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WIDER WORKING PAPERS

Commodity Instability and Developing Countries: The Debate

Alfred Maizels

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of the United Nations University*

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COUNTRIES: THE DEBATE**

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CONTENTS

	Page
1. The 'harmful effects' of commodity price stabilization	3
2. Market intervention as 'unnecessary'	7
Fig.1	11
Table 1	13
3. Market intervention as a less effective mechanism than compensatory financing	15
4. Market intervention as a mechanism for misallocation of resources	21
5. Market intervention as a mechanism for raising prices	35
A brief overview	43

COMMODITY INSTABILITY AND DEVELOPING
COUNTRIES:THE DEBATE

The significance of commodity price instability for the economic development of commodity-exporting countries has been perhaps the dominant theme in the postwar literature on the "commodity problem". One of the contending postwar views of the significance of excessive commodity price fluctuations on the economies of producing countries can be traced back to Keynes. In a now famous memorandum, written in 1942, Keynes argued that commodity price fluctuations led to unnecessary waste of resources and, by resulting in fluctuations in export earnings, had a detrimental effect on investment in new productive capacity and perpetuated a cycle in commodity output and thus in commodity prices. His solution to the problem was to propose the establishment of a series of international buffer stocks for the main primary commodities entering international trade, with finance to be provided by his proposed Clearing Union (which later came into existence, in modified form, as the International Monetary Fund), and with a General Council to oversee and guide the operations of the individual buffer stocks.¹

Keynes' analysis of the problem of excessive instability in commodity prices was not, however, accepted by the postwar school of neoclassical economists, who argued that intervention by governments in the working of commodity

¹ J.M. Keynes, 'The International Control of Raw Materials', Journal of International Economics, No.4, 1974 (U.K. Treasury Memorandum of 1942).

markets was not in the interests of producing countries or of the world economy in general. Several distinct arguments have been advanced by neoclassical economists to support the view that market intervention would be harmful to the economies of commodity-exporting developing countries or to world economic growth, or that such intervention is unnecessary since its objective of reducing fluctuations in export earnings could be achieved more efficiently by other means. The purpose of this Working Paper is to show that these arguments, which underlie the perceptions of the 'commodity problem' of developed country negotiators, are based on untenable assumptions or are otherwise invalid or of limited applicability.

1. The 'harmful effects' of commodity price stabilisation'

One argument, which has had wide influence in the academic literature on this subject, as well as among policy-makers, was first elaborated by Massell², building on earlier analyses by Waugh³ and Oi⁴. This argument, which was later extended by many others, including Hueth and Schmitz⁵, Brook, Grilli and Waelbroeck⁶ and McNicol⁷, was derived from a simple comparative static model of a commodity market based on a number of assumptions, viz. linear demand and supply functions; instantaneous reactions of demand and supply to price changes; parallel shifts in the demand and supply curves over two successive periods (equivalent to assuming additive stochastic disturbances); and price stabilisation at the mean of the prices in the two periods that would have obtained in the absence of price stabilisation. On these assumptions, the following conclusions were reached regarding the operation of a price-stabilising buffer stock:

² B.F. Massell, 'Price Stabilization and Welfare', Quarterly Journal of Economics, Vol.83, 1969.

³ F.V. Waugh, 'Does the Consumer Benefit from Price Instability?', Quarterly Journal of Economics, Vol.58, 1944.

⁴ W.Y.Oi, 'The Desirability of Price Instability under Perfect Competition', Econometrica, Vol.58, 1944.

⁵ D. Hueth and A. Schmitz, 'International Trade in Intermediate and Final Goods; Some Welfare Implications of Destabilized Prices', Quarterly Journal of Economics, Vol.86, 1972.

⁶ E.M. Brook, E.R. Grilli and J. Waelbroeck, Commodity Price Stabilization and the Developing World, Bank Staff Working Paper No.262, Washington, D.C., World Bank, 1977.

⁷ D.L. McNicol, Commodity Agreements and Price Stabilization, Lexington, Mass., Lexington Books, 1978.

(i) where the price fluctuation was due only to changes on the supply side, price stabilisation would result in a destabilisation of export revenues, provided that either demand or supply was price-inelastic (which can be taken as the normal case); and

(ii) where the price fluctuation was due only to changes on the demand side, the revenue fluctuation would be reduced, but only at the expense of a decline in total revenue over the two periods.

These results were often brought forward to throw doubt on the usefulness of international negotiations to establish International Commodity Agreements (ICAs) in general or, more particularly, ICAs for commodities where price fluctuations are normally the result of variations in supply (as for most agricultural products). The study by Brook, Grilli and Waelbroeck, *op. cit.*, even went so far as to identify the specific commodities (only four in number) for which price stabilisation would bring a clear benefit to developing countries

However, the analysis on which these results were based suffered from two major flaws, each of which is sufficient to invalidate all the strong conclusions that were drawn. The first flaw was the assumption that a buffer stock would maintain a fixed price. This was indeed a curious assumption, since the imposition of a fixed price has never been considered in the entire history of postwar international

commodity negotiations. Where ICAs contain provisions for market intervention for price regulation they always specify a price range to be defended by one or more mechanisms, including a buffer stock in certain cases. The use of a price range is indeed an essential element of any stabilisation exercise in order to allow sufficient flexibility to the operation of a buffer stock or other mechanism in the light of changes in market conditions, in exchange rates or in other relevant factors.

The distinction between a fixed price and a price range is important in the present context, since the relationship between price and revenue stabilisation differs significantly in the two cases. As Nguyen⁸ has conclusively shown, even assuming linear demand and supply functions, a buffer stock which maintains prices within an agreed (and market-related) range can stabilise export earnings even when price fluctuations are predominantly supply-induced, provided that demand is price inelastic.⁹ Since demand is, in fact, generally inelastic for the majority of commodities exported by developing countries, stabilisation of prices within a suitable range will not lead to a destabilisation of earnings. Nguyen (op. cit.) also shows that price stabilisation within a range has no effect on the long-term level of export earnings.

⁸ D.T. Nguyen, 'The Effects of Partial Price Stabilization on Export Earnings Instability and Level; Implications for the North-South Negotiations', in Sengupta (ed.), Commodities, Finance and Trade, London, Frances Pinter, 1980.

⁹ Substantially similar results were also arrived at by the present author (see Maizels, 'Commodity Market Stabilization and the Exports of Developing Countries', Working Paper, UNCTAD, Geneva, March 1978).

