources required to compensate for net shortfalls in total export earnings under a single facility are not as great as those which would be required to compensate countries under separate commodity facilities.

Fluctuations in export earnings result from both volume and price factors. At the country level, the effect of volume factors is often greater than that of price factors, but the reverse is true at the world level. This occurs because fluctuations in the volume of exports by individual countries are generally caused by factors specific to the countries concerned (such as weather conditions, strikes, or sociopolitical factors), and because the effects of these country-specific factors tend to offset each other when the export earnings of different countries are aggregated into a world total. Fluctuations in the aggregate export earnings of a large number of countries tend, therefore, to be dominated by price fluctuations which, to a large extent, reflect cyclical fluctuations of economic activity in the industrial countries. For that reason, the drawings under the compensatory financing facility follow a cyclical pattern that reflects the business cycle in industrial countries. Thus, the amount drawn under the facility in 1976 was greater than the total amount drawn in the three subsequent years.

⁹ See Table 1, footnote 2.

Net and Gross Shortfalls

The distinction between net and gross shortfalls is important, as drawings under the Fund facility are based on net shortfalls while STABEX transfers are based on gross shortfalls.¹⁰ Consider a country exporting only two commodities and suppose that it experiences a shortfall of 10 for one and an excess of 6 for the other. The drawing under the Fund facility would be based on the net shortfall of 4, while the STABEX transfer would be based on the gross shortfall of 10.

For a series of consecutive years, the net shortfall in a country's total export earnings is lower than its gross shortfall (i.e., the sum of its commodity shortfalls), except if shortfalls always occur simultaneously for all commodities. The net shortfall in total export earnings is, nevertheless, higher than the net shortfall in one component of the country's total export earnings, except if the shortfall in that component is generally offset by a surplus in the other component of the country's total export earnings.¹¹ Consequently, extending the commodity coverage of the facility would generally raise net shortfalls, but the additional resources required to enlarge the coverage of an existing facility would be less than the amount required to establish an independent facility for the additional commodities. This is illustrated in Table 3, which summarizes the results of simulations conducted for 46 countries over 13 years.

First, for all primary commodities, the gross shortfall exceeds the net shortfall by approximately one half (SDR 21 billion compared with SDR 13.8 billion). Second, enlarging the coverage to all merchandise exports raises net shortfalls by approximately one half; the additional cost is, however, only two thirds of the cost of establishing a separate facility for other merchandise exports (7.5 compared with 11). Third, enlarging the coverage to merchandise and services raises the net shortfall by 17 per cent (from SDR 21.3 billion to SDR 24.9 billion); but the additional cost is only 70 per cent of the cost of establishing a separate facility for services only (3.6 compared with 5.1). When the coverage of the facility is enlarged, the net shortfall is raised but proportionately less than the value of export earnings covered. Consequently,

¹⁰ See Appendix IV.

¹¹ More precisely, if fluctuations in one component are not strongly correlated negatively with fluctuations in the other component, as indicated in equation (14'') in Appendix III, p. 72.

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TABLE 3. SHORTFALLS AND COMMODITY COVERAGE: 46 COUNTRIES, 1963-75
(In billions of SDRs)

Coverage ¹	Earnings ²	Shortfalls ²	Shortfalls as Per Cent of Earnings
Gross shortfall approach			
Commodities	230	21.0	9.1
Net shortfall approach			
Commodities	230	13.8	6.0
Other merchandise	211	11.0	5.2
All merchandise	441	21.3	4.8
Services	127	5.1	4.0
Merchandise plus services	568	24.9	4.4

Source: International Monetary Fund.

¹ All data are based on statistics from the International Monetary Fund's *International Financial Statistics (IFS)* and the commodities selected are those for which export earnings account for at least 5 per cent of the country's earnings from all merchandise exports, as the *IFS* coverage of commodity exports is available only on this basis.

² Sum of earnings and sum of shortfalls for each country and for each year.

the net shortfall declines in relation to the value of export earnings covered. It declines from 6.0 per cent for all commodity exports to 4.8 per cent for all merchandise exports, and to 4.4 per cent for merchandise and services combined.

Volume and Price Movements

The shortfall in export earnings depends on the relationship between fluctuations in volume and fluctuations in export unit values in much the same way as the net shortfall in the combined earnings from different commodities depends on the relationships among fluctuations in earnings from these commodities.

The relative contributions of volume and price movements to the shortfall in the value of exports are illustrated in Table 4, where the volume of exports increases every year (except in the shortfall year), and the volume shortfall amounts to 6.7 per cent of the volume exported in the shortfall year (column (1)). In the two cases, prices increase every year, but the rise in the shortfall year is below average in one case,

TABLE 4. VOLUME AND PRICE COMPONENTS OF EXPORT SHORTFALLS¹*(Indices with basis 100 in shortfall year)*

	Volume (1)	Case 1		Case 2	
		Price (2)	Value (3) = $\frac{(1)(2)}{100}$	Price (4)	Value (5) = $\frac{(1)(4)}{100}$
Year -2	100	85	85	85	85
Year -1	105	95	99.8	90	94.5
Year 0	100	100	100	100	100
Year +1	110	115	126.5	100	110
Year +2	120	130	156	105	126
Trend value	106.7	103.8	110.8	95.7	102.1
Shortfall	6.7	3.8	10.8	-4.3	2.2

¹ In actual calculation, price is replaced by average export unit value which is obtained by dividing value by volume.

and above average in the other. In the first of these, the price shortfall amounts to 3.8 per cent of the price level in the shortfall year (column (2)); the volume shortfall is then aggravated by the price shortfall, and the value shortfall is equal to 10.8 per cent of the value of export earnings in the shortfall year (column (3)). In the second case, the price excess amounts to 4.3 per cent of the price in the shortfall year (column (4)); the volume shortfall is partly offset by the price excess, and the value shortfall is equal to only 2.2 per cent of the value of export earnings in the shortfall year.¹²

At the world level, volume and price tend to move in opposite directions when price changes result mainly from supply fluctuations, which generally occur for food and beverages. In this case, prices rise when the supply is low and fall when it is high.¹³ At the country level, volume

¹² Taking excesses as negative shortfalls, the value shortfall is equal to the volume shortfall plus the price shortfall plus 1 per cent of the product of the volume and price shortfalls. If either the volume shortfall or the price shortfall is small, the value shortfall can be approximated by adding up volume and price shortfalls (see Appendix III, p. 76).

¹³ When the demand for imports is sensitive to changes in industrial activity, as occurs for some metals and agricultural materials, and when the supply of exports is highly responsive to price changes, both volume and price tend to fall in periods of recession and to rise in periods of high industrial activity.

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and prices tend also to move in opposite directions for the major exporter (i.e., the country which accounts for the major share of world exports of the commodity concerned), but not for minor exporters. For example, when a frost severely damages the coffee crop in Brazil, the price of coffee rises on the world market because traders expect the fall in the Brazilian crop to result in a significant decline in the world exportable supply of coffee. A sharp decline in the volume of coffee exported by Brazil is thus associated with an increase in the world price of coffee and in the average export unit value received by Brazil. Because Brazil accounts for the largest share of exportable supplies, prices received by other producers are influenced much more by fluctuations in Brazil's output than in their own. Consequently, volume and price fluctuations tend to have offsetting effects on the export earnings of the major exporter, but not of the minor exporters.

Fluctuations in the export unit values received by different countries are, in percentage terms, almost the same as those of average world export unit values. In contrast, fluctuations in the volume of world exports are, in percentage terms, considerably lower than fluctuations in the volume of country exports. This explains why the contribution of volume changes to fluctuations in export earnings is often more important than that of price fluctuations at the country level, the effect of price fluctuations is clearly dominant at the world level.

Fluctuations in World Commodity Prices

Fluctuations in world commodity prices result from both demand and supply factors. Demand for imports fluctuates with the cyclical pattern of economic activity in industrial countries. But supply of exports is affected chiefly by factors which are specific to the commodities concerned, such as a frost in Brazil for coffee or a prolonged strike in U.S. mines for copper. Because of the specificity in the supply factors, price cycles are not the same for all commodities. Commodity price cycles are, nevertheless, generally related to the cyclical pattern of economic activity in industrial countries, because of the influence of demand factors.

Commodity price cycles are illustrated in Tables 5 and 6 as quarterly indices. The overall commodity price index is the weighted average of the price indices of 37 commodities other than oil and gold. The other price indices relate to 11 of the most important of these commodities.

Whether the indices are measured in terms of SDRs, as in Table 5, or in real terms,¹⁴ as in Table 6, the cyclical pattern remains broadly the same.

For more than half of the commodities listed, prices reached their peak in the first half of 1974, shortly after the peak of the business cycle in the industrial countries, and were at their lowest in the first half of 1975, at the bottom of the recession. For some commodities, however, the cyclical pattern was different because price fluctuations were caused primarily by supply factors. In particular, the sharp increase in coffee prices which occurred in April 1977 resulted from the damage to coffee trees caused by a severe frost in Brazil. Because peaks and troughs did not coincide for all commodities, price fluctuations were considerably smaller for the overall commodity price index than for most individual commodity prices. To take just one example, from peak to trough, the overall index in real terms fell from 158 to 97, while the sugar index fell from 405 to 47 (Table 6).

Over the period 1963–76, fluctuations in quarterly prices were three times as large for hides, copra, fish meal, and sugar¹⁵ as they were for the overall commodity index; they were twice as large for copper, sisal, and rubber (Table 7). In turn, fluctuations in the overall commodity index were almost three times as large as fluctuations in the price index of manufactures.

Fluctuations in a country's total export earnings are obviously affected by the commodity composition of that country's exports. Countries with highly fluctuating export earnings are those dependent mainly on a single commodity export for which world prices fluctuate widely (e.g., Zambia, which derives about 95 per cent of its export earnings from copper). Countries largely dependent on commodity exports but with a well-diversified export pattern (e.g., Australia) are not subject to such wide fluctuations in export earnings. Countries which depend mainly on exports of manufactures experience the smallest fluctuations in export earnings (Table 8).

Fluctuations in the overall price index for commodities other than beverages, oil, and gold can be explained to a large extent by movements

¹⁴ Real price indices are obtained by dividing the index of nominal commodity prices by the United Nations' index of the price of manufactures exported by industrial countries.

¹⁵ At free market prices.

TABLE 5. NOMINAL COMMODITY PRICES IN SDRs, THIRD QUARTER 1973-FIRST QUARTER 1980¹

(Quarterly prices 1972 = 100)

		Over- all ²	Beef	Wool	Cotton	Rubber	Cocoa	Coffee	Tin	Copper	Copra	Wheat	Sugar
1973	III	151	135	163	187	218	200	113	120	169	239	213	112
	IV	158	130	158	207	227	167	116	140	183	322	242	127
1974	I	182	117	147	205	271	182	125	178	197	501	268	232
	II	186	93	137	164	220	243	130	221	233	466	197	278
	III	181	95	116	152	177	226	117	215	147	403	220	369
	IV	194	81	93	127	149	226	115	177	115	326	244	566
1975	I	164	68	92	114	149	197	109	176	104	202	194	385
	II	140	78	101	129	140	149	106	163	103	154	166	216
	III	147	83	98	138	157	165	145	163	106	152	206	208
	IV	144	92	111	144	160	182	155	155	101	134	199	168
1976	I	153	100	128	169	195	205	184	163	109	133	200	175
	II	171	110	139	188	229	262	258	188	134	147	196	175
	III	177	99	148	223	223	317	280	207	137	210	175	132
	IV	180	92	164	221	231	414	343	205	113	237	145	98
1977	I	213	102	161	215	232	550	496	252	127	282	146	108
	II	220	95	150	206	220	564	549	242	120	320	129	112
	III	188	88	147	163	227	589	395	273	105	220	130	92
	IV	181	93	146	149	235	493	349	307	104	231	144	91
1978	I	179	113	136	163	231	424	329	283	104	252	150	99
	II	178	129	144	172	245	440	291	277	108	266	161	87
	III	173	120	150	172	268	457	251	301	112	288	158	83
	IV	181	138	148	181	284	512	247	331	117	337	164	93
1979	I	184	166	159	177	284	461	224	326	145	405	168	91
	II	199	172	171	176	334	446	271	354	156	434	183	90
	III	205	149	172	178	330	416	330	342	153	398	206	101
	IV	213	169	184	183	332	401	331	367	166	353	214	151
1980	I	227	164	184	214	389	410	304	383	203	327	205	223

Source: International Monetary Fund.

¹Peaks are shown in boxes and troughs in circles.²Weighted averages of price indices of 37 commodities other than oil and gold. Commodity composition and weights are given in Table 7.

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TABLE 6. REAL COMMODITY PRICES, THIRD QUARTER 1973-FIRST QUARTER 1980^{1,2}

(Quarterly prices 1972 = 100)

		Over- all ³	Beef	Wool	Cotton	Rubber	Cocoa	Coffee	Tin	Copper	Copra	Wheat	Sugar
1973	III	137	123	148	169	198	182	103	109	154	217	194	102
	IV	143	117	142	187	205	151	105	126	165	291	219	114
1974	I	158	101	128	178	235	158	108	154	171	435	233	201
	II	146	73	108	129	173	191	102	174	183	366	155	218
	III	138	72	88	116	135	172	89	163	112	307	167	281
	IV	139	58	67	91	107	162	83	127	83	233	175	405
1975	I	114	47	64	79	104	137	76	122	72	140	135	267
	II	97	54	70	89	97	103	73	113	71	107	115	150
	III	103	58	69	96	110	116	102	114	74	106	144	146
	IV	100	64	78	100	111	127	108	108	70	94	139	117
1976	I	105	68	87	115	133	141	126	111	74	91	136	120
	II	114	73	92	125	153	174	171	125	89	98	130	117
	III	115	65	96	145	145	206	182	134	89	136	114	86
	IV	114	58	103	139	146	261	216	129	71	150	92	62
1977	I	133	64	101	134	145	344	310	157	79	176	91	68
	II	136	59	93	127	136	349	340	150	74	198	80	69
	III	114	53	89	98	137	356	239	165	63	133	78	56
	IV	108	55	87	89	140	294	208	183	62	138	86	54
1978	I	105	66	79	95	135	248	193	166	61	148	88	58
	II	102	74	82	99	141	252	167	159	62	152	93	50
	III	97	68	84	97	151	258	141	169	63	162	89	47
	IV	100	77	82	100	158	285	137	184	65	187	91	52
1979	I	99	89	85	95	152	248	120	175	78	217	90	49
	II	105	91	90	93	176	235	143	186	82	229	97	48
	III	104	75	87	90	166	210	167	172	77	201	104	51
	IV	104	83	88	90	163	197	162	180	81	173	105	74
1980	I	108	78	87	102	186	196	145	183	97	156	98	106

Sources: Table 5 and United Nations, *Monthly Bulletin of Statistics*.¹Peaks are shown in boxes and troughs in circles.²Real prices calculated by dividing nominal prices given in Table 5 by UN price index of manufactures exported by developed countries.³Weighted averages of price indices of 37 commodities other than oil and gold. Commodity composition and weights are given in Table 7.

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TABLE 7. INDEX OF QUARTERLY PRICE FLUCTUATIONS, 1963-76

Product	Weights ¹	Fluctuation Index ²	
		Nominal prices ³	Real prices ⁴
Manufactures (UN index)		1.54	
Commodities other than oil and gold	100.0	4.14	3.72
Food	31.4	100.0	3.77
Oils and oilseeds	27.1	6.84	6.33
<i>Groundnut oil</i>	7.2	6.25	5.58
<i>Copra</i>	7.1	10.45	10.10
<i>Groundnut cake</i>	4.7	6.38	6.44
<i>Fish meal</i>	4.5	10.27	10.15
<i>Palm oil</i>	2.7	8.55	7.84
<i>Soybean meal</i>	0.5	6.86	7.20
<i>Soybeans</i>	0.4	5.40	4.98
Cereals	25.7	4.27	3.51
<i>Maize</i>	10.1	4.07	3.51
<i>Wheat</i>	8.3	4.55	4.18
<i>Rice</i>	7.3	8.17	7.30
Sugar	21.1	7.05	6.17
<i>U.S. price</i>	10.1	4.88	4.15
<i>Free market price</i>	7.5	10.13	9.28
<i>EEC price</i>	3.5	5.51	4.68
Meat	18.5	3.06	3.23
<i>Beef</i>	14.1	3.40	3.56
<i>Lamb</i>	4.4	3.43	3.49
Bananas	7.6	4.01	3.71
Beverages	18.2	100.0	5.39
Coffee	67.1	6.26	6.30
<i>Columbia mild</i>	12.8	6.44	6.44
<i>Other milds</i>	14.5	6.78	6.72
<i>Unwashed arabica</i>	24.2	6.78	6.89
<i>Robusta</i>	15.6	5.85	5.92
Cocoa	19.7	9.33	8.90
Tea	13.2	4.67	4.02
Agricultural raw materials	22.5	100.0	5.12
Cotton	34.2	4.37	4.06
Wool	28.7	6.98	7.01
Rubber	23.1	7.89	7.71
Hides	8.0	10.63	10.81
Jute	4.0	4.88	3.97
Sisal	2.0	8.47	8.02
Metals	27.9	100.0	5.33
Copper	48.6	8.71	8.46
Iron ore	20.8	3.76	3.23
Tin	11.0	5.78	4.98
Aluminum	10.2	2.89	2.15
Zinc	3.7	5.96	5.50

TABLE 7 (concluded). INDEX OF QUARTERLY PRICE FLUCTUATIONS, 1963-76

Products	Weights ¹	Fluctuation Index ²	
		Nominal prices ³	Real prices ⁴
Nickel	3.0	1.94	2.18
Lead	2.7	7.47	6.65

Source: International Monetary Fund.

¹Weights based on exports by primary producing countries in the period 1968-70.

²Average price shortfall as percentage of the trend value. The price shortfall is the downward deviation from the trend value measured as the geometric average of the 19 quarterly values centered on the quarter for which the shortfall is calculated. Shortfalls are calculated for the 64 quarters starting in the second quarter of 1963, are expressed as percentages of prices, and are averaged for the 64 quarters taking price excess as zero shortfall.

³Nominal prices as given in Table 5.

⁴Real prices as given in Table 6.

TABLE 8. EXPORT EARNINGS INSTABILITY AND DEPENDENCY ON COMMODITY EXPORTS

Country Groups	Export Earnings Instability ¹	Dependency on Commodity Exports ²
Developing countries	4.1	79
<i>of which</i>		
<i>The Gambia</i>	8.7	96 ³
<i>Togo</i>	8.5	93 ⁴
<i>Zambia</i>	7.9	99 ⁵
<i>Korea</i>	2.6	18
More developed primary exporting countries	2.8	56
<i>of which</i>		
<i>Iceland</i>	5.3	95 ⁶
<i>New Zealand</i>	3.3	90 ⁷
<i>Australia</i>	1.9	73
Industrial countries	1.6	21

Source: International Monetary Fund.