The second major flaw in the argument of Massell and his followers is that the assumptions underlying his model are not relevant to actual (or "real world") commodity markets. In particular, the assumption of linear supply and demand functions with instantaneous reactions to price changes needs to be relaxed to allow for time lags of varying length, and for dynamic effects such as the influence on demand of a reduction in the amplitude of price fluctuations for natural raw materials competing with relatively stable-priced synthetic substitutes. On a more technical level, it has been demonstrated that, even assuming that a buffer stock stabilised prices completely (rather than defending a price range), if the random disturbances in the system are multiplicative, rather than additive as in Massell's analysis, then no strong conclusions either way can be drawn, since distribution of the benefits of stabilisation between exporters and importers does not depend on the source of price instability, as it does when demand and supply curves are assumed to be linear (Turnovsky¹⁰).

Thus, the Massell-type analysis is now generally discredited, though the argument that price stabilisation is likely to destabilise export revenues for commodities with large supply fluctuations is still raised on various occasions.

¹⁰ S.J. Turnovsky, 'The Distribution of Welfare Gains from Price Stabilization: A Survey of Some Theoretical Issues', in F.G. Adams and S.A. Klein (eds.), Stabilizing World Commodity Markets, Lexington, Mass., Lexington Books, 1978.

2. Market intervention as 'unnecessary'.

A further argument against the use of intervention in international commodity markets to reduce excessive price fluctuations, which has also been influential, particularly with policy-makers of developed countries, is that such intervention is unnecessary, if the aim is to smooth the movement over time in the foreign exchange availabilities of commodity-exporting countries.

This argument rests on the cyclical character of commodity price movements, a price boom being succeeded by a price slump which, in turn, is followed by another price boom. It is thus conceivable, at least in principle, that a commodity-exporting country could accumulate monetary reserves in the price boom, which it could use later to offset the decline in export earnings in the succeeding price slump. Harry Johnson was an early proponent of this argument.¹¹ He suggested that the difficulties that 'fluctuations in export prices (and) earnings impose on governments of countries dependent on primary product exports attempting to plan their economic development and manage their domestic economies' could be avoided if 'domestic and investment policies [were based] on the normal or trend values of export prices or earnings, offsetting fluctuations around these values by alternating accumulations and decumulations of international

¹¹ H.G. Johnson, Economic Policies Towards Less Developed Countries, London, Allen and Unwin, 1967.

reserves', a process which, Johnson claimed, would be 'costless' (op. cit., pp.141-2).

A closely related argument has recently been advanced by Behrman¹², who defines 'instability' as fluctuations around a trend calculated over a complete price (or earnings) cycle. On this definition, it follows that a given price (or earnings) upswing must necessarily be balanced by an equivalent downswing around the trend. Once again, the implication is that commodity-exporting countries can, given appropriate domestic policies, accumulate sufficient monetary reserves during a commodity price boom to enable them to offset revenue losses during the succeeding price slump.

There are, however, a number of serious limitations to this argument, the most important being that it implicitly assumes a non-inflationary world economy. Since developing countries are normally in deficit in their foreign trade,¹³ a general rise in prices that occurs concurrently with a commodity price boom will worsen their trade deficits, unless the improvement in their terms of trade more than offsets the increased cost of imports resulting from the effect of inflation.¹⁴ A deterioration in the trade balance resulting

¹² J.R. Behrman, 'Commodity Price Instability and Economic Goal Attainment in Developing Countries', World Development, Vol.15, No.5, May 1987.

¹³ The large trade surpluses which emerged in the 1980s for many heavily-indebted developing countries, particularly in Latin America, can hardly be considered a normal feature for developing countries.

¹⁴ The change in the terms of trade necessary to improve the trade balance when import prices are rising is given by the expression:

$$(P_x - 1) / (P_m - 1) > V_m / V_x$$

from inflation in the world economy is thus likely to constrain the accumulation of monetary reserves during a commodity price boom.

This is exactly what happened during the commodity price boom of the 1970s. As Fig.1 shows, non-oil commodity prices, in terms of current United States dollars, rose sharply in 1973 and 1974 and, apart from short-lived recessions in 1975 and 1978, continued their upward trend until 1980 (line A in Fig.1). However, when commodity prices are expressed in terms of the prices of manufactured goods exported by developed countries - an indicator generally used to measure the changes in the terms of trade of commodity-exporting developing countries - the upward trend disappears (line B). If, alternatively, the terms of trade are defined as the relative movement in the unit values of exports and imports of commodity-exporting developing countries, then there is very little "commodity price boom" left (line C). This reflects very largely the impact of the rise in import prices of both manufactured goods (resulting from the inflationary trend in developed countries during the 1970s), and of petroleum (resulting from OPEC actions).¹⁵

where V_m and V_x denote the value of imports and of exports, respectively, in the base year, and P_m and P_x are base-weighted indices of import and export prices. Alternatively, for current-weighted price indices P'_m and P'_x , the corresponding requirement is:

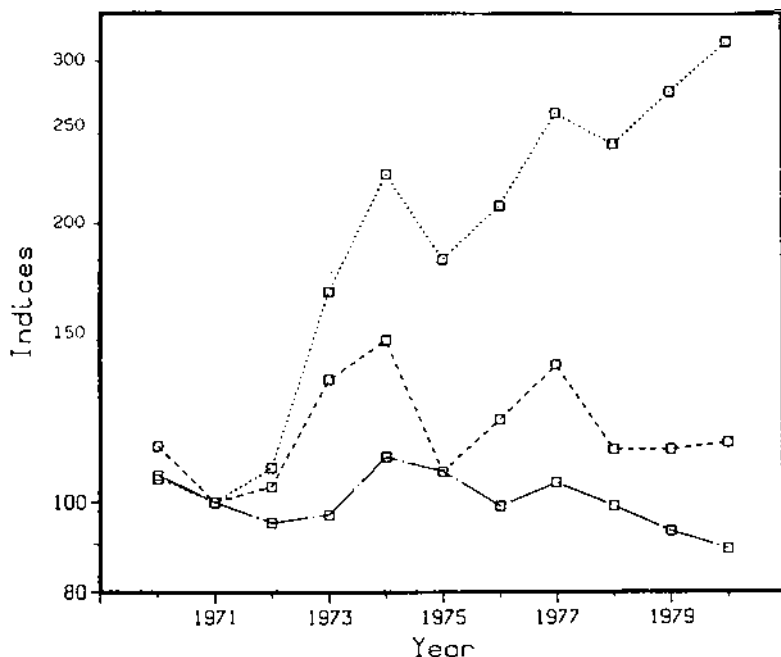
$$(1-1/P'_x) / (1-1/P'_m) > V'_m/V'_x$$

where V'_m and V'_x denote values in the current year, and all price indices are equal to unity in the base year.