¹Shortfall as percentage of trend value of exports, averaged over 1959-76.

²Commodity export earnings as percentage of total export earnings 1961-75.

³Groundnuts and groundnut products account for 87 per cent (of total export earnings).

⁴Phosphates account for 73 per cent; cocoa and coffee together for 20 per cent.

⁵Copper accounts for 95 per cent.

⁶Fish and fish products account for 86 per cent.

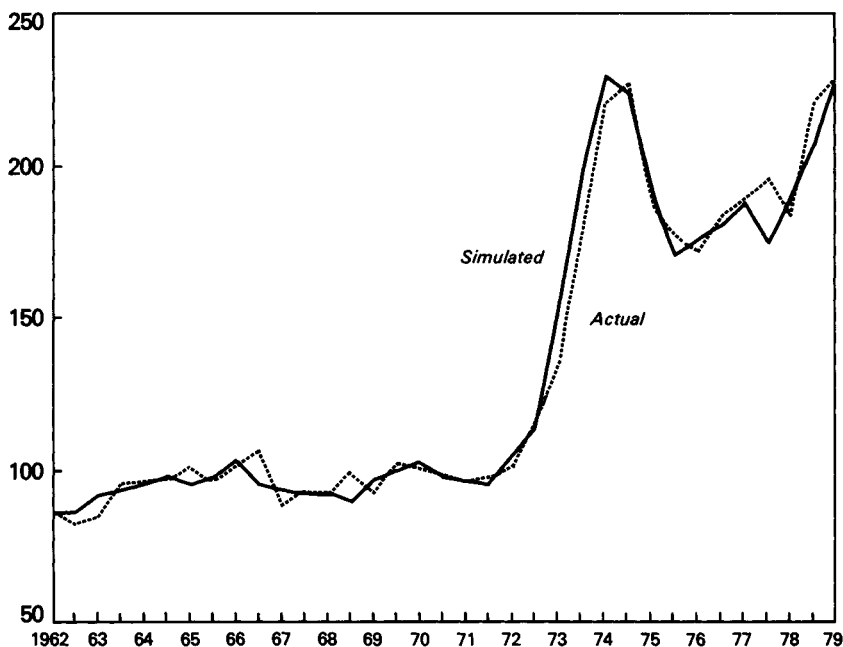
⁷Meat, dairy products, and cheese account for 60 per cent.

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in the business cycle indicator (taken as a proxy for industrial activity) and the price index for manufactured exports (taken as a proxy for inflation in world trade). This is illustrated in Chart 1, which compares

CHART 1. ACTUAL AND SIMULATED INDICES OF NOMINAL PRICES
OF COMMODITIES, 1962-79^{1,2}

(1970 = 100)



Source: International Monetary Fund.

¹Excluding oil, gold, and beverages.

²Price index calculated on the basis of least-squares regression linking commodity prices, P_t , to prices of manufactures, P_{mt} , business cycle indicator, B_t , and lagged value of commodity prices, P_{t-1} :

$$\ln P_t = 0.04 + 2.22 \ln B_t + 0.70 \ln P_{mt} + 0.47 \ln P_{t-1} + \epsilon_t,$$

(1.0) (5.2) (4.7) (3.6)

Com-
modity
prices

Business
cycle
indicator

Prices of
manu-
factures

Commodity
prices
lagged

$$\epsilon_t = 0.75 \epsilon_{t-1} + \eta_t.$$

actual values of the overall price index with the values calculated from a regression equation fitted on semiannual data over the period 1962–79. Although price fluctuations are lower for the overall commodity index than for individual commodities, they remain sizable. For commodities other than oil and gold, the largest annual price increase was 63 per cent in nominal terms and 40 per cent in real terms, while the sharpest decline was 25 per cent in nominal terms and 36 per cent in real terms (Table 9).

Cyclical Pattern of Compensatory Drawings

For a single country, the cyclical pattern of export shortfalls is somewhat obscured by random fluctuations in the volume of exports. For a large group of countries, however, the cyclical pattern appears much more clearly: the effect of price fluctuations becomes dominant because volume fluctuations, which mainly reflect country-specific events (such as floods or strikes), tend to offset each other when country shortfalls are added up. Over a 20-year period, 90 per cent of the variance in the sum of country shortfalls can be explained by variations in two economic variables: the business cycle indicator in industrial countries and the price index for manufactures exported by industrial countries. In contrast, only 40 per cent of the variance in individual country shortfalls can be explained by variations in the same two variables.¹⁶

In any given year, some countries experience shortfalls in their export earnings while others experience excesses, and the net shortfall in the aggregate earnings of all countries is the difference between the gross shortfall (i.e., the sum of country shortfalls) and the gross excess (i.e., the sum of country excesses).¹⁷ The relationship between net and gross shortfalls is illustrated in Chart 2 for 71 countries over 17 years (1959 through 1975). For each year, the net shortfall or excess is measured along the horizontal axis, while the gross shortfall and the gross excess are measured along the vertical axis.

In 1969, which could be considered a relatively normal year, the

¹⁶L. M. Goreux, "Compensatory Financing: The Cyclical Pattern for Export Shortfalls," International Monetary Fund, *Staff Papers*, Vol. 24 (Washington, November 1977).

¹⁷This is strictly true only when shortfalls (excesses) are defined as downward (upward) deviations from the five-year arithmetic average centered on the shortfall year, as was done for the purpose of drawings under the facility until August 1979 (see Appendix III, p. 77).

TABLE 9. BUSINESS CYCLE INDICATOR AND PRICE CHANGES, 1971-FIRST QUARTER, 1980¹
(Price increase in per cent per annum)²

Time Periods		Business Cycle Indicator ³	Changes in Nominal Prices				Changes in Real Prices ⁴		
			Commodities other than gold and oil ⁵	Gold ⁶	Oil ⁷	Manu- factures ⁸	Commodities other than gold and oil	Gold	Oil
1971	Jun.	0.97	-6.6	13.2	26.3	4.8	-10.8	8.0	20.6
	Dec.	0.96	0.6	16.1	26.3	10.5	-8.9	5.1	14.4
1972	Jun.	0.97	12.9	54.8	5.0	10.1	2.5	40.6	-4.8
	Dec.	0.99	29.2	47.0	5.0	4.3	23.9	40.9	0.5
1973	Jun.	1.02	59.4	93.5	34.1	14.2	39.6	69.5	15.4
	Dec.	1.02	62.6	67.0	86.4	22.3	33.0	36.5	55.2
1974	Jun.	1.00	29.7	28.3	237.2	24.1	4.5	3.4	179.1
	Dec.	0.95	12.2	72.2	151.5	25.7	-10.7	37.0	98.9
1975	Jun.	0.86	-24.6	6.5	2.7	17.1	-35.6	-9.0	-11.8
	Dec.	0.89	-24.9	-24.2	8.2	0.5	-25.3	-24.6	8.0
1976	Jun.	0.91	24.0	-23.4	8.2	-4.0	29.2	-20.2	13.0
	Dec.	0.92	27.3	-3.9	0.1	8.6	17.2	-11.4	-7.8
1977	Jun.	0.92	18.7	12.0	7.2	8.9	9.0	2.8	-2.0
	Dec.	0.92	1.2	19.8	9.9	8.4	-6.6	10.5	1.4
1978	Jun.	0.92	-8.6	30.5	3.1	13.9	-19.8	14.6	-9.2
	Dec.	0.94	6.1	29.5	-0.5	17.7	-9.9	10.0	-15.4
1979	Jun.	0.93	20.9	51.9	41.5	13.1	7.0	34.3	25.4
	Dec.	0.91	21.6	119.0	48.7	13.5	7.1	92.9	31.0
1980	Mar.	0.91	24.9	164.9	99.0	13.9	9.6	132.6	75.4

Source: International Monetary Fund.

¹ Peaks of business cycles and sharpest price increases are shown in boxes and troughs of business cycles and sharpest price declines in circles.

² Prices measured in U.S. dollars.

³ Weighted ratio of actual output to potential output of the manufacturing sector for seven industrial countries; ratios refer to the six-month period ended in month indicated.

⁴ Nominal prices deflated by UN quarterly price index of manufactures exported by industrial countries.

⁵ Based on the prices of 37 primary commodities.

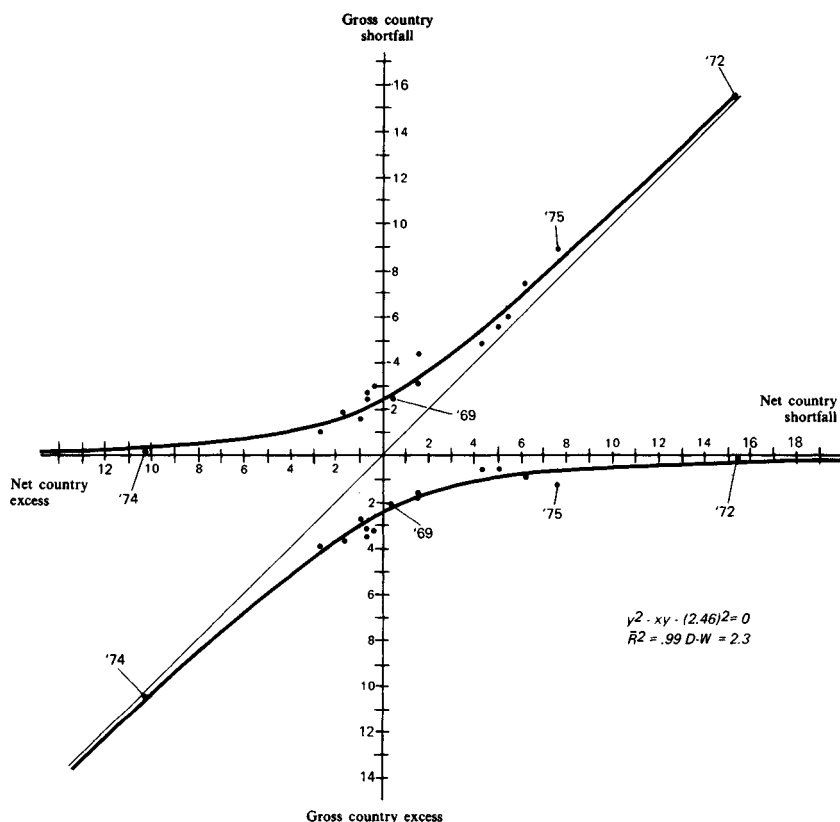
⁶ London price.

⁷ Weighted average of quoted oil prices exported under contract by Saudi Arabia, Venezuela, and Libya (from International Monetary Fund, *International Financial Statistics*).

⁸ UN quarterly price index of manufactures exported by industrial countries.

CHART 2. RELATION BETWEEN GROSS AND NET COUNTRY SHORTFALLS OR EXCESSES FOR 71 COUNTRIES FROM 1959 TO 1975¹

(Expressed as percentage of current aggregate earnings)



Source: L. M. Goreux, *op. cit.*

¹Each dot corresponds to a particular year.

number of countries that experienced shortfalls was about the same as the number that experienced excesses. The gross shortfall and the gross excess were approximately the same (about 2 per cent of aggregate earnings) and the net shortfall was almost zero. In 1974, which was an exceptionally good year, very few countries had a shortfall and most of them had an excess. The gross shortfall was very small (0.1 per cent) while the gross excess was very large (10.3 per cent); thus, the net excess was also very large (10.2 per cent). In 1975, which was a very bad year,

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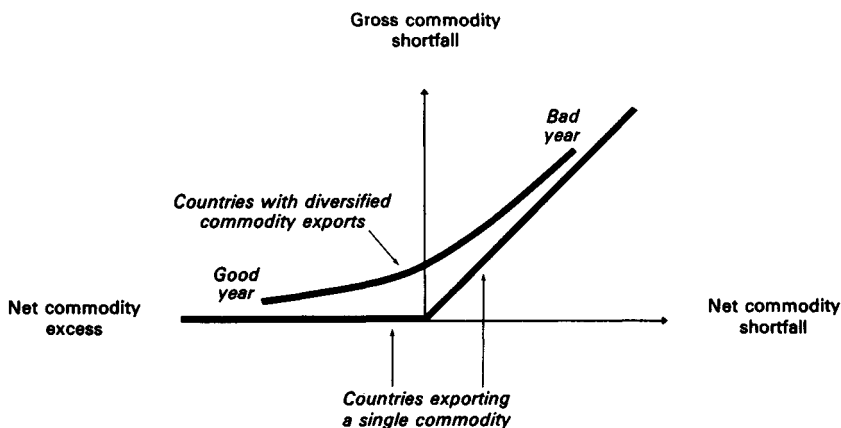
the opposite occurred. As few countries experienced an excess, the gross excess was small (1.2 per cent) while the gross shortfall was large (8.9 per cent); accordingly, the net shortfall was also large (7.7 per cent).

Because the gross shortfall can be derived fairly accurately from the net shortfall using the hyperbolic function illustrated in Chart 2, there is a relatively simple way of assessing the impact of the business cycle on the sum of country shortfalls, which is a major determinant of compensatory financing drawings. It consists in projecting the aggregate export earnings of all countries (instead of the earnings of each country individually), calculating the net shortfall, and deriving the gross shortfall from the function illustrated in Chart 2.

The relation between gross and net country shortfalls (Chart 2) is very similar to that between gross and net commodity shortfalls (Chart 3), which correspond respectively to the STABEX approach and the Fund facility approach. The shape of the curve representing the relation between gross and net commodity shortfalls depends on the degree of export diversification of the country concerned (Chart 3). At one extreme are the countries exporting a single commodity; for those, STABEX shortfalls and Fund facility shortfalls are identical. At the other extreme are the countries with a highly diversified export pattern. Countries in

CHART 3. DEGREE OF EXPORT DIVERSIFICATION AND RELATION BETWEEN GROSS AND NET COMMODITY SHORTFALLS

(Expressed as percentage of countries' export earnings)



this group would almost always be eligible for a STABEX transfer as it would be exceptional if a shortfall were not to arise for at least one commodity. In good years, when shortfalls occur for only a few commodities, the country would clearly be better off with the STABEX approach than with the Fund facility approach, as it would receive something with the former and nothing with the latter. In bad years, when shortfalls occur for most commodities, the country would be slightly better off with the STABEX approach. In exceptionally bad years, when shortfalls occur for all commodities, the country would receive the same amount with both approaches.¹⁸

Operation of Facility

The speed of operations has been a major concern in setting up and administering the compensatory financing facility. A Fund mission does not normally need to visit the country presenting a request, and telex is the most usual means of communication. After the member has provided the necessary data, the staff requires approximately two weeks for analyzing them¹⁹ and, if the request appears justified, for preparing the report to be submitted to the Executive Board. The purpose of the report is to establish the amount which the member can draw and to explain why the staff considers that the various requirements specified in the compensatory financing decision are satisfied. The Executive Board decides on the request about two weeks after receiving the staff report and, if the request is approved, the country can draw within a matter of days. The entire operation can therefore be conducted in about a month.

The conditions under which a member can draw and the ways of calculating the amount it can draw are defined by the decision reproduced in Appendix I. They will be reviewed below in four sections dealing

¹⁸STABEX and the Fund facility approach were used above as shorthand expressions for eligibility based on gross and net shortfalls. In practice, countries with well-diversified export earnings may not be better off with STABEX than with the Fund facility, because eligibility to draw under STABEX is subject to dependency and fluctuation thresholds; the first eliminates commodities accounting for a minor share of the country's earnings, the second eliminates small commodity shortfalls (see Appendix IV).

¹⁹The type of data needed is illustrated by the five tables given in Appendix II.

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with coverage, maximum drawing, conditionality and requirement of need, and terms of purchase and repurchase.

Coverage

The facility, which initially covered shortfalls in earnings from merchandise exports only, was extended in August 1979 to cover both merchandise and services. The new decision did not affect the choice of the shortfall year or the measurement of export earnings in terms of SDRs.

Merchandise and Services

For calculation of the shortfall, exports are measured on a customs basis, whenever feasible, and are net of re-exports. In accordance with UN statistical practice, re-export is defined as the export of goods that have previously been imported and whose physical characteristics have not been modified while they have been within the country's boundaries.²⁰ Exported goods produced with imported raw materials are included in the calculation of the shortfall, and no deduction is made for the import content of exports, although a decrease in the volume of exports may be partly offset by a reduction in imports.²¹

Since the facility was liberalized in August 1979, receipts from travel and workers' remittances can be added to earnings from merchandise exports under two conditions.²² First, the Fund must be satisfied that the statistics are reasonably accurate. Second, the member must opt for

²⁰ Re-exports are a substantial fraction of total exports in countries which serve as entrepôt centers, like Singapore.

²¹ The offsetting effect would be substantial in a country which imports crude oil and exports refined oil products, or imports raw diamonds and exports polished diamonds. It could also be significant for manufactured exports if account were taken of the direct and indirect import content of exports, or for exports of multinational corporations if services and income transfers were taken into account. In the latter instances, however, it would be very difficult to assess the exact amount which should be deducted from export earnings. In practice, a deduction for the import content could not be made in many cases and the determination of the threshold for making such deduction would inevitably contain an element of arbitrariness.

²² Receipts from travel and workers' remittances are subject to sizable fluctuations often caused by circumstances largely beyond the member's control. Tourism is important for a number of countries in the Mediterranean and Caribbean areas. Workers' remittances are important for many low-income countries located in the neighborhood of industrial and oil exporting countries.

the inclusion or the exclusion of travel and workers' remittances when it presents its first request after the end of 1979, and the option cannot be reversed for a period of five years. If a member opts for the inclusion of income from travel and workers' remittances but does not have reasonably accurate statistics for both, only the item for which accurate data are available is included.

Choice of Shortfall Year

The decision prescribed the shortfall year as the latest 12-month period for which customs data are available, and the practice has been to require that the interval between the end of the shortfall year and the time of request not exceed 6 months. This requirement, however, gave rise to two difficulties. First, countries reporting their trade data with more than a 6-month lag could not have access to the facility. Second, even for a country with a short data lag, almost a year would elapse between the middle of the shortfall year and the time of drawing. These two drawbacks were largely eliminated by the introduction in December 1975 of the early drawing procedure, which allowed members to estimate export earnings for up to 6 months of the shortfall year.

By using the early drawing procedure, a member with a data lag of less than 6 months can make a choice among shortfall years ending in 7 different months. Consider, for example, a member having a data lag of 3 months and presenting a request in April 1980. The member could follow the standard procedure and select calendar year 1979 as the shortfall year (the latest 12-month period for which data are known). Alternatively, it could follow the early drawing procedure and select a shortfall year ending any month from January 1980 to June 1980; depending on the choice made, export earnings would have to be estimated for 1 to 6 months.