¹⁵ Other factors involved were that export unit values did not rise as fast as market prices during the commodity boom, while many commodity-exporting countries export some manufactures the prices of which did not increase as fast as those of primary commodities.

As a result of these price changes, there was a large monetary gain from the export price boom, of some \$35 billion a year, on average, over the 1970s, but this was more than offset by a loss - about \$47 billion a year - from higher import prices, the trade balance thus deteriorating by almost \$12 billion a year (Table 1). Over this decade, too, the average annual change in monetary reserves of the group of commodity-exporting countries amounted to only +\$3 billion.

Fig. 1
Commodity price^a and Terms of Trade
of commodity-exporting countries, 1970-1980
 (Indices, 1971 = 100)



A = dotted line B = dashed line C = chain-dotted line

Sources: UNCTAD Monthly Commodity Price Bulletin, 1960-1984 Supplement, Geneva, July 1985; UNCTAD Handbook of International trade and development statistics, 1986 Supplement, United Nations, New York, 1987.

A = UNCTAD index in current United States dollars.

B = UNCTAD index deflated by United Nations index of unit value of exports of manufactures from developed market-economy countries.

C = Terms of trade index for commodity-exporting developing countries.

a) Market prices of 40 major commodities, other than petroleum, exported by developing countries.

Thus, the inflationary pressures in the developed countries, together with the two oil price "shocks", effectively prevented this group of countries from accumulating reserves during the commodity price boom of the 1970s on a scale adequate to cope with the succeeding price slump. The collapse of commodity prices in the 1980s (in terms of U.S. dollars) involved very substantial foreign exchange losses - some \$22 billion a year, on average, over the years 1981 to 1985 (with further losses due to price falls in 1986 and 1987). However, the decline in the dollar prices of manufactured goods provided some offset, yet the net loss in foreign exchange due to price changes, at almost \$13 billion a year from 1981 to 1985, exceeded the corresponding loss during the 1970s.

A new factor which appeared in the 1980s and which, by itself, would represent a major limitation on the present relevance of the Johnson-Behrman argument, is the sharp increase in the present decade in the debt-service burden of commodity-exporting developing countries. Whereas in 1975 interest payments on foreign debts of this group of countries represented 9.5% of exports, by 1980 the proportion had risen to 15.5%, and by 1984 to 23%. For the majority of these countries, this development has meant that commodity exports have become more a means of maintaining debt service payments to foreign creditors than a means of economic development. Thus, even if there had been a symmetry between "excess" export earnings in the commodity price upswing of the 1970s,

Table 1
Gains and losses in the commodity price cycles
of the 1970s and 1980s

	1971-1980			1980-1985		
	Exports	Imports	Trade Balance	Exports	Imports	Trade Balance
(\$billion, annual average change) ^{b)}						
Price-effect ^{c)}	+35.5	-47.1	-11.6	-22.1	+9.4	-12.7
Volume-effect ^{d)}	+4.1	- 4.8	- 0.7	+16.9	-6.9	+10.0
Total change	+39.6	-51.9	-12.3	- 5.2	+2.5	- 2.7

Source: UNCTAD Handbook of Trade and Development Statistics,
1986 Supplement, United Nations, New York, 1987.

- a) Commodity-exporting developing countries.
- b) Change compared with base year of each price cycle.
- c) Defined as $\sum_i P_{1i} Q_{1i} - \sum_i P_{0i} Q_{1i}$ where P and Q refer to prices (unit value) and quantities, respectively, summed over i commodities, the subscripts 0 and 1 relating to the base and current years, respectively.
- d) Defined as $\sum_i P_{0i} Q_{1i} - \sum_i P_{0i} Q_{0i}$

the Johnson-Behrman argument would have been invalidated by the new element of "excess" debt service since 1980.

In any event, developing countries are typically desperately short of foreign exchange to pay for essential imports, so that any accumulation of monetary reserves, even should that be feasible, would involve a significant opportunity cost, rather than being a costless transaction as claimed by Johnson.

There is also some doubt as to whether, even in a non-inflationary world economy, the gains to developing exporting countries in a commodity price boom are likely to equal the losses in the subsequent price slump. Avramovic¹⁶ has argued that low-income developing countries do not have the financial resources to carry stocks, so that they are compelled to sell any surplus production even on a falling market. Thus, their losses in a slump tend to be proportionately greater than those of developed country exporters. Moreover, when prices are rising, developing countries generally cannot afford to hold on to supplies in order to sell later at higher prices, so that their gains in a price boom tend to be correspondingly lower, proportionately, than the world average.

For these various reasons, the argument that developing countries can offset the adverse effects of cyclical fluctuations in world commodity markets by operating a

¹⁶ D. Avramovic, 'Common Fund: Why and of What Kind?', Journal of World Trade Law, Vol. XII, 1978.

counter-cyclical monetary reserves policy is oversimplified and highly unrealistic. It is worth noting, however, that this argument implicitly assumes that commodity price and earnings cycles are indeed injurious to the economic interests of commodity-exporting countries.

3. Market intervention as a less effective mechanism than compensatory financing

It has often been claimed that commodity price stabilisation by some form of market intervention is less efficient than the use of a central fund for compensating commodity-exporting developing countries for temporary shortfalls in their export earnings. For one thing, it is evident that even if market intervention is successful in reducing the amplitude of fluctuations in the total earnings of developing countries from the export of a particular commodity, this would not necessarily reduce the degree of fluctuation in export earnings from each individual country. As a recent UNCTAD report¹⁷ has shown, while fluctuations in total commodity export earnings of developing countries result mainly from price fluctuations, for individual countries earnings fluctuations are due mainly to fluctuations in the volume of exports which reflect, in turn, country-specific factors such as changes in output due to climatic variation, domestic price policies, political problems, or lagged responses to fluctuations in world market prices, as well as

¹⁷ Report of the Expert Group on the Compensatory Financing of Export Earnings Shortfalls, UNCTAD document TD/B/1029, 4 December 1984.

to variations in world demand. For this reason, a financing scheme which could compensate individual countries for shortfalls in their commodity export earnings would be able to reduce the instability of export earnings at the country level, an objective which schemes of market intervention may not be able to achieve.