In addition, the early drawing procedure allows a member with a data lag of more than 6 months but no more than 12 months to use the facility. As the lag increases from 6 to 12 months, the choice among different shortfall years is progressively reduced. Thus, a member with a lag of 12 months would not have any choice. For it, the first half of the shortfall year would have to comprise the last 6 months for which data are available, as earnings in the shortfall year can be estimated for no more than 6 months.

As protection against exaggerated shortfall estimates, a special re-

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purchase provision is associated with the early drawing procedure.²³ Shortly after actual data become available for the part of the shortfall year that previously had been estimated, the amount of the shortfall is recalculated by substituting these data for the earlier estimates. The original forecast for the two following years is retained. If the new calculation shows that the member was overcompensated, the member is asked to repurchase the excess.

The early drawing procedure was applied to 30 of the 107 drawings made from 1976 through March 1980. At the end of that period, the actual value of export earnings in the shortfall year was known in 22 of the 30 cases.²⁴ In 2 of these, the member was required to repurchase. In the remaining 20 cases, a repurchase was not requested, either because earnings in the shortfall year had not been underestimated, or because the margin between the calculated shortfall and the amount drawn was not sufficiently wide.

Receipts from travel and workers' remittances raise special problems because they are often recorded only on the basis of either calendar or fiscal years, which may not correspond with the 12-month period selected as the shortfall year. Suppose that the shortfall year ends in March 1980 but that earnings from services are recorded only for calendar years. Suppose further that the latter are 100 in 1979 and are estimated to be 80 in 1980. Earnings from services in the shortfall year would be prorated from their calendar-year values and calculated as $(100 \times 3/4) + (80 \times 1/4) = 95$. Because of the special data problems for services, earnings from travel and workers' remittances can be estimated for up to the full 12 months of the shortfall year. As in the case of merchandise exports, the member must represent that it shall repurchase any excess compensation which might result from an underestimation of earnings from services.

Measurement of Export Earnings

The effect of currency fluctuations on export earnings is reduced by measuring earnings in SDRs. For this purpose, monthly earnings

²³ A member using the early drawing procedure must represent in its request that it shall repurchase promptly the excess drawn, if it had been overcompensated on account of an underestimation of its export earnings during the shortfall year.

²⁴ Several members used the early drawing procedure more than once during that period.

recorded in U.S. dollars (or in another currency) are transformed into SDRs by applying the average monthly exchange rate between the U.S. dollar (or the other currency) and the SDR. Fluctuations in export earnings result, therefore, from the combination of the fluctuations in the volume of exports and fluctuations in average export unit values expressed in SDRs.

In the staff report submitted to the Executive Board, export earnings are shown for the 12-month period selected as the shortfall year and for the five preceding 12-month periods, with an analysis of total export earnings among main export commodities (e.g., sugar, copper) or groups of export items (e.g., manufactures, workers' remittances). For the main export commodities, an analysis of export earnings between volume and unit values is also given.²⁵

Maximum Drawing

The maximum amount which a member can draw under the facility is assessed in three steps. First, a forecast is made of export earnings in the two post-shortfall years in order to calculate the amount of the shortfall. Second, when necessary, a deduction is made from the shortfall to avoid double compensation with previous drawings made under the compensatory and buffer stock financing facilities. Third, this adjusted amount is reduced, whenever required, in order that the member's outstanding drawings under the facility does not rise above 100 per cent of its quota in the Fund.²⁶

²⁵ See Tables 18 and 19 in Appendix II.

²⁶ Under the 1975 decision (Decision No. 4912-(75/207), *Selected Decisions of the International Monetary Fund and Selected Documents*, 8th issue (Washington, May 10, 1976), p. 62), earnings in the two post-shortfall years could be derived from earnings in the two pre-shortfall years by applying a three-year growth factor taken as the ratio of earnings in the three-year period ended in the shortfall year over earnings in the preceding three-year period (see pp. 72-73). This simple extrapolation formula would provide an exact forecast when export earnings increase at a steady rate, but could lead to large errors when the growth rate fluctuates widely. For this reason, the 1975 decision provided that a judgmental forecast could be used instead of the extrapolation formula whenever the results obtained with the latter were considered not reasonable. As the extrapolation formula under the 1975 decision was seldom used, reference to the formula was deleted when a new decision was adopted in August 1979. Since then, earnings in the two post-shortfall years have been estimated by judgmental forecast only.

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Export Earnings Forecast

As the shortfall year always includes the latest data on export earnings, calculation of the trend value requires a forecast of export earnings during the two-year period following the end of the shortfall year. This projection is made in terms of both volume and price for major commodities and in terms of earnings only for other exports. It is based on past trends and changes from the trend likely to arise from factors within the member's control (e.g., production and trade policies) and from other factors (e.g., world market prospects). The projection of export unit values relies heavily on the forecast of commodity prices made regularly by the staff of the Fund. Volume projections are made, when relevant, within the framework of a commodity balance showing domestic production, domestic consumption, exports, and changes in stocks.

Approximately two years after the request, or a little longer when the early drawing procedure was used, the error which had been made in forecasting export earnings can be measured. The amount drawn by the member can then be compared with the amount it would have drawn in the absence of any forecasting error. Such calculations were done for 53 purchases made in 1976 and 1977.²⁷ In 37 of these, the amounts purchased would have been unchanged if the forecasts had been completely accurate; in 11 instances members were overcompensated because post-shortfall earnings had been overestimated, and in the remaining 5 cases members were undercompensated because post-shortfall earnings had been underestimated. The total amount drawn in these 53 cases was SDR 2.5 billion; it would have been SDR 2.3 billion had there been no forecasting errors.

One country accounted for more than a third of total overcompensa-

²⁷ For 11 of the requests made in the early part of 1976, the forecast value for the two post-shortfall years was not specified in the staff report. It was only stated that the forecast exceeded the minimum required to justify the purchase requested. As it happened, actual post-shortfall earnings exceeded the minimum required for 10 of these 11 requests. For 42 other requests, a comparison could be made in April 1980 between *ex ante* and *ex post* shortfalls. These were the same in 3 cases; *ex ante* shortfalls were overestimated in 18 cases and underestimated in the remaining 21 cases. The sum of the 42 *ex ante* shortfalls was 14 per cent lower than that of the *ex post* shortfalls. Excluding 2 cases in which actual exports increased by more than 60 per cent per annum, *ex post* growth rates in the two post-shortfall years averaged 19.7 per cent per annum, compared with 16.7 per cent per annum on the basis of the forecasts made at the time of request.

tion and another for almost two thirds of total undercompensation. For the first country, growth of 13.8 per cent a year had been projected for the two post-shortfall years, but actual growth was only 11.2 per cent a year. For the second country, growth of 15.4 per cent a year had been projected, but the actual growth rate was 19.9 per cent a year. As can be seen from these cases, forecasting errors that are relatively small in percentage terms may cause sizable differences in the amounts purchased.

Use of Geometric Average

The trend value used in assessing the amount of the shortfall was calculated as an arithmetic average until the adoption of the 1979 decision. The change to a geometric average was made because it was recognized that the nominal value of export earnings follows much more closely a geometric curve than an arithmetic curve. Calculating the trend as a geometric average instead of an arithmetic average hardly affects the amount of the shortfall when export earnings remain approximately constant, but it makes a substantial difference when export earnings follow a strong upward trend. This is illustrated in Table 10 by assuming that export earnings increase each year at a constant rate, taken alternatively as 0 per cent, 10 per cent, and 25 per cent. In the first example, earnings are 100 during each of the five years; whether the trend is calculated as a geometric average or as an arithmetic average, the trend value remains 100 and the amount of the shortfall is zero. In the last example, in which earnings increase by 25 per cent a year, the five-year geometric average centered on the shortfall year is, by definition, equal to the value of export earnings in that year and the shortfall is again zero. If instead the trend had been defined as a five-year arithmetic average, its value in the shortfall year would have been 105 and the amount of the shortfall would have been equivalent to 5 per cent of the value of export earnings in that year. In contrast, if export earnings had been increasing each year by a constant amount (instead of at a constant rate), the use of an arithmetic average would have shown a zero shortfall while the use of a geometric average would have shown an excess.

Whether export earnings tend to increase geometrically (i.e., at a constant rate) or arithmetically (i.e., by a constant amount) was tested with a sample of 74 countries during 22 consecutive years (1957 through

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TABLE 10. SHORTFALLS CALCULATED WITH ARITHMETIC AND GEOMETRIC AVERAGES FOR VARIOUS GROWTH RATES OF EXPORT EARNINGS

	Annual Growth Rates of Export Earnings in Per Cent		
	0	10	25
Export earnings			
Year -2	100	82.6	64
Year -1	100	90.9	80
Year 0	100	100	100
Year +1	100	110	125
Year +2	100	121	156
Arithmetic average			
Trend value	100	100.9	105
Shortfall	0	0.9	5
Geometric average			
Trend value	100	100	100
Shortfall	0	0	0

1978). The statistical fit is clearly better with a geometric trend than with an arithmetic one, especially for the more developed countries (Table 11). Moreover, shortfalls and excesses tend to offset each other with a geometric average, while the sum of shortfalls is substantially greater than the sum of excesses with an arithmetic average (Table 12). The difference is particularly striking for Korea, the country with the fastest growth of export earnings (38 per cent a year). The sum of shortfalls is 100 times greater than that of excesses when the trend value is measured as an arithmetic average, while the sum of shortfalls exceeds the sum of the excesses by only 9 per cent when it is measured as a geometric average.

The use of a geometric average facilitates the analysis of the shortfall into its volume and price components, but it complicates the analysis of the shortfall in total export earnings into its commodity components. With an arithmetic average, the shortfall in total earnings is equal to the sum of the commodity shortfalls minus the sum of the commodity excesses but this equality is not true with a geometric average. With the latter, the shortfall in the aggregate is lower than the sum of shortfalls in the components minus the sum of excesses in

TABLE 11. ARITHMETIC AND GEOMETRIC TRENDS, RELATIVE GOODNESS OF FIT FOR 74 COUNTRIES, 1957-78¹

	Arithmetic	Geometric
Best fit (highest R^2)	<i>(Number of countries)</i>	
Trust Fund countries ²	5	34
Other less developed countries	0	23
More developed countries	0	12
All countries	5	69
Average correlation coefficient	(\bar{R}^2)	
Trust Fund countries ²	0.68	0.78
Other less developed countries	0.73	0.86
More developed countries	0.79	0.92
All countries	0.71	0.83

¹ Excluding the industrial and oil exporting countries listed in footnotes 2 and 3 of Table 1.

² Countries with low per capita income eligible to borrow from the Trust Fund.

TABLE 12. AMOUNTS AND NUMBER OF SHORTFALLS AND EXCESSES CALCULATED WITH ARITHMETIC AND GEOMETRIC AVERAGES FOR 74 COUNTRIES, 1959-76¹

	Arithmetic Average		Geometric Average	
	Shortfalls	Excesses	Shortfalls	Excesses
Amounts	<i>(Per cent of export earnings²)</i>			
Trust Fund countries	5.30	3.62	4.21	4.45
Other less developed countries	5.29	2.94	3.94	3.83
More developed countries	4.12	2.15	2.87	2.95
All countries	5.10	3.17	3.91	4.01
Number of years	<i>(Per cent of total)</i>			
Trust Fund countries	57	43	52	48
Other less developed countries	60	40	55	45
More developed countries	64	36	57	43
All countries	59	41	54	46

¹ The basic data cover the 22-year period 1957-78 as in Table 11, but shortfalls and excesses cannot be calculated for either the first two years (1957 and 1958) or the last two (1977 and 1978).

² Obtained by averaging shortfalls (or excesses) over trend value of export earnings.

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the components, except when export earnings from each component increase at the same rate.²⁸

Deductions for Avoiding Double Compensation

Once the amount of the shortfall has been calculated, deductions may have to be made in order to avoid double compensation which could arise from previous drawings made under the compensatory financing facility or the buffer stock facility. Deductions may also have to be made when stocks have increased during the shortfall year.

Previous compensatory drawing.—Since members can purchase under the compensatory financing facility more than once within a 12-month period, the shortfall years associated with two consecutive compensatory purchases may overlap. It is clear that a member should not be compensated twice for the shortfall experienced during the overlapping months. This is avoided by deducting from the second shortfall the amount of the previous compensatory purchase prorated according to the number of overlapping months. For example, if there is a 3-month overlap, one fourth of the first purchase is taken as compensation already received for the second shortfall and deducted from the amount calculated for the second shortfall. This deduction does not, however, reduce the amount which a member can purchase if the shortfall thus adjusted exceeds the maximum amount which the member can purchase on account of quota limitations.

Previous buffer stock drawing.—Under the terms of the 1977 International Sugar Agreement, exporting members have to constitute a minimum amount of stocks when prices remain below an agreed level. Such members, if they are also members of the Fund, may draw under the buffer stock facility an amount corresponding to the export earnings forgone by constituting these stocks. The maximum amount of the drawing is calculated by valuing the stocks at the price prevailing on the free market at the time of their constitution, or at the floor price of the Agreement if the latter is below the market price. For

²⁸For commodities which may cease to be exported in a given year, the geometric shortfall would be meaningless. The trend value calculated as a five-year geometric average would be zero if export earnings were zero in any of the five years included in the calculation. Consequently, if exports fell to zero in a given year, there would be no shortfall in that year.

example, suppose that a member requests a drawing under the buffer stock facility in January 1980 on account of its stocking obligation for 1979, and that it simultaneously requests a drawing under the compensatory financing facility on account of a shortfall experienced in 1979. Part of the export shortfall calculated for that year would be due to constitution of the special stocks, which are not recorded as exports because they are held within the country's boundaries.

If the member is compensated for the constitution of its special stocks under the buffer stock facility, it should not be compensated a second time under the compensatory financing facility for the part of its shortfall resulting from the constitution of the special stocks. The method used for avoiding double compensation is to treat the amount drawn under the buffer stock facility as unrecorded export earnings during the 12-month period preceding the buffer stock drawing, and to allocate $\frac{1}{12}$ of the total amount drawn to each of these 12 months. Raising the value of export earnings during one of the months of the shortfall year would reduce the calculated shortfall, while raising it during one of the 24 months preceding the shortfall year or during one of the 24 months following it would increase the amount of the shortfall. When the buffer stock purchase is made in the period starting the fourth month of the shortfall year and ending at the time of the compensatory drawing, the adjustment results in a deduction from the shortfall.²⁹ This deduction would not, however, affect the amount drawn, if the deduction was less than the excess of the calculated shortfall over the maximum amount which could be drawn on account of the quota limit.

The problem of double compensation does not arise for a buffer stock drawing made in connection with internationally financed stocks, as is the case for tin. As the stocks bought by the international buffer stock manager are normally recorded as exports, they do not affect the export shortfall and no adjustment is required.

Stock accumulation.—Suppose that a country accumulates stocks in 1979 and sells them at the beginning of 1980 just before presenting a request to draw under the compensatory financing facility. Part of the

²⁹ Making an adjustment only in these cases contains an element of arbitrariness and the method used for avoiding double compensation may need to be reviewed.

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shortfall calculated for 1979 would correspond to the export earnings forgone by having accumulated stocks in that year, but the member would have already been compensated for this part of the shortfall when it sold its stocks before requesting a drawing under the compensatory financing facility. The possibility of double compensation is avoided by adding the value of the stocks accumulated in the shortfall year to the earnings recorded in that year, and by subtracting the proceeds obtained by selling the stocks in the following year from the earnings projected for that year. If prices were to be unchanged, the adjustment would be equivalent to subtracting the value of the stocks accumulated in the shortfall year from the amount of the calculated shortfall.

At the time the compensatory financing request is made, it is generally not known when the stocks will be sold or at what price they will be sold. Sometimes, even the amount of stocks accumulated in the shortfall year is not known precisely. Moreover, the member may have to hold stocks for a long time due to circumstances beyond its control. In view of these uncertainties, adjustments for stock accumulation have been confined so far to instances where it was clear that double compensation should be avoided.

Before the decision of August 1979, deductions had also to be made in connection with credit tranche drawings made prior to the drawings under the facility. The rules applied were, however, complex and somewhat arbitrary, because it was not possible to determine *ex post* the part of a previous credit tranche drawing which ought to be considered as compensation for the export shortfall on which the compensatory financing request was based. Because of these difficulties and because the application of the rules had had little effect on the amounts drawn, it was decided to make a deduction from the calculated shortfall only in connection with previous drawings made under the compensatory and buffer stock facilities as described above. The fact that credit tranche drawings were taken into account when assessing the need for the member to draw was considered as sufficient protection against possible double compensation. A similar view was taken regarding transfers received by members under STABEX, the compensatory facility administered by the European Community. STABEX transfers are taken into account only in assessing the member's need to draw on the basis of its balance of payments deficit and reserve position.

Quota Limits

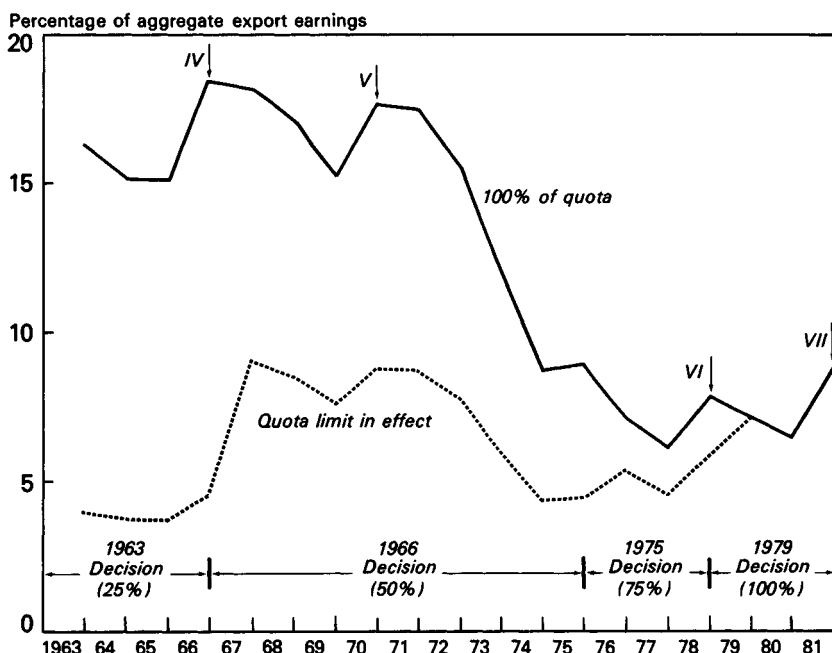
The amount a member can draw under the facility can exceed neither the calculated shortfall net of adjustments for avoiding double compensation nor 100 per cent of the member's quota in the Fund. Drawings have always been subject to quota limitations since the facility was established, but the maximum amount of outstanding drawings has been raised progressively from 25 per cent of quota under the 1963 decision to 50 per cent of quota under the 1966 decision, 75 per cent of quota under the 1975 decision, and 100 per cent of quota under the 1979 decision. The last decision also eliminated the additional constraint on drawings within a 12-month period, which were limited to 25 per cent of quota under the 1966 decision and to 50 per cent of quota under the 1975 decision.