Another advantage of the compensatory financing approach is that it can be applied to earnings shortfalls for any commodity, or for any group of commodities, whereas market intervention by means of buffer stocks or export quotas - the two traditional mechanisms of price stabilisation - is unlikely to be successful, or even technically feasible, for more than limited range of commodities. Moreover, a compensatory financing scheme, once established on a viable basis, can provide assurance of continuity, whereas an international price stabilisation agreement often faces the possibility of breakdown, thus injecting an additional element of risk in the outlook for commodity export earnings.

These undoubted advantages of the compensatory financing approach have led a number of economists, as well as Governments, to argue that efforts to negotiate new ICAs, or even to renegotiate existing ones, should be abandoned in favour of improving existing international compensatory financing schemes, or of introducing new ones.

This argument, too, has a number of serious limitations. First, it assumes that the shortfalls in export earnings to be

offset by compensatory finance are identical to the shortfalls which an ICA seeks to prevent or minimise. Based on the experience of the two compensatory financing schemes in operation - that of the IMF and the STABEX scheme of the European Community - the shortfalls for such schemes have been defined in relation to a moving short-term trend, usually of five years' duration. The 'floor' price defended by an ICA, however, will not necessarily be equal to the moving average centred on the year in question. Much would depend on the willingness of the executive body of the ICA to shift the price range as market conditions change, and on the amount of financial and other resources at its disposal to defend the agreed price range. Thus, the two approaches - compensatory financing and market intervention - are often not perfect substitutes.

Second, it is highly unlikely that an international compensatory financing facility (CFF) would be endowed with financial resources adequate to offset commodity export earnings shortfalls for more than a limited number of developing countries. The IMF/CFF, in the peak year of its use (financial year 1982/83) had drawings amounting to 3.7 billion SDRs, but the total drawings under this facility declined to 1.2 billion SDRs in both 1983/84 and 1984/85, and to 0.6 billion in 1985/86. As pointed out by the Group of 24,¹⁸ the contraction in CFF drawings reflected both a reduction in access limits in 1983 from 100 per cent to 83 per cent of

¹⁸ Report of the Group of 24 (Executive Directors of the IMF representing developing countries), June 5, 1987.

quota, and also the application of a highly restrictive test of cooperation with the IMF. These amounts represented only a small proportion of shortfalls in earnings of developing countries from commodity exports. An indication of the magnitude of such shortfalls has recently been given by the UNCTAD Expert Group mentioned earlier. For the period 1978 to 1982, the aggregate annual shortfall for all developing countries from exports of primary commodities amounted to \$12.5 billion, shortfalls being calculated on the basis of a 10-year exponential trend.¹⁹ For the same period, the annual average drawings under the IMF/CFF amounted to the equivalent of \$1.7 billion, so that this facility would have had to be seven times larger in order to meet the total shortfalls of all developing countries.

Third, the view that compensatory financing can substitute for the stabilisation of commodity prices implicitly assumes that the economic impact of these two measures is closely similar. However, the economic impact is likely to be substantially different, at least in most cases. The difference arises essentially because compensatory payments must necessarily be made to the governments of the commodity-exporting countries concerned, and such payments may, or may not, be passed on, either wholly or in part, to the commodity sector suffering the export shortfall. By contrast, the successful support of a 'floor' price by an ICA

¹⁹ Report of the Expert Group on the Compensatory Financing of Export Earnings Shortfalls, op. cit.

has a direct, and stabilising, impact on the export earnings of commodity producers.

This differential impact can have important consequences for the traditional cycle of overproduction followed by underproduction of many primary commodities. A reduction of commodity price fluctuations can be expected to lead to a reduction in the amplitude of the production cycle whereas - as Peter Ady²⁰ has argued - compensatory payments would leave the production cycle untouched. Moreover, a compensatory scheme involving loans would require future debt-servicing obligations, an additional claim on scarce foreign exchange that would not arise if market intervention was successful in defending a 'floor' price.

In view of the different economic impacts of the two approaches, as well as the probable infeasability of meeting temporary export earnings shortfalls from a compensatory payments scheme alone, it would seem desirable to pursue both avenues simultaneously. This would also have the important practical advantage of reducing the total amount of finance that would be required to meet temporary export earnings shortfalls of individual developing countries. For small exporters, variations in the volume of exports are not likely to have a significant impact on the world price. For such countries (the 'price takers'), variations in export earnings arise mainly from variations in export volume, though price

²⁰ P. Ady, in 'Proceedings of the Seminar', in Sengupta (ed.), op. cit., pp.264-268.

fluctuations can also play an important role for some countries in some years. Any reduction in price fluctuations resulting from market intervention would thus also reduce fluctuations in export earnings of such countries and, *ipso facto*, would also reduce their earnings shortfalls.

For large exporters, however, the position is more complicated, since changes in their export volumes can affect the world price. For example, if a large exporter which dominated world supplies faced a world demand of unit price-elasticity, fluctuations in its export volume would be offset by equal, and opposite, proportionate fluctuations in the world price, so that its export earnings would remain constant. In that situation, any market intervention which limited the price fluctuation would thereby also create a fluctuation in export earnings. More generally, there is a critical level of the reduction in the amplitude of price fluctuation above which the export earnings of large exporters (the 'price makers') will be destabilised when the price-elasticity of demand for their exports is relatively high.²¹

²¹ Let $\alpha = p^*/p$, where p = proportionate change in price from one period to the next, and p^* = the corresponding price change resulting from market intervention. Then, for a large exporter, the proportionate change in export earnings (r) in the absence of market intervention is:

$$r = q(1-1/\epsilon)$$

where q is the proportionate change in volume and ϵ is the price-elasticity of demand. The corresponding change in export earnings with market intervention (r^*) is:

$$r^* = q(1-\alpha/\epsilon)$$

so that the critical value of α is when $\alpha = 2\epsilon - 1$. For example, if market intervention reduces the amplitude of price fluctuation by 50% (i.e. $\alpha = 0.5$), then the export earnings fluctuation of a large exporter will also be reduced provided the demand elasticity for its exports is lower than -0.75. A smaller degree of market intervention, for example, with

Thus, a reduction in the amplitude of price fluctuation, in the context of an ICA, can be expected to reduce export earnings instability, and shortfalls, of the majority of commodity-exporting developing countries (since these are 'price takers'), as well as of larger exporting countries (the 'price makers'), providing the demand elasticity for their exports does not exceed a critical level. There will no doubt be some large exporters, however, which will find that their export earnings fluctuations are exacerbated by a reduction in price instability, and for these compensatory payments would be highly appropriate.