The progressive relaxation of quota limitations has been partly offset by the erosion of Fund quotas resulting from inflation. As shown in Chart 4, the ratio of quotas to export earnings follows a cycle that rises sharply when new quotas go into effect and then falls progressively until the next quota increase. The peak, which should have coincided with the entry into effect of the sixth quota increase in 1978, is, however, hardly apparent on the chart because of the high rate of inflation in the five preceding years. From 1967 to 1972, the 50 per cent quota limit of the 1966 decision was equivalent to 8.4 per cent of export earnings for a sample of 74 countries. In 1978, the 75 per cent quota limit of the 1975 decision was equivalent to only 6 per cent of quota earnings for the same 74 countries. The 100 per cent quota limit of the 1979 decision is likely to be equivalent to less than 7 per cent of export earnings for the same group of countries in 1980. It would, however, rise in 1981 to almost 9 per cent of export earnings if Fund quotas were raised by one half in that year as envisaged under the Seventh General Review of Quotas.

Although the maximum amount of outstanding purchases was raised to 75 per cent of quota under the 1975 decision, quota limitations prevented the majority of the members which drew under that decision from being fully compensated for their shortfalls. In order to eliminate the effect of the forecasting errors made at the time of request, rates of compensation have been measured *ex post* by dividing the amount of the purchase by the amount of the shortfall calculated on the basis of actual

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CHART 4. QUOTAS AS PERCENTAGE OF EXPORT EARNINGS
FOR 74 COUNTRIES, 1963-81¹



¹ Sum of quotas divided by sum of export earnings for 74 sample countries, assuming quotas are raised by 50 per cent in 1981 and earnings increase by 10 per cent a year from their estimated value in 1979.

↓ Quota increases associated with the periodic reviews of quotas.

export earnings in the two post-shortfall years. In April 1980 post-shortfall earnings were known for 53 purchases made under the 1975 decision, and average rates of compensation were derived from the rates calculated for each purchase by combining two different measurements of the shortfall with three types of averaging (Table 13). The amount of the shortfall was measured by calculating the trend value either as an arithmetic average or as a geometric average. The overall rate of compensation was then derived in three different ways. The first is the weighted average obtained by dividing the sum of purchases by the sum of shortfalls. The second is the median obtained by ranking individual rates by increasing order and selecting the rate appearing in the middle of the list. The third is the simple average calculated as the unweighted average of individual rates.

The weighted average is substantially lower than the simple average, because the former is heavily weighted by a few countries that experienced a very large shortfall and were compensated for only a very small part of their shortfall. Thus, when two countries (Korea and Malaysia) are excluded from the calculation, the weighted average is raised from 41 per cent to 48 per cent when a geometric trend value is used. On the other hand, the simple average is heavily influenced by the rates calculated for the countries that were overcompensated; this was the reason for eliminating from the calculations compensation rates in excess of 500 per cent.

TABLE 13. AVERAGE RATES OF COMPENSATION FOR 53 PURCHASES,
1976 AND 1977¹

(In per cent)

Nature of Average	Shortfall Calculated With	
	Arithmetic average	Geometric average
Weighted average ²	32 (38)	41 (48)
Median ³	36	54
Simple average ⁴	60	68

¹ Purchases expressed as percentage of shortfalls calculated on the basis of actual earnings in the two years following the end of the shortfall year.

² Sum of drawings as a percentage of sum of shortfalls. In the figures shown between parentheses, Korea and Malaysia are excluded from the calculation.

³ Rates of compensation were listed by increasing order and the rate corresponding to the purchase in the middle of the list was selected.

⁴ Unweighted average of rates of compensation calculated for each purchase, excluding rates higher than 500 per cent.

Individual rates of compensation that are either very low or very high do not affect the value of the median which, for this reason, probably provides the best measurement. Similarly, calculating the trend as a geometric average provides a more accurate measurement of the shortfall than calculating it as an arithmetic average, since nominal export earnings tend to increase by a constant rate rather than by a constant amount each year. The median derived from individual rates calculated with a geometric average being equal to 54 per cent, it seems fair to say that, on the average, members were compensated for approximately half of their shortfalls. The fact that members were com-

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pensated for only half of their shortfalls does not mean, however, that the facility has achieved only half of what it was intended to achieve. There are two reasons for this.

First, the facility was established to provide assistance for the financing of balance of payments "deficits arising out of export shortfalls,"³⁰ and export shortfalls are not always associated with a balance of payments deficit of an equal or greater magnitude. This is because the export shortfall may be partly or fully compensated for by offsetting movements in other items of the balance of payments. For example, among the 53 purchases covered in Table 13, the two largest shortfalls were those experienced by Korea (SDR 1,119 million) and Malaysia (SDR 552 million). When these two countries presented requests under the facility (in June and August 1976, respectively), their needs to draw were considered relatively small. The need could, nevertheless, justify purchases of SDR 40 million and SDR 93 million, respectively. Both amounts were equivalent to 50 per cent of quota, but they represented only a small fraction of the calculated shortfalls. As it happened, the reserve positions of both members improved substantially soon after the purchases, and both countries experienced a balance of payments surplus in 1976. For these two countries, even in the absence of any quota limitation, the need to draw could not have justified purchases equal to the full amount of the shortfall.³¹

Second, the compensatory financing facility was established as a special means of assisting countries adversely affected by unstable commodity markets and not as a substitute for other forms of Fund credit. The 61 members that received balance of payments assistance amounting to SDR 4 billion under the facility from January 1976 to March 1980 also received balance of payments assistance amounting to

³⁰ First sentence of the compensatory financing decision, see Appendix I.

³¹ It could be argued that countries need compensatory financing assistance only when they experience substantial export shortfalls, and that assistance could be provided subject to a deductible amount defined as a given percentage of the trend value of export earnings. With a given amount of resources, if countries receive less when they had small shortfalls, they could receive more when they had large shortfalls. Simulation experiments suggest that, if a 2 per cent deductible was introduced, the quota limit could be raised from 100 per cent to 150 per cent of quota without changing significantly the total amount drawn. The possibility of introducing a deductible (1 per cent or 2 per cent) was considered by the Executive Board in 1979, but it was decided not to do so at that time.

SDR 4.8 billion under other Fund facilities during the same period.³² It would clearly be inappropriate for the Fund to extend all its financial assistance in connection with the low conditionality associated with the compensatory financing facility, as many of the countries experiencing export shortfalls have balance of payments difficulties that arise partly from inappropriate policies and cannot be solved without adjustments in these policies. Providing large amounts of assistance without financial programs might be counterproductive in this situation; it might induce the member to delay the adoption of the necessary policy adjustments and, as a result, exacerbate its financial difficulties. A proper balance has to be found between the assistance extended by the Fund under the facility with low conditionality and that extended with higher conditionality under other Fund facilities.

Conditionality and Need

The member does not have to present a financial program for making a purchase under the compensatory financing facility, but some conditions need to be satisfied. The shortfall must be temporary and largely attributable to circumstances beyond the control of the member. Moreover, the member must cooperate with the Fund and have a balance of payments need.

Shortfall of a Temporary Character

The temporary character of the shortfall is ensured, to a large extent, by defining the shortfall as the downward deviation from the five-year average centered on the shortfall year. It has been sometimes argued that such a definition may not be appropriate when the five-year average is raised either by abnormally high prices for a key export product during the two pre-shortfall years, or by the anticipation of new exports resulting, for example, from the opening of a new mine during the two post-shortfall years. If adjustments were made for abnormal events, they should be made for abnormally low earnings as well as for abnormally high earnings, and they should be made whenever the abnormal event occurs in any of the five years included in the calculation of the trend value. Such adjustments would be difficult to make

³² See Table 1.

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in a precise and objective manner, and they would have the effect of raising the size of the shortfall as often as of reducing it. Another solution for reducing the impact of abnormal events on the calculated shortfall would be to extend the length of the five-year average centered on the shortfall year to seven years or even to nine years. This possibility has been considered, but has not been adopted.

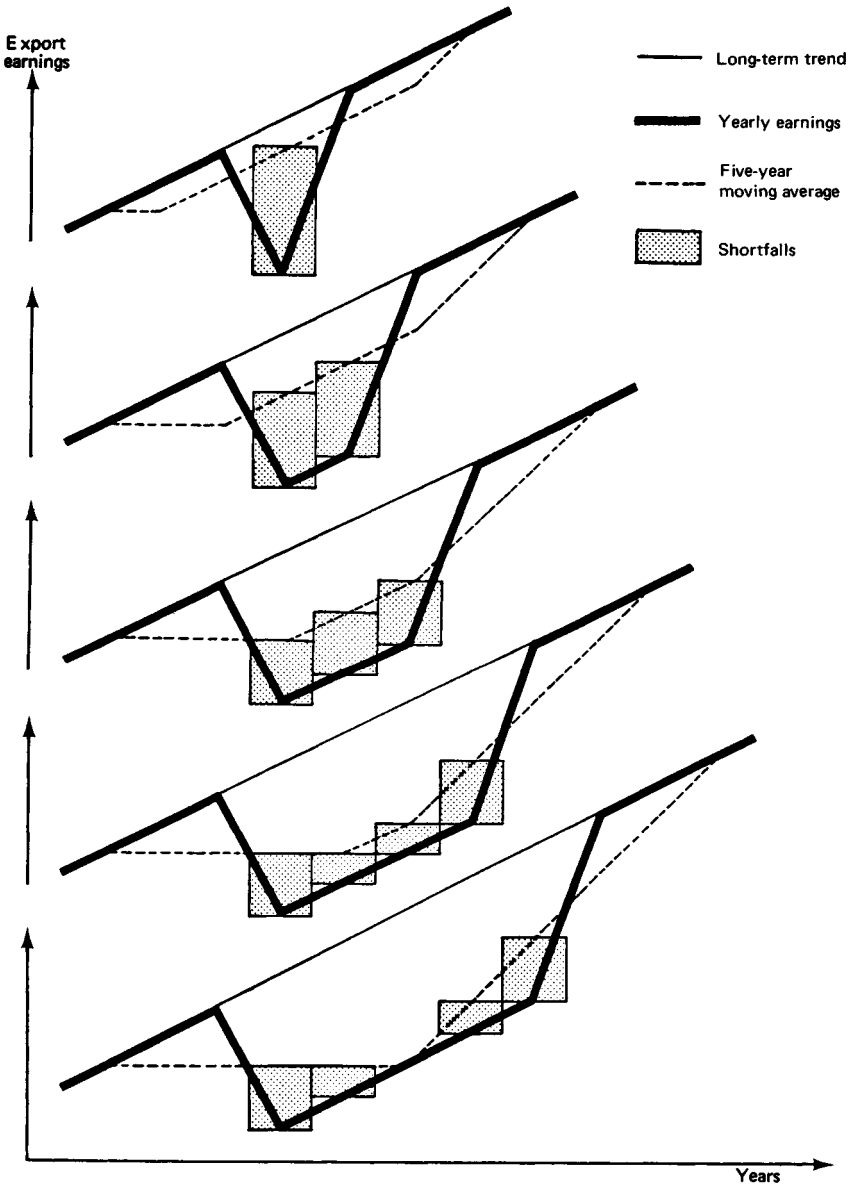
If the fall in export earnings were to last for several years, the shortfall as defined for the purpose of the facility would progressively disappear. This is illustrated in Chart 5 where export earnings increase steadily except during a shortfall period that lasts only one year in one case (top of the chart), but up to five years in another (bottom of the chart). When the shortfall lasts for a single year, its destabilizing effect on the economy of the country can be largely offset by the drawing under the facility, provided the drawing is not severely constrained by the quota limit and is made as soon as the shortfall is identified. When the shortfall lasts for two consecutive years, its destabilizing effects may still be alleviated by making use of the facility, and a number of countries have drawn on account of shortfalls encountered during two consecutive years. When the length of the export shortfall reaches five years, the compensatory financing shortfall disappears in the middle year and the facility, which has been designed to deal with shortfalls of a temporary character, would be clearly inappropriate. In the latter case, the member should apply for financial assistance from the Fund under stand-by arrangements that extend over two-year periods or extended Fund facility arrangements that cover a three-year period, and from the World Bank under structural adjustment loans. Such assistance would require the preparation of financial programs, but the very fact that the member's balance of payments difficulties are likely to last for a number of consecutive years indicates that there is a need for policy adjustment.

Shortfall Beyond Member's Control

When the shortfall in export earnings results mainly from a decline in world market prices and when the member accounts for only a small share of the world exports of the commodities concerned, it is clear that the shortfall is attributable to circumstances beyond the member's control. However, when the immediate cause of the shortfall is a decline in the volume of exports, the ultimate cause may be partly in the

CHART 5. EFFECT OF LENGTH OF SHORTFALL PERIOD ON
CALCULATED SHORTFALL

(Temporary decline from a linear long-term trend)



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policies followed by the member. Where the volume decline results from the withholding of stocks in the expectation of higher world prices or of the depreciation of an overvalued currency, the amount of the shortfall may be adjusted by taking into account the increase in the level of stocks during the shortfall year.³³ Where the member's policies have been a factor contributing to the shortfall, an attempt is made by the staff to assess the part of the shortfall which is attributable to circumstances beyond the member's control. Moreover, when the shortfall is partly attributable to inappropriate pricing policies or to unrealistic exchange rates, such policies are taken into account in assessing the adequacy of the member's cooperation with the Fund.

Cooperation with International Monetary Fund

For making any purchase under the facility, the member must represent that it "will cooperate with the Fund in an effort to find, where required, appropriate solutions for its balance of payments difficulties."³⁴ The test of cooperation is stricter when the purchase has the effect of raising outstanding purchases above 50 per cent of the member's quota, as the Fund must then be satisfied that past cooperation has been adequate. Although the extent of the cooperation required has not been codified, satisfactory performance in the context of a financial program supported by the Fund would be considered as evidence of past cooperation.

From the beginning of 1976 through March 1980, 107 purchases were made and outstanding purchases under the facility exceeded 50 per cent of quota in 37 cases (Table 14). In 11 of these, the member had no financial program supported by the Fund at the time of purchase; in 5 of the 11 cases, however, the member adopted a program supported by the use of the Fund's resources within the 12 months following the drawing under the facility. In the other 26 cases where the stricter test of cooperation had to be applied, the member had a financial program in effect at the time of the purchase and this program was supported by the Fund. This program was supported by a Trust Fund loan or a first credit tranche drawing in 14 cases, and by drawings

³³ See pp. 35-36, above.

³⁴ Decision No. 6224-(79/135), paragraph 2(b), in Appendix I.

under second or higher credit tranches or under extended facility arrangements in 12 cases.

The record clearly shows that a financial program in effect is not required for passing the stricter test of cooperation. In fact, some of the countries which passed this test had already taken appropriate measures to solve their balance of payments difficulties, even though they did not have a financial program supported by the Fund's resources. On the other hand, the fact that a member has presented a program supported by the Fund cannot always be taken as evidence of past cooperation; it is also necessary that the country's performance under

TABLE 14. PURCHASES UNDER FUND FACILITY AND TEST OF COOPERATION

Type of Compensatory Financing Purchase	Number of Purchases	Amount Purchased (<i>Million SDRs</i>)
All purchases under facility	107	4,048
Purchases under facility not raising outstanding purchases above 50 per cent of quota	70	2,488
Purchases under facility raising outstanding purchases above 50 per cent of quota ¹	37	1,560
No financial program in effect at time of facility purchase	11	546
—Nor within 12 months of facility purchase	6	280
—Program within 12 months of facility purchase	5	266
Financial program in effect at time of facility purchase	26	1,014
—Program associated with Trust Fund or first credit tranche stand-by arrangement	14	439
—Program associated with higher credit tranche stand-by or extended arrangement	12	575

¹ Including countries with outstanding drawings that were already above 50 per cent of quota at the time of drawing.

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the program has been satisfactory. For these reasons, the extent of the member's cooperation with the Fund has to be reviewed on a case-by-case basis.

Requirement of Need

Purchases under the facility, like all other Fund purchases, are subject to the requirement of need, which is assessed on the basis of the member's balance of payments or reserve position or developments in its reserves.³⁵ In making this assessment, it is necessary to look both backward and forward. As assistance is provided under the compensatory financing facility to members experiencing deficits arising from export shortfalls, it is necessary to consider the overall balance of payments position of the member during the shortfall year which generally ends several months before the request is made. It is also necessary to consider the need of the member to draw at the time the request is made. Balance of payments statistics are normally available only on a calendar-year or fiscal-year basis. The balance of payments position of the member needs, therefore, to be reviewed for two consecutive calendar (or fiscal) years, in order to cover not only the shortfall year associated with the purchase under the facility but also the period during which the request is made and a few months beyond it. For example, suppose a request were to be made in June 1980 in connection with a shortfall experienced in the 12-month period ended March 1980; the relevant balance of payments deficits would be those relating to calendar years 1979 and 1980. The balance of payments for 1979 would normally be based on actual data, while that for 1980 would be essentially based on forecasts.

The particular balance of payments deficit used for assessing need is the one financed by reserve assets and selected liabilities. A deficit of this kind, which is the most comprehensive of the several measures of imbalance that are in common use, is often termed an "overall" or "official settlements" deficit. Under this approach, an element of judgment is usually required in deciding whether certain capital flows should be regarded as contributing to the deficit or as helping to finance it. Decreases in international reserves, increases in uses of Fund credit, and the accumulation of payments arrears are always taken to be

³⁵ Article V, Section 3(b)(ii) of the Fund's Articles of Agreement.

financing items. The motivation for much official borrowing, however, is ambiguous or unknown; a loan may be contracted, for example, to bolster reserves, to finance a development project, or to achieve both of these purposes. It has not been possible, therefore, to lay down hard and fast rules about how a balance of payments deficit is to be measured in all circumstances.³⁶

The member's reserve position normally relates to its gross international reserves which, for comparative purposes, are generally expressed in terms of weeks' imports. Considering all purchases made under the facility since 1976, the reserve position was, on the average, equivalent to about ten weeks of imports. The average ratio in the three months following the purchase (excluding the amount of this purchase) was on the average one fourth below the average ratio recorded during the eight-year period 1971 through 1978. Members' reserves were, therefore, at a low point when the purchase was made under the facility, as could have been expected. These averages are, however, only mentioned for illustrative purposes. It is not possible to define a threshold below which reserves should be considered as inadequate, because the adequate level of reserves may vary considerably from country to country. On the one hand, some countries belonging to a common currency union (e.g., African countries in the French franc area) may operate with very low reserves of their own, because they have easy access to a pool of reserves within the union. On the other hand, some countries subject to wide fluctuations in their export earnings consider that their reserves are inadequate if they do not exceed the equivalent of half a year of imports.

Repurchases

In order to make a purchase under the facility, members must have simultaneously an export shortfall and a need to draw. It could be argued by analogy that members should be expected to repurchase when they have simultaneously an export excess and the ability to repay. The Fund decided, however, not to link the repurchase expectation to the existence of an export excess and to treat repurchase under the facility in the same manner as any other repurchase of the Fund's resources. The reason for not linking repurchase to export excess is a pragmatic one.

³⁶ International Monetary Fund, *Balance of Payments Manual*, 1977.

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Doing so would have required a forecast of export earnings at regular intervals (e.g., quarterly) for every country with outstanding drawings under the facility, and an agreement between the Fund and the member on such forecasts when they led to a repurchase expectation.

As in the case of repurchase under the normal credit tranches, repurchases of drawings under the facility are "made in equal quarterly installments during the period beginning three years and ending five years after the date of purchase unless the Fund approves a different schedule."³⁷ However, an expectation to repurchase earlier will normally arise on the basis of an improvement in the member's balance of payments and reserve position, as in the case of any other purchase from the Fund.

A member's balance of payments and reserve position would normally be deemed to have improved sufficiently for repurchases to be expected under Article V, Section 7(b), if the member's position is judged sufficiently strong for inclusion in the quarterly designation plan or the operational budget. During the quarter following the adoption of the plan or budget, it would be expected that the member's outstanding purchases would be reduced either by repurchases or by sales of the member's currency, the amount of the reduction being related to the level of the member's gross reserves and to changes in the level of these reserves during the previous six months.³⁸

Another instance of early repurchase may arise in connection with drawings based on partly estimated data for the shortfall year. When the underestimation of export earnings in the shortfall year results in overcompensation, the member has to repurchase the excess promptly in accordance with its representation made at the time of purchase.³⁹

Concluding Remarks

The compensatory financing facility was established in 1963 to provide additional balance of payments assistance to countries adversely affected

³⁷ Article V, Section 7(c) and Executive Board Decision No. 5703-(78/39), adopted March 22, 1978, effective April 1, 1978, in *Selected Decisions of the International Monetary Fund and Selected Documents*, Supplement to 8th issue (Washington, December 4, 1978), p. 43.

³⁸ See paragraph c of Decision No. 5704-(78/39), *Selected Decisions of the International Monetary Fund and Selected Documents*, Supplement to 8th issue (Washington, December 4, 1978), p. 42.

³⁹ See p. 28, above.

by fluctuations in their export earnings, but its role remained relatively modest until the facility was liberalized at the end of 1975. Since then, it has become an important means of balance of payments assistance: in the four years following the liberalization, yearly drawings under the facility averaged SDR 1 billion, which represents approximately 30 per cent of all Fund credits.

The amount drawn varies widely from year to year; it follows a highly cyclical pattern which reflects that of the business cycle in industrial countries. In expansion years, most commodity prices rise, few countries experience export shortfalls, and the amount drawn is small. In recession years, most commodity prices fall, many countries experience export shortfalls and balance of payments difficulties, and the amount drawn is large. Compensatory financing may, therefore, have a sizable anticyclical effect, provided assistance is timely.

In order to provide assistance to members as soon as they experience an export shortfall, the 1975 decision introduced the early drawing procedure which has been widely used since 1976. When the facility was reviewed in 1979, various ways of measuring more accurately the effect of the shortfall on the balance of payments deficit were considered (e.g., measuring exports net of their import content), but the Executive Board decided against a number of possible refinements which would have required additional data and reduced the speed of operations. In fact, the 1979 decision simplified the *modus operandi* of the facility in several respects.

The compensatory financing facility is complementary to other forms of Fund credit. It provides balance of payments assistance expeditiously to members that have been adversely affected by temporary export shortfalls largely attributable to circumstances beyond their control. When the member's balance of payments difficulties result from inappropriate policies, the member should not seek Fund assistance under the compensatory financing facility. Rather, it should draw under the Fund credit tranche policies on the basis of a program outlining the measures it intends to apply to find appropriate solutions to its balance of payments difficulties.

The facility is a means of cushioning export earning fluctuations, but it is not a substitute for price stabilization. It should, therefore, be regarded as complementary to other approaches, such as commodity agreements and international buffer stock schemes, which aim at reducing price fluctuations for selected commodities.

APPENDICES

Appendix I. Decision on Compensatory Financing of Export Fluctuations

Decision No. 6224-(79/135), adopted August 2, 1979, supersedes Decision No. 4912-(75/207), adopted December 24, 1975, as amended by Decision No. 5348-(77/33), adopted March 11, 1977. It reads as follows:

1. The financing of deficits arising out of export shortfalls, notably those of primary exporting member countries, has always been regarded as a legitimate reason for the use of Fund resources, which have been drawn on frequently for this purpose. The Fund believes that such financing helps these members to continue their efforts to adopt adequate measures toward the solution of their financial problems and to avoid the use of trade and exchange restrictions to deal with balance of payments problems, and that this enables these members to pursue their programs of economic development with greater effectiveness.

2. The Fund has reviewed its policies to determine how it could more readily assist members, particularly primary exporters, encountering payments difficulties produced by temporary export shortfalls, and has decided that such members can continue to expect that their requests for drawings will be met where the Fund is satisfied that

- (a) the shortfall is of a short-term character and is largely attributable to circumstances beyond the control of the member; and
- (b) the member will cooperate with the Fund in an effort to find, where required, appropriate solutions for its balance of payments difficulties.

3. Drawings outstanding under this Decision may amount to 100 per cent of the member's quota, provided that requests for drawings which would increase the drawings outstanding under this Decision beyond 50 per cent of the member's quota will be met only if the Fund is satisfied that the member has been co-operating with the Fund in an effort to find, where required, appropriate solutions for its balance of payments difficulties.

4. When a member makes a request under this Decision and if, in the opinion of the Fund, adequate data on receipts from travel and workers' remittances are available, the member shall specify whether the receipts shall be included or excluded in the calculation of the shortfall. The choice by a member shall continue to apply for a period of five years, except in the case of a member that makes a request under this Decision prior to January 1, 1980 and elects to exclude these services at the time of the request.

5. The existence and amount of an export shortfall for the purpose of any drawing under this Decision shall be determined with respect to the latest 12-

month period preceding the drawing request for which the Fund has sufficient statistical data, provided that a member may request a drawing in respect of a shortfall year for which not more than six months of the data on merchandise exports, and 12 months of the data on travel and workers' remittances, are estimated.

6. In order to identify more clearly what are to be regarded as export shortfalls of a short-term character, the Fund, in conjunction with the member concerned, will seek to establish reasonable estimates regarding the medium-term trend of the member's exports based partly on statistical calculation and partly on appraisal of export prospects. For the purposes of this Decision, the shortfall shall be the amount by which the member's export earnings in the shortfall year are less than the geometric average of the member's export earnings for the five-year period centered on the shortfall year. In computing the five-year geometric average, the Fund, in conjunction with the member, will use an estimate based on a judgmental forecast for the two post-shortfall years. When the Fund allows a member to draw under the proviso in paragraph 5 above, the Fund may use such methods of estimating exports during the period for which sufficient statistical data are not available as it considers reasonable.

7. A member requesting a drawing under the proviso in paragraph 5 above will be expected to represent that, if the amount drawn on the basis of estimated data exceeds the amount that could have been drawn on the basis of actual data for the full 12-month period under paragraph 6 above, the member will make a prompt repurchase in respect of the outstanding drawing, in an amount equivalent to the excess.

8. Whenever the Fund's holdings of a member's currency resulting from a drawing under this Decision are reduced by the member's repurchase or otherwise, the member's access to this facility, in accordance with its terms, will be restored *pro tanto*.

9. In order to implement the Fund's policies in connection with compensatory financing of export shortfalls, the Fund will be prepared to waive the limit on the Fund's holdings of 200 per cent of quota, where appropriate. In particular, the Fund will be prepared to waive this limit (i) where a waiver is necessary to permit compensatory drawings to be made under this Decision or (ii) to the extent that drawings in accordance with this Decision are still outstanding.

Moreover, the Fund will apply its tranche policies to drawing requests by a member as if the Fund's holdings of the member's currency were less than its actual holdings of that currency by the amount of any drawings outstanding under this Decision. When drawings are made under this Decision, the Fund will so indicate in an appropriate manner.

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TABLE 15. PURCHASES, REPURCHASES, AND OUTSTANDING BALANCES UNDER
COMPENSATORY FINANCING FACILITY, 1963-MARCH 1980

(In millions of SDRs)

	Purchases	Repurchases	Outstanding Balance (End of Period)
1963 decision			
1963	76	—	76
1964	—	—	76
1965	11	—	87
1966 decision			
1966	24	16	96
1967	198	18	261
1968	68	78	251
1969	12	37	226
1970	2	97	132
1971	69	70	132
1972	299	51	380
1973	113	34	460
1974	107	32	535
1975	239	51	722
1975 decision			
1976	2,308	317	2,713
1977	240	187	2,756
1978	578	387	2,921
1979 (Jan.-July)	279	353	2,848
1979 decision			
Aug. 1979-Mar. 1980	643	498	2,993

Source: International Monetary Fund.

TABLE 16. COMPENSATORY FINANCING PURCHASES, 1963-MARCH 1980

Country	Date of		Drawing	
	Purchase	End of shortfall	In millions of SDRs	As per cent of quota
1963 decision				
Brazil	6/63	12/62	60.0	21.4
Egypt	10/63	6/63	16.0	17.8
Sudan	6/65	12/64	11.25	25.0

TABLE 16 (continued). COMPENSATORY FINANCING PURCHASES, 1963-MARCH 1980

Country	Date of		Drawing	
	Purchase	End of shortfall	In millions of SDRs	As per cent of quota
1966 decision				
Afghanistan	6/68	11/67	4.8	16.6
Argentina	3/72	10/71	64.0	14.5
Argentina	12/75	10/75	110.0	25.0
Bangladesh	12/72	6/72	62.5	50.0
Burma	11/67	9/67	7.5	25.0
Burma	9/71	5/71	6.5	10.8
Burma	2/74	9/73	15.0	25.0
Burundi	6/70	12/69	2.5	16.7
Chile	12/71	9/71	39.5	25.0
Chile	12/72	12/72	39.5	25.0
Colombia	3/67	1/67	18.9	15.1
Colombia	4/68	12/67	1.9	1.5
Dominican Rep.	12/66	9/66	6.6	25.0
Ecuador	10/69	7/69	6.25	25.0
Egypt	3/68	11/67	23.0	15.3
Egypt	8/73	4/73	47.0	25.0
El Salvador	12/69	8/69	6.25	25.0
Ghana	11/66	8/66	17.25	25.0
Guatemala	2/68	10/67	6.25	25.0
Guinea	3/74	9/73	6.0	25.0
Guyana	3/74	9/73	5.0	25.0
Haiti	8/67	2/67	1.3	8.7
Haiti	12/67	8/67	1.0	6.7
Iceland	11/67	9/67	3.75	25.0
Iceland	11/68	9/68	3.75	25.0
India	12/67	10/67	90.0	12.0
India	2/74	6/73	62.0	6.6
Iraq	11/67	3/67	17.5	22.0
Jamaica	3/74	12/73	13.25	25.0
Jordan	11/71	8/71	4.5	19.6
Jordan	1/73	6/72	2.85	12.4
Kampuchea, Dem.	3/72	12/71	6.25	25.0
Kampuchea, Dem.	4/73	12/72	6.25	25.0
Lao People's Dem. Rep.	12/75	9/75	3.25	25.0
New Zealand	5/67	3/67	29.2	18.6
New Zealand	7/75	3/75	50.5	25.0
Peru	6/72	12/71	30.75	25.0
Philippines	5/73	12/72	38.75	25.0

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TABLE 16 (continued). COMPENSATORY FINANCING PURCHASES, 1963-MARCH 1980

Country	Date of		Drawing	
	Purchase	End of shortfall	In millions of SDRs	As per cent of quota
1966 decision (concluded)				
Sri Lanka	3/67	11/66	19.5	25.0
Sri Lanka	4/68	1/68	19.3	24.7
Sri Lanka	1/72	9/71	19.45	19.8
Sri Lanka	6/73	12/72	18.6	19.0
Sri Lanka	2/74	8/73	5.9	6.0
Sudan	3/75	10/74	18.0	25.0
Syrian Arab Rep.	9/67	6/67	9.5	25.0
Syrian Arab Rep.	1/72	9/71	12.5	25.0
Turkey	11/75	6/75	37.75	25.0
Uruguay	2/68	10/67	9.5	25.0
Uruguay	5/72	2/72	17.25	25.0
Western Samoa	11/75	10/75	0.50	25.0
Zaire	7/72	12/71	28.25	25.0
Zambia	12/71	6/71	19.0	25.0
Zambia	8/72	12/71	19.0	25.0
Zambia	11/75	6/75	19.0	25.0
1975 decision				
Argentina	3/76	12/75	110.0	25.0
Australia	7/76	2/76	332.5	50.0
Bangladesh	8/76	3/76	39.1	31.25
Barbados	1/77	12/76	3.5	26.9
Barbados	10/77	12/77	3.0	23.1
Bolivia	7/78	9/78	15.0	33.3
Cameroon	7/76	12/75	17.5	50.0
Central African Rep.	2/76	9/75	5.1	39.2
Chad	8/76	12/75	6.5	50.0
Chile	6/76	12/75	79.0	50.0
Congo	2/77	12/76	6.5	50.0
Cyprus	5/76	10/75	13.0	50.0
Cyprus	1/79	9/78	9.9	29.1
Dominican Rep.	9/76	12/76	21.5	50.0
Dominican Rep.	1/79	12/78	6.0	10.9
Egypt	6/76	12/75	94.0	50.0
Ethiopia	8/79	12/78	18.0	50.0
Fiji	7/77	12/76	6.5	50.0
Gambia, The	3/77	9/76	3.5	50.0
Gambia, The	11/78	9/78	4.5	50.0
Greece	9/76	2/76	58.0	42.0
Guinea Bissau	4/79	12/78	1.1	28.2

TABLE 16 (continued). COMPENSATORY FINANCING PURCHASES, 1963-MARCH 1980

Country	Date of		Drawing	
	Purchase	End of shortfall	In millions of SDRs	As per cent of quota
1975 decision (continued)				
Guyana	12/76	12/76	10.0	50.0
Guyana	7/78	12/77	8.75	35.0
Iceland	3/76	12/75	11.5	50.0
Israel	8/76	12/75	65.0	50.0
Israel	9/78	6/78	72.4	35.32
Ivory Coast	3/76	10/75	26.0	50.0
Jamaica	9/76	6/76	13.25	25.0
Jamaica	11/76	9/76	13.25	25.0
Jamaica	6/78	6/78	15.75	21.3
Kenya	9/76	12/75	24.0	50.0
Korea	6/76	11/75	40.0	50.0
Lao People's Dem. Rep.	6/76	12/75	3.25	25.0
Malawi	8/79	2/79	9.5	50.0
Malaysia	8/76	2/76	93.0	50.0
Mauritania	4/76	12/75	6.5	50.0
Mauritius	7/77	3/77	11.0	50.0
Mexico	11/76	6/76	185.0	50.0
Morocco	4/76	6/76	56.5	50.0
Morocco	8/78	12/77	56.0	37.3
Nepal	7/78	4/78	9.5	50.0
New Zealand	4/76	11/75	50.5	25.0
New Zealand	12/76	5/76	50.5	25.0
Nicaragua	5/79	1/79	17.0	50.0
Pakistan	7/76	12/75	90.5	38.5
Pakistan	4/77	12/76	27.0	11.5
Panama	12/76	7/76	18.0	50.0
Papua New Guinea	6/76	12/75	10.0	50.0
Peru	5/76	3/76	61.5	50.0
Peru	9/78	6/78	61.5	37.5
Philippines	4/76	12/75	77.5	50.0
Philippines	6/79	12/78	44.2	21.0
Portugal	7/76	12/75	58.5	50.0
Portugal	7/77	12/77	29.25	25.0
Romania	4/76	12/75	95.0	50.0
Romania	9/77	6/77	47.5	25.0
Romania	4/79	12/78	41.25	16.8
Senegal	11/78	12/78	21.0	50.0
Sierra Leone	3/76	12/75	7.0	28.0
Sierra Leone	9/76	7/76	5.5	22.0

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TABLE 16 (continued). COMPENSATORY FINANCING PURCHASES, 1963-MARCH 1980

Country	Date of		Drawing	
	Purchase	End of shortfall	In millions of SDRs	As per cent of quota
1975 decision (concluded)				
Solomon Islands	4/79	12/78	1.05	50.0
South Africa	11/76	8/76	160.0	50.0
Spain	2/78	7/77	98.75	25.0
Sri Lanka	11/76	6/76	15.8	16.1
Sudan	5/76	12/75	26.7	37.1
Sudan	9/78	12/78	21.3	24.2
Tanzania	4/76	10/75	21.0	50.0
Tanzania	5/79	12/78	20.25	36.8
Thailand	8/76	3/76	67.0	50.0
Thailand	7/78	9/78	68.75	38.0
Togo	8/76	9/76	7.5	50.0
Tunisia	8/77	3/77	24.0	50.0
Turkey	4/76	12/75	37.75	25.0
Turkey	5/78	3/78	74.50	37.25
Uganda	4/76	10/75	20.0	50.0
Uruguay	3/76	12/75	25.9	37.5
Viet Nam	1/77	6/76	31.0	50.0
Western Samoa	11/76	5/76	0.5	25.0
Western Samoa	2/77	11/76	0.5	25.0
Western Samoa	11/78	12/78	1.25	41.7
Yemen, People's Dem. Rep.	5/76	12/74	2.5	8.6
Yugoslavia	5/79	12/78	138.5	50.0
Zaire	3/76	12/75	56.5	50.0
Zaire	5/77	12/76	28.25	25.0
Zambia	6/76	12/75	19.0	25.0
Zambia	4/77	12/76	19.0	25.0
Zambia	5/78	3/78	48.75	34.6
1979 decision				
Burundi	11/79	6/79	9.5	41.3
Costa Rica	10/79	6/79	20.5	50.0
Dominica	12/79	12/79	0.95	50.0
Dominican Rep.	9/79	12/79	27.5	50.0
Ethiopia	12/79	6/79	18.0	50.0
Guyana	1/80	12/79	6.25	25.0
Jamaica	9/79	10/79	31.75	42.9
Kenya	10/79	3/79	69.0	100.0
Liberia	12/79	6/79	20.5	55.4
Malawi	11/79	5/79	9.5	50.0

TABLE 16 (concluded). COMPENSATORY FINANCING PURCHASES, 1963-MARCH 1980

Country	Date of		Drawing	
	Purchase	End of shortfall	In millions of SDRs	As per cent of quota
1979 decision (concluded)				
Mali	3/80	12/79	5.1	18.9
Mauritania	1/80	6/79	10.5	61.8
Nicaragua	10/79	9/79	17.0	50.0
Philippines	3/80	8/79	93.3	44.4
Sudan	11/79	12/79	36.0	40.9
Uganda	8/79	3/79	5.0	10.0
Uganda	1/80	9/79	25.0	50.0
Turkey	2/80	12/79	71.6	35.8
Yugoslavia	2/80	12/79	138.5	50.0

Source: International Monetary Fund.