4. Market intervention as a mechanism for misallocation of resources

An apparently powerful argument against the use of market intervention in order to reduce commodity price fluctuations derives from the neoclassical model of the workings of a perfectly competitive market. Standard neoclassical theory proceeds from a set of assumptions which define a "perfect" market in which buyers and sellers trade in order to maximise their subjective utilities, while each productive factor is remunerated according to its marginal productivity. The main assumptions made are the existence of perfect competition in both goods and factor markets, perfect foresight, perfect factor mobility and price flexibility, full employment, the

$\alpha = 0.75$, would reduce earnings fluctuation provided the demand elasticity was less than -0.875 .

absence of 'externalities', and an unchanged original income-distribution. On these assumptions, neoclassical theory demonstrates that the 'free play of market forces' will result in an equilibrium situation characterized by both an optimum allocation of resources and an optimum level of welfare or real income. Moreover, exogenous shocks will cause adjustments which will move the system towards a new equilibrium. Market 'imperfections', such as oligopoly or 'externalities', are then analysed as aberrations from the ideal world of perfect competition.

Neoclassical theory thus provides the basis for the argument that intervention in international commodity markets, by distorting the 'free play of market forces', would inevitably result in a global misallocation of resources and a consequential loss of real income on a world scale. This argument has often been advanced in international commodity discussions by those who are opposed in principle to commodity price stabilisation.

Given its assumptions, the neoclassical theory is a self-contained logical system. However, as has frequently been pointed out, those assumptions are so far removed from reality that the theory has little relation to actual economic change. Moreover, as soon as some of the basic assumptions are modified, so as to reflect real-world phenomena, the theory is faced with major logical problems. As one eminent neoclassical theorist has recently explained, neoclassical general equilibrium theory faces logical limitations if there are

increasing returns to scale which are large relative to the size of the economy (since this will lead to the emergence of large firms with monopoly power); if there is market power for individuals to exploit (since this will lead to individuals influencing equilibrium prices); if market information differs as between buyers and sellers (in which case certain contingent markets cannot logically exist); if there are public goods (for which the fundamental welfare theorems cannot hold); and if there are externalities, i.e. if one individual's actions affect the welfare of another (Hahn, 1982).

Thus, neoclassical theory faces a dilemma - that as a logical system it is unrealistic, while as it moves towards reality it becomes subject to logical limitations. Some of these limitations arise in acute form where, as in many of the international commodity markets, large transnational enterprises use their oligopoly or oligopsony positions not only to increase their profits but to extend their market power on a global scale. What Perroux²² has called the 'domination effect' - where a dominant economy, exerts its influence on another economy, either through market operations or by more direct means, to serve its own purposes - is only a particular example of a rejection of the neoclassical notion that economic activity consists of buyers and sellers of equal power exchanging goods and services through a market process. The basic assumptions of the neoclassical approach have tended

²² F. Perroux, 'The domination effect and modern economic theory', Social Research, Vol.17, 1950 (reprinted in K.W. Rothschild, Power in Economics, London, Penguin Books, 1971).

to result in analyses of primary commodity markets being focussed on price and income fluctuations of buyers and sellers in market clearing situations with ancillary consideration of the effects of market 'imperfections'.

In a 'free market' system, price performs a dual function. First, changes in relative prices indicate changes in relative scarcities in goods and factor markets, thus providing signals and incentives for new investment and for appropriate changes in relative outputs of different goods and services. Second, changes in prices necessarily involve changes in the distribution of the benefits of trade between buyers and sellers. The neoclassical approach raises some major problems for the analysis of each of these two functions of price, essentially because actual (or 'real world') commodity markets do not conform to the neoclassical paradigm.

The central difference between actual and neoclassical international markets for primary commodities is that a wide range of actual markets have tended to become dominated by oligopolistic and/or oligopsonistic elements, reflecting the dramatic postwar expansion of the market power of transnational corporations (TNCs), as well as - for a number of important commodities - the intervention of governments in market operations. While neoclassical price theory can explain price changes when competition prevails on the side either of buyers or of sellers (as well as, of course, when both sides of the market are competitive), it becomes ineffective when a group of oligopsonistic buyers confront a small number of

oligopolistic sellers. The oligopsony-oligopoly situation is fairly typical in a number of commodities (particularly so in minerals exported by developing countries), for which prices are determined, to a greater or lesser extent, by the relative bargaining power of the two sides.

In such situations, the theory of bargaining related to two-person zero-sum games can provide useful insights. But, as Labys²³ argues, bargaining theory tends to be ineffective where there is mutual dependence between buyer and seller, where more than two decision-making entities operate on each side of the market, or where there is a non-zero sum involved. Nonetheless, a credible explanation of price in its division of benefit function would seem to require the incorporation of some form of bargaining theory.

A second difficulty with the neoclassical approach in relation to commodity markets arises because, by its treatment of 'externalities' as market 'imperfections', it implies that governments can eliminate such imperfections by appropriate policy measures. On closer analysis, many of these imperfections are seen to be integral parts of the economic system, reflecting essentially the underlying power structure and its institutional manifestations. Thus, the assumption by many neoclassical analysts (and often by government negotiators) that the absence of government intervention in a commodity market can be equated with perfect, or near-perfect,

²³ W.C. Labys, Market Structure, Bargaining Power and Resource Price Formation, Lexington Books, 1980.

competition, and with an optimum allocation of resources, is a spurious one.

In fact, actual markets perform inefficiently in many important respects, not least in their allocation of resources. Particularly where market forces reflect an oligopolistic market structure, decisions on investment, output and prices can diverge substantially from those which would obtain in a perfectly competitive market, thus distorting both the allocation of resources and the division of benefit. Equally, when the 'free play of market forces' gives rise to large price fluctuations, the price mechanism fails to provide a sure guide to new investment and to rational resource allocation. Such commodity markets move from one disequilibrium situation to another, in a continuous series of shortages and gluts, rendering the neoclassical thesis that market forces will automatically re-establish an equilibrium position unrealistic and unhelpful.