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Appendix II. Illustrative Case of a Request Under Compensatory Financing Facility

The Executive Board considers requests for purchases under the compensatory financing facility on the basis of a staff report establishing the amount which can be drawn and explaining why the staff considers that the request meets the requirements specified in the decision. The statistical information contained in these reports is illustrated in Tables 17-21.

Country X derives most of its export earnings from three commodities: coffee, tea, and sugar. In February 1980 the authorities request a purchase of SDR 10 million under the facility on account of a shortfall experienced in the 12-month period ended September 30, 1979. The amount of the requested purchase is the maximum which the country can purchase under the facility, because it is the difference between the member's quota in the Fund (SDR 20 million) and the amount outstanding under the facility (SDR 10 million) at the time of request.

REQUIREMENT OF NEED

Country X's need is assessed on the basis of its balance of payments and reserve position, which are summarized in Table 17. The balance is based on actual data for calendar years 1977 and 1978, on provisional data for 1979, and on projections for 1980.

Country X's overall balance shifted from a surplus of SDR 42 million in 1977 to deficits of SDR 23 million in 1978 and SDR 38 million in 1979. Although the 1979 deficit was financed partly by a previous purchase under the facility (SDR 10 million) and an accumulation of payments arrears (SDR 4 million), official reserves declined sharply (by SDR 24 million) in 1979. At the end of the year, gross official reserves were equivalent to only seven weeks of imports. The overall deficit is expected to be lower in 1980 than in 1979, but gross reserves are not expected to rise in 1980, even if the purchase of SDR 10 million under the facility is granted. On the basis of these developments (actual and expected), the proposed purchase is compatible with Country X's balance of payments need. As the country has been cooperating with the Fund to find appropriate solutions to its balance of payments difficulties, the stricter test of cooperation is met.

SIZE OF SHORTFALL

Country X's export earnings declined by 5.9 per cent in the shortfall year⁴⁰

⁴⁰The export data shown in Tables 17 and 18 do not coincide because they relate to calendar years in one case and to years ended in September in the other.

after stagnating in the previous year, but a recovery is projected in the two post-shortfall years. On the basis of the projection made for the period October 1979 through September 1981, the amount of the shortfall is equivalent to SDR 18.4 million. Half of the SDR 10 million purchase under the facility made previously in connection with a shortfall year ended in March 1979 is considered as compensation for the shortfall experienced in the year ended September 1979, because the two shortfall years overlap by six months. Consequently, the minimum shortfall required for an SDR 10 million purchase is equal to SDR 15 million, which is lower than the estimated shortfall (SDR 18.4 million). The member may, therefore, purchase up to SDR 10 million, which raises its outstanding purchases under the facility to 100 per cent of its quota in the Fund. The shortfall is considered to be temporary in view of the expected recovery in 1980 and 1981.

TABLE 17. COUNTRY X: BALANCE OF PAYMENTS

(In millions of SDRs)

	Calendar Years			
	1977	1978	1979 ¹	1980 ²
A. Current account	-31.9	-100.2	-125.9	-112.0
Trade balance	14.4	-61.2	-61.8	-69.0
Exports	171.1	149.3	166.0	193.0
Imports	-156.7	-210.5	-227.8	-262.0
Services	-68.1	-74.9	-106.8	-95.0
Unrequited transfers	21.8	35.9	42.7	52.0
B. Capital account	74.0	77.0	87.8	100.0
C. Overall balance (A + B)	42.1	-23.2	-38.1	-12.0
D. Financing	-42.1	23.2	38.1	12.0
Accumulation of arrears	—	3.2	4.0	—
Increase in Fund credit	—	—	10.0	10.0
Reduction in net official reserves:				
Increase in liabilities	—	5.9	—	—
Reduction in assets	42.1	14.1	24.1	2.0
Memorandum item:				
Gross official international reserves	72.2	58.1	34.0	32.0
(In weekly equivalent of imports)	24.1	14.4	7.4	6.6

¹ Provisional.² Projected.

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TABLE 18. COUNTRY X: ESTIMATION OF EXPORT SHORTFALL, 1977-81

(In millions of SDRs)

	1977	1978	1979	1980-81 Geometric Average	
				Estimated ¹	Minimum ²
Total exports	150.9	154.8	145.7	187.1	177.5
Shortfall					
Estimated			18.4		
Minimum ³			15.0		
Proposed purchase			10.0		

¹ Based on projections shown in Table 19.

² Minimum level of post-shortfall earnings required for a purchase of SDR 10 million. Because the shortfall years associated with the two consecutive purchases under the facility overlap by six months, the minimum shortfall justifying a purchase of SDR 10 million is the amount of the requested purchase plus half of the previous shortfall purchase ($10 + 5 = 15$).

³ Shortfall corresponding to geometric average of SDR 177.5 million.

ANALYSIS BY COMMODITIES

More than 40 per cent of the shortfall is attributable to coffee which accounted for more than half of total export earnings in the shortfall year. Smaller shortfalls were also recorded for tea, sugar, and other exports (Table 19).

The shortfall is due entirely to a temporary price decline in the shortfall year, in particular, for coffee and sugar. The volume of exports in the shortfall year was higher than the trend value for coffee and sugar, but a little lower for tea (Table 20). Since Country X accounts for only a small share of world exports of coffee, tea, and sugar, the shortfall resulting from temporary price declines was clearly beyond the member's control.

For coffee, which is the major export crop, projections are made for production, domestic consumption, and exports, and stocks are estimated at the beginning and end of each year (Table 21). As the level of stocks did not increase during the shortfall year, no adjustment needs to be made on account of stocks.

TABLE 19. COUNTRY X: EXPORT EARNINGS AND SHORTFALLS BY MAJOR COMMODITIES, 1974-81

	1974	1975	1976	1977	1978	1979	1980	1981	Shortfalls	
									Geometric	Arithmetic
<i>(Million SDRs)</i>										
Total exports	72.4	95.2	107.0	150.9	154.8	145.7	175.0	200.0	18.4	19.6
Coffee	31.6	38.5	53.7	76.1	89.9	81.0	93.4	106.1	7.7	8.3
Tea	15.8	20.5	22.8	40.8	26.7	27.8	30.2	34.2	3.8	4.1
Sugar	2.6	12.8	11.5	16.0	12.9	14.6	21.9	25.6	3.0	3.6
Others	22.4	23.4	19.0	18.0	25.3	22.3	29.5	34.1	2.9	3.5
<i>(Annual rate of percentage change in earnings from previous year)</i>										
Total exports		31.5	12.4	41.0	2.6	−5.9	20.1	14.3		
Coffee		21.8	39.5	41.7	48.8	−9.9	15.3	13.6		
Tea		29.7	11.2	78.9	−34.6	4.1	8.6	13.2		
Sugar		392.3	−10.2	39.1	−19.4	13.2	50.0	16.9		
Others		4.5	−18.8	5.6	−24.9	−11.9	32.3	15.6		

TABLE 20. COUNTRY X: VALUE, VOLUME, AND UNIT VALUE INDICES BY MAJOR COMMODITIES, 1974-81

(1979 = 100)

	Value Share in Total Exports in 1979 (Per Cent)	Years Ending September 30								Shortfall in Per Cent of Level in Shortfall Year
		1974	1975	1976	1977	1978	1979	1980	1981	
Value	85	40	59	71	108	105	100	118	135	12.6
Coffee	56	39	48	66	94	111	100	115	131	9.5
Tea	19	57	74	82	147	96	100	109	123	13.6
Sugar	10	18	88	79	110	88	100	150	175	20.5
Volume		74	93	81	75	100	100	96	109	-4.7 (excess)
Coffee		87	102	82	63	100	100	92	109	-8.8 (excess)
Tea		67	81	92	104	99	100	105	115	4.4
Sugar		13	64	56	89	100	100	100	100	-2.3 (excess)
Unit Value		65	67	89	145	105	100	123	124	18.3
Coffee		45	47	80	150	111	100	125	120	20.0
Tea		85	91	88	141	97	100	103	107	8.6
Sugar		138	136	141	124	88	100	150	175	23.4

TABLE 21. COUNTRY X: COFFEE BALANCES, 1974-81

	Years Ending September 30							
	1974	1975	1976	1977	1978	1979	1980	1981
Stocks at beginning of period (1)	6.4	10.4	3.6	—	2.0	2.4	2.4	2.4
Production (2)	34.4	28.0	26.0	24.8	34.8	35.6	34.8	38.8
Supply (1) + (2) = (3)	40.8	38.4	29.6	24.8	36.8	38.0	37.2	41.2
Domestic consumption (4)	4.4	4.4	4.8	4.0	4.4	5.6	6.0	6.0
Exports (5)	26.0	30.4	24.8	18.8	30.0	30.0	28.8	32.8
Stocks at end of period (3) - (4) - (5) = (6)	10.4	3.6	—	2.0	2.4	2.4	2.4	2.4

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Appendix III. Statistical Analysis

The statistical analysis is presented in two sections. In the first section, export earnings are assumed to fluctuate randomly from an exponential trend and shortfalls are defined as the downward deviations from that trend. This definition is used to analyze (a) the expected value of the shortfall, (b) the value of the shortfall in terms of its volume and price components, and (c) the shortfall in total export earnings in terms of its commodity components. In the second section, shortfalls are defined as the downward deviation from a five-year average centered on the shortfall year, which is the definition used in the compensatory financing facility.

STATISTICAL MODEL

Export earnings are assumed to fluctuate randomly from an exponential trend

$$\ln X_t = a + ct + \epsilon_t, \quad (1)$$

where the error term is normally distributed

$$E(\epsilon_t) = E(\epsilon_t \epsilon_{t+\tau}) = 0 \quad \text{for } \tau \neq 0, \quad \text{and } E(\epsilon_t^2) = \sigma^2.$$

The trend value of export earnings in year t is given by

$$\ln \hat{X}_t = a + ct.$$

When random variable ϵ_t takes negative values ($\epsilon_t < 0$), export earnings fall short of the trend value (\hat{X}_t) and the amount of the shortfall ($\hat{X}_t - X$) is related to the error term (ϵ_t) by

$$\ln \frac{\hat{X}_t}{X_t} = \ln \left(\frac{\hat{X}_t - X_t}{X_t} + 1 \right) = -\epsilon_t, \quad (2)$$

which, for ϵ_t small, can be approximated by

$$\frac{\hat{X}_t - X_t}{X_t} \approx -\epsilon_t. \quad (2')$$

When random variable ϵ_t is negative and sufficiently small, its absolute value measures the amount of the shortfall divided by the value of export earnings in the shortfall year.

It should be noted that equation (1) is a simplified representation of the true world. First, coefficient c (which measures the growth rate of export earnings) does not remain constant over time. When export earnings are measured in nominal terms, the value of c is greater in periods of high inflation than in periods of low inflation. Second, error terms ϵ_t are not serially independent, and export earnings

often follow some cyclical pattern. Cycles are, however, far from regular and they are not the same for all countries. The main virtue of the model selected is its simplicity.

(a) *Expected value of shortfalls*

When random variable ϵ_t is positive, there is an excess which can be treated as a negative shortfall. Since the expected value of random variable ϵ_t is assumed to be zero, that of the algebraic shortfall is also equal to zero. The expected value of positive shortfalls is, however, positive and can be calculated in relation to its density function $f(\epsilon_t)$ as

$$-E(\epsilon_t | \epsilon_t < 0) = - \int_{-\infty}^0 \epsilon_t f(\epsilon_t) d\epsilon_t.$$

If variable ϵ_t is normally distributed with mean zero and σ^2 as variance, its density function is given by

$$f(\epsilon_t) = \frac{1}{\sigma\sqrt{2\pi}} e^{-1/2\epsilon_t^2/\sigma^2}$$

The expected value of positive shortfalls can be derived by integration as

$$-E(\epsilon_t | \epsilon_t < 0) = (2\pi)^{-1/2}\sigma, \quad \text{or} \quad (3)$$

$$E(\hat{X}_t - X_t | \hat{X}_t - X_t > 0) \approx \frac{\sigma}{\sqrt{2\pi}} X_t \text{ for } \epsilon_t \text{ small.} \quad (3')$$

The expected value of shortfalls expressed as a fraction of the level of export earnings is, therefore, approximately 40 per cent of the standard deviation of random variable ϵ_t when this variable is normally distributed.

Similarly, the expected value of excesses would be given by

$$E(\epsilon_t | \epsilon_t > 0) = (2\pi)^{-1/2}\sigma.$$

The expected value of shortfalls ($-\epsilon_t > 0$) is the same as that of excesses ($\epsilon_t > 0$), and the expected value of algebraic shortfalls is equal to zero because fluctuations are assumed to be symmetrically distributed in relation to the trend value.

Calling α_{it} the share of country i in the aggregate earnings of all the countries having access to the facility

$$\alpha_{it} = X_{it}/X_t,$$

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the expected value of the sum of the positive country shortfalls is given by⁴¹

$$E \left[\sum_i (\hat{X}_{it} - X_t) | (\hat{X}_{it} - X_{it}) > 0 \right] \approx \frac{X_t}{\sqrt{2\pi}} \sum \alpha_{it} \sigma_i.$$

The contribution of country i in the sum of the positive country shortfalls depends, therefore, on two sets of parameters. The first α_{it} is the share of country i 's earnings in the aggregate earnings of the group. The second σ_i is the index of export earnings instability, which is measured by the standard deviation of fluctuations in the normalized variable. These results are not surprising since the amount a country may be expected to draw from a compensatory financing scheme obviously depends on the size of the country and the degree of instability of its export earnings.

Since shortfalls and disbursements are proportional to the standard deviations of export earnings fluctuations, shortfalls and disbursements can conveniently be analyzed in terms of the variance of these fluctuations.

(b) Volume and price components

The value of export earnings can be decomposed into its volume and price components as

$$\begin{aligned} X_t &= Q_t \times P_t \\ (\text{Value}) &= (\text{Volume}) \quad (\text{Average export unit value}). \end{aligned} \quad (4)$$

Shortfalls in volumes and prices can be defined as downward deviations from a logarithmic trend in the same way as was the shortfall in export earnings.

Assume that the volume, price, and value equations can be written as

$$\ln Q_t = a_q + c_{qt} + \epsilon_{qt}, \quad (5)$$

$$\ln P_t = a_p + c_{pt} + \epsilon_{pt}, \quad (6)$$

$$\ln X_t = a_x + c_{xt} + \epsilon_{xt} \text{ with} \quad (7)$$

$$E(\epsilon_{qt}) = E(\epsilon_{qt}\epsilon_{qt+\tau}) = 0 \text{ for } \tau \neq 0, \text{ and } E(\epsilon_{qt}^2) = \sigma_q^2,$$

$$E(\epsilon_{pt}) = E(\epsilon_{pt}\epsilon_{pt+\tau}) = 0 \text{ for } \tau \neq 0, \text{ and } E(\epsilon_{pt}^2) = \sigma_p^2,$$

$$E(\epsilon_{xt}) = E(\epsilon_{xt}\epsilon_{xt+\tau}) = 0 \text{ for } \tau \neq 0, \text{ and } E(\epsilon_{xt}^2) = \sigma_x^2.$$

⁴¹The ordinate of the point where the upper branch of the hyperbola of Chart 2 intersects the vertical axis is $(2\pi)^{-1/2} \sum_i \alpha_i \sigma_i$.

It follows from (4) that

$$\begin{aligned}
 c_x &= c_q + c_p, \\
 \epsilon_{xt} &= \epsilon_{qt} + \epsilon_{pt}, \\
 \sigma_x^2 &= \sigma_q^2 + \sigma_p^2 + 2R_{pq}\sigma_q\sigma_p \quad \text{or} \\
 \sigma_x^2 &= (1 + 2b)\sigma_p^2 + \sigma_q^2, \tag{8}
 \end{aligned}$$

where b is the elasticity of volume fluctuations in relation to price fluctuations, and R_{pq} the correlation coefficient calculated from regression equations

$$\epsilon_{qt} = b\epsilon_{pt} + \eta_t, \quad \text{or} \tag{9}$$

$$\ln Q_t = a + b \ln P_t + ct + \eta_t, \quad \text{with} \tag{9'}$$

$$a = a_q - ba_p \quad \text{and} \quad c = c_q - bc_p.$$

For selected values of the correlation coefficient, equation (8) can be simplified as follows:

$$\begin{aligned}
 \sigma_x &= \sigma_q + \sigma_p & \text{for } R = 1, \\
 \sigma_x &= \sqrt{\sigma_q^2 + \sigma_p^2} & \text{for } R = 0, \\
 \sigma_x &= |\sigma_q - \sigma_p| & \text{for } R = -1.
 \end{aligned}$$

If volume and price fluctuations are independent, the variance of value fluctuations is the sum of the variances of volume and price fluctuations, and the relative role of each can be measured unambiguously. If volume and price fluctuations are dependent, the variance of value fluctuations exceeds that of volume fluctuations if elasticity coefficient b is greater than -0.5 . The meaning of this elasticity coefficient is, however, ambiguous. It would represent the price elasticity of demand if the demand curve was stable, while the supply curve was unstable; but it would represent the price elasticity of supply, if the supply curve was stable while the demand curve was unstable. In order to remove the ambiguity, it is necessary to specify the structural model by writing the demand and supply equations as

$$\begin{aligned}
 \ln Q_{dt} &= D(Z_{dt}) + b_d \ln P_t + e_{dt}, \\
 \ln Q_{st} &= S(Z_{st}) + b_s \ln P_t + e_{st},
 \end{aligned}$$

where b_d and b_s are, respectively, the price elasticities of demand and supply, while Z_{dt} and Z_{st} are, respectively, the exogenous factors affecting demand and

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supply. The exogenous variable affecting demand for imports Z_{dt} could be the gross domestic product or the level of industrial activity in importing countries, while the variable affecting supply Z_{st} could be the production capacity in the commodity sector concerned in exporting countries. Although the values of these variables often increase over time, their fluctuations from the time trend may be independent. In that event, the effects of the exogenous variables on demand and supply may be expressed in the form of a time trend and of independent fluctuations from this trend.⁴² The demand and supply equations may then be rewritten as

$$\ln Q_{dt} = a_d + b_d \ln P_t + c_d t + u_{dt}, \quad (10)$$

$$\ln Q_{st} = a_s + b_s \ln P_t + c_s t + u_{st}, \quad \text{with} \quad (11)$$

$$E(u_{dt}) = E(u_{dt}u_{d,t+\tau}) = 0 \quad \text{for } \tau \neq 0, E(u_{dt}^2) = \sigma_d^2,$$

$$E(u_{st}) = E(u_{st}u_{s,t+\tau}) = 0 \quad \text{for } \tau \neq 0, \text{ and } E(u_{st}^2) = \sigma_s^2,$$

$$E(u_{dt}u_{st}) = 0.$$

The demand and supply curves defined by (10) and (11) are subject to two types of shifts. The first is a uniform shift over time characterized by time-trend coefficients c_d and c_s . The second is a random shift characterized by variances σ_d^2 and σ_s^2 .

The quantity, price, and value equations (5), (6), and (7) can be rewritten in relation to the structural parameters of demand and supply equations (10) and (11) as

$$\ln Q_t = a_q + \frac{c_d b_s - c_s b_d}{b_s - b_d} t + \frac{b_s u_{dt} - b_d u_{st}}{b_s - b_d}, \quad (5')$$

$$\ln P_t = a_p + \frac{c_d - c_s}{b_s - b_d} t + \frac{u_{dt} - u_{st}}{b_s - b_d}, \quad (6')$$

$$\ln X_t = a_x + \frac{c_d(1 + b_s) - c_s(1 + b_d)}{b_s - b_d} t + \frac{(1 + b_s)u_{dt} - (1 + b_d)u_{st}}{b_s - b_d}. \quad (7')$$

Equations (5'), (6'), and (7') can be used to derive the variances of volume, price, and value fluctuations (σ_q^2 , σ_p^2 , and σ_x^2) from the variances of the fluctua-

⁴²In the most straightforward case of a demand and supply model, i.e., when the demand and supply equations (10) and (11) can be satisfactorily estimated by ordinary least squares, demand and supply fluctuations can be considered as independent $E(u_{dt}u_{st}) = 0$.

tions of the demand and supply curves (σ_d^2 and σ_s^2) and the price elasticities of demand and supply (b_d and b_s):

$$\sigma_q^2 = \frac{b_s^2 \sigma_d^2 + b_d^2 \sigma_s^2}{(-b_d + b_s)^2},$$

$$\sigma_p^2 = \frac{\sigma_d^2 + \sigma_s^2}{(-b_d + b_s)^2}.$$

$$\sigma_x^2 = \left(\frac{(1 + b_s)}{-b_d + b_s} \sigma_d \right)^2 + \left(\frac{(1 + b_d)}{-b_d + b_s} \sigma_s \right)^2.$$

Elasticity coefficient b which was calculated in (9) by regressing quantity fluctuations against price fluctuations becomes:

$$b = \frac{b_s \sigma_d^2 + b_d \sigma_s^2}{\sigma_d^2 + \sigma_s^2} = b_s \frac{\sigma_d^2}{\sigma_d^2 + \sigma_s^2} + b_d \frac{\sigma_s^2}{\sigma_d^2 + \sigma_s^2}. \quad (12)$$

Coefficient b is, therefore, the average of price elasticities of demand and supply weighted, respectively, by the variances of supply and demand. It is identical to the supply elasticity when the demand curve is stable and to the supply elasticity when the supply curve is stable:

$$b = b_d \quad \text{for } \sigma_d = 0, \quad \text{and}$$

$$b = b_s \quad \text{for } \sigma_s = 0.$$

When supply is price inelastic, which is a reasonable approximation in the short term for many commodities, volume fluctuations are identical to supply fluctuations:

$$b_s = 0 \text{ implies } \sigma_q = \sigma_s,$$

$$\sigma_p^2 = \frac{\sigma_d^2 + \sigma_s^2}{b_d^2}, \quad b = b_d \frac{\sigma_s^2}{\sigma_d^2 + \sigma_s^2}, \quad \text{and}$$

$$\sigma_x^2 = \frac{\sigma_d^2}{b_d^2} + \left(1 + \frac{1}{b_d} \right)^2 \sigma_s^2 = (1 + 2b) \sigma_p^2 + \sigma_s^2. \quad (13)$$

Equation (13), derived in the context of a world commodity model, can be rewritten in the context of country i as

$$\sigma_{xi}^2 = (1 + 2b_i) \sigma_{pi}^2 + \sigma_{si}^2 \text{ with } \sigma_{pi} \approx \sigma_p \text{ and } \sigma_{si} > \sigma. \quad (13')$$

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Fluctuations in average export unit values received by country i for a given commodity closely reflect fluctuations in spot prices recorded on a representative world market for that commodity. Consequently, it is reasonable to assume that the variance of price fluctuations at the country level and at the world level are the same ($\sigma_{pi} = \sigma_p$). In contrast, the variance of supply fluctuations is generally much higher at the country level than at the world level. This occurs because supply fluctuations in a country are generally due to factors specific to that country, and because the supply fluctuations of different countries tend to offset each other when the supplies of each country are added to a world total.

These properties are illustrated for coffee and cocoa for the period 1961 through 1977 (Table 22). For coffee, the variance of fluctuations in export unit values is almost the same at the world level as at the country level: the variance of average world export unit values is equal to 98 per cent of the one which would have been calculated from country data by assuming that fluctuations of average export unit values are perfectly correlated among countries (993 compared with 1,018). In contrast, the variance of volume fluctuations at the world level is only 36 per cent of the one which would be calculated from country data by assuming that volume fluctuations are perfectly correlated among countries (85 compared with 235). Volume fluctuations are not, however, strictly independent among countries since the variance at the world level is about twice the one which would have been calcu-

TABLE 22. VARIANCES OF WORLD EXPORT VOLUME, UNIT VALUES, AND VALUES FOR COFFEE AND COCOA

Actual Variance and Hypothetical Variances Under Two Extreme Assumptions	Variances of Fluctuations		
	Volume σ_q^2	Unit value σ_p^2	Total value σ_x^2
Coffee			
Actual	85	993	595
Assuming			
no correlation between country fluctuations ¹	42	173	99
perfect correlation between country fluctuations ²	235	1,018	716
Cocoa			
Actual	130	909	469
Assuming			
no correlation between country fluctuations ¹	65	212	135
perfect correlation between country fluctuations ²	319	988	686

¹ Calculated as $\sigma^2 = \sum_i \alpha_i^2 \sigma_i^2$ where α_i is the share of country i in world exports.

² $\sigma^2 = \sum_i \alpha_i \sigma_i$.

lated from country data by assuming no correlation between volume fluctuations among countries (85 compared with 42). For cocoa the results are similar: fluctuations in unit values are strongly correlated among countries, but volume fluctuations are not.

For most of the countries accounting for a small share of world exports, fluctuations in the volumes exported are not correlated with fluctuations in the volume of world exports and, consequently, are not correlated with the fluctuations in world prices. Volume and prices generally fluctuate independently of each other, and the price elasticity coefficient b_i generally does not differ significantly from zero. In that case, value fluctuations exceed volume fluctuations ($\sigma_x^2 = \sigma_q^2 + \sigma_p^2$), and price stabilization contributes to stabilizing export earnings.

For the country which accounts for the major share of world exports, the situation is different. Fluctuations in the volume exported by the major producers are positively correlated with fluctuations in the volume of world exports and, consequently, are negatively correlated with world prices. For the major exporters, price fluctuations are, therefore, partly offset by volume fluctuations. In Brazil for coffee and in Ghana for cocoa, price stabilization would have reduced the fluctuations of export earnings only to a limited extent and to a much more limited extent than for the minor exporting countries.⁴³

(c) *Commodity components*

Suppose a country exports only two commodities, A and B . The variance of fluctuations in total earnings (σ_{A+B}^2) can be derived from the variance in earnings from A and B (σ_A^2 and σ_B^2) as

$$\sigma_{A+B}^2 = \sigma_A^2 + \sigma_B^2 + 2R_{AB}\sigma_A\sigma_B, \quad (14)$$

where R_{AB} is the correlation coefficient between value fluctuations for commodity A and value fluctuations for commodity B .

It follows from equation (14) that the expected value of the net shortfall in total export earnings is always lower than the expected value of the sum of the commodity shortfalls, except when value fluctuations are perfectly correlated between commodities A and B :

$$\sigma_{A+B} < \sigma_A + \sigma_B \text{ for } R_{AB} < 1. \quad (14')$$

Because earnings from different commodities are never perfectly correlated, the net shortfall in earnings from all commodities (compensatory financing formula) is always smaller than the sum of commodity shortfalls (STABEX formula).

The expected value of the net shortfall remains, nevertheless, greater than the

⁴³ The effect of price stabilization on export earnings fluctuations would depend on the value of coefficient b_i . As appears from equation (13'), earnings would be stabilized for $b_i > -1/2$; they would not be affected for $b_i = -1/2$ and they could be destabilized for $b_i < -1/2$.

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shortfall in any of its components, except when the fluctuations in the earnings of the components are strongly correlated negatively:

$$\sigma_{A+B} > \sigma_A \quad \text{for} \quad R_{AB} > -\frac{\sigma_B}{2\sigma_A}. \quad (14'')$$

Because earnings derived from different commodities are seldom strongly correlated negatively, and never perfectly correlated positively ($-\sigma_A/2\sigma_B < R_{AB} < 1$), expanding the coverage of a compensatory financing scheme from A to $A + B$ generally increases the size of the expected value of the net shortfall, but the cost of the expanded scheme is less than that of establishing two independent schemes for commodities A and B

$$(\sigma_A < \sigma_{A+B} < \sigma_A + \sigma_B).$$

SHORTFALLS UNDER COMPENSATORY FINANCING FACILITY

For the purpose of the Fund facility, the trend value of export earnings in year t is measured by the five-year geometric average centered on that year. Since the shortfall year is the latest 12-month period for which export earnings are known, earnings in the two post-shortfall years have to be forecast. The trend value and the amount of the shortfall, defined as the downward deviation from that trend, are therefore calculated as:

$$\bar{X}_t = (X_{t-2}X_{t-1}X_t\hat{X}_{t+1}\hat{X}_{t+1})^{.2}, \quad (15)$$

$$SX_t = \bar{X}_t - X_t. \quad (16)$$

(Shortfall) = (Trend value) — (Current value)

The five-year geometric average given in equation (15) is identical with the trend value which would have been calculated from a semilogarithmic equation ($\ln X_t = a + bt$) adjusted by least squares for the five-year period centered on the shortfall year. Provided the same five years were used and the same logarithmic trend formula was applied, the amount of the shortfall calculated by least-squares regression would, therefore, be the same as the one calculated from equations (15) and (16).

With the extrapolation formula of the 1975 decision, earnings in the two post-shortfall years would be derived from earnings in the two pre-shortfall years by applying a three-year growth factor

$$\left(\frac{\hat{X}_{t+1}\hat{X}_{t+2}}{X_{t-2}X_{t-1}} \right)^{1/2} = (1+b)^3,$$

taken as

$$(1 + b)^3 = \left(\frac{X_t X_{t-1} X_{t-2}}{X_{t-3} X_{t-4} X_{t-5}} \right)^{1/3}.$$

The trend value given in equation (15) could, therefore, be derived from known values of export earnings by calculating post-shortfall earnings as:

$$\hat{X}_{t+1} \hat{X}_{t+2} = X_{t-2} X_{t-1} \left(\frac{X_t X_{t-1} X_{t-2}}{X_{t-3} X_{t-4} X_{t-5}} \right)^{2/3}.$$

(a) *Expected value of compensatory financing shortfalls*

If export earnings were fluctuating randomly from an exponential trend as previously assumed in equation (1), the amount of the compensatory financing shortfall could be written as

$$\ln \left(\frac{SX_t}{X_t} + 1 \right) = 0.2(\epsilon_{t-2} + \epsilon_{t-1} + \epsilon_{t+1} + \epsilon_{t+2}) - 0.8\epsilon_t = \eta_t. \quad (17)$$

More generally, when the shortfall is defined as the downward deviation from an n -year moving average, its amount η_t becomes a linear combination of n error terms $\epsilon_{t+\tau}$:

$$\eta_t = -\epsilon_t + \frac{1}{n} \sum_{\tau=(1-n)/2}^{\tau=(n-1)/2} \epsilon_{t+\tau},$$

with coefficients $(1 - n)/n$ for $\tau = 0$, and $1/n$ for $\tau \neq 0$. As all covariance terms are equal to zero, $E(\epsilon_t \epsilon_{t+\tau}) = 0$ for $\tau \neq 0$, the variance of η_t is given by:

$$E(\eta_t^2) = \left(\left(\frac{n-1}{n} \right)^2 + (n-1) \frac{1}{n^2} \right) \sigma^2 = \left(1 - \frac{1}{n} \right) \sigma^2.$$

When ϵ_t is normally distributed, η_t is also normally distributed, as it is obtained as a linear combination of $\epsilon_{t+\tau}$. The expected value of positive shortfalls can therefore be derived from equation (3) as

$$E(\eta_t | \eta_t > 0) = \sqrt{1 - \frac{1}{n}} \frac{\sigma}{\sqrt{2\pi}} = -\sqrt{1 - \frac{1}{n}} E(\epsilon_t | \epsilon_t < 0). \quad (18)$$

Approximating the trend by an n -year average has the effect of reducing the expected value of shortfalls, as the expected value of the shortfall defined in relation to the true trend is multiplied by $\sqrt{1 - 1/n}$, which can be approximated by $1 -$

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$1/2n$ when n is a large number. With a five-year average, the expected value of shortfalls is reduced by 10.6 per cent.

When a request under the compensatory financing facility is made, the values of the error terms are known for the shortfall year and the years before ($\epsilon_{t+\tau}$ known for $\tau \leq 0$) but not for the years after. With the logarithmic model given in equation (1), the shortfall would be estimated at the end of year t as

$$\ln \left(\frac{\hat{S}X_t}{X_t} + 1 \right) = \left(\frac{1}{n} \sum_{\tau=(1-n)/2}^{\tau=0} \epsilon_{t+\tau} \right) - \epsilon_t = \hat{\eta}_t, \quad \text{with}$$

$$E(\hat{\eta}_t^2) = \left(\left(\frac{n-1}{n} \right)^2 + \frac{n-1}{2} \frac{1}{n^2} \right) \sigma^2 = \left(1 - \frac{1}{n} \right) \left(1 - \frac{1}{2n} \right) \sigma^2.$$

Consequently, the expected value of shortfalls would be given by

$$E(\hat{\eta}_t | \hat{\eta}_t > 0) = \sqrt{\left(1 - \frac{1}{n} \right) \left(1 - \frac{1}{2n} \right)} \frac{\sigma}{\sqrt{2\pi}} = \sqrt{1 - \frac{1}{2n}} E(\eta_t | \eta_t > 0).$$

If the shortfall year was excluded from the calculation of the trend value, the shortfall ζ_t would become a linear combination of $\epsilon_{t+\tau}$ with coefficients -1 for $\tau = 0$ and $1/n - 1$ for $\tau \neq 0$. Consequently, the variance of ζ_t would be given by

$$E(\zeta_t^2) = \left(1 + \frac{n-1}{(n-1)^2} \right) \sigma^2 = \left(1 + \frac{1}{n-1} \right) \sigma^2$$

when $\epsilon_{t+\tau}$ are known for $\tau > 0$, and

$$E(\hat{\zeta}_t^2) = \left(1 + \frac{n-1}{2(n-1)^2} \right) \sigma^2 = \left(1 + \frac{1}{2(n-1)} \right) \sigma^2$$

when $\epsilon_{t+\tau}$ are unknown for $\tau > 0$.

Whether or not the shortfall year is included in the average, the variance of estimated shortfalls and, consequently, their expected value is reduced by taking the error terms in the post-shortfall years at their expected mean value. With a five-year moving average, shortfalls would be estimated on the average at 5 per cent below their true value.

The algebraic findings are summarized in Table 23, which also illustrates the significant estimation bias for a five-year average. Approximating the trend value by a moving average always reduces the expected value of shortfalls when the shortfall year is included in the calculation of the average, but always increases it when the shortfall year is excluded. The bias is significant when the number of years included in the average is small, but it is negligible when the number of years is large. These results may be understood intuitively by noting that a country presents

TABLE 23. EFFECT OF REPLACING LOGARITHMIC TREND VALUE BY A MOVING AVERAGE ON EXPECTED VALUE OF SHORTFALLS

Treatment of Shortfall Year in Calculation of Trend Value	Estimation of Shortfall	
	<i>Ex post</i>	<i>Ex ante</i>
	← Expected values ¹ →	
Included	$\sqrt{1 - \frac{1}{n}}$	$\sqrt{\left(1 - \frac{1}{n}\right)\left(1 - \frac{1}{2n}\right)}$
Excluded	$\sqrt{1 + \frac{1}{n-1}}$	$\sqrt{1 + \frac{1}{2(n-1)}}$
	← Approximate relative change →	
Included	$-\frac{1}{2n}$	$-\frac{3}{4n}$
Excluded	$\frac{1}{2(n-1)}$	$\frac{1}{4(n-1)}$
	← Percentage change for $n = 5$ →	
Included	-10.6	-15.2
Excluded	11.8	6.1

¹ As a ratio of the expected value of the shortfall for the case of logarithmic trend.

a request under the compensatory financing facility precisely when its export earnings are abnormally low. Including a year with abnormally low exports in the calculation of the average leads to an underestimation of the trend value and, consequently, of the amount of the shortfall. By the same token, excluding years with abnormally low exports leads to an overestimation of the trend value and, consequently, of the amount of the shortfall.

It has been assumed above that export earnings were fluctuating randomly from a logarithmic trend. Actual export data show that a logarithmic trend provides a better fit than an arithmetic one but that fluctuations from the trend are generally serially correlated for two reasons. First, the value of the trend coefficient does not generally remain constant over a long period. Second, fluctuations from the trend may follow a cyclical pattern.