A third difficulty is that even where there is effective competition among many sellers and among many buyers, it is not possible to ensure that all decisions are rational in the sense that they correctly take future developments into account. Uncertainty about future prices is a major perennial problem of actual commodity markets and this, together with supply time-lags in adjustment to price changes, inevitably leads to a greater or lesser degree of misallocation of new investment. While futures and contingency markets have a useful role to play in shifting the risk of future loss from

traders to speculators, the existence of such markets will reduce the probability of resource misallocation only to the extent that they correctly anticipate future market conditions. Such markets exist only for a limited, though important, range of commodities, while as Kofi²⁴ (1973) shows, their efficiency in anticipating future price changes varies considerably. The degree of price uncertainty may also be reduced as a result of intergovernmental intervention, for example by means of a commodity agreement which effectively maintains prices within an agreed range. To the extent that uncertainty is thereby reduced, such market intervention may in fact result in less misallocation of resources than would otherwise occur.

Thus, it is not valid to argue on the basis of standard neoclassical theory that market intervention *per se* will necessarily result in resource misallocation. Rather, the effects of market intervention on resource utilisation and the division of benefits between producers and consumers will depend on the type of intervention, the mechanisms adopted, their flexibility in terms of changing market conditions and their effects on current and longer-term demand and supply.

Export quotas. One particular mechanism of market intervention, viz. export quota restriction, can result in significant resource misallocation in so far as quotas may "freeze" the existing pattern of production, thereby keeping

²⁴ T.A. Kofi, 'A framework for comparing the efficiency of future markets', American Journal of Agricultural Economics, Vol.55, No.4, Part I, November 1973.

high-cost producers in business and discriminating against more efficient producers. This problem arises essentially when export quotas are used as the sole, or the principal, mechanism of price stabilisation. The difficulty arises because while it is in the collective interest of exporters to limit their aggregate export volume, it is in their individual interest to maximise their share of world exports of the commodity concerned. The allocation of quota shares, at least in the initial negotiations, tends to reflect very largely the relative bargaining strengths of the various exporting countries, rather than their relative export potential. Moreover, export potential depends to a greater or lesser extent on investment in new capacity, and this, in turn, is likely to be influenced by the quota allocation itself. Thus, unless there are effective provisions for quota reallocation during the lifetime of an Agreement, there is a real danger that the export potential of small, or of new, exporting countries with weak bargaining power will be frustrated. An incentive would, therefore, exist for such countries either not to join an Agreement, or to break away from it, unless acceptable quota allocation and reallocation arrangements are provided by the terms of the Agreement.

Accommodating the interests of new exporting countries - some of which may have the capability of rapidly expanding their output to become large exporters - raises some difficult problems since negotiations on market shares (which determine each country's basic quota) have necessarily to be based in large measure on historical performance. Since total exports

are limited under a quota system, the share of new exporters can grow only at the expense of established exporting countries.²⁵ This is essentially a "trade-off" situation, in which the established exporters will seek to offer small current quotas plus some degree of export growth in order to keep the new exporters in the Agreement. The latter will seek larger current quotas than indicated by historical performance, together with provision for export growth corresponding to their production expansion programmes.

A number of different compromise solutions have been adopted in recent Agreements. The quota allocation principles adopted in the Tin and Cocoa Agreements came closest to reflecting changes in the relative production potential of exporting countries. In the case of tin, quotas were based on relative shares of production or exports in the last preceding year in which controls were not in force, while for cocoa - under the 1975 Agreement - quotas were envisaged as being based on a moving average of production in the preceding five crop years. The use of a moving average of production performance to determine export quotas incorporates some element of flexibility into an international quota scheme and, to that extent, the criticism that quotas inevitably involve the "freezing" of production patterns is less justified.

The Sugar Agreement of 1977 used a different approach, making provision, after the first two years of operation, for

²⁵ For a detailed consideration of conflicts of interest in commodity agreements, see Rangarajan, *op. cit.*

the renegotiation of the quotas originally agreed, thus allowing for some flexibility so as to reflect any changes in the structure of world sugar production. In the International Coffee Agreement, 1976, a more complex formula was elaborated, by which the major part of the export quota was fixed in relation to past export performance, while a variable part was related to the volume of stocks held. The Agreement laid down that if quotas came into effect in the first year, the fixed part should be related to average exports over the four years 1968/69-1971/72 (the mid-point of which was over six years earlier). Only if quotas came into effect in later years, or if they had been imposed but had been suspended, were more recent exports taken into account. These provisions thus allowed a certain amount of flexibility, while safeguarding the market shares of the large established exporters (Brazil and Colombia), which would also be the main beneficiaries of the variable part of the quota. In the event, however, quotas did not come into effect until October 1980, since market prices had previously remained above the ceiling level.

Though there is not yet an Agreement for tea, the question how best to allocate export quotas in a possible tea Agreement has been under discussion among tea-producing countries for over a decade. In this case, the main established exporters (India and Sri Lanka) proposed using the principle of "differential growth", whereby, after the initial quotas were established, the major part of the growth in world demand would be met by increased quotas for the newer producing countries (essentially those of East Africa). Thus,

while the share of the established exporters would decline, the absolute volume of their exports would increase, albeit by only a small amount. However, an agreement on these lines did not prove possible because the growth in world import demand for tea was insufficient to accommodate the growth in export potential of the newer producers as well as the existing volume of exports of the traditional exporters. More recently, discussions on this problem among tea-producing countries have focused on the possibility of quota allocation based on estimates of the export potential of individual countries.²⁶ If an Agreement were reached on this basis, it would constitute an important innovation in efforts to ensure adequate flexibility in quota allocations.

Each of the different Agreements discussed above thus adopted a somewhat different approach to the problem of maintaining flexibility in the pattern of production. It is, however, extremely difficult to determine with any accuracy the precise degree of flexibility involved in each case, since a simple comparison of quota shares with production shares would ignore the fact that, as mentioned earlier, production trends may well be influenced by the quota itself. This is likely to be particularly the case if the quota cut is deep and/or if quota restrictions are maintained for a number of consecutive years.²⁷ On an *a priori* basis, however, it can be

²⁶ This is possible in the case of tea, since good estimates of the mature planted area, and of mature area yields, can be made for some years ahead.

²⁷ Estimates of the probable impact of quota restrictions on the country pattern of production might be derived from econometric models of markets with occasional or intermittent use of quota restrictions, but this

said that Agreements containing provisions for annual revisions of quotas to correspond with the changing country pattern of production should go far to avoid the danger of "freezing" the existing pattern. If this accepted - and the various quota allocation principles embodied in recent ICAs would have this implication - one question that arises is whether, and to what extent, such revisions can be based on some element of automaticity.