As the purpose of the facility is to provide assistance to members adversely affected by temporary shortfalls in their export earnings, the amount of the shortfall has to be defined in relation to a medium-term trend. Apart from data problems and difficulties of projecting export earnings many years ahead, the use of a long-

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term trend would not be consistent with the purpose of the facility, as illustrated for Brazil for the period 1958 through 1978 (Chart 6). When the trend line is fitted by least squares over the entire 21-year period, shortfalls occur during 11 consecutive years (1962 through 1972) and in no other years. In contrast, shortfalls never occur during more than 2 consecutive years when the trend is calculated as a 5-year moving average.

(b) Volume and price components

When values are decomposed into volume and average export unit value

$$X_t = Q_t P_t, \quad (19)$$

shortfalls expressed as percentages of the shortfall year levels can be defined as

$$x_t = 100 \left(\frac{\bar{X}_t}{X_t} - 1 \right)$$

$$q_t = 100 \left(\frac{\bar{Q}_t}{Q_t} - 1 \right)$$

$$p_t = 100 \left(\frac{\bar{P}_t}{P_t} - 1 \right)$$

It follows that

$$0.01 p_t q_t = 100 \left[\frac{\bar{P}_t \bar{Q}_t}{P_t Q_t} - \frac{\bar{P}_t}{P_t} - \frac{\bar{Q}_t}{Q_t} + 1 \right], \quad \text{or}$$

$$0.01 p_t q_t = 100 \left[\left(\frac{\bar{X}_t}{X_t} - 1 \right) - \left(\frac{\bar{P}_t}{P_t} - 1 \right) - \left(\frac{\bar{Q}_t}{Q_t} - 1 \right) \right], \quad \text{or}$$

$$0.01 p_t q_t = x_t - p_t - q_t, \quad \text{or}$$

$$x_t = p_t + q_t + 0.01 p_t q_t$$

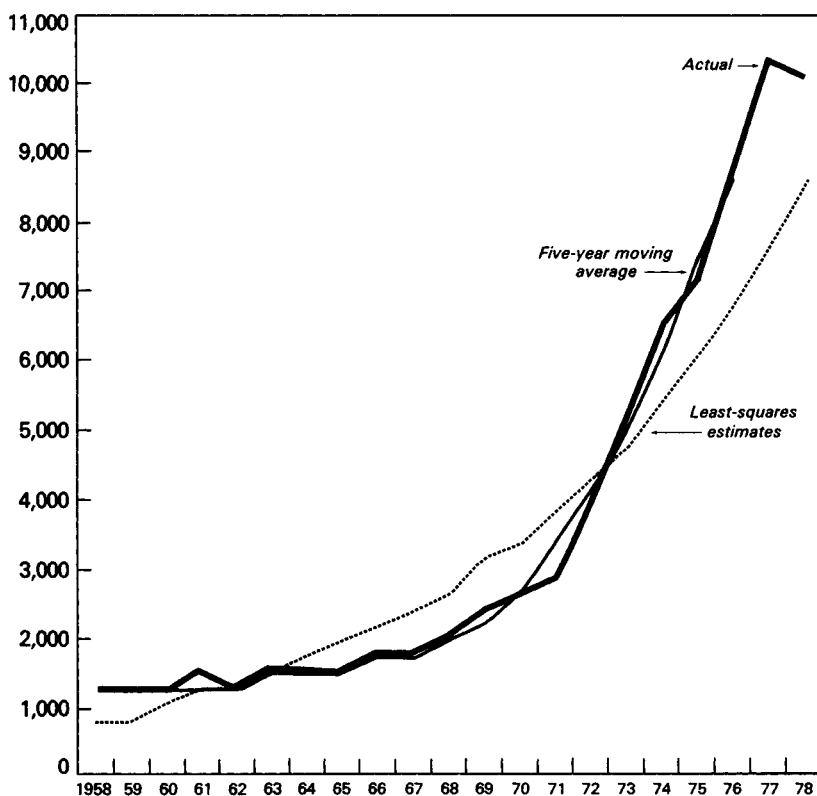
and for p_t and q_t small,

$$x_t \approx p_t + q_t.$$

(c) Commodity components

Defining the trend value as a geometric average instead of an arithmetic average helps to analyze the value shortfall in terms of its volume and price components.

CHART 6. BRAZIL'S EXPORT EARNINGS, 1958-78



However, it complicates the analysis of the shortfall in total export earnings into its commodity components. With an arithmetic average, the net shortfall in total export earnings is the sum of the commodity shortfalls minus the sum of the commodity excesses. With a geometric average, the shortfall in total export earnings is less than the algebraic sum of the commodity shortfalls unless the growth rate of earnings is the same for all commodities. If earnings from different commodities increase exponentially at different rates constant through time, total export earnings will rise at an increasing rate, since the growth rate of total earnings will rise asymptotically toward the highest of the growth rates. Consequently, a shortfall will be calculated for total export earnings, although no shortfalls will be calculated for any of the commodity components.

(d) Calculations in real terms

For the purpose of the Fund facility, shortfalls are calculated in relation to the nominal value of export earnings measured in SDRs. It has often been proposed

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that the calculations be conducted in relation to the real value of export earnings. Real earnings (RX_t) would be calculated by dividing nominal earnings (X_t) by an index of the purchasing power of exports (I_t) taken as unity in the shortfall year so that

$$RX_{t+\tau} = \frac{I_t}{I_{t+\tau}} X_{t+\tau} \text{ with } \tau = -2, -1, 0, 1, 2. \quad (20)$$

The trend value of real export earnings would then be calculated as

$$RX_t = (RX_{t-2}RX_{t-1}RX_tRX_{t+1}RX_{t+2})^{-2}.$$

Replacing $RX_{t+\tau}$ by its value from (20), and calling \bar{X}_t and \bar{I}_t the trend values of the nominal earnings and of the price index

$$\bar{X}_t = (X_{t-2}X_{t-1}X_tX_{t+1}X_{t+2})^{-2},$$

$$\bar{I}_t = (I_{t-2}I_{t-1}I_tI_{t+1}I_{t+2})^{-2},$$

the trend value of real export earnings becomes

$$\overline{RX}_t = \bar{X}_t \frac{I_t}{\bar{I}_t}.$$

As the price index is taken as unity in the shortfall year, nominal and real export earnings have the same value in that year ($X_t = RX_t$). The difference between nominal and real shortfalls is, therefore, identical with the difference between nominal and real trend values:

$$SX_t - SRX_t = \bar{X}_t - \overline{RX}_t = \bar{X}_t \frac{\bar{I}_t - I_t}{\bar{I}_t}, \quad \text{or}$$

$$\frac{SX_t - SRX_t}{\bar{X}_t} = \frac{\bar{I}_t - I_t}{\bar{I}_t}. \quad (21)$$

Equation (21) shows that the amount of the shortfall is raised by conducting calculations in real terms ($SRX_t > SX_t$) when the price index in the shortfall year is above its trend value ($I_t > \bar{I}_t$), but reduced when the price index is below its trend value. In other words, the amount of the shortfall is raised (reduced) by using real terms when the price level is abnormally high (low) in the shortfall year.

Call i_- the average rate of inflation from the two pre-shortfall years to the shortfall year and i_+ the rate from the shortfall year to the two post-shortfall years

$$(1 + i_-)^{3/2} = \frac{I_t}{(I_{t-2}I_{t-1})^{1/2}},$$

$$(1 + i_+)^{3/2} = \frac{(I_{t+1}I_{t+2})^{1/2}}{I_t}$$

Equation (21) can be rewritten

$$\frac{SX_t - SRX_t}{\bar{X}_t} = 1 - \left(\frac{1 + i_-}{1 + i_+} \right)^{.6}. \quad (21')$$

Conducting calculations in real terms raises the amount of the shortfall ($SRX_t > SX_t$) if the rate of inflation falls after the end of the shortfall year ($i_+ < i_-$), but reduces it if the rate of inflation increases after the end of the shortfall year ($i_+ > i_-$). Periods of higher and lower inflation alternate and, for many consecutive years, the average shortfalls calculated in nominal and real terms are about the same.

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Appendix IV. STABEX

The compensatory financing scheme (STABEX) administered by the European Community was established under the 1975 Lomé Convention for a five-year period (1975 through 1979) and has been extended for another five years (1980–84) under the 1979 Lomé Convention. The first section of this annex describes the differences between STABEX and the Fund's compensatory financing facility, while the second section describes the changes in STABEX resulting from the 1979 Lomé Convention.

DIFFERENCE BETWEEN STABEX AND FUND FACILITY

Although STABEX and the Fund's facility both provide compensatory financing assistance to countries adversely affected by fluctuations in their export earnings, the two schemes differ substantially in scope, objectives, and modes of operation.

(1) STABEX covers only the earnings derived from the exports of specified commodities to the European Community and it is open to the 59 countries of the African, Caribbean, and the Pacific regions (the ACP countries)⁴⁴ that signed the 1975 Lomé Convention or have acceded to it since 1975, while the Fund facility covers earnings from all merchandise exports to all destinations and is open to a wider group of countries.

(2) The amount transferred to a country under STABEX is the sum of the shortfalls calculated for each of the commodities covered in the scheme, while the amount drawn under the Fund facility cannot exceed the net shortfall in earnings from all merchandise exports. STABEX aims mainly at bringing relief to the sector where the shortfall occurred, while the purpose of the Fund facility is to provide assistance to members with an overall balance of payments deficit arising from the export shortfall.

(3) STABEX shortfalls can relate only to calendar years, while Fund facility shortfalls can relate to any period of 12 consecutive months. The amount of the shortfall is defined in both schemes as the downward deviation from the trend value calculated in nominal terms, but this value is calculated as the average of export earnings in the four years preceding the shortfall year for the purpose of STABEX, while it is calculated as the five-year average centered on the shortfall year for the purpose of the Fund facility. On the one hand, the calculation of the Fund facility shortfall requires a forecast of export earnings two years ahead, but this forecast would eliminate the effects of inflation on the amount of the calculated shortfall if the rate of inflation remained constant. On the other hand, the calculation of the STABEX shortfall does not require any forecast, but the amount of the shortfall calculated in nominal terms would be always lower than the one calculated in real terms if the rate of inflation was positive.

(4) A member can draw under the Fund facility only if it has a balance of

⁴⁴A similar scheme is open to 18 "overseas countries and territories."

payments need and if it cooperates with the Fund to find solutions to its balance of payments difficulties. In contrast, STABEX transfers are not subject to any balance of payments test.

(5) Under STABEX, there is a limit on the amount that can be transferred to all member countries over a five-year period, but there is no limit applicable to individual countries. Under the Fund facility, the total amount which can be drawn by all members is not subject to an overall limit, but no member can draw more than 100 per cent of its quota in the Fund.

(6) Drawings under the Fund facility are not subject to any thresholds, while STABEX transfers are subject to two types of threshold. First, the commodity must be of sufficient importance to the country applying for a transfer; it must account for at least 2 per cent of the country's total export earnings in the least developed, landlocked, and island countries, and 6.5 per cent of it in other ACP countries. Second, the commodity shortfall must be sufficiently large; it must exceed 2 per cent of the trend value in the least developed, landlocked, and island countries, and 6.5 per cent of it in other countries.⁴⁵

(7) Financial assistance is provided with easier terms under STABEX than under the Fund facility. For STABEX, transfers are in the form of grants to the 36 of the 59 ACP states that are classified as least developed countries, and in the form of interest-free loans to the remaining 23 states in this group. Under the Fund facility, rates of charges on purchases are the same as for credit tranche purchases, and they are uniform for all members.

The many differences between STABEX and the Fund facility explain why 12 countries having received SDR 79 million under STABEX did not receive anything under the Fund facility from January 1976 to March 1980, while 8 other countries that are members of the Lomé Convention received SDR 268 million under the Fund facility but nothing under STABEX (Table 24). During the same period, 21 other countries received assistance under both facilities: SDR 226 million under STABEX and SDR 364 million under the Fund facility. Of these 21 countries, assistance was received by 7 for shortfalls in years which did not overlap, by 8 for shortfalls in years which partly overlapped, and by the remaining 6 for shortfalls in the same year. On the one hand, the amounts transferred under STABEX could not be reduced on account of drawings under the Fund facility. On the other, a deduction could have been made from the shortfalls calculated for drawing under the Fund facility. This possibility was considered, but the Fund's Executive Board decided that it would be sufficient to

⁴⁵Consider a country for which the 6.5 per cent threshold is applicable and suppose that, for a commodity covered by STABEX, the value of exports of that country to the European Community averages 100 in the period 1976 through 1979. If the value of exports exceeded 93.5 in 1980, the country would not be eligible for a transfer. The country could, however, be compensated for the full amount of its shortfall if the value of its exports fell below 93.5 in 1980; for example, if it fell to 93, the country could receive 7. The threshold values quoted above are those applicable under the 1979 Lomé Convention.

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TABLE 24. STABEX TRANSFERS AND PURCHASES UNDER FUND FACILITY BY COUNTRIES ELIGIBLE UNDER STABEX, JANUARY 1976-MARCH 1980

Nature of Assistance	Countries Having Received Assistance Under			Total
	STABEX only	STABEX and Fund facility	Fund facility only	
	<i>(Number of countries)</i>			
STABEX	12	21	—	33
<i>Grants</i>	8	15	—	23
<i>Loans</i>	4	6	—	10
Fund facility	—	21	8	29
	<i>(Million SDRs)</i>			
STABEX	79	226	—	305
<i>Grants</i>	66	140	—	206
<i>Loans</i>	13	86	—	99
Fund facility	—	364	268	632

take into account the amounts of the STABEX transfers in assessing the need for the member to draw under the Fund facility.

For the years 1975 through 1978, 62 per cent of STABEX transfers were in grants and the remaining 38 per cent in interest-free loans. The bulk of transfers (84 per cent) was for groundnuts, iron ore, wood, and cotton, although earnings from these four commodities hardly exceeded one fourth of total earnings for all STABEX commodities (Table 24). In contrast, only 5 per cent of the transfers were for coffee and cocoa, although earnings from these two commodities exceeded 60 per cent of earnings from all STABEX commodities. Transfers for coffee and cocoa were relatively small because the prices of these two commodities remained high during most of the period.⁴⁶

CHANGES IN LOMÉ CONVENTION

The spirit of STABEX was not modified by the 1979 Convention, but the scheme was amended in several ways and new arrangements were made for minerals.

⁴⁶Transfers on account of coffee were equivalent to 17 per cent of all transfers made for 1975, but no transfer was made on account of coffee in 1976 and 1977 because of the sharp price increase which occurred in those two years. Similarly, because of the high cocoa prices, no transfer was made on account of cocoa, except to Western Samoa where the volume of exports fell sharply.

TABLE 25. SHARES OF STABEX COMMODITIES IN EXPORT EARNINGS
AND TOTAL TRANSFERS OF AFRICAN, CARIBBEAN, AND PACIFIC
COUNTRIES, 1977-79

(In per cent)

Commodities Covered by First and Second Lomé Conventions	Share of STABEX Commodities in Relation to	
	1977-78 Exports ¹	1975-79 Transfers
Lomé I		
Coffee	33.7	4.6
Cocoa	28.5	0.5
<i>Beans</i>	23.7	0.3
<i>Butter</i>	2.5	—
<i>Paste</i>	2.3	0.2
Wood	9.3	12.1
Iron ore	6.9	18.2
Groundnuts	6.2	37.6
<i>Oil</i>	3.2	20.3
<i>Seeds</i>	1.7	12.0
<i>Cake</i>	1.3	5.3
Tea	3.6	1.7
Cotton	3.5	10.4
Bananas	2.3	0.8
Palm products	1.8	1.5
<i>Oil</i>	1.1	0.7
<i>Oilseeds</i>	0.7	0.8
Hides	1.2	2.7
Other	3.0	9.9
Subtotal	160.0	100.0
Lomé II		
Rubber	1.2	
Other commodities (11)	1.8	
Total	103.0	

¹ Aggregate earnings of ACP countries from exports of STABEX commodities to the European Community.

STABEX resources were raised from 400 million European units of account (EUA) for the period 1975 through 1979 to EUA 559 million for the period 1980 through 1984.⁴⁷ The number of commodities covered by STABEX was raised by one fourth, but this had the effect of raising the aggregate value of the exports covered by only 3 per cent (Table 25). The coverage was also expanded by

⁴⁷ The allocation for the first period amounted to EUA 400 million, consisting of EUA 375 million for the original ACP states; EUA 5 million for three states having acceded

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allowing members, subject to approval by the Council of ACP/EEC Ministers, to add their exports to other ACP countries to their exports to the European Economic Community.

Both the dependence and fluctuation thresholds were eased; they were reduced from 2.5 per cent to 2 per cent for least developed, landlocked, and island countries, and from 7.5 per cent to 6.5 per cent for other ACP countries. The dependency threshold was further eased by allowing members to treat some related commodities (i.e., groundnuts and groundnut products) as a single export item.⁴⁸

A new facility has been established to assist countries largely dependent on mineral exports and facing serious and temporary disruptions which are beyond the control of the ACP member. For this purpose, EUA 280 million has been earmarked for a five-year period. Assistance is to be extended in the form of project or program loans designed to restore production and export capacity.

The commodities covered are copper/cobalt, phosphate, bauxite/alumina, manganese, tin, and iron ore.⁴⁹ The commodity concerned should account for a substantial share of the country's total export earnings,⁵⁰ and the fall in production or export capacity should be substantial (more than 10 per cent). The amount of the loan is to be determined by the Commission on a case-by-case basis. Loans are to be repaid in 40 years with a 10-year grace period and the interest rate is to be 1 per cent a year.

to the Lomé Convention; and EUA 20 million for overseas countries and territories. The allocation for the second period consists of EUA 550 million for ACP states and EUA 9 million for overseas countries and territories.

⁴⁸Consider a country for which the 6.5 per cent threshold is applicable. Suppose that the country exports groundnuts in the form of seeds, oil, and cakes, and suppose that each of the three products accounts for 3 per cent of the country's total export earnings. Under the 1975 Convention, the country could not have received any compensation for its exports of groundnuts and groundnut products. Under the 1979 Convention, the country could satisfy the dependency threshold by treating groundnuts and groundnut products as a group instead of as separate commodities. The amount of the transfer would then be calculated as the net shortfall for the group and not as the sum of gross shortfalls for each commodity component. For 22 of the 44 STABEX commodities, eight groups have been defined; for each group, the member may opt for the group treatment or for the commodity treatment.

⁴⁹Insofar as these are not covered by STABEX.

⁵⁰As a general rule, this share should have exceeded 15 per cent during the four preceding years. For least developed countries, the minimum share is reduced to 10 per cent.

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