The search for a fully automatic system of quota revision is intellectually appealing. If such a system gained general acceptance within the framework of an ICA, it would remove a major source of contention among producing countries, and at the same time prevent an undesirable "freezing" of the pattern of production. A proposal for such an automatic system was indeed put forward over 25 years ago by Professor Kaldor.²⁸ Under his proposal, the initial export quotas would be negotiated in the traditional manner. Each producing country would then impose a variable export duty, the height of the duty being set at a level that would limit domestic production to the total of domestic requirements plus the quantity of exports allowed by the quota. Once each country attains the export duty that keeps its domestic production in balance with its requirements, the level of that duty in relation to the f.o.b. price of the commodity gives a clear indication of the domestic cost of production in terms of international

approach would probably not be practicable where quotas have been in more or less continuous use for a considerable period.

²⁸ N. Kaldor, 'Stabilizing the terms of trade of under-developed countries', Economic Bulletin for Latin America, March 1963.

currency. It follows that a country which has to impose a duty higher than average also has lower-than-average costs of production.

Professor Kaldor suggested that after an initial phase of, say, three or five years, during which the basic quotas would remain unchanged, there would be an annual redistribution of quotas in favour of countries whose net export duties are above average, at the expense of countries whose net export duties are below average. To guard against the imposition of excessive export duties to gain a quota increase, Professor Kaldor proposed that only countries making full use of existing quotas should be entitled to any quota increase. Since countries whose basic quotas are increased would be forced to reduce their export duties (in order to take up the additional quota), while countries whose quotas are reduced would be forced to increase them (to avoid accumulating excessive stocks), there would be a gradual equalization of the level of export duties among the various exporting countries.²⁹ This, in turn, implies that the scheme would tend to bring about the same distribution in the pattern of production and trade as would occur in a fully competitive market, but without the price fluctuations and uncertainties involved in the latter.

Professor Kaldor's proposal would, if fully implemented, reconcile the potential rigidities of an export quota scheme

²⁹ To allow for the possibility of some countries providing subsidies to commodity producers, the export tax in Professor Kaldor's scheme should be interpreted as net of subsidy.

with the need for flexibility in production and trade patterns so as to reflect changes in relative productive efficiency. One modification which could usefully be considered would be to make special allowance for developing countries which are heavily dependent on exports of a particular commodity.³⁰ If such countries have above-average production costs, a continuing reduction in their quotas would entail considerable economic disruption. Such countries could, however, be exempted from quota cuts, unless they were provided with effective international assistance to diversify their economies. The scheme would remain viable provided, however, that the exempted countries accounted for only a small proportion of total supplies coming on to the world market.³¹

However, it would seem unrealistic to expect this type of scheme, even with modifications,³² to be adopted by governments in the near future. For one thing, governments of many developing countries appear to be opposed in principle to the imposition of taxes on their exports on the grounds, *inter alia*, that such taxes would be detrimental to an expansion in demand in consuming countries. A second consideration is that many governments are generally opposed to any automatic formula in the framework of international commodity

³⁰ Special allowance for such countries was incorporated in the International Sugar Agreement, 1977, article 34, para. 2(v), as regards the renegotiation of basic export tonnages.

³¹ This qualification would be especially relevant to commodities such as tin, where the main high-cost producer has been a major exporter.

³² Apart from exemption of certain countries from quota cuts, such modifications would have to include allowance for changes in the effective exchange rates confronting exporters.

Agreements, whether related to the price range, to the quota mechanism or to any other aspect. The large established exporters, or the large importers, according to the issue in question, tend to prefer an open, non-automatic, system in which "all relevant factors" can be discussed, since this maximizes their effective bargaining position. While a modified Kaldor-type approach may be the most efficient solution in principle to the quota allocation problem, it is doubtful whether it could be successfully negotiated, at least in the medium-term future.

Meanwhile, a more practical short-term approach would be to build on what has already been achieved. There is no doubt that the various quota-using Agreements had made very considerable efforts to ensure adequate flexibility in quota allocations, though clearly the flexibility achieved was greater in some cases than in others. One possible way forward might be for the Agreements to seek some appropriate semi-automatic indicator which would combine some of the main principles already in use (e.g. recent export performance, current levels of stocks and the importance of the commodity in the export earnings of individual countries), as a guide for the quota revision process, while allowing member Governments freedom to consider "all other relevant factors".

5. Market intervention as a mechanism for raising prices

Finally, an argument that has often been raised against 'pure' price-stabilising ICAs (i.e., where the objective is to

reduce fluctuations, but not to alter the trend) is that though they may be successful in reducing price fluctuations, the average level of prices will eventually be higher than it would be in the absence of market intervention. This could arise, in principle, in several ways, as suggested by Sengupta.³³

One possibility for such 'price enhancement' to occur would be if, in the context of an ICA, the price range defended was significantly higher than that indicated by underlying market conditions. This could arise if a surplus of supplies emerged on the world market, but the price range adopted earlier was not revised downwards accordingly, as a result of the resistance to such revision by producer countries. Similarly, in a period of supply shortage, producer pressure could result in an upward 'overshooting' of the price range. However, this argument overlooks the countervailing power of consumer countries in influencing revisions to the price range defended by an ICA. Since consumer countries have, in aggregate, equal votes as producers - standard practice in ICAs - it is unlikely that they would acquiesce in maintaining an unrealistically high price range for any length of time. Indeed, the recent experience of price range revisions indicates that consumer pressure to reduce the price range in a period of excess supply has been determined and frequently successful.

³³ A. Sengupta, *op. cit.*

A second possibility mentioned by Sengupta (op. cit.) is that while an ICA may be able to defend a 'floor' price, it may not find it possible to defend a 'ceiling' price (i.e. the maximum of an agreed price range). To the extent that this is the case, and if the period covers several failures to defend the 'ceiling', then the average price over the period will be higher than it would have been in the absence of ICA intervention. This is, of course, correct but a persistent failure to defend an agreed price maximum indicates a lack of adequate resources (i.e. too small a physical stock), combined possibly with inefficient planning of operations by the ICA authorities. Both producing and consuming countries have generally been reluctant to finance large holdings of stocks by price-stabilising ICAs, but since it is in the interests of consuming countries to provide for adequate resources to defend an agreed price 'ceiling' within the context of an ICA of which they are members, the remedy for a persistent failure to do so lies essentially in their own hands.

A third avenue leading to price enhancement could arise to the extent that cooperation among producers in the context of an ICA led to new forms of producer cooperation such as production regulation or joint marketing of exports. In some cases, producer cooperation to restrict production or exports would lead to higher prices on world markets. Once again, however, this argument would appear to overstate the case, since if the objective conditions for effective producer cooperation exist, as they manifestly did for the petroleum-exporting countries in the early 1970s, then they would be

likely to create the required institutional mechanisms directly, or to use their existing institutions as in the case of OPEC, rather than to develop such institutions as a result of prior cooperation with consuming countries.

These various arguments, in any case, implicitly assume that action to raise commodity prices above the level that would obtain in the absence of intervention is inherently 'bad' - being unfair to consumers and also involving some degree of resource misallocation - and thus to be avoided at all costs. It should perhaps be noted that the very governments which oppose intervention in the international commodity markets have been pursuing interventionist policies in their domestic markets for agricultural products throughout the whole postwar period and even long before that. By the mid-1980s, the total amount of government subsidies to domestic farmers in the United States, the European Community and Japan exceeded \$50 billion annually, equivalent to about 60% of the total annual value of all agricultural exports from developing countries.

There is, moreover, a positive case to be considered for price enhancement in certain circumstances, which could, in principle, justify extending the objectives of a price-stabilising ICA to include influencing the trend of prices as well as reducing price fluctuations. First, where depressed commodity prices on the world market have arisen partly or wholly as a result of the subsidisation by developed country governments of an expansion of domestic high-cost production,

then low-cost producing countries have a claim, in equity, for some form of compensation for loss of markets or loss of export earnings. This has been the situation for several important commodities exported by developing countries, notably for sugar.³⁴ In such situations, intervention aimed at raising prices on the world market from depressed levels could be considered as one possible form of compensation.

A second situation in which positive action to raise a depressed level of prices would merit serious consideration is where a persistent surplus has arisen as a result of a more rapid expansion of exportable production in developing countries than the corresponding growth in world demand at constant prices. This situation would also be associated with a loss of export earnings and with a corresponding constraint on the financing of development in the exporting countries concerned. Action to raise prices in such circumstances would alleviate the balance of payments constraint, but would rapidly become ineffective if the price increase was passed on to the producing sector involved.

Thus, international intervention would need to be supplemented by assurances from governments of producing countries that exportable production, or exports, of the commodity would not be increased as a result of any rise in

³⁴ A recent estimate of the effect of a complete removal of barriers to trade in sugar and beef by all OECD countries shows that this would result in a rise in export earnings of developing countries from about \$6.5 to \$12 billion a year (at 1980 prices), most of the gain relating to sugar (J. Zietz and A. Valdés, The cost of protectionism to developing countries, World Bank Staff Working Paper, No.769, Washington, D.C., World Bank, January 1986).

prices on the world market. If the surplus appears likely to persist, then there would be a case for part of the increase in export earnings resulting from market intervention to be channelled towards the financing of diversification away from the surplus commodity. However, in a period in which a wide variety of commodities may well be in continuing oversupply, as indicated by persistently low prices, some institutional mechanism for harmonisation of the diversification programmes of different countries would be needed in order to avoid the danger that diversification might result simply in transferring a surplus situation from one commodity to another.³⁵

As demonstrated in a recent theoretical analysis by Spraos, price enhancement by means of an ICA (with equal consumer and producer representation) would have benefits for developed countries if the alternative was an effective producer cartel.³⁶ As is now widely recognised, the Western industrial countries would have reaped substantial gains had they been willing to negotiate a price enhancement (and stabilisation) agreement with OPEC before 1973. Though the conditions for successful price enhancement by producer action remain fairly rigorous,³⁷ they would be significantly eased, as

³⁵ For a more detailed discussion, see Report of the Advisory Committee to the Trade and Development Board and to the Committee on Commodities, [ref. to be inserted]

³⁶ J. Spraos, Inequalising Trade? A Study of Traditional North/South Specialisation in the Context of Terms of Trade Concepts, Oxford, Clarendon Press in cooperation with UNCTAD, 1983 (Chapter VIII).

³⁷ Apart from the commodity in question having a price-inelastic demand, the conditions for successful cartel action would include a high proportion of initial output under the control of cartel members; cohesion

Spraos points out, if such action covered a range of competing products (e.g, coffee, cocoa and tea; or aluminium, copper and tin), rather than a single product alone, and if cohesion among producing countries could be significantly increased. For those groups of commodities for which potential producer action would appear feasible, it would be in the interests of developed countries to avoid unilateral price enhancement by the negotiation of appropriate ICAs.

Apart from such specific circumstances in which a case can be made for price enhancement, there is the general case as put forward almost simultaneously in the now famous thesis of Prebisch³⁸ and Singer³⁹, to the effect that there exists a long-term tendency of the terms of trade of commodity-exporting developing countries to deteriorate. The controversy surrounding this thesis is touched upon in Chapter 8. Here it suffices to mention that the deterioration thesis implies - as was indeed proposed by Prebisch - that countervailing action is needed in order to "transfer, in one way or another, to the countries exporting primary commodities the extra income accruing to the industrial countries as a result of the deterioration in the terms of trade".⁴⁰ A price-enhancing

among these members; significant start-up costs for non-members; low cost for members in deterring non-member production; and no concerted retaliation by consumers (see Spraos, op. cit.).

³⁸ R. Prebisch (1950), op. cit.

³⁹ H. Singer (1950), op. cit.

⁴⁰ R. Prebisch, Towards a New Trade Policy for Development in Proceedings of the United Nations Conference on Trade and Development, New York, United Nations, 1964, Vol. II, p.12.

commodity agreement could, in principle, be one method of effecting such an income transfer.

A brief overview

Intervention in the international commodity markets in order to attenuate the fluctuations in commodity prices has been strenuously opposed by many influential economists in the neoclassical tradition, and their arguments have often been deployed by the governments of the larger Western industrial countries to justify their own reluctance to support market intervention agreements. A detailed examination of the principal arguments that have been used in this context, however, reveals that many of them are based on untenable assumptions or are otherwise invalid or of limited applicability. At the same time, it must be recognised that some forms of market intervention could have undesirable effects in retarding the process of structural change in the pattern of world production, and that market intervention alone cannot, in any event, solve the problems of commodity-exporting countries. Complementary measures, in particular, adequate compensatory financing arrangements and provision for international financial support for diversification programmes, would be necessary to deal effectively with the problems for developing countries arising from excessive commodity market instability.

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